Platform Documentation

ProVision

Application Version 8.2.0

Covering:

- Installation Guide
- Getting Started
- User Guide
- Admin Guide
- Developer Tools
- Help & Support

For additional information, please visit https://docs.6connect.com or contact 6connect at support@6connect.com

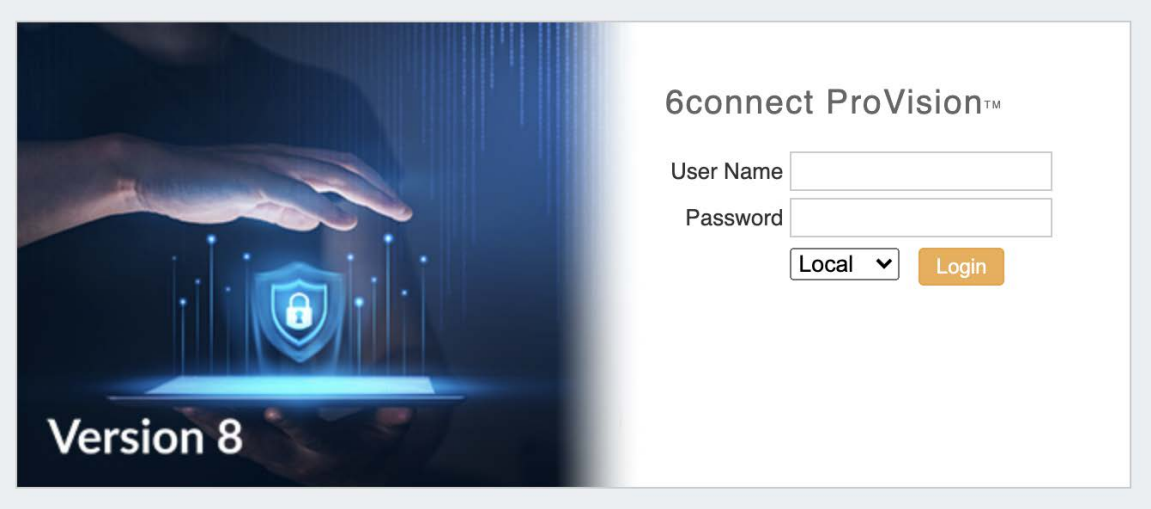
1. Installation Guide . . . 4
1.1 Hosted Instances Guide . . . 5
1.2 LocalVM Installation Guide . . . 6
1.2.1 System Requirements . . . 7
1.2.2 Backup and Redundancy Local-VM . . . 10
1.2.3 6connect Local Software Upgrades . . . 12
1.2.4 Local Installations - Peering Setup . . . 13
1.2.5 Local Installations - Master-Master Replication . . . 18
1.2.6 Local Installations: SNMP . . . 28
1.3 ESXi VM Image Setup . . . 32
2. Getting Started . . . 34
2.1 First Steps . . . 35
2.2 Resource Concepts . . . 40
2.3 Workflow Concepts . . . 44
3. User Guide . . . 65
3.1 The Dashboard . . . 66
3.1.1 Customizing the Dashboard . . . 70
3.1.2 Working with Dashboard Widgets . . . 75
3.1.3 Available Dashboard Widgets . . . 78
3.2 Working with Resources . . . 92
3.2.1 Working with Entries . . . 95
3.2.2 Customizing Sections . . . 110
3.2.3 Customizing Fields . . . 117
3.2.4 Customizing Resource Lists . . . 125
3.2.5 Gadgets . . . 137
3.2.5.1 ACP Gadgets . . . 139
3.2.5.2 Contacts Gadgets . . . 143
3.2.5.3 Data Storage and Info Gadgets . . . 145
3.2.5.4 DHCP Gadgets . . . 149
3.2.5.5 DNS Gadgets . . . 154
3.2.5.6 IPAM Gadgets . . . 157
3.2.5.7 Peering Gadgets . . . 164
3.2.5.8 Resource Gadgets . . . 167
3.2.5.9 XML Specifications . . . 177
3.2.6 Contact Manager . . . 178
3.3 DNS Tab . . . 191
3.3.1 Working with DNS Groups . . . 196
3.3.2 Editing DNS Zones . . . 214
3.3.2.1 Zone View . . . 217
3.3.3 Working with DNS Zones - Common Tasks . . . 224
3.3.4 Working with DNS Records . . . 238
3.4 DHCP Tab . . . 252
3.4.1 Working with DHCP Groups . . . 254
3.4.2 Working with DHCP Pools . . . 266
3.4.3 Working with DHCP Classes . . . 285
3.4.4 Working with DHCP Gadgets . . . 290
3.5 Managed Servers . . . 305
3.5.1 Working with Managed Servers . . . 319
3.6 IPAM Tab . . . 341
3.6.1 IPAM Workflow . . . 353
3.6.2 Working with IP Aggregates . . . 356
3.6.3 Working with IP Blocks . . . 367
3.6.3.1 Working with IP Blocks - Common Tasks . . . 378
3.6.3.2 Working with NAT Blocks . . . 397
3.6.4 Working with IP Rules . . . 402
3.6.5 VLAN . . . 409
3.6.5.1 Working with Domains . . . 426
3.6.5.2 Working with the VLAN Manager . . . 434
3.7 Peering v2 . . . 447
3.7.1 Peering Exchanges . . . 456
3.7.2 Peering Routers . . . 463
3.7.3 Peering Sessions . . . 467
3.7.4 Managing Peers . . . 471
3.7.5 Peering Emails . . . 478
3.8 Reporting . . . 486
3.8.1 Working with Reports . . . 497
3.9 User Preferences . . . 509
4. Admin Guide . . . 512
4.1 Admin Settings . . . 514
4.1.1 Application Settings . . . 515
4.1.2 Authentication Options . . . 522
4.1.2.1 RADIUS Authentication . . . 526
4.1.2.2 LDAP Authentication . . . 530
4.1.2.2.1 LDAP Authentication on Windows Server . . . 537
4.1.2.3 SAML Authentication . . . 541

4.1.2.4 DUO Authentication . . . 545
4.1.3 DNS Settings . . . 547
4.1.4 DHCP Settings . . . 552
4.1.5 Peering Settings . . . 554
4.1.5.1 Peering Templates . . . 556
4.1.6 Template Settings . . . 563
4.1.7 Scanning and Discovery Settings . . . 566
4.1.8 Managed Servers Settings . . . 568
4.2 IPAM Administration . . . 577
4.2.1 IPAM Parameters . . . 580
4.2.2 IPAM Rules . . . 596
4.2.3 Holding Tank Management . . . 602
4.2.4 RIR Integration: SWIP-RPSL . . . 609
4.2.5 LIR Management and Use . . . 613
4.2.5.1 ARIN LIR Setup and Use . . . 620
4.2.5.2 RIPE LIR Setup and Use . . . 625
4.2.5.3 LIR Walkthrough . . . 629
4.2.6 Smart Assign Templates . . . 634
4.2.7 Alerts Management . . . 647
4.3 DNS Administration . . . 654
4.3.1 Working with DNS Servers . . . 667
4.3.2 Configuring ISC BIND Support . . . 678
4.3.3 Configuring PowerDNS Support . . . 682
4.3.4 Configuring Secure64 Support . . . 687
4.3.5 Configuring Secure64 x86 . . . 694
4.3.6 Configuring Route53 Support . . . 697
4.3.7 Configuring Split Horizon and Views . . . 701
4.3.8 Configuring DNSSEC . . . 706
4.4 DHCP Administration . . . 710
4.4.1 Working with DHCP Servers . . . 714
4.5 Importing Your Data . . . 725
4.5.1 Resource Import from CSV . . . 731
4.5.2 Resource Import Tool . . . 738
4.5.2.1 Resource Importer Walkthrough - Step 1 . . . 741
4.5.2.2 Resource Importer Walkthrough - Step 2 . . . 743
4.5.2.3 Resource Importer Walkthrough - Step 3 . . . 745
4.5.2.4 Resource Importer Walkthrough - Step 4 . . . 746
4.5.2.5 Resource Importer Walkthrough - Step 5 . . . 750
4.5.2.6 Resource Importer Walkthrough - Step 6 . . . 751
4.5.3 Import Sessions . . . 754
4.5.4 IP Import from CSV . . . 759
4.5.5 Import Aggregate Blocks . . . 766
4.5.6 Import DNS Zones . . . 769
4.5.6.1 BIND DNS Zone Upload and Import . . . 773
4.5.6.2 PowerDNS Zone Import . . . 778
4.5.6.3 InfoBlox Zone Import . . . 780
4.5.6.4 NS One Zone Import . . . 783
4.5.6.5 Dyn DNS Zone Import . . . 786
4.5.6.6 DNSMadeEasy Zone Import . . . 789
4.5.6.7 IPPLAN Zone Import . . . 792
4.6 Users and Permissions . . . 794
4.6.1 Global Permissions . . . 798
4.6.2 Resource Permissions . . . 801
4.6.3 Verifying Permissions . . . 803
4.6.4 Working with Users . . . 806
4.6.5 Working with Groups . . . 817
4.7 API Tab . . . 827
4.8 Scheduler . . . 828
4.9 Log . . . 836
4.10 Approvals . . . 841
4.10.1 Pending Approvals . . . 853
4.10.2 Approval Permission Groups . . . 862
4.11 Constraints . . . 875
5. Developer Tools . . . 890
5.1 Theming . . . 893
5.2 APIv2 . . . 904
5.3 API v1 . . . 913
5.3.1 API Module - Admin and Audit . . . 917
5.3.1.1 Authentication Testing . . . 918
5.3.1.2 Backup . . . 920
5.3.1.3 Log Management . . . 921
5.3.1.4 Scheduler API . . . 923
5.3.1.5 Zone Templates . . . 927
5.3.2 API Module - DHCP . . . 929
5.3.2.1 API Module - DHCPv2 . . . 934

5.3.3 API Module - DNS . . . 944
5.3.4 API Module - IPAM . . . 967
5.3.5 API Module - LIR . . . 987
5.3.6 API Module - Peering . . . 994
5.3.7 API Module - Resource . . . 1003
5.3.8 API Module - VLAN . . . 1012
5.3.9 3 - SDK . . . 1020
5.3.10 How Do I... . . . 1023
5.4 Portable Gadgets . . . 1033
5.4.1 Getting Started With Portable Gadgets . . . 1041
5.4.2 Portable Gadget Customization . . . 1044
5.5 Toolkit . . . 1046
5.5.1 IPPlan Importer . . . 1050
5.6 Resource Concepts 1 . . . 1053
5.6.1 Resource Classes Doc . . . 1054
5.6.2 Database Layout 1 . . . 1056
5.6.3 Asset System . . . 1058
6. Global Commander . . . 1060
7. Help and Support . . . 1067
7.1 Tutorials . . . 1071
7.1.1 Common Tasks . . . 1072
7.1.2 UI Tours . . . 1073
7.2 FAQ . . . 1075
7.3 Additional Resources . . . 1078
7.3.1 Import Templates . . . 1079
7.3.2 List of Abbreviations . . . 1080
7.4 Feedback and Feature Requests . . . 1081

Installation Guide

Installing ProVision



You have 6connect ProVision and now it's time to set it up! 6connect offers both cloud hosted instances and local installations of ProVision.

Follow the links below for specific instructions on each instance type.

For setup assistance or additional information, you can contact our support team at support@6connect.com.

Table of Contents

- Hosted Instances Guide
- Local / VM Installation Guide
- ESXi VM Image Setup

Hosted Instances Guide

Hosted Instances Guide

With a cloud hosted instance of ProVision, all you need is one of the following web browsers with an internet connection and login credentials!

Once you have confirmed that you have a supported browser and valid login, you can proceed to ProVision Getting Started, the ProVision User Guide, or the ProVision Admin Guide to learn more about ProVision.

- Hosted Instances Guide
  - 6connect Cloud Hosted Instance: Browser Requirements
  - Backup and Redundancy

6connect Cloud Hosted Instance: Browser Requirements

6connect makes every effort to maintain broad compatibility across browser vendors and versions.

Web Browsers Supported:

- Chrome (recommended)
- Firefox (recommended)
- Safari
- Microsoft Edge (current versions).

Backup and Redundancy

Backup Schedule

Both local and hosted instances are provided with a default Scheduler task to perform a backup every 24 hours, with a 1 month retention policy.

Restoration
Is a phone call or email away. We can spin up a new instance with your preferred data set.

LocalVM Installation Guide

Installing ProVision

Local and VM installs of ProVision have specific requirements and configuration settings. An installation wizard / script is available to install ProVision locally on Ubuntu 20.04 or Centos 7.

Contact support@6connect.com for installation script assistance and instructions, or for any other setup assistance required.

See the links below for additional information on specific local installation scenarios, including local upgrades, peering setup, master-master replication, and SNMP.

Table of Contents

- Installation and System Requirements
- Backup and Redundancy: Local / VM
- 6connect Local Software Upgrades
- Local Installations: Peering Setup
- Local Installations: Master-Master Replication
- Local Installations: SNMP

System Requirements

Installation and System Requirements

- Installation and System Requirements
- Local Installation and Requirements
    - Installation Wizard
    - Hardware Requirements
    - Software Requirements
    - Port Requirements
    - Additional Installation Options
        - Enable SSL for Database Connections
            - Troubleshooting:

Local Installation and Requirements

Initial application installation is included with the purchase of a license from 6connect. If modifications need to be made, we recommend contacting support prior to any changes to ensure there is no negative impact to production systems or product functionality.

Installation Wizard

An installation wizard is available to install ProVision locally on Ubuntu 20 or Centos 7.

Contact support for assistance and instructions.

Hardware Requirements

The optimum resource mix will be based on page views/refreshes. A larger concurrent user base with constant editing may benefit from additional RAM.
The minimum recommended hardware is:

	Minimum	Recommended
Processor	Dual-core Xeon class processor or equivalent	Quad-core Xeon
RAM	2GB RAM	4GB RAM
Storage	20 GB	100GB

*Virtual instances are also acceptable. We have confirmed functionality with Citrix Xen Essentials, VMware, KVM, etc.

6connect, Inc. will support customers who run 6connect ProVision products on supported Operating Systems, irrespective of whether they are running in VMware environments or not. 6connect, Inc. supports Operating Systems, not specific hardware configurations. Accordingly, VMware operates as a hardware abstraction layer.

VMware supports a set of certified Operating Systems and Hardware, and the customer and VMware will be responsible for any interactions or issues that arise at the Hardware or Operating System layer as a result of their use of VMware.

6connect, Inc. will not require clients to recreate and troubleshoot every issue in a non-VMware environment; however, 6connect, Inc. does reserve the right to request our customers to diagnose certain issues in a native certified Operating System environment, operating without the virtual environment. 6connect, Inc. will only make this request when there is reason to believe that the virtual environment is a contributing factor to the issue.

Any time spent on investigation of problems that may, in the sole opinion of 6connect, Inc. be related to VMware, will be handled in the following fashion:

1) 6connect, Inc. will provide standard support to all 6connect ProVision products.

2) If a problem is encountered while 6connect ProVision is/are running in a VMware environment, the client may be required to recreate the problem on a non-VMware server unit, at which time 6connect, Inc. will provide regular support.

3) The client can authorize 6connect, Inc. to investigate the VMware related items at normal time and materials rates. If such investigation shows that the problem is VMware related, the client may contract 6connect, Inc. to provide a software change to resolve the issue if such a resolution is possible.

4) Regardless of the problem type or source, if the problem is determined to be a non VMware related issue - time spent on investigation and resolution will be covered as part of regular maintenance, and support will be provided as usual.

Software Requirements

Base Software Needed (ProVision 8.0.0 +) :

	Required	Link
Operating System	Ubuntu 20.04 or Centos 7	
Apache	Apache 2.4	http://httpd.apache.org/
PHP	PHP 8.0 / 8.1	http://php.net/downloads.php
MySQL	MySQL 8.x	http://www.mysql.com/downloads/

MySQL Triggers

6connect does not support custom MySQL triggers at this time - please email support@6connect.com if you have any questions.

MySQL Packet Size Configuration

We recommend increasing the max_allowed_packet setting in the MySQL configuration file to 128MB (or similar) to account for the typical dataset size handled in ProVision.

Port Requirements

Open outbound ports 443 and port 80

- cloud.6connect.com is used for license check
- checkip.dyndns.org validates the IP address of the machine to communicate with the licensing server

The ProVision DNS Module also supports zone checks on attached DNS Server(s) as an external user. Port 53 will need to be open and usable for ProVision to query the servers. If not, zone error checking and verification will not work as intended.

Depending on the Connectors in use, there may be other port requirements needed. Port 22 (SSH) is used extensively for control of downstream devices.

Additional Installation Options

Enable SSL for Database Connections

Some installations may require SSL support for using database connections like MySQL, MariaDB, Azure, etc.

To create server keys and and allow SSL database connections, expand the instructions below.

Follow the steps below to enable SSH for database connections:

1) Install MySQL (MariaDB)

2) Generate, process, and sign server keys:

```
openssl genrsa 2048 > ca-key.pem
openssl req -new -x509 -nodes -days 365000 -key ca-key.pem -out ca-cert.pem
openssl req -newkey rsa:2048 -days 365000 -nodes -keyout server-key.pem -out server-req.pem
openssl rsa -in server-key.pem -out server-key.pem
openssl x509 -req -in server-req.pem -days 365000 -CA ca-cert.pem -CAkey ca-key.pem -set_serial 01 -out
server-cert.pem
```

3) Make sure MySQL can read the keys:

```
chown mysql
```

4) Restart MySQL and check that SSL is enabled"

```
SHOW VARIABLES LIKE 'have_ssl';
```

5) Set the following constant in "[installation path]/globals.php":

```
define('DB_SSL_CA', '/etc/mysql/ssl/server-cert.pem');
```

6) If using self-signed certs, also set this constant

```
define('DB_SSL_VERIFY_CERT', FALSE);
```

7) To make sure Provision is using SSL, edit the permissions of the MySQL user account to require SSL.

Troubleshooting:

Some potential errors and responses are listed below:

Error	Response
"Uncaught PDOException: SQLSTATE [HY000] [1045] Access denied for user"	This means the server-cert is missing or incorrect. Check the cert and defined installation path in globals.php.
"Uncaught PDOException: failed loading cafile stream"	This means cert verification failed. Check permissions, or if using self-signed certs set 'DB_SSL_VERIFY_CERT' to FALSE in globals.php.
"Uncaught PDOException: PDO:: __construct(): This stream does not support SSL/crypto"	This means the connection doesn't support SSL. Most likely because you are connecting over the local socket (i.e. the $db_host is set to localhost). Change it from localhost to 127.0.0.1 to connect over TCP/IP

Backup and Redundancy Local-VM

Backup and Redundancy

Local/VM Instance

Backup Schedule

Both local and hosted instances are provided with a default Scheduler task to perform a MySQL backup every 24 hours, with a 1 month retention policy.

What data is contained in the backup MySQL dump?

The MySQL dump contains an output of the entire ProVision database, with all DNS data and configuration information specific to the ProVision instance. This does not include MySQL configuration or system level configuration data. The MySQL dump also does not contain the globals.php files under ProVision's /data folder, though it may easily be recreated if needed.

How much space does the backup need?

Database sizing has many factors for both space planning and backup strategies. For larger databases, moving large MySQL databases can be challenging and reduce efficiencies. For a rough idea on how to estimate database sizes and thus backups, here are some conservative metrics that you can use:

- We estimate 3KB to 5KB per “resource object” for planning purposes. Each “Resource Object” is a discrete entry in the ProVision database. For example, a DNS Zone or a Resource Holder would each count as a Resource Object. The estimate has a wide range - this is largely based on logging.
- If you have years of logging data stored in ProVision, that will drive you to the higher end. By default, MySQL dumps will export everything including logging. So if you have a dataset with 10M records and 180 days of logging retention, that will be smaller than if you had the same number of records and 1,800 days of logging retention. If you have a centralized logging system and only store 6 months of transaction logs in ProVision, 3KB should be a good estimate. These are conservative estimates based on what we have seen in production across a variety of customers.

If you have specific questions regarding your backup scenario - please contact us at support@6connect.com.

Restoration

Restoration is only a phone call or email away. We can spin up a new instance with your preferred data set, or send you a link to download your database. Optionally, we can even help you set it up and import your data to your new instance or assist with redundant configuration options depending on your RPO/RTO guidelines.

Backup your Data

For local customers, you should be backing up the following items:

mysqldump

And system folders off the 6connect root:

/scans

/zones

/keys

/archive

/data

6connect Local Software Upgrades

Local Software Upgrades

- Local Software Upgrades
  - Upgrade Methods for Local Installs of 6connect Provision
    - Manual Upgrade (Recommended)
      - GUI
      - Command Line

Upgrade Methods for Local Installs of 6connect Provision

The recommended upgrade method for local installations of ProVision is a manual download of the latest version and running the associated upgrade script.

For upgrades consisting of multiple versions, ensure that each version upgrade is performed in order. If you have a particularly complicated upgrade or special concerns, contact our support team, and 6connect engineers can recommend an upgrade strategy tailored to your situation and assist as needed.

If you have questions, need assistance, or wish to schedule an upgrade to the latest version, contact support@6connect.com.

Manual Upgrade (Recommended)

A manual upgrade is the recommended route for local installations, providing the highest level of control and oversight, and may be performed in installation scenarios where company policies restrict automatic downloads / script executions :

1. Download the latest 6connect tar file from https://cloud.6connect.com/Download/Latest/
2. Extract into web root.
3. Run configDir.sh web user from the command line as root in the web root. This will setup the directories apache user needs read/write access to.

```
cd /var/www/html /var/www/html/configDir.sh <web user>
```

4. Run the upgrade scripts located in the upgrade/scripts directory in order of version number via:

```
php <upgrade-script.php> -v
```

The following local upgrade options are available, but are not generally recommended - differences in installation setup and access levels may result in these options being less reliable than the manual upgrade option.

GUI

In ProVision, navigate to Admin Admin Settings page. If there is a new version available, an Upgrade button will be available.

Click on the Upgrade Now button to go to the upgrade page. It will automatically download the latest version available, run all upgrade scripts, and create a log of the upgrade process.

Command Line

In upgrade/scripts run 'php upgrade.php -h' to get the help and full usage of upgrade.php.

This script will automatically get the latest tar file, create a backup, and run all the necessary upgrades between the current and latest version. The most common usage of upgrade will look like this: 'php upgrade.php -v -b /path/to/store/backup'

Local Installations - Peering Setup

Peering Setup - Local Installations:

- Peering Setup - Local Installations:
  - ProVision versions 8.2 and newer
    - PeeringDB Options:
    - Sync via PeeringDB API (Recommended):
    - Self-Manage a Local DB (Not Recommended):
  - ProVision versions 7.x and newer
  - ProVision versions 5.3.0 to 6.1.2 (Legacy)
  - Peering Constants
  - Additional Information:

ProVision versions 8.2 and newer

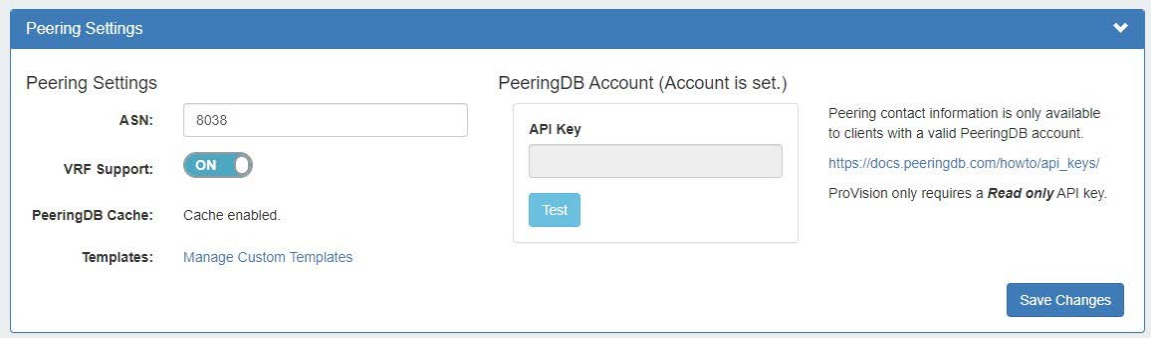
PeeringDB Options:

Local Installations may opt to sync peering data via the PeeringDB API (recommended), or by self-managing a local database utilizing a cron task to sync data - this option is only recommended for advanced users experiencing heavy loads.

Sync via PeeringDB API (Recommended):

> ProVision only requires a ***Read Only*** API Key. For information on PeeringDB API keys, please refer to: https://docs.peeringdb.com/howto/api_keys/

To set a PeeringDB Account, go to Admin Settings Peering, and enter the Read Only PeeringDB API key. Click "Test" to verify the connection.



When done, click "Save Changes". If successful, the phrase "Account is set" will display above the API key form.

Self-Manage a Local DB (Not Recommended):

Instead of making API requests to PeeringDB, you can now make them to a local PeeringDB copy and sync through either a separate cron job or by using the associated Scheduler Task.

> This option is only recommended for advanced users experiencing heavy loads. Most users should utilize the API Key option, above.

Define Constants

To link a provision instance to PeeringDB, define these constants in globals.php, where the values match the actual database that is hosting PeeringDB. :

```
define('PEERINGDB_HOST', 'localhost');

define('PEERINGDB_USERNAME', 'root');

define('PEERINGDB_PASSWORD', 'mypass');

define('PEERINGDB_NAME', ‘peeringdb');
```

This will change Settings section in the Peering area so it will now show the database status, instead of asking you for an account API KEY.

Installation:

For local customers, they can find install instructions for the PeeringDB Python Client here:

https://peeringdb.github.io/peeringdb-py/

You may create a config file as follows:

```
$ cat .peeringdb/config.yaml
orm:
  backend: django_peeringdb
  database:
    engine: mysql
    host: localhost
    name: peeringdb
    password: supers3cr3t
    port: 0
    user: peeringdb
  migrate: true
  secret_key: ''
sync:
  api_key: YOUR_API_KEY
  only: []
  password: ''
  strip_tz: 1
  timeout: 0
  url: https://www.peeringdb.com/api
  user: ''
```

Sync set up:

To run a sync of PeeringDB:

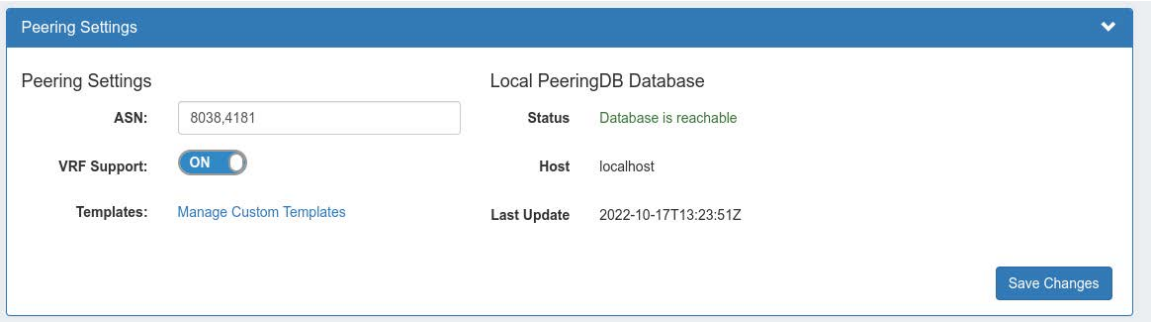
```
. pdbvenv/bin/activate
peeringdb sync
```

The database can also be synced using the scheduler. The task needs to know the location of the python virtual environment where peeringdb-py is installed and the directory that hosts the peeringdb-py config file.
For information on how to add a scheduler task, see Scheduler Tab.

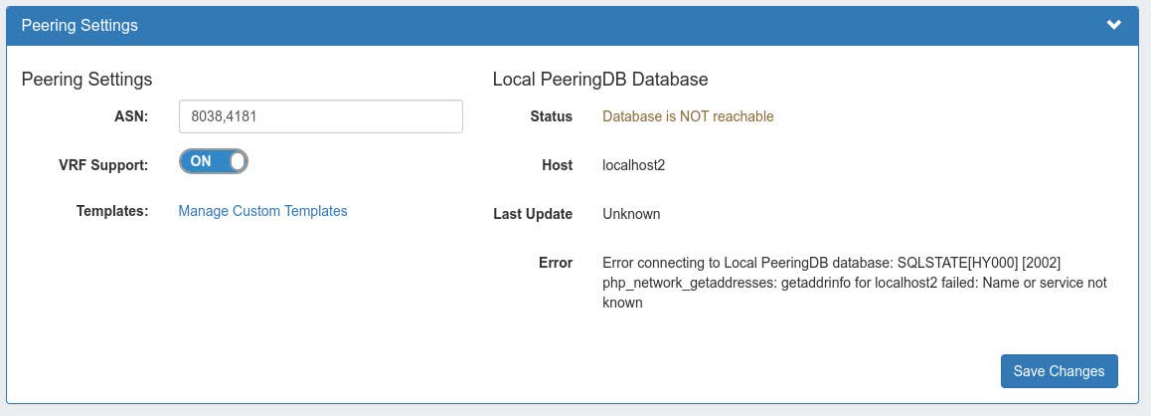
Customers who are not using a python virtual environment, or who are not running their local peeringdb database on the same server, should be able to set up their own cron task as outlined in the documentation below:
https://peeringdb.github.io/peeringdb-py/cli/#sync

View the Status:

Once set up, If the local database is reachable a green success message will display in Admin Settings Peering Settings.



If the database fails to connect, a warning and error message will display instead:



ProVision versions 7.x and newer

For ProVision versions 7.x and later, ProVision directly interfaces with PeeringDB's API to update exchange and peering data, caching the data for a default time of 12 hours.

This requires a PeeringDB account, and for the account credentials to be set in ProVision. The credentials may either be hard coded into globals.php, or set into the database via the Admin/Peering GUI. See Admin Settings and Peering for detailed information.

Additional Peering constants may be added into globals.php to change the PeeringDB URL between the main and beta site (some users may find the beta site to have faster response times), and to adjust the PeeringDB cache TTL.

For real-time updates, TTL may be set to 0. However, some users may experience severe lag with a TTL = 0; we recommend using a 10 to 15 minute or greater TTL if this occurs.

ProVision versions 5.3.0 to 6.1.2 (Legacy)

For legacy set up (not recommended):

ProVision uses a locally-hosted mirror of the PeeringDB database in order to perform non-edit Peering functions. There are a few steps to take in order to set up your locally hosted instance to coordinate with PeeringDB information.

> As of PeeringDB 2.0, SQL dump files are no longer provided. If you are using ProVision 5.3.0 or higher, you must follow this new install process. If you are using a lower version of ProVision, then please follow the instructions in the previous version of this page.

1) Create a new database to store the PeeringDB data. This **must** be on the same server as the database which is used by ProVision.

2) Download, install, and use the PeeringDB Python Client to populate the database.

The PeeringDB documentation is available here: http://peeringdb.github.io/peeringdb-py/

3) Once this has been done, edit the ProVision global configuration file located here:

```
[ProVision Root]/data/globals.php
```

It must be updated with the following variables to inform ProVision of the location of this new install. The username and password fields correspond to the username and password of the MySQL account which has access to the database (Not the username and password to your PeeringDB account).

> This can, but does not have to be, the same MySQL user which is used for the ProVision database. However, the ProVision MySQL user **must** have at least READ access to the PeeringDB database.

```
$peeringdb_host = 'localhost';          // Database host must be the same for provision and peering
$peeringdb_username = 'username';       // username for the MySQL user
$peeringdb_password = 'password';       // password for the MySQL user
$peeringdb_db_name = 'peeringdb';       // name of the database in MySQL
```

4) Periodically sync with the PeeringDB server to get the latest updates. This can be done manually, or there are instructions in the PeeringDB documentation on how to automatically schedule syncs using cron (http://peeringdb.github.io/peeringdb-py/cli/#sync).

Peering Constants

In globals.php, the following constants can be defined to tweak the Peering internals:

PEERINGDB_USERNAME

```
define('PEERINGDB_USERNAME', 'username');
```

Default value: none

The username for the account used to connect to the PeeringDB API

Instead of saving the username and password in the database, the values can be hard coded into globals.php

PEERINGDB_PASSWORD

```
define('PEERINGDB_PASSWORD', 'mypass');
```

Default value: none

The password for the account used to connect to the PeeringDB API

PEERINGDB_URL

```
define('PEERINGDB_URL', 'https://www.peeringdb.com/api/');
```

Default value: https://www.peeringdb.com/api/

The URL of the PeeringDB API. Alternate value: https://beta.peeringdb.com/api/

Note: PeeringDB URL Change - (Affects only v8.0.1 and earlier)

Previous versions of PeeringDB allowed authenticated requests to `https://peeringdb.com/api/.` As of March 2022, PEERINGDB_URL must be set to https://www.peeringdb.com/api/ for authenticated requests to succeed.

Customers updated to v8.0.2 and later do not need to take any action and are not affected.

Local customers using versions 8.0.1 or earlier, and who are using Peering (or wish to start using Peering), should perform the following update(s) as applicable to their situation:

A) Existing local customers who already have their peeringdb account details saved in Provision should update PEERINGDB_URL in globals.php to:

```
define('PEERINGDB_URL', 'https://www.peeringdb.com/api/');
```

B) Customers who wish to begin using Peering (thus, do not already have saved peeringdb account details) will not be able to add their account via the GUI prior to v8.0.2. An attempt to do so will fail the "valid account test", which uses a hardcoded string value.

Instead, affected users must do both of the following:

B1) Save peeringdb account details using the API:

```
https://[$your instance]/APIv2/spec.php?family=peering#/default/save_account
```

B2) Update PEERINGDB_URL in globals.php to:

```
define('PEERINGDB_URL', 'https://www.peeringdb.com/api/');
```

PEERINGDB_CACHE_TTL

```
define('PEERINGDB_CACHE_TTL', 43200);
```

Default value: 43200 (12 hours)

How often (in seconds) to purge the cached PeeringDB API calls. If a customer wants real time access, this can be set to 0.

If experiencing major lag issues with real time access, it is recommended to increase to increase the cache TTL from 0 to 5, 10, or 15 minutes.

Additional Information:

For additional information on working with Peering, see the following documentation sections:

- Peering
- Import Peering Sessions

Local Installations - Master-Master Replication

Configuring ProVision for Master-Master Replication

1. Create two ProVision installs on two different servers. These servers can be bare metal or they can be VMs. These servers will be referred to as **Rep1** and **Rep2**.

2. Open an SSH session to **Rep1**.

3. Confirm that **Rep1** can communicate with **Rep2** by issuing a ping command:

```
ping ip-of-Rep2
```

If the **Rep1** cannot communicate with **Rep2**, consult your system or network administrator to clear this error.

4. Stop the apache2 service using the following command:

```
service apache2 stop
```

5. Run the following command to open the MySQL configuration file for editing:

```
vi /etc/mysql/mysql.conf.d/mysqld.cnf
```

6. Find the line that reads:

```
bind-address = 127.0.0.1
```

And change it to:

```
bind-address = 0.0.0.0
```

Note: you may wish to consult with your security department to determine the least-permissible values.

7. Add the following lines to the end of the file, then save and exit:

```
server-id=1

   log-bin="mysql-bin"

    binlog-do-db=name_of_database

    replicate-do-db=name_of_database

    relay-log="mysql-relay-log"

    auto-increment-offset = 1

auto-increment-increment = 10
```

Note: “name_of_database” is a placeholder for the name of the 6connect ProVision database. This is typically “provision” but may be different based on the choices made during installation.

8. Enter the following command:

```
service mysql restart
```

If you get errors, please re-check that you have correctly entered the changes in step (6) to the configuration file, and that you have replaced the name of the database correctly.

9. Create a dump of the current database state:

```
mysqldump -uroot -p name_of_database > initial.sql
```

You will need the MySQL root password for this, which can normally be found at:

/var/www/html/data/globals.php

Note you will also need to change the database name as in the previous step.

10. Transfer the database dump to **Rep2**, to serve as the basis for the synchronization:

```
scp initial.sql username@location-of-rep2:~
```

You will have to customize this command with a user on **Rep2** and its location. Ex:

```
scp initial.sql username@67.221.241.164:~
```

Note: You will need to customize this command with your credentials on **Rep2**.

11. Run the following command:

```
rm /var/lib/mysql/auto.cnf
```

12. While still on **Rep1**, log in to MySQL as root.

```
mysql -u root -p
```

13. Run the following commands in MySQL:

```
CREATE USER 'replicator'@'%' IDENTIFIED BY 'replication_password';

GRANT REPLICATION SLAVE ON *.* TO 'replicator'@'%';
```

Note: The specific requirements for password strength are governed by your local policies.

14. Run the following command in MySQL:

```
SHOW MASTER STATUS;
```

Note the 'File' and 'Position' columns. These will be referred to later as "rep1_file" and "rep1_position."

15. Leave the SSH session to **Rep1** open. Open a second SSH session to **Rep2**.

16. Confirm that **Rep2** can communicate with **Rep1** by issuing a ping command:

```
ping ip-of-Rep1
```

If the **Rep2** cannot communicate with **Rep1**, consult your system or network administrator to clear this error.

17. Stop the apache2 service using the following command:

```
service apache2 stop
```

18. Run the following command to open the MySQL configuration file for editing:

```
vi /etc/mysql/mysql.conf.d/mysqld.cnf
```

19. Find the line that reads

```
bind-address = 127.0.0.1
```

And change it to:

```
bind-address = 0.0.0.0
```

Note: you may wish to consult with your security department to determine the least-permissible values.

20. Add the following lines to the end of the file, then save and exit:

```
server-id=2

   log-bin="mysql-bin"

    binlog-do-db=name_of_database

    replicate-do-db=name_of_database

    relay-log="mysql-relay-log"

    auto-increment-offset = 2

auto-increment-increment = 10
```

Note: “name_of_database” is a placeholder for the name of the 6connect ProVision database. This is typically “provision” but may be different based on the choices made during installation.

21. Enter the following command:

```
service mysql restart
```

If you get errors, please re-check that you have correctly entered the changes in step (20) to the configuration file, and that you have replaced the name of the database correctly.

22. Run the following command:

```
rm /var/lib/mysql/auto.cnf
```

23. Log into MySQL as root:

```
mysql -u root -p
```

24. Run the following commands to delete the current ProVision database and to adopt the MySQL dump that was created in step (9). If this is not part of the initial ProVision configuration, ensure that proper backups have been made and are accessible before deleting.

```
DROP DATABASE name_of_database;

CREATE DATABASE name_of_database;

USE name_of_database;

source /home/root/initial.sql;
```

Note: you may have to customize the final line with the location of the “initial.sql” file that was transferred to **Rep2** in step (10).

Note: you will have to replace name_of_database with the 6connect ProVision database chosen at install.

25. While still in MySQL on **Rep2**, run the following commands:

```
CREATE USER 'replicator'@'%' IDENTIFIED BY 'replication_password';

GRANT REPLICATION SLAVE ON *.* TO 'replicator'@'%';
```

Note: The specific requirements for password strength are governed by your local policies.

26. Run the following command in MySQL:

```
SHOW MASTER STATUS;
```

Note the ‘file’ and ‘position’ columns. These will be referred to later as “rep2_file” and “rep2_position.”

27. On **Rep1**, in MySQL, run the following commands:

```
STOP SLAVE;

CHANGE MASTER TO MASTER_HOST = 'location_of_rep2',MASTER_USER = 'replicator', MASTER_PASSWORD =
'replication_password', MASTER_LOG_FILE = 'rep2_file', MASTER_LOG_POS = rep2_position;

START SLAVE;
```

Note that you must replace “location_of_rep2”, “replication_password”, “rep2_file” and “rep2_position” with values from earlier in this tutorial.

28. On **Rep2**, in MySQL, run the following commands:

```
STOP SLAVE;

CHANGE MASTER TO MASTER_HOST = 'location_of_rep1',MASTER_USER = 'replicator', MASTER_PASSWORD =
'replication_password', MASTER_LOG_FILE = 'rep1_file', MASTER_LOG_POS = rep1_position;

START SLAVE;
```

Note that you must replace “location_of_rep1”, “replication_password”, “rep1_file” and “rep1_position” with values from earlier in this tutorial.

29. On **Rep1**, exit MySQL and enter the following command:

```
service apache2 start
```

30. On **Rep2**, exit MySQL and enter the following command:

```
service apache2 start
```

31. Replication should now be running between the two servers. To test this, log in to MySQL on both **Rep1** and **Rep2**, switch to the ProVision database on both and run the following command:

```
SELECT COUNT(*) FROM log;
```

This will show how many logs are recorded by each database. Now, use a web browser to navigate to the ProVision GUI on **Rep1** and log in. This will produce additional log events within the ProVision database.

Return to MySQL on both databases and run the above command again. You should see two things: that the log count has increased, and that the count is identical on both servers. If this matches what you see then replication is working.

To complete the test now use a web browser to navigate to the ProVision GUI on **Rep2** and log in. This should again produce an equal increase in log counts on both servers.

1. Create two ProVision installs on two different servers. These servers can be bare metal or they can be VMs. These servers will be referred to as **Rep1** and **Rep2**.

2. Open an SSH session to **Rep1**.

3. Confirm that **Rep1** can communicate with **Rep2** by issuing a ping command:

```
ping ip-of-Rep2
```

If the **Rep1** cannot communicate with **Rep2**, consult your system or network administrator to clear this error.

4. Stop the apache2 service using the following command:

```
service httpd stop
```

5. Stop the software firewall, if running:

```
service firewalld stop
sudo systemctl disable firewalld
```

Note: local security policies may mandate specific firewall settings. See your network administrator for acceptable firewalld policies.

6. Run the following command to open the MySQL configuration file for editing:

```
vi /etc/my.cnf
```

7. Find the line that reads

```
bind-address = 127.0.0.1
```

And change it to:

```
bind-address = 0.0.0.0
```

If this line does not appear, add it to the bottom of the config.

If you are using an IPv6-only network, use "::" instead of "0.0.0.0".

Note: you may wish to consult with your security department to determine the least-permissible values.

8. Add the following lines to the end of the file, then save and exit:

```
server-id=1

   log-bin="mysql-bin"

    binlog-do-db=name_of_database

    replicate-do-db=name_of_database

    relay-log="mysql-relay-log"

    auto-increment-offset = 1

auto-increment-increment = 10
```

Note: "name_of_database" is a placeholder for the name of the 6connect ProVision database. This is typically "provision" but may be different based on the choices made during installation.

9. Enter the following command:

```
service mysql restart
```

If you get errors, please re-check that you have correctly entered the changes in step (6) to the configuration file, and that you have replaced the name of the database correctly.

10. Create a dump of the current database state:

```
mysqldump -uroot -p name_of_database > initial.sql
```

You will need the MySQL root password for this, which can normally be found at:

/var/www/html/data/globals.php

Note you will also need to change the database name as in the previous step.

11. Transfer the database dump to **Rep2**, to serve as the basis for the synchronization:

```
scp initial.sql username@location-of-rep2:~
```

You will have to customize this command with a user on **Rep2** and its location. Ex:

```
scp initial.sql root@67.221.241.164:~
```

Note: You will need to customize this command with your credentials on **Rep2**. You may also have to customize this command to use it on an IPv6-only network.

12. Run the following command:

```
rm /var/lib/mysql/auto.cnf
```

13. Restart MySQL:

```
service mysqld restart
```

14. While still on **Rep1**, log in to MySQL as root.

```
mysql -u root -p
```

15. Run the following commands in MySQL:

```
CREATE USER 'replicator'@'%' IDENTIFIED BY 'replication_password';

GRANT REPLICATION SLAVE ON *.* TO 'replicator'@'%';
```

Note: The specific requirements for password strength are governed by your local policies.

16. Run the following command in MySQL:

```
SHOW MASTER STATUS;
```

Note the 'File' and 'Position' columns. These will be referred to later as "rep1_file" and "rep1_position."

17. Leave the SSH session to **Rep1** open. Open a second SSH session to **Rep2**.

18. Confirm that **Rep2** can communicate with **Rep1** by issuing a ping command:

```
ping ip-of-Rep1
```

If the **Rep2** cannot communicate with **Rep1**, consult your system or network administrator to clear this error.

19. Stop the apache2 service using the following command:

```
service httpd stop
```

20. Stop the software firewall, if running:

```
service firewalld stop
sudo systemctl disable firewalld
```

Note: local security policies may mandate specific firewall settings. See your network administrator for acceptable firewalld policies.

21. Run the following command to open the MySQL configuration file for editing:

```
vi /etc/my.cnf
```

22. Find the line that reads

```
bind-address = 127.0.0.1
```

And change it to:

```
bind-address = 0.0.0.0
```

If this line does not appear, add it to the bottom of the config.

If you are using an IPv6-only network, use "::" instead of "0.0.0.0".

Note: you may wish to consult with your security department to determine the least-permissible values.

23. Add the following lines to the end of the file, then save and exit:

```
server-id=2

   log-bin="mysql-bin"

    binlog-do-db=name_of_database

    replicate-do-db=name_of_database

    relay-log="mysql-relay-log"

    auto-increment-offset = 2

auto-increment-increment = 10
```

Note: "name_of_database" is a placeholder for the name of the 6connect ProVision database. This is typically "provision" but may be different based on the choices made during installation.

24. Enter the following command:

```
service mysql restart
```

If you get errors, please re-check that you have correctly entered the changes in step (20) to the configuration file, and that you have replaced the name of the database correctly.

25. Run the following command:

```
rm /var/lib/mysql/auto.cnf
```

26. Restart MySQL:

```
service mysqld restart
```

27. Log into MySQL as root:

```
mysql -u root -p
```

28. Run the following commands to delete the current ProVision database and to adopt the MySQL dump that was created in step (10). If this is not part of the initial ProVision configuration, ensure that proper backups have been made and are accessible before deleting.

```
DROP DATABASE name_of_database;

CREATE DATABASE name_of_database;

USE name_of_database;

source /home/root/initial.sql;
```

Note: you may have to customize the final line with the location of the "initial.sql" file that was transferred to **Rep2** in step (10).

Note: you will have to replace name_of_database with the 6connect ProVision database chosen at install.

29. While still in MySQL on **Rep2**, run the following commands:

```
CREATE USER 'replicator'@'%' IDENTIFIED BY 'replication_password';

GRANT REPLICATION SLAVE ON *.* TO 'replicator'@'%';
```

Note: The specific requirements for password strength are governed by your local policies.

30. Run the following command in MySQL:

```
SHOW MASTER STATUS;
```

Note the 'file' and 'position' columns. These will be referred to later as "rep2_file" and "rep2_position."

31. On **Rep1**, in MySQL, run the following commands:

```
STOP SLAVE;

CHANGE MASTER TO MASTER_HOST = 'location_of_rep2',MASTER_USER = 'replicator', MASTER_PASSWORD =
'replication_password', MASTER_LOG_FILE = 'rep2_file', MASTER_LOG_POS = rep2_position;

START SLAVE;
```

Note that you must replace "location_of_rep2", "replication_password", "rep2_file" and "rep2_position" with values from earlier in this tutorial.

32. On **Rep2**, in MySQL, run the following commands:

```
STOP SLAVE;

CHANGE MASTER TO MASTER_HOST = 'location_of_rep1',MASTER_USER = 'replicator', MASTER_PASSWORD =
'replication_password', MASTER_LOG_FILE = 'rep1_file', MASTER_LOG_POS = rep1_position;

START SLAVE;
```

Note that you must replace “location_of_rep1”, “replication_password”, “rep1_file” and “rep1_position” with values from earlier in this tutorial.

33. On **Rep1**, exit MySQL and enter the following command:

```
service httpd start
```

34. On **Rep2**, exit MySQL and enter the following command:

```
service httpd start
```

35. Replication should now be running between the two servers. To test this, log in to MySQL on both **Rep1** and **Rep2**, switch to the ProVision database on both and run the following command:

```
SELECT COUNT(*) FROM log;
```

This will show how many logs are recorded by each database. Now, use a web browser to navigate to the ProVision GUI on **Rep1** and log in. This will produce additional log events within the ProVision database.

Return to MySQL on both databases and run the above command again. You should see two things: that the log count has increased, and that the count is identical on both servers. If this matches what you see then replication is working.

To complete the test now use a web browser to navigate to the ProVision GUI on **Rep2** and log in. This should again produce an equal increase in log counts on both servers.

A Note On Passwords!

For local password storage, you will need to sure that the encryption key is "in sync" across your replicated instances.

The way ProVision/ACP works is that when we have to store a password to an external system we encrypt it in our database, then store the encryption key outside the database on the file system. This way if there is a database compromise, access credentials are unusable.

The encryption key is stored in a file described in the "secure_dir" parameter in the ProVision/ACP config.php file. It is typically:

'secure_dir' => '/var/www/secure/'

The file will be named "[your-database].keyFile".

If you have installations in master-master configuration, and one or more of the keyFiles is out of sync with the rest of the cluster, that out-of-sync node will be encrypting passwords that the other nodes cannot decrypt.

The solution for this is to just pick a keyFile and replicate it across all the nodes.

If a keyFile is lost it means that no stored passwords will be able to be decrypted. This can be fixed by just re-entering the passwords.

After copying the KeyFile, please ensure that you check permissions on the file.

Local Installations: SNMP

Monitoring Setup - Local Installations:

There is a MIB file in the repository (tools/snmp/PROVISION-MIB.mib). It contains the description of the OID numbers provided by ProVision.

Step 0: In order to test you must install snmpd:

apt-get install snmpd snmp-mibs-downloader

> On CentOS7, use the following command: yum install net-snmp net-snmp-utils

Step 1: Add the following lines in /etc/snmp/snmpd.conf:

view all included .1.3.6.1.4.1.36009
pass .1.3.6.1.4.1.36009 /usr/bin/php /var/www/html/**[/var/www/html/[$ProVisionDir]**/tools, etc]/tools/snmp/Provision.php

Step 2: Add the MIB file to the shared mib library:

ln -s /var/www/html/**[/var/www/html/[$ProVisionDir]**/tools/snmp/PROVISION-MIB.mib /usr/share/snmp/mibs/PROVISION-MIB.txt

Step 3: Restart the webserver

systemctl restart snmpd

Step 4: Verify the SNMP is working

snmpwalk -v 2c -m +PROVISION-MIB -c public 127.0.0.1 provisionStats

```
[admin@centos7 snmp]$ snmpwalk -v 2c -m +PROVISION-MIB -c public 127.0.0.1 provisionStats
PROVISION-MIB::webService = STRING: OK
PROVISION-MIB::apiTransactions = INTEGER: 0
PROVISION-MIB::replicationStatus = STRING: Not OK
PROVISION-MIB::ProvisionServiceStatus = STRING: OK
PROVISION-MIB::ProvisionLocalAuthentication = STRING: OK
PROVISION-MIB::usersLoggedIn = INTEGER: 6
PROVISION-MIB::enumSubscribersCount = INTEGER: 0
PROVISION-MIB::acpStatus = STRING: Not OK
PROVISION-MIB::usedMemory = INTEGER: 51
PROVISION-MIB::inboundPacketsRate = INTEGER: 0
PROVISION-MIB::outboundPacketsRate = INTEGER: 0
[admin@centos7 snmp]$
```

OID	KPI	Description
.1.3.6.1.4.1.36009.1.0	Web Service Status	Connects to the instance API with wrong user and password. It waits for 403 (Unauthorized customer).
.1.3.6.1.4.1.36009.1.3	DB Replication status	Shows master/slave status. Currently we keep the initial version of the code based on instance replicant id, even when it's not used.
. 1.3.6.1.4.1.36009.1.4	Provision DB service status	Tries to get TLR resource via RQ class.

.1.3.6.1.4.1.36009.1.5	Provision local authentication status	The monitor creates customer, tries to login, then removes the customer.
.1.3.6.1.4.1.36009.1.6	Current users logged in	Uses direct queries from php_sessions table.
.1.3.6.1.4.1.36009.1.8	ENUM Subscriber count	Number of unique NAPTR Records in zones whose names end with "e164.arpa.". The query uses zone resource attributes in order to be able to provide the result as quickly as possible.
.1.3.6.1.4.1.36009.1.9	ACP Service Status	Monitors ACP Service linked to ProVision.

Number	KPI	Description
1	DNS Service Status	UDP Query for localhost. Response type 'host doesn't exist' is also valid.
2	Zone transfer rate	Number of zone pushes for a server for the last minute
3	Dynamic Update rate	Number of dynamic updates for a server for the last minute

Additional Information:

These are OID numbers from which SNMP clients can gather information. They are directly provided by the OS:

CPU Load time:
1 minute Load: .1.3.6.1.4.1.2021.10.1.3.1
5 minute Load: .1.3.6.1.4.1.2021.10.1.3.2
15 minute Load: .1.3.6.1.4.1.2021.10.1.3.3

Memory:
Total memory:
.1.3.6.1.4.1.2021.4.5.0

Memory Free:
.1.3.6.1.4.1.2021.4.6.0

Disks:
Path where the disk is mounted:
.1.3.6.1.4.1.2021.9.1.2.1

Path of the device for the partition:
.1.3.6.1.4.1.2021.9.1.3.1

Total size of the disk/partion (kBytes):
.1.3.6.1.4.1.2021.9.1.6.1

Available space on the disk:
.1.3.6.1.4.1.2021.9.1.7.1

Used space on the disk:
.1.3.6.1.4.1.2021.9.1.8.1

Percentage of space used on disk:
.1.3.6.1.4.1.2021.9.1.9.1

Percentage of inodes used on disk:
.1.3.6.1.4.1.2021.9.1.10.1

Network:
Network interfaces:
.1.3.6.1.2.1.31.1.1.1.1

Network Received Packets:
.1.3.6.1.2.1.31.1.1.1.7.1

Network Outgoing Packets:
.1.3.6.1.2.1.31.1.1.1.11.2

Individual counters for incoming traffic in bytes:
.1.3.6.1.2.1.31.1.1.1.6

Individual counters for outgoing traffic in bytes:
.1.3.6.1.2.1.31.1.1.1.10

The number of inbound packets that contained errors
.1.3.6.1.2.1.2.2.1.14

Current maximum allowed connections (ProvisionStats.maxConnections)
.1.3.6.1.4.1.36009.4.0

The peak number of connections since the database server daemon was started (ProvisionStats.maxUsedConnections)
.1.3.6.1.4.1.36009.4.1

The number of currently open connections (ProvisionStats.threadsConnected)
.1.3.6.1.4.1.36009.4.2

NOTE: If the MySQL maximum connections limit is reached, then ProVision will not be able to respond to the SNMP Daemon, as it will not be able to connect to MySQL. Please keep this in mind when setting alert thresholds.

NOTE: ProVision collects information from /proc/meminfo. We calculate usedMemory in the following way: 100 - ((availableMemory / totalMemory) * 100).

ProVision SNMP KPIs can be configured to send trap events for the ProVision application. For the host system KPIs (CPU, RAM, etc.) the monitoring tool will need to be configured to poll the KPIs and then set the alert thresholds accordingly.

Open data/globals.php and add the following lines.

SNMP Version 2c:

```
define('SNMP_TRAP_VERSION', 'v2c');
define('SNMP_TRAP_V2C_COMMUNITY', 'enter_v2c_community');
define('SNMP_TRAP_HOST', 'enter_snmp_host');
```

SNMP Version 3:

```
define('SNMP_TRAP_VERSION', '3');
define('SNMP_TRAP_V3_ENGINE_ID', 'enter_engine_id');
define('SNMP_TRAP_V3_AUTH_USER', 'enter_auth_user');
define('SNMP_TRAP_V3_AUTH_PASSWORD', 'enter_auth_password');
define('SNMP_TRAP_V3_AUTH_PROTOCOL', 'enter_auth_protocol');
define('SNMP_TRAP_V3_PRIV_PASSWORD', 'enter_auth_priv_password');
define('SNMP_TRAP_HOST', 'enter_snmp_host');
```

SNMP TrapsV3 using AES cypher:

```
define('SNMP_TRAP_VERSION', '3');
define('SNMP_TRAP_HOST', '[host]');
define('SNMP_TRAP_V3_ENGINE_ID', '[engine_id]');
define('SNMP_TRAP_V3_AUTH_USER', '[auth_user]');
define('SNMP_TRAP_V3_AUTH_PASSWORD', '[auth_password]');
define('SNMP_TRAP_V3_PRIV_PASSWORD', '[passphrase]');
```

ESXi VM Image Setup

Before you Begin:

> Ensure that you have the root user information for the VM and a license key - please contact 6connect Support (support@6connect.com) or your Reseller/VAR for more information.

Step 1

Download OVF and VMDK files from 6connect (or approved) download area. If you do not have this information, please contact 6connect Support (support@6connect.com) or your Reseller/VAR for more information.

Step 2

Option 1: Import OVF and VMDK to your ESXi VM environment (VMware ESXi 6.5 or later).

Option 2: If you do not have ESXi 6.5 or later, then you can create a new VM (CentOS, 64-bit, 4GB RAM) and use the VMDK disk image that you downloaded in Step 1.

Step 3

Power on the VM and login, using the root user account information per "Before you Begin".

Step 4

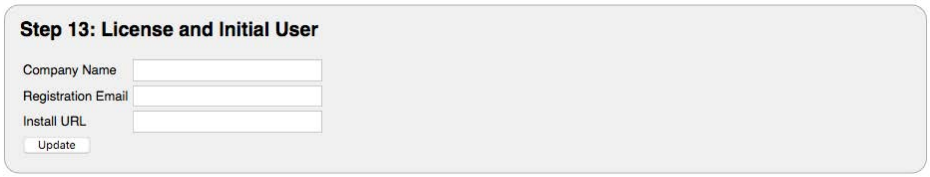
Customize the VM environment for the following items:

1. Change the root user password from its default
2. edit /etc/sysconfig/network-scripts/ifcfg-ens192 with your IP information
3. edit /etc/hostname
4. edit /etc/resolv.conf
5. Optional - add SSL certs (non self signed) per normal CentOS7 installation
6. Reboot the VM

Step 5a

Finish setup of ProVision for your organization:

1. Go to https://hostname or IP address/install/configTest.php in a web browser
2. Scroll to the bottom to complete Step 13 (see image below). The Registration Email is your License Email that would have been sent to you by 6connect or ProVision VAR. If your VM is in an "offline" or SCIF environment please go to Step 5b.



3. You should now be able to go to your Instance URL and login with the credentials generated for your user/registration email address.

Step 5b

For an "offline" license, you will be emailed a license file and path to place it. Without this file, you will not be able to login to ProVision. One the license file is applied, you should now be able to go to your Instance URL and login with the credentials generated for your user/registration email address.

> Please note that the offline license file is version specific, so before you upgrade to a new version of ProVision, you will also need to make sure you update the license file after the upgrade.

Getting Started

Welcome to ProVision!

Our Getting Started documents provide a high-level overview to orient you to working in ProVision.

If you need setup assistance or additional information, you can contact our support team at support@6connect.com.

- Welcome to ProVision!
  - ProVision Getting Started
  - ProVision User Guide
  - ProVision Admin Guide
  - ProVision Developer Tools
  - Additional Resources

ProVision Getting Started

First Steps - Not sure where to begin? Here are some key items to consider when setting up your first ProVision instance, including high level overviews of resources, permissions, and importing data into ProVision.

The Resource System - The Resource Management System is a key component of ProVision. This system supports a variety of hierarchies and metadata - understanding how these pieces can be used is important prior to importing data or setting up the application.

Workflow Concepts - ProVision has two distinct interfaces depending on the user level and task. It is important to understand how these interfaces work together from the centralized data. This is important for user on-boarding and training of internal operations staff, developers or engineering teams.

ProVision User Guide

The user guide gives you an overview on the standard UI functions of ProVision and installed modules.

ProVision Admin Guide

The Admin Guide provides an overview of administrative level functions of the different functional areas of ProVision.

ProVision Developer Tools

The Developer Tools section has details on our API, SDKs, and customizing your ProVision instance.

Additional Resources

The Tutorials and FAQ provides additional information on performing specific tasks.

First Steps

ProVision First Steps

- ProVision First Steps
  - Overview Video: First Steps - Part 1
  - Before you Begin
    - 1) What type of physical and non-physical components do you wish to track?
    - 2) What is your current data structure? What is your ideal data structure?
    - 3) Who needs access to what data?
  - Overview Video: First Steps - Part 2
  - Getting your Data into ProVision
    - 1) Gather and Prep your data
    - 2) Import or Manually Add Data
      - A) Resources
      - B) IP Aggregates and Blocks
      - C) Add DNS servers and zones
    - 3) Add Users and Groups
  - Working In Provision

Overview Video: First Steps - Part 1

This video gives a high level overview of the "Before you Begin" content on this page, as well as an introduction to ProVision's Resource System.

Note: Recorded in ProVision v5.1.x, newer versions may have interface updates.

This video may also be viewed at https://www.youtube.com/watch?v=apJRcQv3ZQ0.

Before you Begin

We recommend that new users work through the following questions with their internal team to plan their ProVision instance:

> **Need Help?**
>
> Remember that 6connect's engineers are here to help. If you have questions, or want to test out some ideas, our team has worked with a variety of data sets and can help get you started on the right path. You can reach us any time at support@6connect.com.

1) What type of physical and non-physical components do you wish to track?

Impacts: What Sections and Resources are created

An important first step is determining what items you currently are (or will be) tracking, and what relationship they have with each other.

ProVision's flexible resource system allows you create and customize detailed entries for any type of item you may want to track: customers, contacts, data centers, routers, VMs, and more. These types of resources are labeled as "Sections" in ProVision. Once a Section is made, individual items (resources) may be created as a part of that Section. Each Section may have different Gadgets selected, which then provide additional functionality on a resource entry page.

See: Resources, Customizing Sections, Gadgets

2) What is your current data structure? What is your ideal data structure?

Impacts: Resource Hierarchy, Assignment Behavior

The resource hierarchy structure in ProVision allows for "child" resources to be created under a parent resource (for example: servers as children under a datacenter resource entry, or subsidiaries under a parent company, who then share IP aggregates). The structure decided upon will influence how resources are set up in ProVision, as well as the behaviors of functions while working with items such as IP blocks or DNS zones.

See: Resources, The Resource System

3) Who needs access to what data?

Impacts: User and Group Permissions

In ProVision, standard user permissions are set by resource and functional area (IPAM, Resource, Peering, etc), with fine-grained permissions able to be set for specific resources.

Global Admin permissions give access to additional functions such as configuration settings, importing, and Scheduler tasks. Determine which users will require administrative access, and which will have access to only specific resources or functional areas. You will need to get more specific later, but having some high level groups to work with is a great start.

See: Users & Permissions

Overview Video: First Steps - Part 2

This video gives a high level overview of the "Getting your Data into ProVision" content on this page.

Note: Recorded in ProVision v5.1.x, newer versions may have interface updates.

This video may also be viewed at https://www.youtube.com/watch?v=2e0H1H4rTTs.

Getting your Data into ProVision

After determining your internal goals and processes, it's time to get your data into ProVision!

> **Start Small**
>
> When importing data into ProVision, data validation is a key step to ensure that everything is accurate. Upon importing your data, you may see some errors that result in a stop in the import process! It is recommended that you break up your imports to both keep them manageable and give you a chance to normalize your data prior to importing.

1) Gather and Prep your data

Determine where your data will be from:

Excel / Spreadsheets:

May be used to import: Resources, IP Aggregates/ Blocks, DNS BIND Zones

If you currently use Excel or other spreadsheet program for tracking, you will need to verify that your spreadsheets are "cleaned up" according to the information on the Importing Your Data page under "Preparing for Data Import":

- Make sure that you use UTF-8 encoding, remove extraneous blank rows, and compare your data to the data fields available in ProVision, shown under "Which Import Tool Should I Use?".
- Review sample files if desired to see example formats.
- If you plan to track custom types of resources by creating Sections, you will need to create a Section with custom fields, and verify that your spreadsheet contains the same fields.

Once your verification / cleanup is complete, export your spreadsheet as a .csv file.

See: Importing Your Data, Resources, Import DNS Zones

RIR

May be used to import: IP Aggregates

No advance preparation is needed for aggregates imported from RIR. ProVision's built-in importer will ask for your ORGID or an IP, and then populate an aggregate list from that information. Simply choose which aggregates you wish to import.

See: Import Aggregate Blocks

DNS Servers

May be used to import: DNS Zones

ProVision provides automated tools for importing DNS zones from the following server types: BIND, PowerDNS, InfoBlox, NS One, Dyn DNS, and DNSMadeEasy servers, as well as IPPlan MySQL Databases.

Before importing DNS zones, it is recommended that a DNS Group be created to hold the zones being imported, and that the DNS server be added into ProVision so that zone updates may be pushed.

For general DNS task, see: DNS Administration, DNS Tab, Working with DNS Groups, Working with DNS Servers

For specific DNS zone import instructions for each DNS server type, see: Import DNS Zones

Manually Adding Data

ProVision allows manual adding of data at any time. We recommend verifying that the item has not already been added beforehand (to prevent duplicates), and keeping your desired data structure in mind.

2) Import or Manually Add Data

The order in which items are added will depend on what ProVision functional area (Resources, IPAM, DNS) you will be using, and what the current / desired data structure is.

In general, the following order is recommended:

A) Resources

Importing or creating your resources first allows subsequent items to be associated with those resources.

> Note: If you already have "Resource" data associated with your IP block data (ie, as fields in a spreadsheet with Resource Name and Resource ID), you may choose not to create those resources ahead of time. The IP Import from CSV tool will give you an option to create those resources during the IP import process.

Import customers, physical devices, locations, and so forth through the Resource Import from CSV tool. If you wish for additional customization, you may create a custom Section, add the desired fields, and import resources under that Section through the Resource Import Tool.

Adding resources manually may be done at any time under the **Resources** tab, by clicking the "Add Entry" button.

See: Resources, Importing Your Data

B) IP Aggregates and Blocks

Import your IP Aggregates through the Import from RIR tool, or from a .csv file via IP Import from CSV.

The Import from CSV tool will create Top-Level Aggregates and place blocks under those aggregates based on the following method:

> First, the importer will parse through the provided data, order all blocks from largest to smallest, then attempt to split the largest block out of an existing block matching the IP space and RIR. If that fails (no larger block exists), then that block is added in the system as its own Top-Level-Aggregate. Subsequent blocks will undergo the same process.

This method ensures that your list of IP blocks does not need to be organized in any particular order.

> If your import includes a large number of small blocks (/30s, /32s), be sure you've included at least one large block which encompasses them (/24, /22). This will ensure that the smaller blocks are neatly organized under the larger block, rather than imported as their own Top-Level Aggregates.

See: Importing Your Data

C) Add DNS servers and zones

If using the DNS module in ProVision, you will need to add your servers prior to importing zones.

Add DNS Severs

Adding DNS servers requires administrative access.

Servers are added under the DNS tab of ProVision, under "DNS Servers". Click on "Add Server" and fill out the server information.

See: Working with DNS Servers

Information for specific server types and options is available under the following sections:

- Configuring ISC BIND Support
- Configuring PowerDNS Support
- Configuring Secure64 Support
- Configuring Split Horizon and Views
- Configuring DNSSEC

Import DNS Zones

After creating the applicable servers in ProVision, you may import or manually add DNS zones.

ProVision offers multiple DNS zone import options, available under the **Data Import** tab in the Admin section. For more information on importing DNS zones, see Importing your Data and Import DNS Zones.

BIND Zone Import

- Imports using the named.conf configuration file tied to the zones you are uploading, a .zip or .tar file of the zones themselves, and an optional .csv file mapping zones to customers.

PowerDNS Zone Import

- Option is available after configuring a PowerDNS server with a MySQL backend. Connects to the selected server and imports all zones.

InfoBlox Zone Import

- Imports DNS zones using a provided host, username, and password. The InfoBlox import pulls all zones on the InfoBlox LOCAL grid and adds them to a designated group. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

NS One Zone Import

- Imports DNS zones using a NS One API Key. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

Dyn DNS Zone Import

- Imports DNS zones using a Dyn DNS customer name, username, and password. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

DNSMadeEasy Zone Import

- Imports DNS zones using a DNSMadeEasy API Key and API Secret. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

IPPlan Zone Import

- Imports DNS zones using IPPlan MySQL database options. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

Manually adding zones may be done at any time from the **DNS** tab. See Working with DNS Zones and DNS Zones Overview.

3) Add Users and Groups

In ProVision, the permissions structure is handled by assigning users to groups, then setting specific resource-level C/R/U/D permissions for that group. It is designed to give you as much flexibility as you need to accommodate most use cases. When mapping out the permissions structure for your organization, keep in mind who you want to access to application:

- Internal users and roles (Admins, Read-Only, etc.)
- Partners related to multiple specific resources or accounts
- Customers / departments with limited view to only their respective resources or accounts

See: Users & Permissions, Working With Users

Users and groups may be added at any time. However, assigning permissions to users and groups is best done after the applicable resource hierarchy has been added into ProVision.

Working In Provision

With the basic data now imported, and users set up, you (and your team) are ready to work in ProVision!

Refer to our ProVision User Guide and ProVision Admin Guide for details on standard user and admin level areas of ProVision. Or, follow the links below for additional details grouped by specific task areas:

Concepts:

- The Resource System
- Workflow Concepts

Resources:

- Resources
- Customizing Sections
- Customizing Fields
- Gadgets

IPAM:

- IPAM Tab
- Working with IP Blocks
- Working with IP Rules
- IPAM Administration

DNS:

- DNS Tab
- Working with DNS Groups
- Working with DNS Zones
- DNS Zones Overview
- DNS Administration
- Working with DNS Servers

DHCP:

- DHCP Tab
- Working with DHCP Groups
- Working with DNS Zones
- Working with DHCP Gadgets
- DHCP Administration

Peering:

- Peering
- Peering Exchanges
- Peering Routers
- Peering Sessions
- Import Peering Sessions

Resource Concepts

The Resource System

- The Resource System
  - Resource System Components
    - Resources
    - Section
    - Entry
    - Category
  - Resource Hierarchy
    - Additional Information:

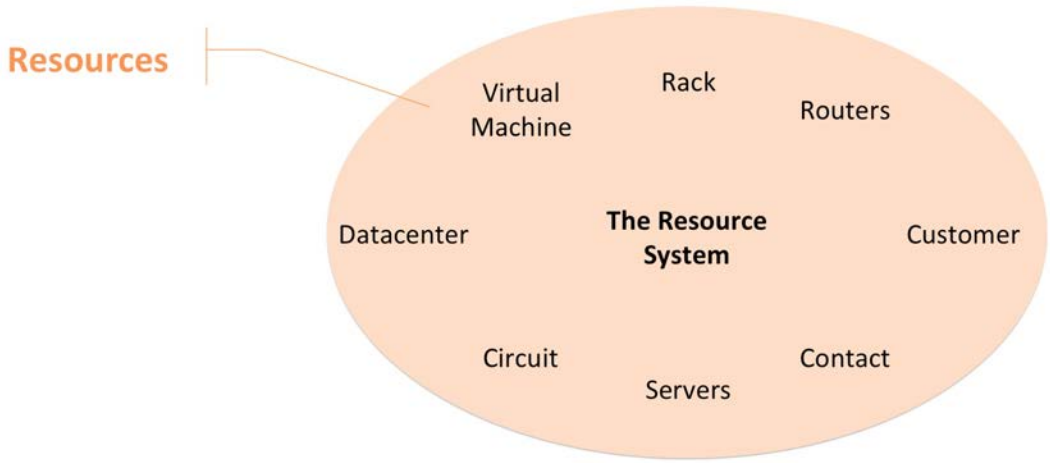
Resource System Components

Resources

In ProVision, a “Resource” is simply an umbrella term for the components that you are tracking.

Resources may be:

- Physical assets such as servers and routers
- Virtual assets such as DNS Zones or VMs
- Individual people or companies (customers)
- Places holding your assets, such as datacenters

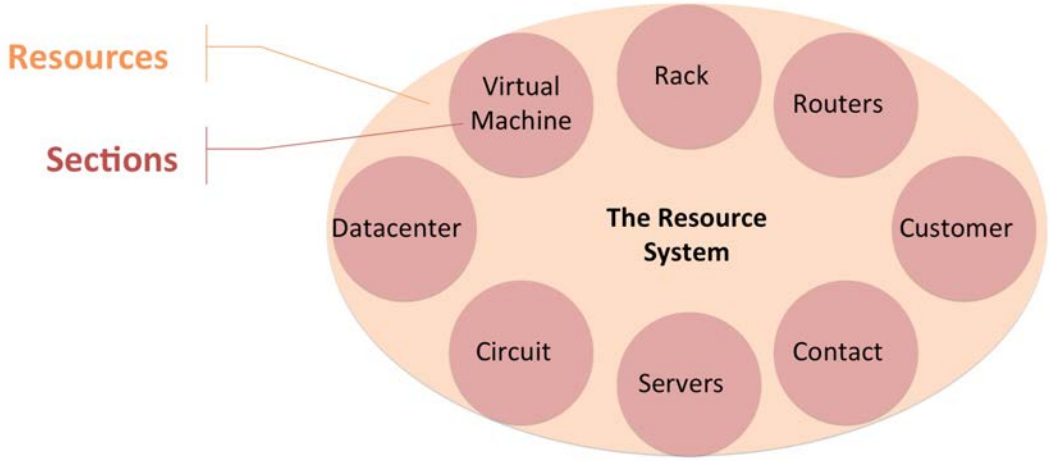


Section

The generic type of a resource is called a Section. General terms such as rack, routers, customer, servers, and datacenters would be considered "Sections" in ProVision.

Example: You might have an individual server named "Test Server", but its generic type of resource is that of a “Server” – so we would associate “Test Server” with the Section “Server”.

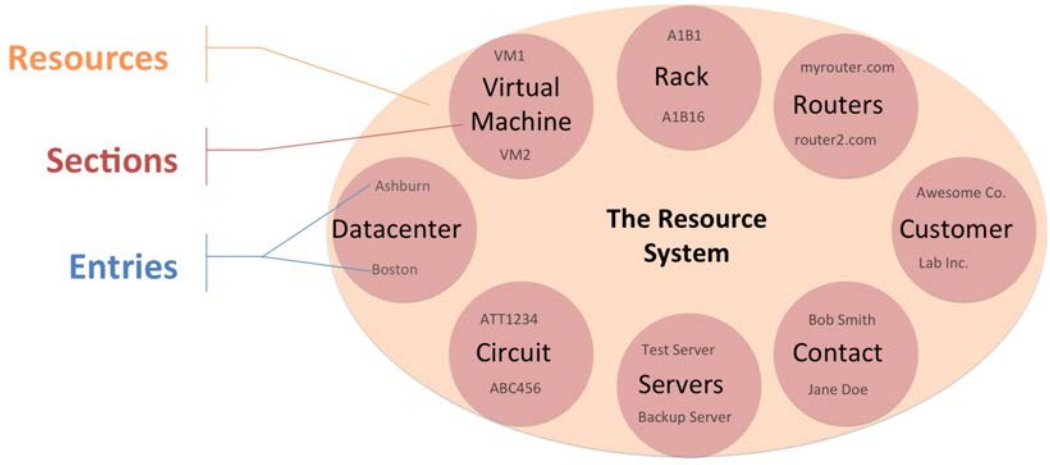
Think of Sections as templates for your resources. When a Section is created, you can associate specific fields and gadgets with that Section. In the case of our "Server" section, we would want to associate fields that are common server properties, such as make, model, operating system, and domain. Then, anytime we looked up a specific server in ProVision, we can see and update the make, model, OS, and domain information.



Entry

Think of an Entry as the individual item you are tracking – it has a specific name, it might have an IP Address, a physical address, or additional descriptive data that is associated with it.

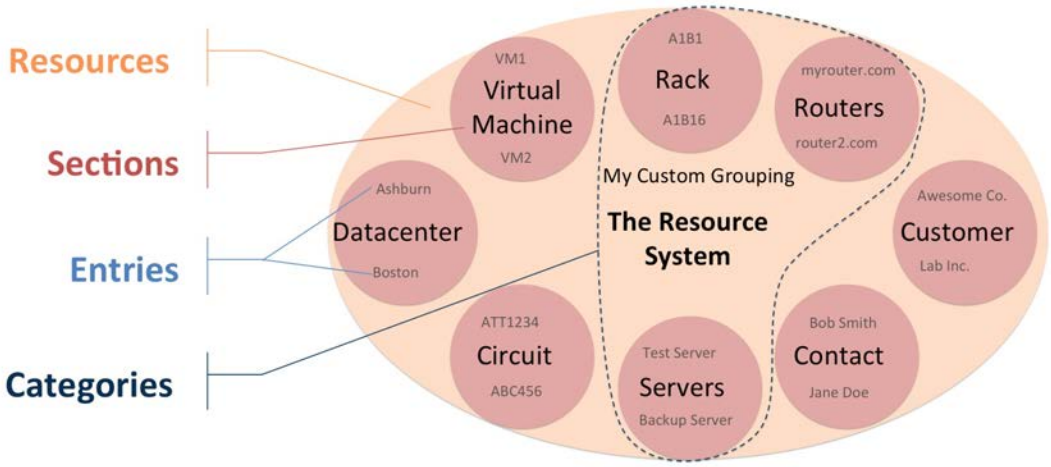
Our "Test Server" resource is an Entry under the "Server" Section.



Here, we can see that under the “Datacenter” section, we have two entries – one is the Ashburn datacenter, the other is the Boston datacenter. Under “Servers”, we have entries for “Test Server” and “Backup Server”.

Category

Another part of ProVision's resource system is "Categories". Categories allow you to group resources together under a name of your choosing to further organize your resources. A category that is often used is "Customer", grouping customer resources together.

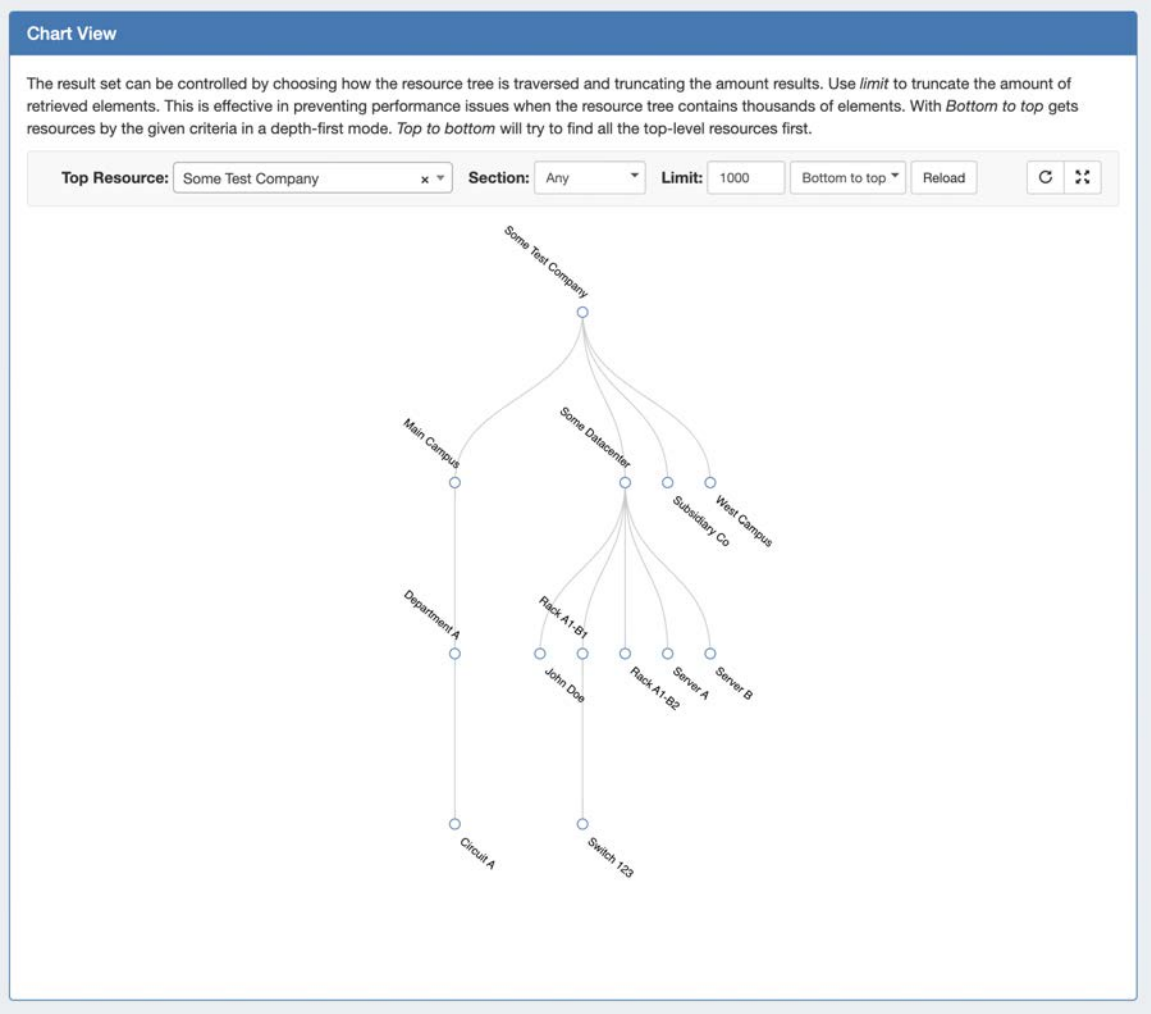


In this example, we are grouping racks, servers, and routers under the "My Custom Grouping" category.

Creating categories is entirely optional, so you can decide internally if the additional organization is needed in your instance.

Resource Hierarchy

In ProVision, "Child" Resources can be created underneath a "Parent" resource. This functionality allows for hierarchies to be created to match the desired organizational structure. An example of this would be to create racks and servers as children under a datacenter entry. Chart View, available from the **Resources** tab, lets you see this structure graphically.



The structure decided upon will influence how resources are set up in ProVision, as well as behaviors of functions while working with items such as IP Blocks or DNS zones.

Additional Information:

- Resources
- Working with Entries
- Customizing Sections
- Customizing Fields
- Gadgets

Workflow Concepts

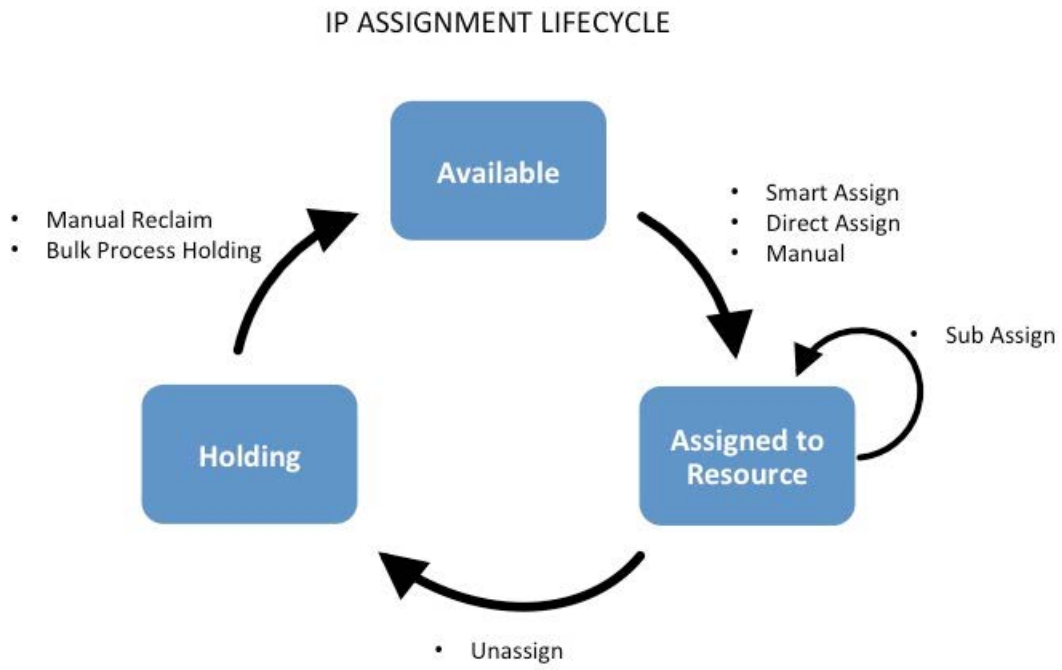
Workflow Concepts

- Workflow Concepts
- IP Assignment Lifecycle
    - IP Management
- Peering
- VLAN Manager
    - VLAN Workflow:
        - Create Domain(s)
        - Add / Edit VLANs
        - Add IP Blocks to VLANs
        - Manage Domains and VLANs
    - VLAN Workflow (Legacy):
        - Standard flow (without VLAN tags):
        - Optional flow (with VLAN tags):
- DHCP
- DNSv3 Workflow
- Approvals Workflows
    - Initial Setup
        - Step 1 - Review Existing User Groups and Process Needs
        - Step 2 - Add or Edit ProVision User Groups
        - Step 3 - Assign Approval Action Settings to Groups
        - Step 4 - Enable Notifications (Optional)
        - Step 6 - Add Scheduler Task: "Approvals - Delete events older than 1 month"
    - Daily Use

IP Assignment Lifecycle

In ProVision, the IP assignment lifecycle starts with an available block which is free to be assigned to any IPAM-enabled resource holder. There are multiple methods that may be used to assign a block to a resource holder: Smart Assign, Direct Assign, or Manual Assign (Smart Browse).

Once an IP block is assigned, blocks can be further subassigned via the same methods if desired. When an assigned block is un-assigned it proceeds into the Holding Tank: a special resource where blocks are held until either a set time has elapsed or until they are manually reclaimed to 'available' status.



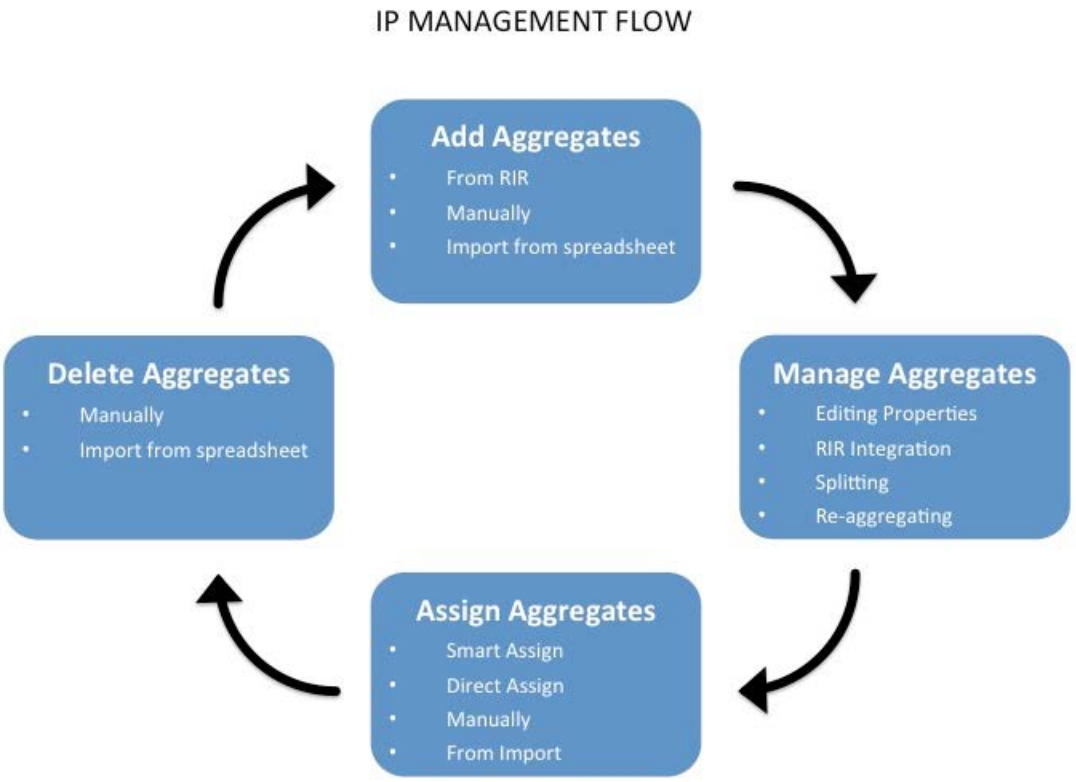
For more information on performing tasks in this IP Assignment Lifecycle, see the following documentation sections:

- Working with IP Blocks
- IPAM Administration

IP Management

IP Management is comprised of four basic functions: adding aggregates into ProVision, managing those aggregate blocks, assigning them to a resource, and deleting the aggregates.

ProVision provides multiple ways for you to achieve each step, depending on your needs. For example, if your organization currently uses spreadsheet data to track aggregates, ProVision provides tools that can import your existing spreadsheets for bulk updates, saving you time. Need to just quickly assign a single IP? Direct Assign will allow you to do so with just a few clicks.



For more information on performing tasks in this IP Management Flow, see the following documentation sections:

- Working with IP Blocks
- IPAM Administration
- Importing Your Data
- Import Aggregate Blocks

Peering

ProVision versions 7.0.0 and later:

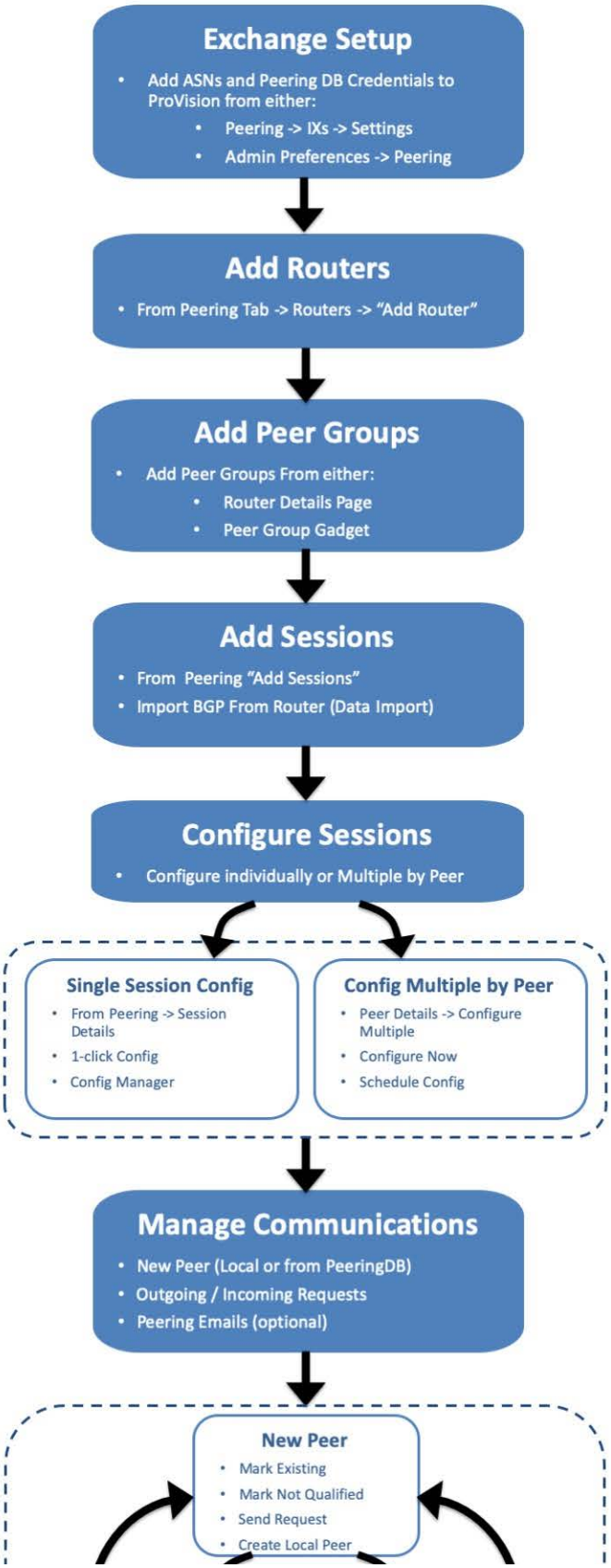
Initially, ASNs and Peering DB information will need to be entered into ProVision to enable Peering functionality. After that, Peering starts with designating Routers. Routers may be added from the "Add Router" button under the Peering Tab Routers sub-tab. Once a router has been created, Peer Groups may be added from the Router Details page or the Peer Group Gadget.

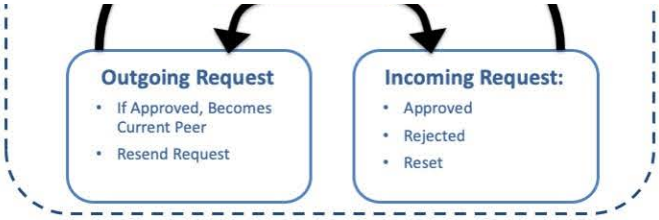
After the router(s) and Peer Groups have been created in ProVision, Sessions need to be added. Sessions may be added manually through the "Add Session" dialog in the Peering tab, or Imported from a router (requires ProVision Admin permissions).

Once a session has been created, it can be configured and managed through the Sessions list and Session details page (using 1-click Config or Config Management), or multiple sessions may be configured for a specific Peer via the "Configure Multiple Sessions" option, which will provide options to either "Config Now" or "Schedule Config" for a later time.

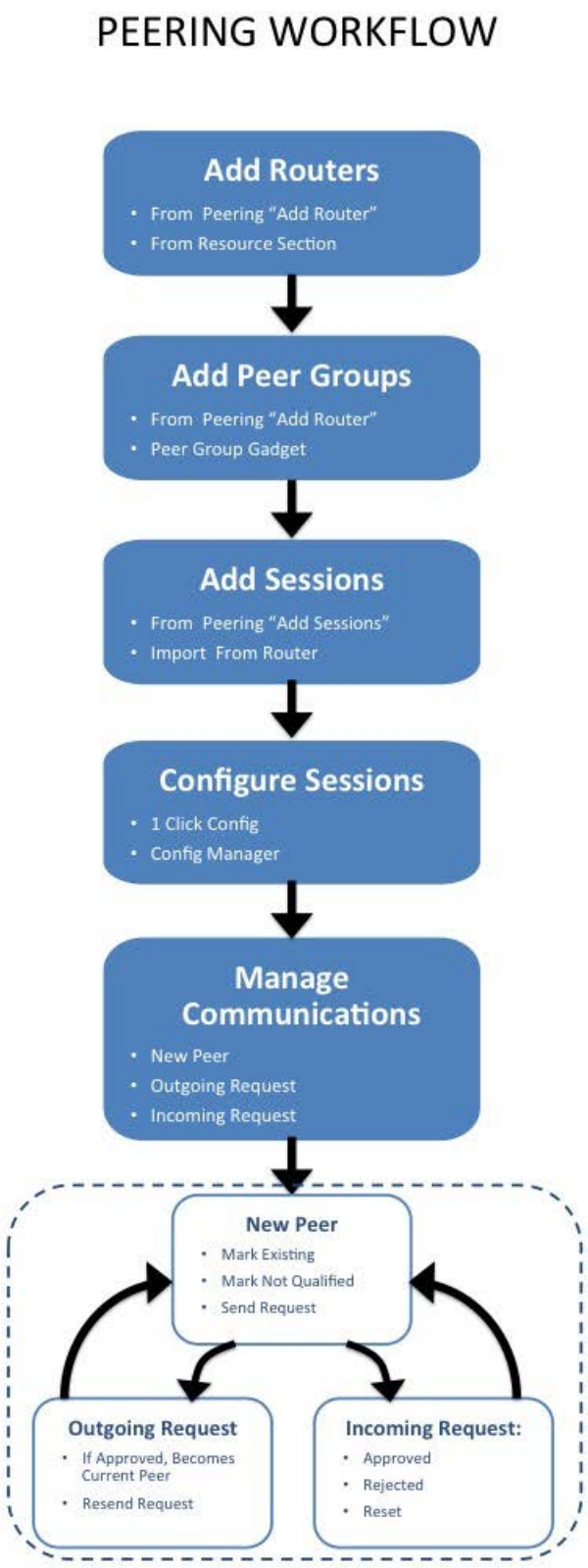
Managing Peer Communications is done primarily from the Exchange Communications menu, sending requests and marking peers as existing / not qualified / approved, etc. If desired, a corporate Peering email account may be associated with ProVision under the Peering Emails subtab, allowing for peering requests to be viewed from ProVision and associated with Peers.

PEERING WORKFLOW





ProVision versions 6.2.1 and earlier:



For more information on performing tasks under Peering, see the following documentation sections:

Peering:

- Peering
- Peering Exchanges
- Peering Routers
- Peering Sessions
- Import Peering Sessions

VLAN Manager

ProVision versions 7.3.0 and later:

The VLAN Manager allows users to add domains and VLANs to their ProVision instance, and associate them with IP blocks. Customizable VLAN columns - including up to ten user-defined metadata columns - allow you to rename column headers, set the display order, select which columns are visible, and display your own information fields.

Permissions and VLAN

The Permissions structure in VLAN includes the following items of note:

The following VLAN tasks requires Admin-level permissions:

- Adding new Numbering Authority ranges for VLAN use
- Editing IPAM / VLAN Columns
- Adding, editing, and removing Domains
- Adding, editing, and removing VLANs

Non-Admin users may:

- View the VLAN Home Page and utilization data, however, only resources that the user has view permissions for will display under the "Resources" and "Recent Assignments

VLAN Workflow:

Create Domain(s)

The workflow starts with creating a domain in the IPAM Tab VLAN section of ProVision, by clicking the "Add Domain" button and entering domain information.

VLAN domains may be created as pre-set Numbering Authority ranges, or defined manually. Two default Numbering Authority VLAN ranges are provided, one for a Cisco Standard domain, and another for a Cisco Extended Domain. Admins may create new Numbering Authority ranges at any time to support other router types, range extents, or exclusions. Those ranges will then be available as options when adding a new domain from the VLAN area. If you select to create a new domain by defining a manual range, you may enter the range extents, any exclusions, and associate a specific router if desired.

Add / Edit VLANs

VLANs may be added to the domain at the time the domain is created (via the "Add VLANs" input area) or added to an existing domain later via the "Add VLANs" button. You can add one VLAN, multiple VLANs, a large range of VLANs, or a mixed selection at the same time.

Once a VLAN has been added to a domain in ProVision, the VLAN may be edited to add a VLAN name or metadata information, and have IP blocks associated with it.

Add IP Blocks to VLANs

Once a VLAN has been added to a domain in ProVision, IP blocks may be associated with ('assigned to') that VLAN. There are multiple methods to set the VLAN for a block:

- **Individual block edit** - Edit one or more blocks and set the Domain and VLAN fields to the desired values. Direct edit may be performed from IPAM Manage, VLAN Manage, and the IPAM Gadget, by selecting "Edit Block".
- **Direct Assign a block** - Open the "Assign Blocks" panel, expand "Direct Assign", and type in the CIDR to assign to the VLAN. Advanced options are available to distinguish between duplicate blocks. The "Assign Block" panel is available from the VLAN's Utilization Box, and/or the VLAN Manage header bar.
- **Smart Browse for blocks** - Open the "Assign Blocks" panel, expand "Browse Assign", and enter filter criteria to create a list of blocks meeting that criteria. Then, select one or blocks from the list to assign to the VLAN. The "Assign Block" panel is available from the VLAN's Utilization Box, and/or the VLAN Manage header bar.

After assigning a block to the VLAN by any method, that block will immediately display in VLAN Manage for that VLAN, in the VLAN's Quickview Panel, and the VLAN Utilization display panel will be updated to include the new block.

Manage Domains and VLANs

Managing VLANs and blocks under the VLANs may include standard IPAM tasks, such as editing blocks, splitting / merging blocks, or allocating/ assigning / unassigning the blocks to a resource. All of these functions, and more, may be performed from either VLAN Manage or IPAM Manage.

Other tasks, such as editing VLAN names, metadata, or adding/removing VLANs from a domain are performed from the VLAN Action Panels on the VLAN Home page, or from VLAN Manage.

Editing Domains - including renaming, adding metadata, and deleting - may be performed from VLAN Advanced.

VLAN Workflow (Legacy):

ProVision versions 7.3.0 and earlier:

The VLAN Manager allows Admin users to add domains and VLANs to their ProVision instance, and associate them with IP Blocks. Optionally, VLAN tags may be associate with ranges or individual VLANs under a domain, to help limit VLAN search results when enabling VLANs.

Standard flow (without VLAN tags):

The workflow starts with creating a domain in the VLAN Admin section of ProVision. During creation, domains may be selected as "standard" or "extended" domains, declaring the size of the VLAN pool from which VLANs are available to be enabled. Next, VLANs must be enabled and added to the domain. This is done under the IPAM Tab -> VLAN section of ProVision. Add VLANs to the domains by clicking "Add", searching for the desired range of VLANs to enable from the standard / extended pool, and selecting the desired VLANs to enable. Once enabled, VLANs may be edited or have IP blocks associated with that VLAN. Editing VLANs and Direct / Smart Browse / Search IPs functions for adding blocks to VLANs are available from the Domain/ VLAN list under under the IPAM Tab -> VLAN section of ProVision by expanding the desired domain and clicking on the VLAN link. IP blocks may also be edited individually through the IPAM gadget, IPAM Manage, and VLAN Manage areas to add domain and VLAN information to the block.

Optional flow (with VLAN tags):

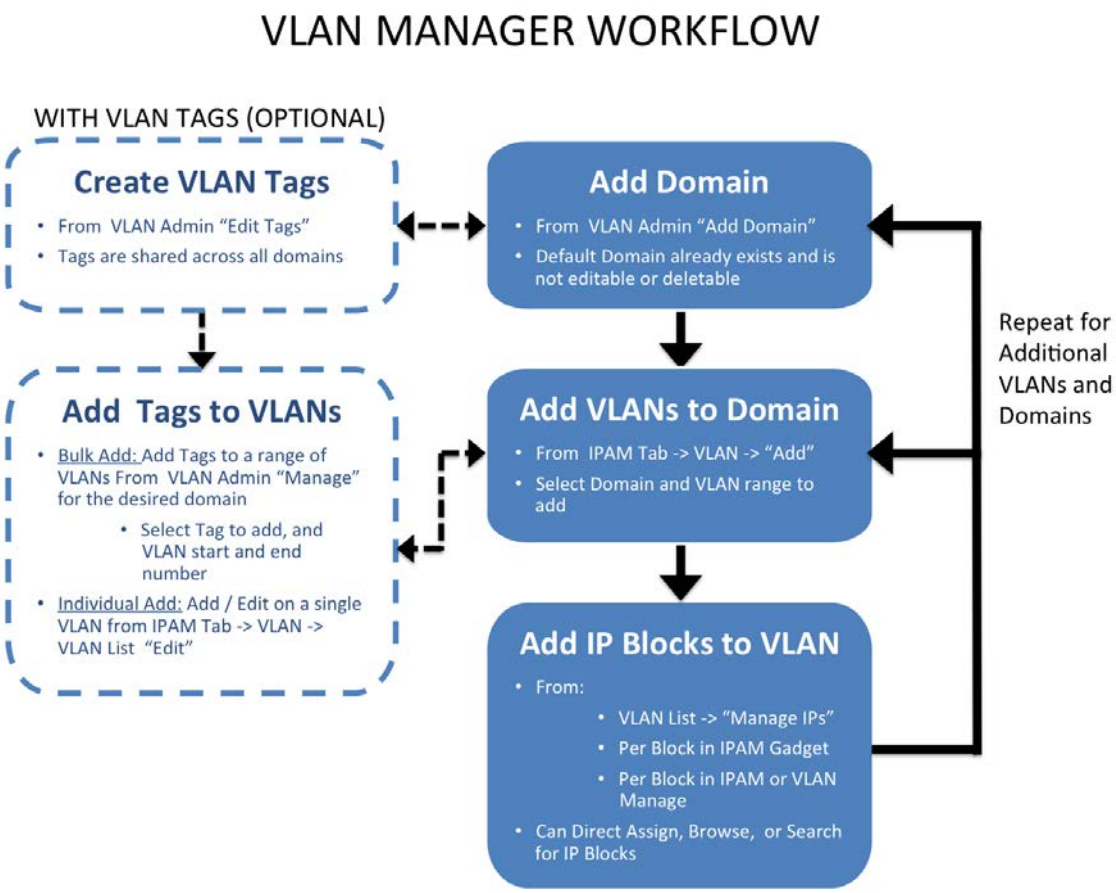
The workflow starts with creating a domain in the VLAN Admin section of ProVision. During creation, domains may be selected as "standard" or "extended" domains, declaring the size of the VLAN pool from which VLANs are available to be enabled. VLAN tags may be added (from the VLAN Admin Tab -> Edit Tags submenu) before or after domain creation. Tags created in this area are available to all domains and VLANs.

If the tags created need to be added to a large range of VLANs, the next step would be to add tags to the desired range(s) of VLANs from the VLAN Admin -> Domain "Manage" button. Domain Manage allows you to select an existing tag, type in the numeric VLAN start and end point, and assign that tag to that entire range of VLANs under the current domain.

Once a bulk range of tags is associated with VLANs, you can use the tag as a search criteria when adding VLANs to a domain. This is done under the IPAM Tab -> VLAN section of ProVision. Add VLANs to the domains by clicking "Add", using the tag name as a search field for the desired range of VLANs, and then selecting the desired VLANs to enable.

If tags are only desired for individual VLANs, they may be added when editing a VLAN after the VLAN has already been added/enabled for the domain. Editing VLANs may be accessed from the IPAM Tab -> VLAN section, then expanding the desired domain and clicking on the VLAN link, selecting "Edit".

Next, VLANs must be enabled and added to the domain. This is done under the IPAM Tab -> VLAN section of ProVision. Add VLANs to the domains by clicking "Add", searching for the desired range of VLANs to enable from the standard / extended pool, and selecting the desired VLANs to enable. Once enabled, VLANs may be edited or have IP blocks associated with that VLAN. Editing VLANs and Direct / Smart Browse / Search IPs functions for adding blocks to VLANs are available from the Domain/ VLAN list under under the IPAM Tab -> VLAN section of ProVision. IP blocks may also be edited individually through the IPAM gadget, IPAM Manage, and VLAN Manage areas to add domain and VLAN information to the block.



DHCP

ProVision versions 7.0.0 and later:

ProVision 7.0.0+ includes many updates to the DHCP module, including the introduction of DHCP Groups, updated interface, improved permissions control, and simplified pool management. The DHCP Tab contains areas for managing both admin and non-admin tasks together for DHCP Groups, DHCP Servers, and DHCP Pools.

DHCP Groups allow you to create, view, and manage groups of DHCP Servers and Pools. Using groups, you can configure and push selected combinations of zones at one time. DHCP pools may be gathered under DHCP Groups, and servers attached to those Groups. Pools, attached servers, and failovers are managed at a per-Group level. Users can then view and manage Groups, individual pools, failover values, attach servers, and perform pushes all on the same page.

Additionally, starting in ProVision 7.0.0, any IPAM aggregate or block may be used for DHCP pools - provided it meets the specified criteria when creating a DHCP Pool. If assigning a pool out from a specific resource, ensure ahead of time that the resource contains suitable blocks with subassignments enabled.

The DHCP Workflow begins with adding DHCP Servers into ProVision and creating an additional DHCP Groups as needed.

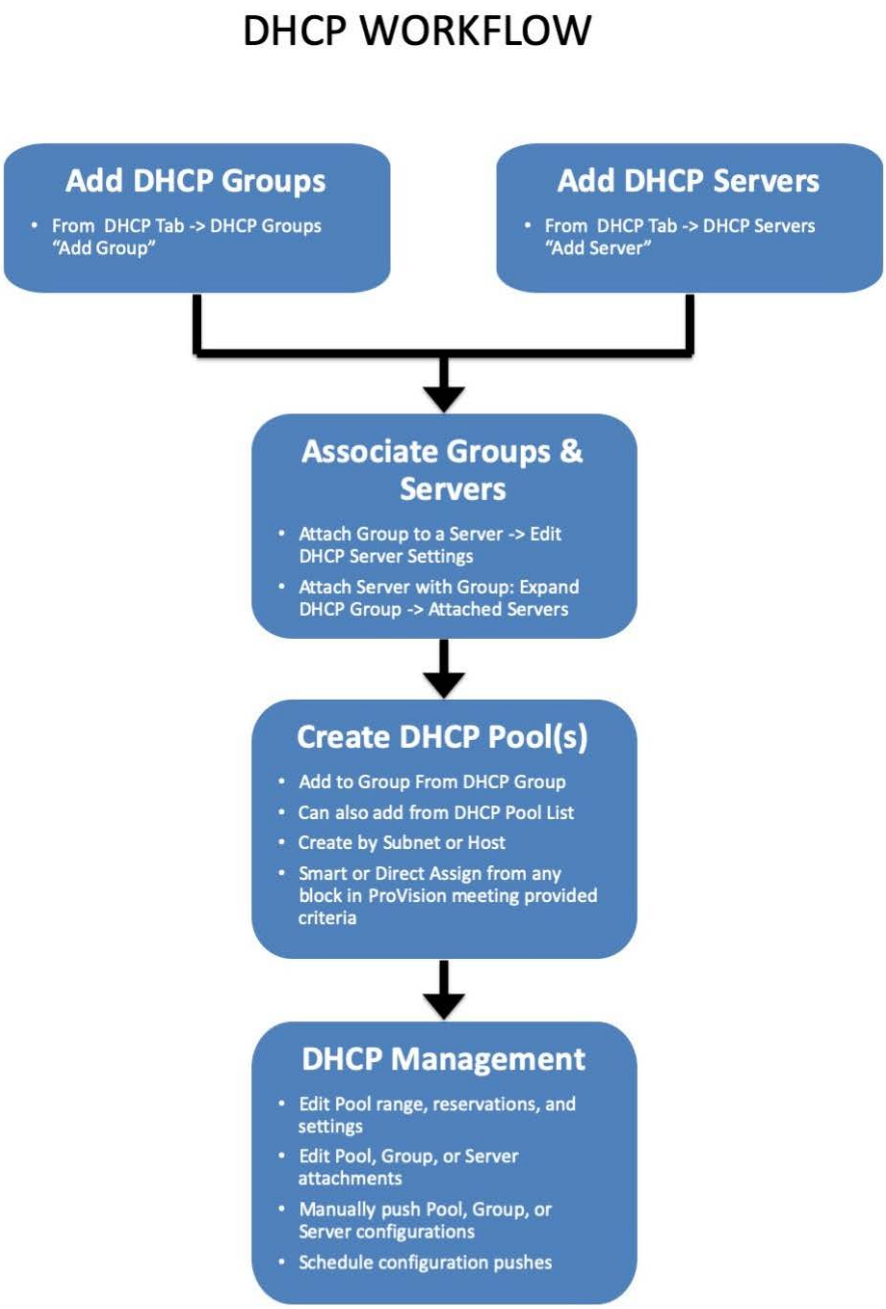
New DHCP servers may be added from the DHCP Tab - DHCP Servers subtab by clicking "Add Server". Type in the server information, select the service, and choose the resource to which the DHCP server belongs if applicable. This creates a hierarchical relationship, with the server as a child resource under the selected parent, and affects how permissions are handled for the server and pools. Then, enter any service-specific or advanced settings for the server. You may also choose which DHCP group to associate with the server if the group already exists, but you may also add that setting later.

If desired, you may create additional DHCP Groups to organize certain pools and associated DHCP servers together to push concurrently, with the option of a common failover value. A common scenario is using separate DHCP Groups per server, or separate Groups for IPv4 vs. IPv6 pools. A new DHCP Group may be created from the DHCP Groups subtab "Add Group" button. Enter the Group Name and parent resource. Once created, you may attach a DHCP server to the Group, associate a failover, and add pools to it.

Next, you may add/assign DHCP pools. Before assigning pools, ensure that you have suitable IP aggregates created in ProVision meeting your desired parameters to assign to the pool (such as desired RIR, region, VLAN, or allocated to a specific Resource). If assigning a pool out from a specific resource, ensure ahead of time that the resource contains suitable blocks that have subassignments enabled.

To add a pool to a DHCP Group, click the "Add Pool" button for that group. You may also add a pool from the DHCP Pools subtab without associating the pool with a DHCP Group. From the "Create New Pool" dialog, select the pool type ("Subnet" or "Host), enter in the relevant information, and select to either Direct Assign a specific block, or have ProVision Smart Assign a block based on provided filter criteria - such as assigned resource, region, rule, or VLAN. Click "Save" to complete the Pool assignment.

Once servers, groups, and pools have been created, you may complete management tasks such as pushing configs on either a server, group, or individual pool level, schedule pushes, update reservations or assignment ranges, and change group/server associations as needed.



For ProVision versions 6.2.1 and earlier:

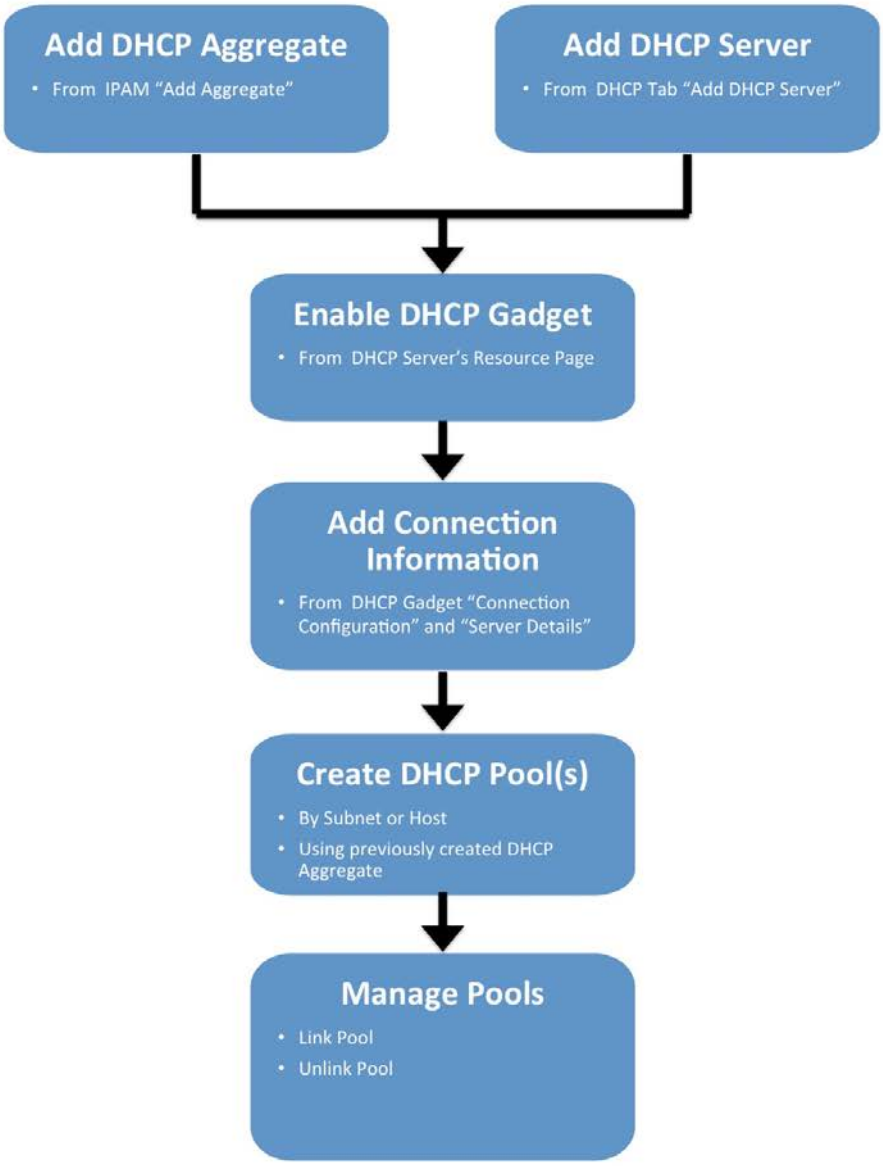
The DHCP Workflow in ProVision begins with denoting the DHCP IP Aggregate(s) from the IPAM Tab -> "Add Aggregate". When creating DHCP aggregates, ensure that the block is designated as 1918 space, and has the check boxes next to "DHCP Aggregate" and "Allow Sub-assignment" selected. This will ensure the block is automatically added to the DHCP Available Resource, and is usable when defining DHCP Pools.

Separately, ensure that the DHCP server is added into ProVision. New DHCP servers may be added from the DHCP Tab "Add DHCP Server" button. Type the server name, then choose the resource to which the DHCP server belongs. This creates a hierarchical relationship, with the server as a child resource under the selected parent.

Once the server has been created in ProVision, click on the server name in the DHCP server list to go to the server's Entry Page. If the server was created through the DHCP Tab, the DHCP Management Gadget will already be enabled for the DHCP server. If created elsewhere, the DHCP Gadget may need to be enabled by simply selecting the "On" radio toggle next to "DHCP Services", and clicking the "Update" button. Next, add in the connection configuration and server details for the DHCP server in the DHCP Gadget.

Now that the DHCP server is set up and DHCP aggregates created, DHCP Pools may be created and managed. Pools may be created by subnet or host. Creating by subnet allows for a block to either be directly assigned manually, or for ProVision to SmartAssign a block based on the provided criteria. Creating by host requires providing a host and MAC address, and then likewise may have an IP directly assigned or Smart Assigned. DHCP Pools, once created, are managed by linking or unlinking to the DHCP server. IP assignments and pool details may be changed at any time by clicking on the pool name, editing the details as desired, then clicking "Save".

DHCP WORKFLOW



For more information on working with DHCP in ProVision, see the DHCP Tab documentation.

For more information on DHCP tasks, see the following sections:

- DHCP Tab
- Working with DHCP Groups
- Working with DHCP Pools
- Working with DHCP Gadgets
- DHCP Administration
- Working with DHCP Servers

DNSv3 Workflow

DNSv3 revolves around Groups. Zones are gathered under Groups, servers attached to Groups, and pushes may be done on a per Group level. Thus, the first workflow step in DNSv3 is to set up one or more DNS Groups. A "Default Group" is automatically provided in ProVision, but other Groups may be desired to organize zones and default values.

To create a new DNS Group, click the "Add Group" button from the **DNS Groups** tab. Enter the desired default values for the Group, and save. If only using the Default Group, ensure the default parameter values are set as needed. For more information, see Working with DNS Groups.

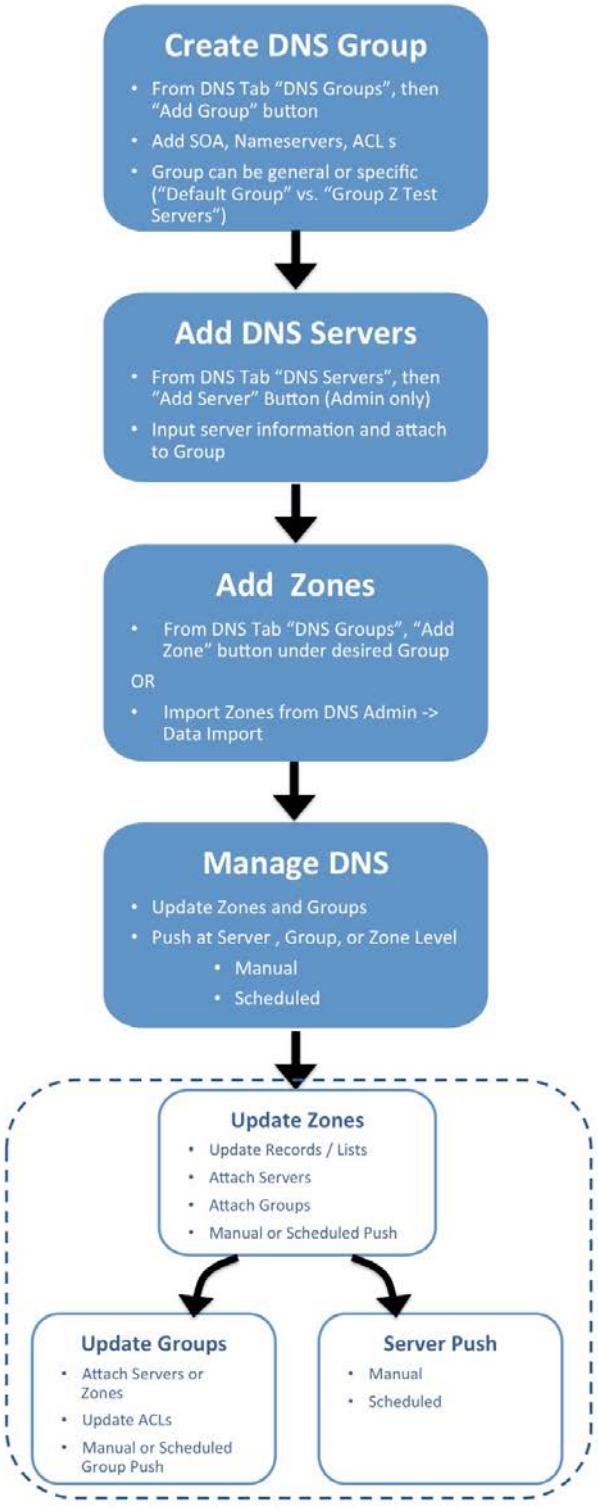
After Groups have been set up, DNS servers should be added or settings verified. Admin users may add DNS servers from the **DNS Servers** tab "Add Server" button. Input the server information and save. Existing servers may be reviewed and edited by clicking on the server name in the DNS Server List. Once a server is created in ProVision, it may be attached to any DNS Group under the Group's "Attached Servers" module. Attaching a server to a Group will allow for zones in that group to be pushed to the attached server(s). See Working with DNS Servers.

Next, add zones to your groups. Zones may be manually added under each group by clicking the "Add Zone" button, or it may be imported via DNS Importers into a selected Group. Add the zone and record information, and save. See Working with DNS Zones for additional information.

Zones may be only exist once per Group, but may be duplicated under multiple Groups. Zones may also be moved from Group to Group as needed.

At this point, all major components of the ProVision DNS system have been added - from here management tasks take over. Zones may be updated and moved to or from Groups; Groups may be edited with different default values or servers, and pushes maybe be performed for an individual zone, a full Group, or for an entire server. Pushes may be manual or scheduled for a future time through the Scheduler.

DNS WORKFLOW



For more information on DNSv3 tasks, see the following sections:

- DNS Tab
- Working with DNS Groups
- Working with DNS Zones
- DNS Administration
- Working with DNS Servers
- Import DNS Zones

Approvals Workflows

Initial Setup

The high level process to use when first setting up approvals is as follows:

1. Review User Groups and Approval Process Needs

Step 1 - Review Existing User Groups and Process Needs

When setting up Approvals for the first time, review the information in the previous section under "Approvals Fundamentals" to ensure a basic understanding of how Policies, Actions, and User Groups relate together in Approvals.

Then, take a few minutes to think about the following questions to get a better sense of how to use Approvals with your specific organization:

Who are the users that perform DNS / DHCP tasks, and at what level?

Affects which users should be included in what User Groups

What ProVision User Group(s) are they in?

Approvals settings are applied to the User Group, not individuals - ensure users with similar oversight needs are grouped together

What actions made by a certain user group should be automatically denied, if any?

Assign the "Deny" policy to that Action/User Group combination

What actions made by a certain user group should require oversight (admin approval / rejection)?

Assign "Action to be approved" to that Action/User Group combination

Who is the admin / User Group that will make the final approval on a change?

Ensure the approver(s) is in a User Group with the "Must Approve" policy assigned for the actions requiring approval

Should any changes require multiple admins / User Groups to approve it in order to execute?

A single user from every group assigned with "Must Approve" for the action must approve the action for it to succeed

If two admins are required to both separately agree on a change, they should be under two separate User Groups assigned "Must Approve"

What User Groups would need to receive email Approval Status notifications, and on what type of actions?

Affects whether to enable notifications and set up the scheduler task to send the notifications, and to what User Groups. When enabled, all users of the relevant group(s) will receive the email(s)

Once your User Groups are optimized for use with Approvals, you may want to write down a quick note on which Action Types and policies are planned for each group.

2. Edit User Groups / Create Approvals-Specific User Groups, if needed

Step 2 - Add or Edit ProVision User Groups

From here, depending on the answers to the questions in step 1, you may need to do one or more of the following from the **Users** tab:

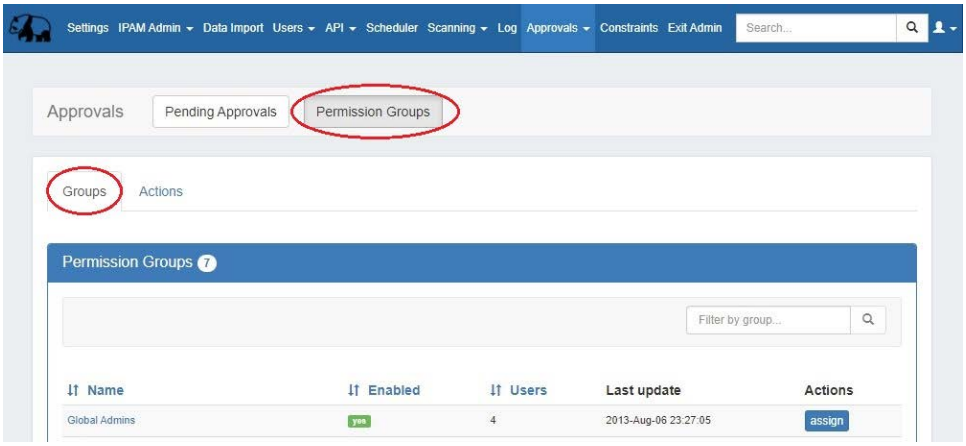
a. Edit existing User Groups to add or remove users, in order to combine users who will need similar action types approved.
b. Verify the User Groups have appropriate CRUD permissions set to perform the action(s) to be approved (e.g, you may have previously removed "Create" permissions for a group, but if the intent is now for those users to have "Add" actions approved by an Admin, the submitter will need User Group resource "Create" permissions back!)
c. Create new User Groups specifically for use with Approvals (recommended)
d. Associate users with different, or additional User Groups (remember - users can be associated with multiple groups!)

For more information on adding and editing ProVision User Groups, see Users & Permissions, Global Permissions, and Working With Users.

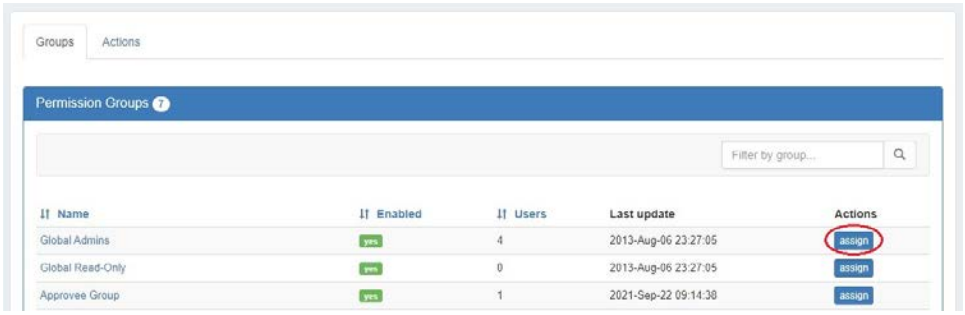
3. Assign Action and Policy Settings to User Groups

Step 3 - Assign Approval Action Settings to Groups

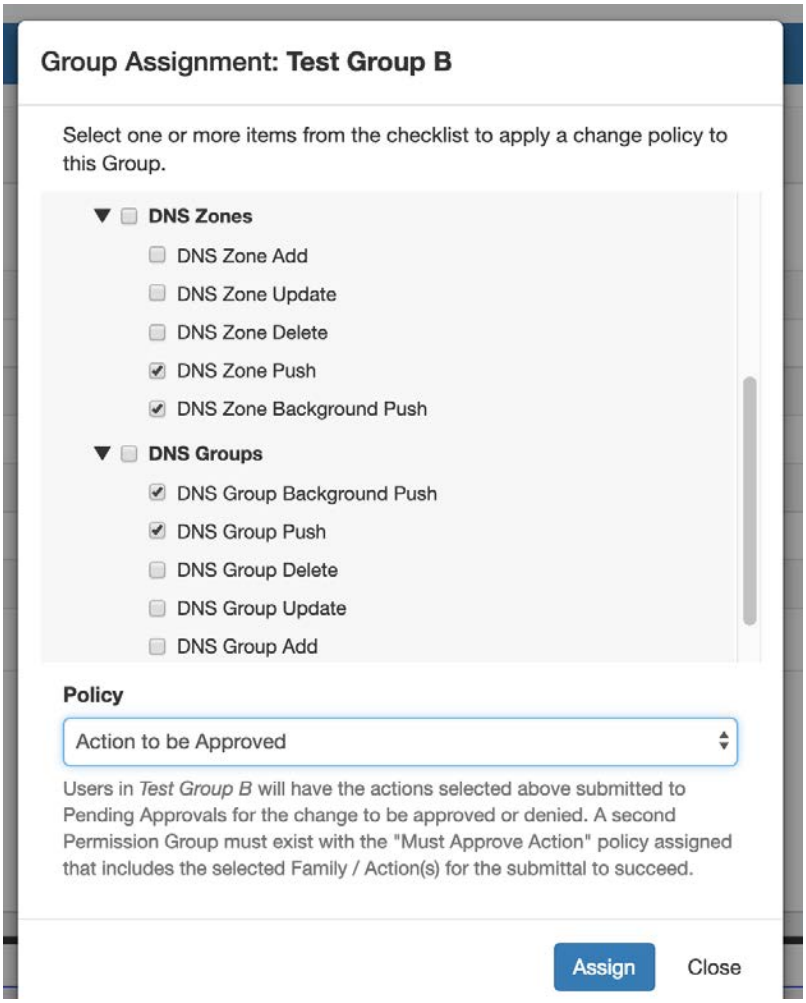
From the Approvals Tab, navigate to the **Permission Groups** sub-tab.



Then, under the **Groups** page tab, find the ProVision User Group you wish to want to assign a policy to and click "Assign".



Clicking the "Assign" button for a group brings up a checklist to select what policy to apply to the group for what Family and Actions (i.e. DNS Zone 'Add' or DNS Group 'Update'). You can "quick-select" all actions for a DNS Family (Severs, Groups, Zones, Records) or DHCP Family (Servers, Groups, Pools, Reservations) by clicking the checkbox next to the family name, or only select individual action types for each Family.



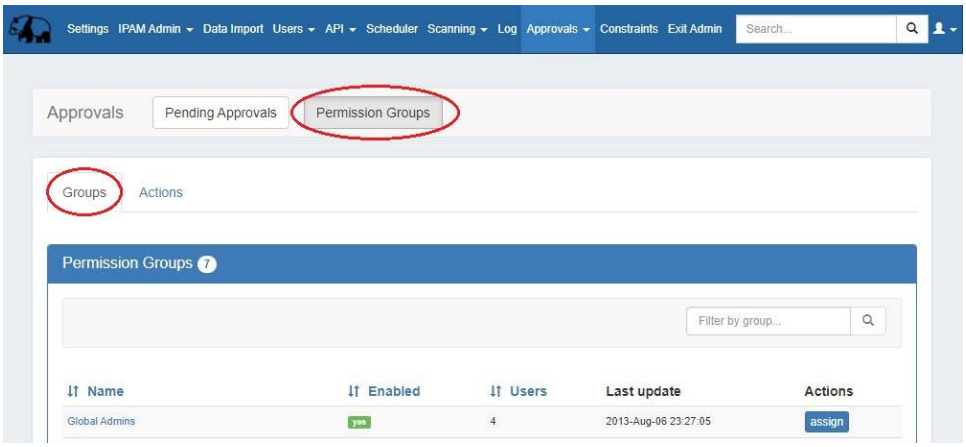
Once you've selected the applicable Family/Action combinations to apply a policy for, select either "Deny", "Action to be Approved", or "Must Approve Action" under Policy.

When done, Click "Assign", and repeat as needed for other Policy types or User Groups.

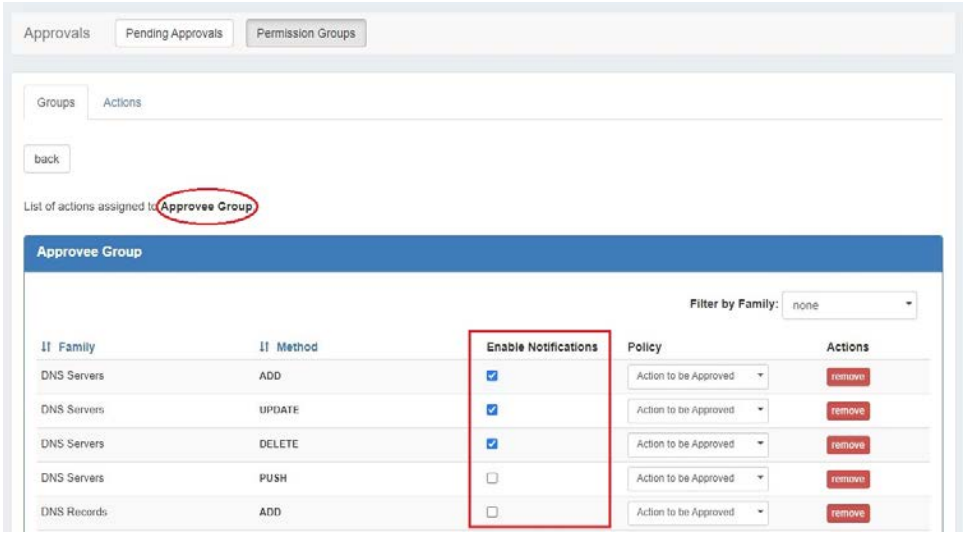
4. If using Approvals notifications, enable notifications for the appropriate Permissions Group(s)

Step 4 - Enable Notifications (Optional)

From the Approvals Tab, navigate to the **Permission Groups** sub-tab **Groups** page tab.



Click on the group name for which you want to set notifications - the Group Permissions Detail page will provide additional information on the group's settings.



For any Family/Action that you want to enable notifications, click the checkbox under "Enable Notifications". All users of that group will get email notifications when a change of the selected type(s) are made.

5. If using Approvals notifications, set up a Scheduler task for "Approvals - Process Subscription"

Step 5 - Add Scheduler Task: "Approvals - Process Subscription"

The "Approvals - Process Subscription" task processes approval request events and handles the sending of notification emails to subscribed Approvals Groups - this task must be created and running on a regular interval in order for Approval Notification emails to be sent.

In order to receive the most up to date information in the Approval Notifications, is recommended to create this task with a run time of "every 5 minutes" and no end date.

For information on setting up Scheduler Tasks, see Scheduler Tab.

6. Set up a Scheduler Task for "Approvals - Delete events older than 1 month", to occasionally clear out old and obsolete Approval request events

Step 6 - Add Scheduler Task: "Approvals - Delete events older than 1 month"

The "Approvals - Delete events older than 1 month" task deletes any Approvals history events older than 30 days.

It is recommended to set this task to run monthly with no end date, to clear out obsolete approvals items, reduce data storage space needs, and reduce approvals page load time.

For information on setting up Scheduler Tasks, see Scheduler Tab.

Daily Use

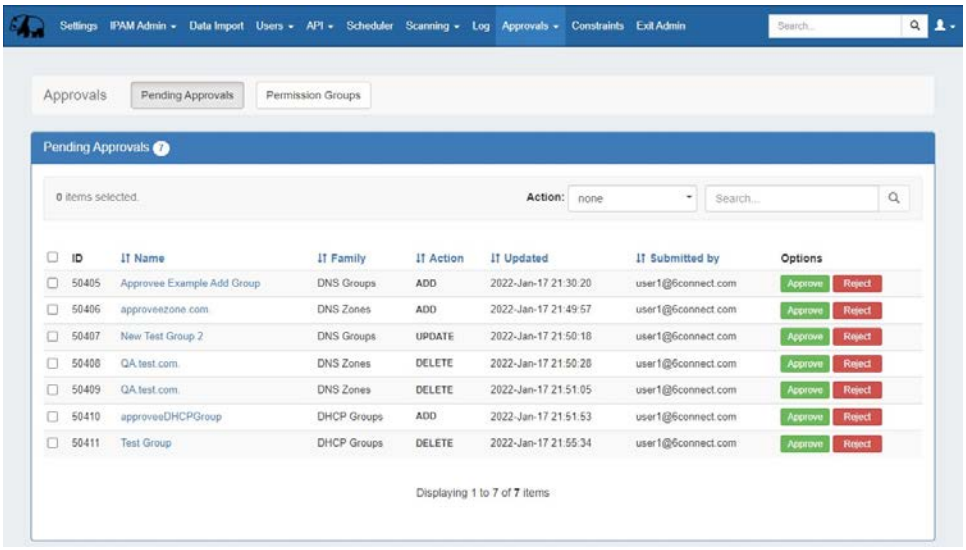
On a day-to-day basis after initial setup, an Approvals Workflow will be similar to the following (with "Submitter" as the user whose actions require approval, and "Approver" as the admin with the ability to approve/reject the change):

1. Submitter makes an action (either by action type or DNS Family) that requires approval
2. Submitter is notified that their action is pending approval

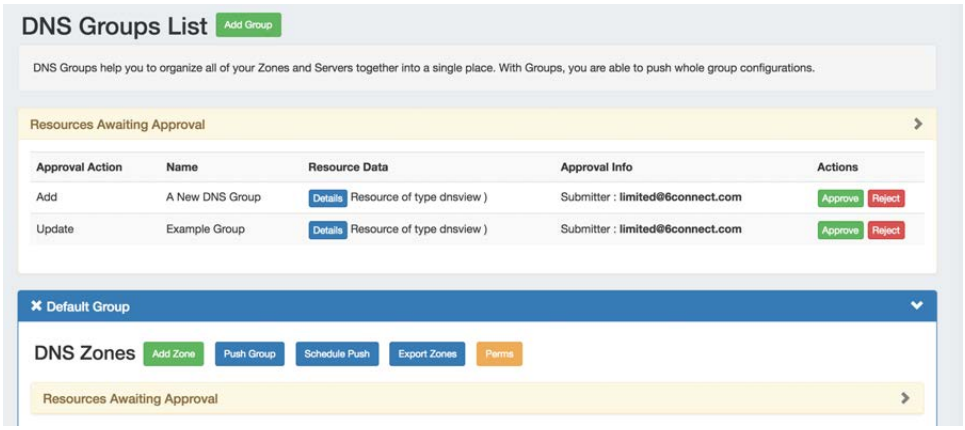


3. The requested change is sent to the **Approvals** Tab **Pending Approvals** list, and also to the **DNS** **Resources Awaiting Approval** module (the submitter may see their own submitted action under "Resources awaiting approval", but only Approvers can take approve /reject actions)

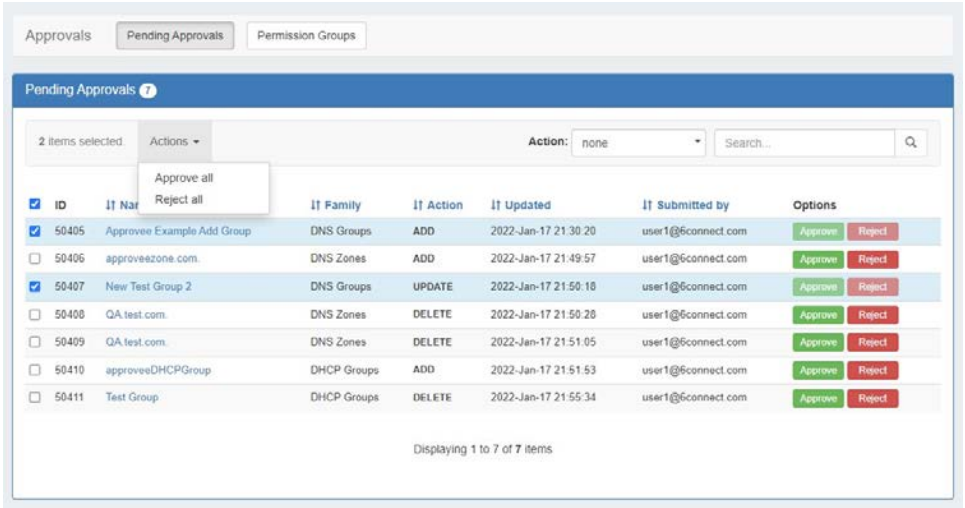
The **Pending Approvals** list is under the **Approvals** Tab. It shows Approvals events (change requests) for which the user has the ability to Approve or Deny - it does not show approval requests for all of ProVision or those for other users.



A "Resources Awaiting Approval" module will display in selected DNS / DHCP pages to Users with Admin / Approval permissions, if a change has been submitted on that page that is pending approval by the User's Approval Group.

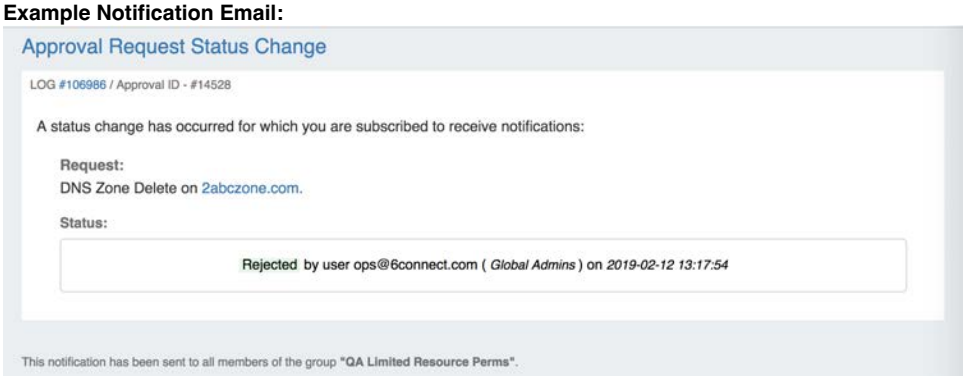


4. The Approver reviews the change in either their **Approvals** Tab **Pending Approvals** list, or the **Resources Awaiting Approval** module, and chooses to Approve or Reject the change:



   a. If Approved, and no other groups need to approve it, then the change executes and is saved. A status change notification email is sent, if enabled.
   b. If Approved, and is waiting approval from an additional User Group, the change continues to be held as Pending, until the other group responds (Both groups must "Approve" for the change to execute). A status change notification email is sent, if enabled, stating that the change is awaiting another Group.
   c. If Rejected, the change is not executed. A status change notification email is sent, if enabled.

Example Notification Email:



See the following areas for more information on Approvals:

- DNS Tab
- DHCP Tab
- Approvals
- Pending Approvals
- Permission Groups
- Scheduler Tab

User Guide

User Guide

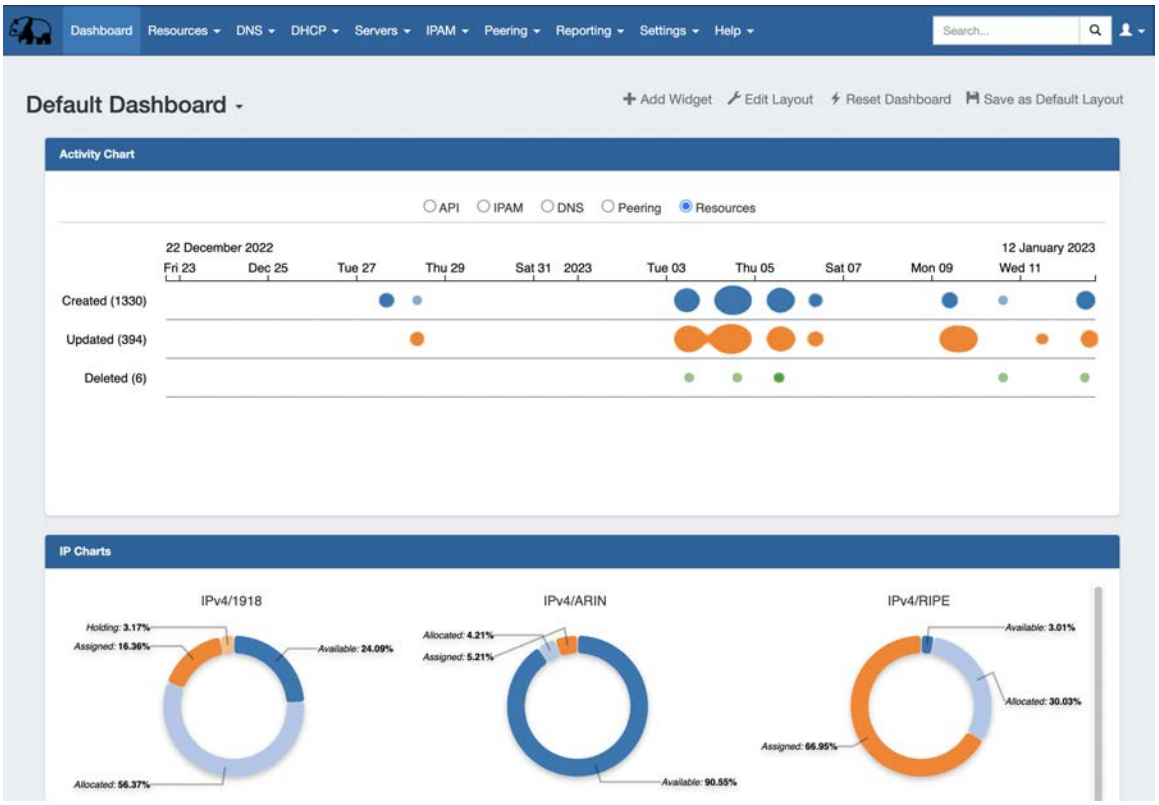
The ProVision User Guide provides information on features accessible in the standard user tabs within ProVision - Dashboard, Resources, DNS, DHCP, IPAM, Peering, and Reporting. For more detailed information on features accessible with Admin permissions, see the ProVision Admin Guide.

Table of Contents

- The Dashboard
- Resources
- DNS Tab
- DHCP Tab
- Managed Servers
- IPAM Tab
- Peering
- Reporting
- User Preferences

The Dashboard

The Dashboard



The Dashboard is your first stop when logging into 6connect Provision, giving you a quick graphical status overview as well as convenient links for reference and support. The Dashboard is comprised of modular "Widgets" that show different types of information. These Widgets may be added, moved, edited, and customized to create personalized Dashboards.

There are two levels of Dashboards:

Default Dashboard: The Default Dashboard is a shared dashboard for all users of the ProVision instance. It may only be edited by admin level users, but it is viewable by all users.

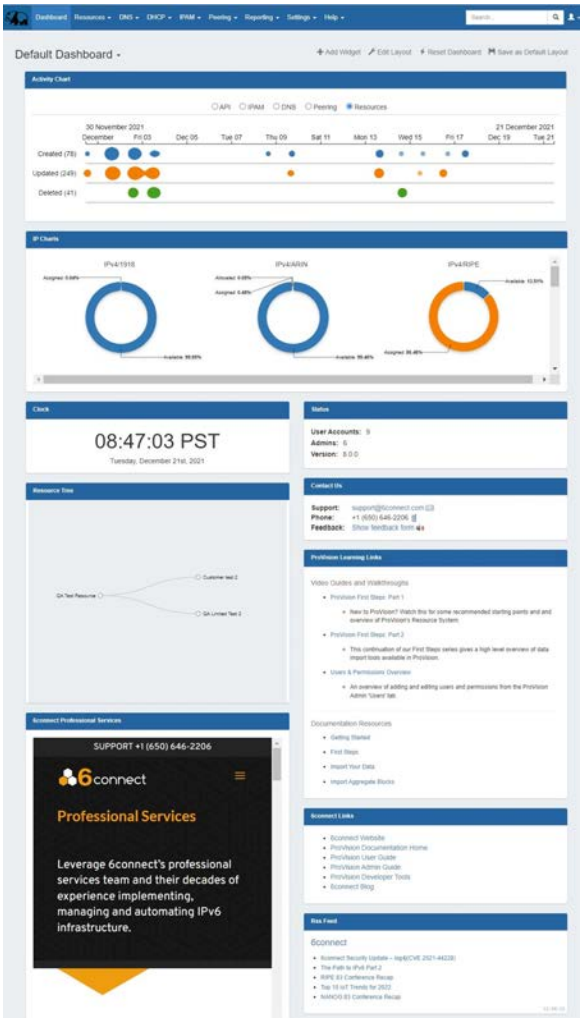
Individual Users' Dashboards: Additional Dashboards may be created by individual users. These dashboards are tied to the user logged in, and are only viewable / editable by that user.

> **Dashboards and Permissions**
>
> Note: An individual's permission levels may limit what that user can view in both default and personal Dashboards. Although all users can view the Default Dashboard, they may be not be able to view all elements or data inside the dashboard.

- Default Dashboard Overview:
  - Activity Chart (Viewable by Admins Only):
  - IP Charts:
  - Clock:
  - Status:
  - Resource Tree:
  - Contact Us:
  - Learning Links: (Markdown Widget)
  - Professional Services: (iFrame Widget)
  - Documentation Links (Links Widget):
  - RSS (RSS Feed Widget):

Default Dashboard Overview:

Although each user may have access to or create wildly differing dashboards, below are descriptions of the Widgets shown on the Default Dashboard (from left to right):



Activity Chart (Viewable by Admins Only):

Illustrates activity level for API, IPAM, DNS, Peering, and Resource areas of ProVision.

Select the desired ProVision area by clicking on the radio buttons. Then, hover over the chart, and use the mouse scroll wheel to zoom in or out of specific date / times. Clicking on a bubble will show activity detail, and resource / IP block links if applicable.

Only one Activity Chart Widget may exist on a dashboard.

IP Charts:

Illustrates the percentage of assigned, unassigned, allocated, or holding tank hosts for the selected space type and RIR out of the total available hosts in ProVision viewable by the user. Hovering over any section of the ring will display additional data.

Only one IP Charts Widget may exist on a dashboard.

Clock:

Shows the current time and date for the selected time zone, based on format set by the user.

Multiple Clock Widgets may exist on a dashboard.

Status:

General status information on number of user / admin accounts, ProVision version number, and a 'Coming Soon' link to the future releases roadmap in the the documentation.

Only one Status Widget may exist on a dashboard.

Resource Tree:

An interactive horizontal or vertical treeview of a selected Resource and its children. Select a top-level resource from the Widget's Edit menu. Users may click and drag to move within the Widget, as well as zoom in and out using a scroll wheel. Clicking on filled dots will expand the tree to show the children of that resource. Double-clicking on a resource in the tree will give you the option to navigate to the resource's entry page.

Multiple Resource Tree Widgets may exist on a dashboard.

Contact Us:

Provides support email, phone, and feedback form information. Support phone number and email address are set from the ProVision Admin settings. The feedback form email address is editable within the Widget.

Only one Contact Us Widget may exist on a dashboard.

Learning Links: (Markdown Widget)

Pre-created Markdown Widget containing links to commonly referenced ProVision documentation sections, video guides, and walkthroughs.

The Markdown Widget is a blank slate where users may add links, text, or other content through use of the Markdown language.

Multiple Markdown Widgets may exist on a dashboard.

Professional Services: (iFrame Widget)

Pre-created iFrame Widget accessing the Professional Services website.

The iFrame Widget sets a https URL to be viewed in an iFrame, to view stats or commonly referenced websites.

Multiple iFrame Widgets may exist on a dashboard.

Documentation Links (Links Widget):

Pre-created Links Widget listing company resources and documentation links.

Link URL and display may be set from within the Widget.

Multiple Links Widgets may exist on a dashboard.

RSS (RSS Feed Widget):

Pre-created RSS Feed Widget accessing the 6connect Blog RSS.

Shows the most recent five entries of a selected https RSS Feed. Feed links open in a new window when clicked.

Multiple RSS Feed Widgets may exist on a dashboard.

Additional Information

Continue on for details on dashboard customization, as well as how to add, move, update, and delete individual Widgets.

- Customizing the Dashboard
- Working with Dashboard Widgets

Customizing the Dashboard

Dashboard Customization

The Dashboard is your first stop when logging into 6connect Provision, giving you a quick graphical status overview as well as convenient links for reference and support. The Dashboard is comprised of modular "Widgets" that show different types of information. These widgets may be added, moved, edited, and customized to create personalized Dashboards.

There are two levels of Dashboards:

Default Dashboard: The Default Dashboard is a shared dashboard for all users of the ProVision instance. It may only be edited by admin level users, but it is viewable by all users.

Individual Users' Dashboards: Additional personal dashboards may be created by individual users. These dashboards are tied to the user logged in, and are only viewable / editable by that user.

Dashboards and Permissions

Note: An individual's permission levels may limit what that user can view in both default and personal Dashboards. Although all users can view the Default Dashboard, they may be not be able to view all elements or data inside the dashboard.

Browser Compatibility

It is recommended to use the most recent versions of the Chrome or Firefox browsers when working with the dashboard. Due to incompatibilities with Internet Explorer / Edge, the dashboard is set to read-only mode and is not editable when accessed from IE at this time.

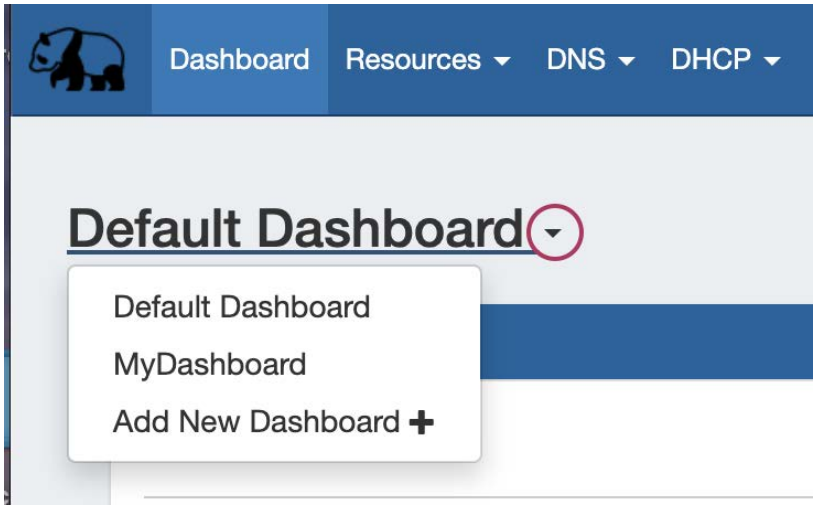
- Dashboard Customization
- Working with Dashboards
  - Viewing an Existing Dashboard
  - Adding a Dashboard
  - Editing a Dashboard
    - To Edit the Page Layout:
    - To Edit the Location of Individual Widgets:
  - Saving a Dashboard
  - Deleting a Dashboard
  - Reset the Default Dashboard
- Next Step: Widgets

Working with Dashboards

Viewing an Existing Dashboard

The Default Dashboard will be the primary dashboard that appears when clicking on the **Dashboard** Tab.

To view another, already created dashboard, click on the dashboard name at the top left of the dashboard page. This will open the list of existing dashboards.

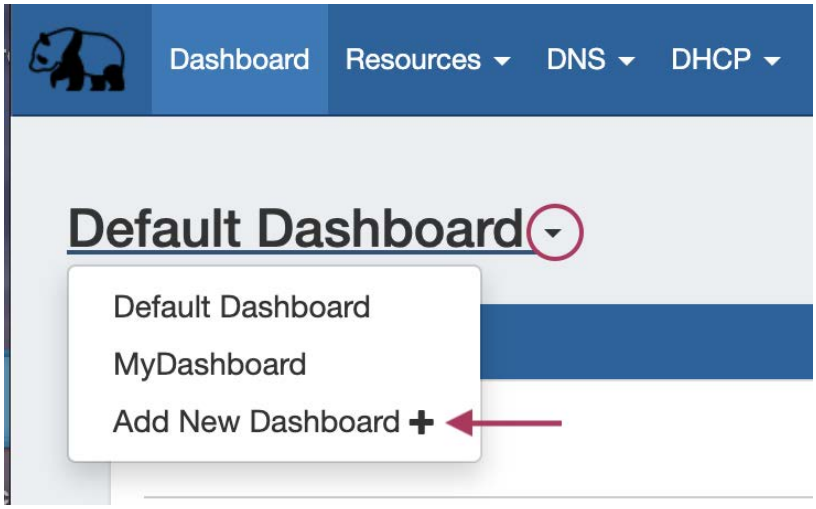


From there, click on the name of the dashboard you wish to view.

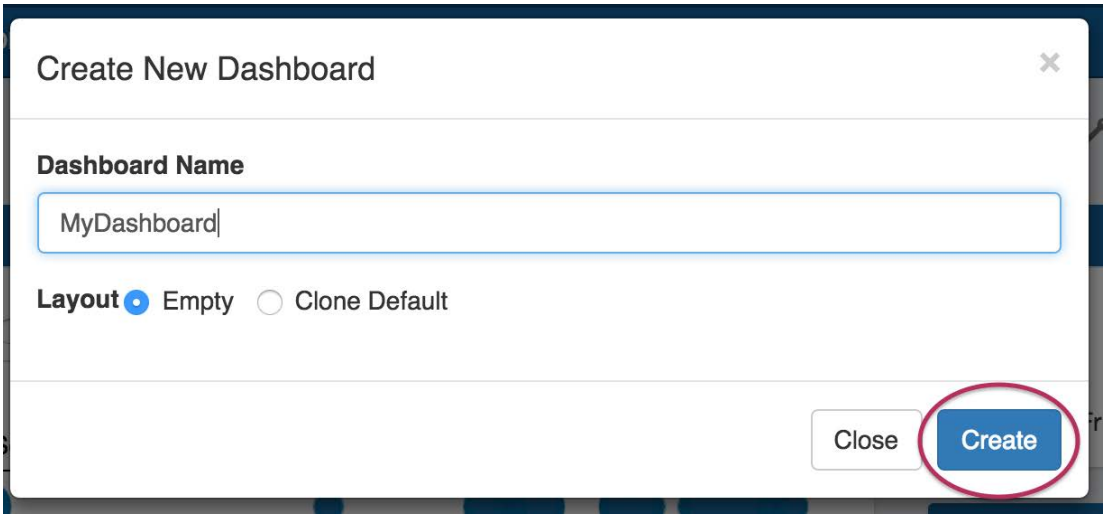
Adding a Dashboard

To add a new personal dashboard, click on the dashboard name at the top left of the dashboard page. This will open the list of existing dashboards.

Click on "Add New Dashboard"



Fill out the desired dashboard name, and choose whether the dashboard will be empty or cloned from the default dashboard. Selecting "Empty" will provide a (mostly) blank canvas for selecting and placing widgets from scratch; selecting "Clone" will duplicate the current state of the Default Dashboard, which the user can then edit as desired.

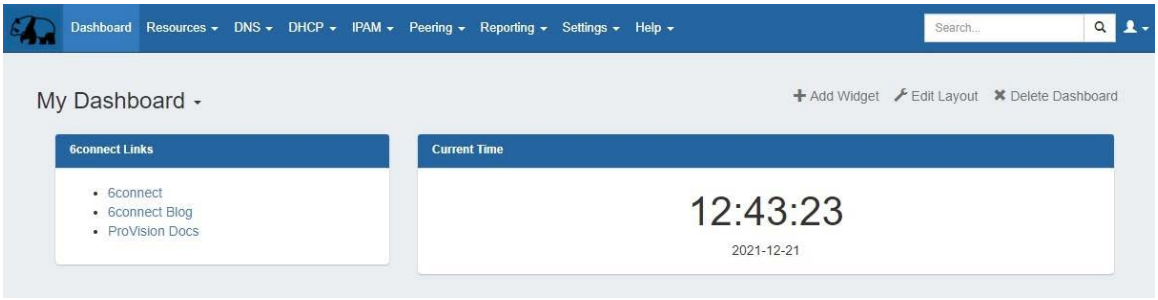


Note

Note: If "Empty" is selected, a default widget will still show in the head of each page column, this is to assist in both visualizing the current page layout and to aid in placing new widgets. These widgets may be edited or deleted as desired during the process of selecting layout and adding other widgets.

For best performance of the dashboard, ensure that at least one widget is placed in each column, or columns may be difficult to "detect" when moving widgets to different page areas.

MyDashboard has now been created as an "Empty" dashboard, is accessible from the dropdown list of dashboards, and is ready to set up!

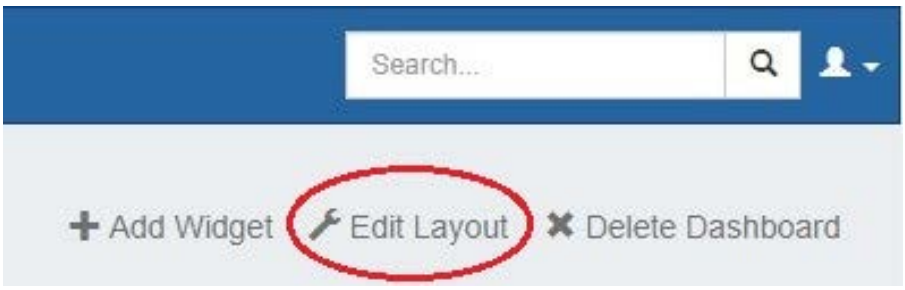


Editing a Dashboard

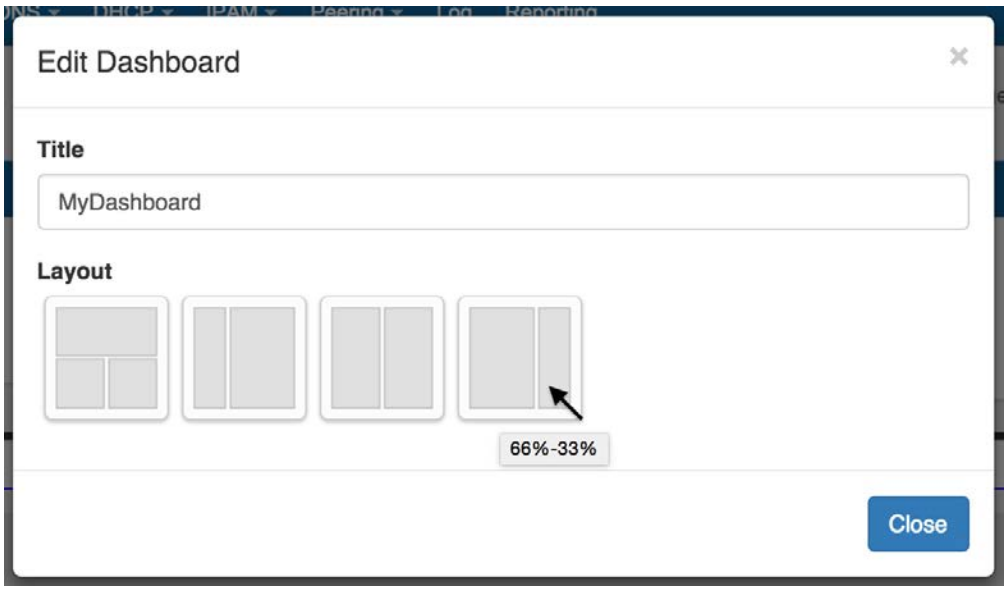
You can change the layout of your dashboard by selecting overall page layout options (for column size and location on the page), as well as move individual widgets around the page.

To Edit the Page Layout:

At the top of the page, click "Edit Layout".



This will bring up an option box where you can choose to rename your dashboard, and / or select a column organization structure.



Title: Type in how you want your dashboard title to display.

Layout: Click on a layout option to immediately apply that layout to your dashboard. Hovering over the option will show the column width percentages.

100% / (50% / 50%): Creates a page with a full width section at the top, and two equal sized columns below that.

33% / 66%: Creates a page with two columns, with the left column being one-third of the page width, and the right column as two-thirds of the page width.

50% / 50%: Creates a page with two equal sized columns, split down the middle.

66% / 33%: Creates a page with two columns, with the left column as two-thirds of the page width, and the right column as one-third of the page width.

To Edit the Location of Individual Widgets:

Individual widgets may be moved around the page by clicking and dragging on the "Move" icon on the right side of the widget header.

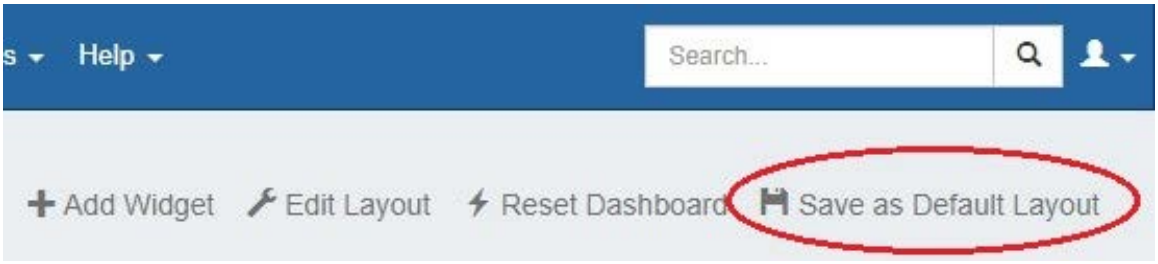
While mousing over the move icon, when the cursor changes to a hand icon, click and hold your left mouse button, then drag the widget up or down to the desired location. To move the widget to another column, drag the widget sideways to the column, then up to briefly hover over a widget already in the desired column (this "selects" the column for the widget). Then, drop the widget in the desired location in that column.

Saving a Dashboard

Personal dashboards are automatically saved after making layout or widget edits (the exception is that widget resizing must be manually saved - see Working with Dashboard Widgets).

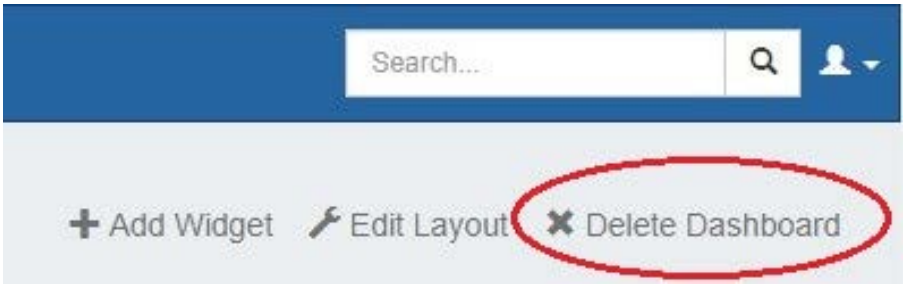
Default Dashboards must be manually saved after edits for those changes to apply to all dashboard users.

Admin users can save Default Dashboard changes by clicking "Save as Default Layout" at the top right section of the dashboard page, and the changes will be applied for all users.



Deleting a Dashboard

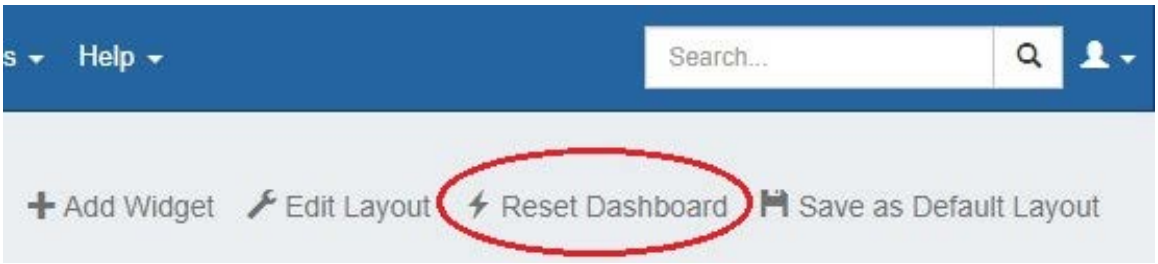
Personal dashboards may be deleted by clicking the "Delete Dashboard" button at the top right of the page. Default Dashboards may not be deleted.



Reset the Default Dashboard

The Default Dashboard may be reset to the ProVision default dashboard by clicking "Reset Dashboard".

This will remove any admin changes, and set the Default Dashboard to its original state. This action may only be made by admin users.



Next Step: Widgets

Continue on to Working with Dashboard Widgets for information on each widget, as well as how to add, move, update, and delete individual widgets.

- Working with Dashboard Widgets

Working with Dashboard Widgets

Dashboard Widgets

The previous section, Customizing the Dashboard, gave a high level overview of the dashboard types, how to create new personal dashboards, edit the dashboard layout, and remove personal dashboards. This section will give an overview of how to work with individual widgets, and options available in each widget type.

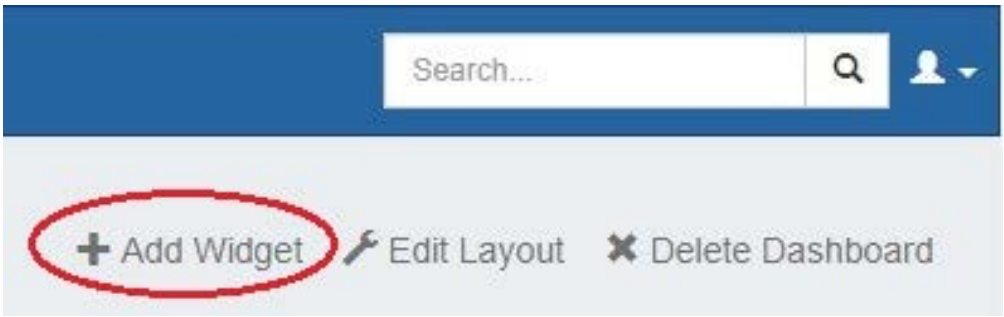
Before you begin working with individual widgets, make sure that you have reviewed the information contained in Customizing the Dashboard and are familiar with the tasks outlined there.

- Dashboard Widgets
  - Working with Widgets
    - Adding Dashboard Widgets
    - Move a Widget:
    - Maximize / Pop-Out a Widget:
    - Edit a Widget (Widget Action Menu):
  - Additional Information

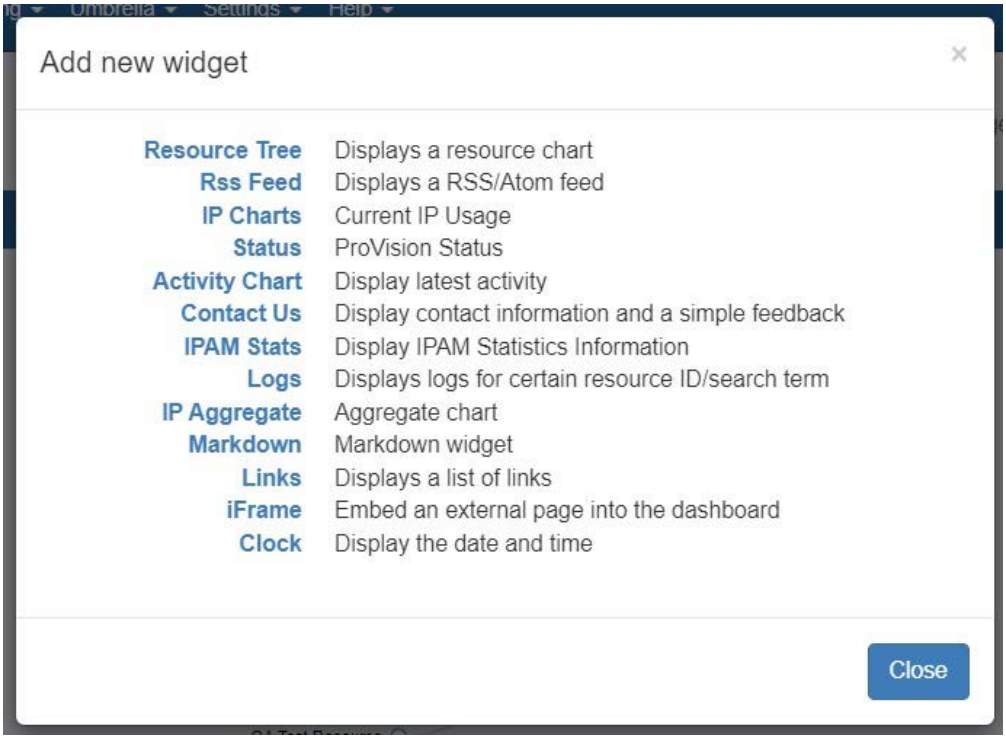
Working with Widgets

Adding Dashboard Widgets

To add a widget to personalize your dashboard, click on the "Add Widget" button at the top of the page.



Then, click on the name of the widget you want to appear on your page. It will automatically be added into the leftmost column of your page.

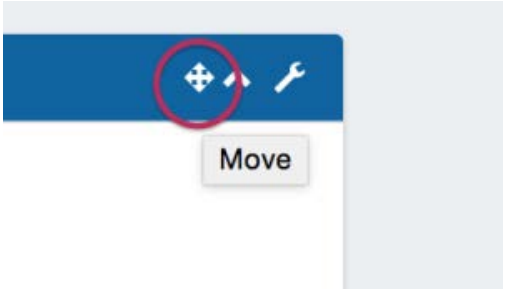


Some widgets may only have one instance per dashboard, whereas other widgets may be able to have multiple instances per dashboard. The Add New Widget dialog will only show you the widgets you have available to add.

For detailed information on each individual widget, view Available Dashboard Widgets.

Move a Widget:

Individual widgets may be moved around the page by clicking and dragging on the "Move" icon on the right side of the widget header.



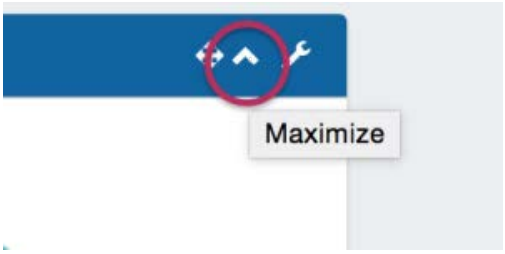
While mousing over the move icon (when the cursor changes to a hand icon) click and hold your left mouse button, then drag the widget up or down to the desired location.

To move the widget to another column, drag the widget sideways to the column, then up to briefly hover over a widget already in the desired column (this "selects" the column for the widget). Then, drop the widget in the desired location in that column.

Your browser does not support the HTML5 video element

Maximize / Pop-Out a Widget:

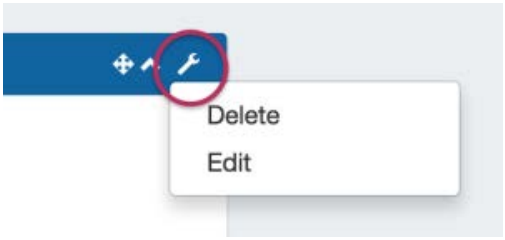
Widgets can temporarily be viewed at a larger size by hitting the "Maximize" icon on the widget header. This will "pop out" the widget information to a larger page size for easier viewing.



While maximized, you may interact with the widget as normal. When done, hit the "Close" button.

Edit a Widget (Widget Action Menu):

To open the edit menu for a widget, click on the Action Menu (wrench icon) on the right side of the widget header. A drop down menu will appear with some of the following options:



Edit: Opens an edit widget pop up, where widget-specific options may be changed. Options may include changing the title, links, applicable resources, and so forth depending on the particular widget.

Resize: For widgets able to be resized vertically, brings up a draggable black bar at the bottom of the widget. Drag the bar up or down to the desired widget height, then select the Action Menu again and click on "Save Resize" to save and complete the size edit.

Save Resize: Available only after the "Resize" action has been used. After resizing a widget, selecting the Action Menu again and clicking on "Save Resize" will save the widget size.

Delete: Deletes the widget.

Additional Information

For details on available widgets and working with a specific widget, see the next section:

- Available Dashboard Widgets

Available Dashboard Widgets

Dashboard Widgets

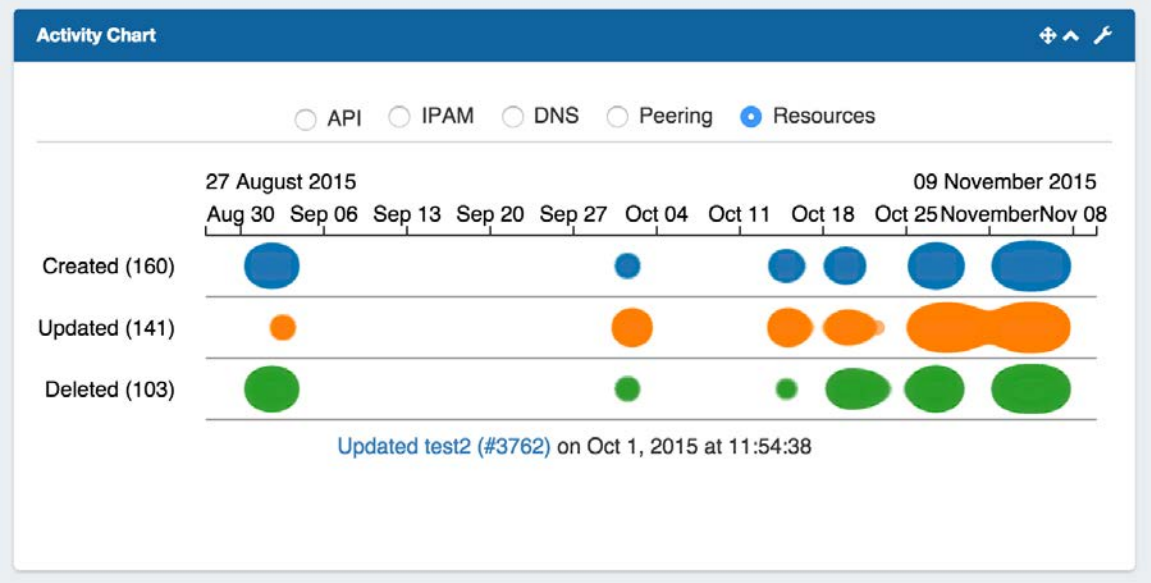
The previous sections, Customizing the Dashboard, and Working with Dashboard Widgets, gave a high level overviews of the dashboard types, how to work with personal and default dashboards, and the basics of working with widgets. This section will give an overview of all available widgets and options available in each widget type.

Before you begin working with individual widgets, make sure that you have reviewed the information contained in Customizing the Dashboard and Working with Dashboard Widgets, and are familiar with the tasks outlined there.

- Dashboard Widgets
  - Available Widgets
    - Activity Chart (Admin only)
    - Resource Tree
    - IP Charts
    - IP Aggregate
    - IPAM Stats
    - RSS Feed
    - Status
    - Clock
    - Contact Us
    - Logs
    - Markdown
    - Links
    - iFrame

Available Widgets

Activity Chart (Admin only)



Illustrates activity level for API, IPAM, DNS, Peering, and Resource areas of ProVision. The Activity Chart is only visible to Admin users. Only one Activity Chart Widget may exist on a dashboard.

Activity Chart Actions:

Radio Buttons: Select the desired ProVision activity area to view by clicking on the radio buttons (API, IPAM, DNS, Peering, or Resources).

Chart: While hovering over the chart, you can:

Use the Scroll Wheel to zoom in or out of the date/time detail level

Double click to zoom into the next date/time detail level

Click & Drag left or right to move to an earlier or later date/time at the current zoom level

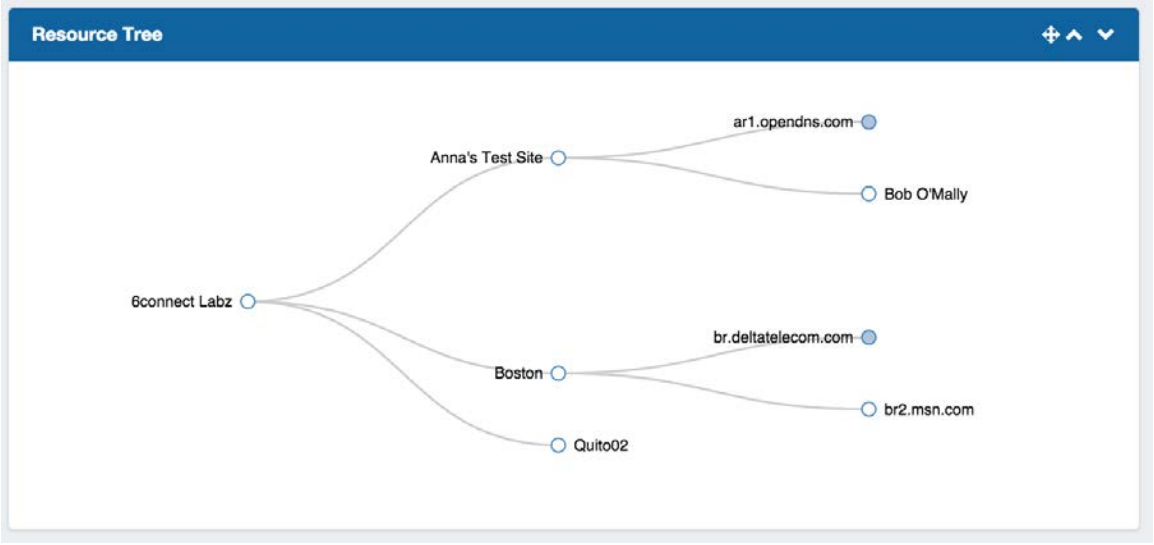
Single Click on a bubble will show the activity detail, and resource / IP block links if applicable.

Activity Chart Edit Options:



Title: Edits the title of the widget shown on the header.

Resource Tree



Interactive graphical display of the resource structure for a parent resource.

Resource Tree Actions:

Users may:

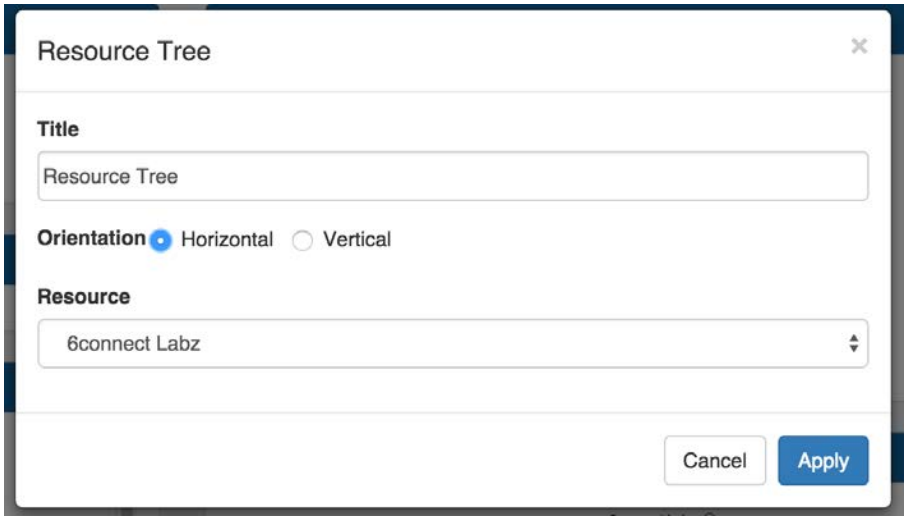
Click & Drag to move the chart within the widget,

Use the Scroll Wheel to zoom in or out

Click on Filled dots to expand the tree to show the children of that resource.

Double click on a resource in the tree to give you the option to navigate to the resource's entry page.

Resource Tree Edit Options:



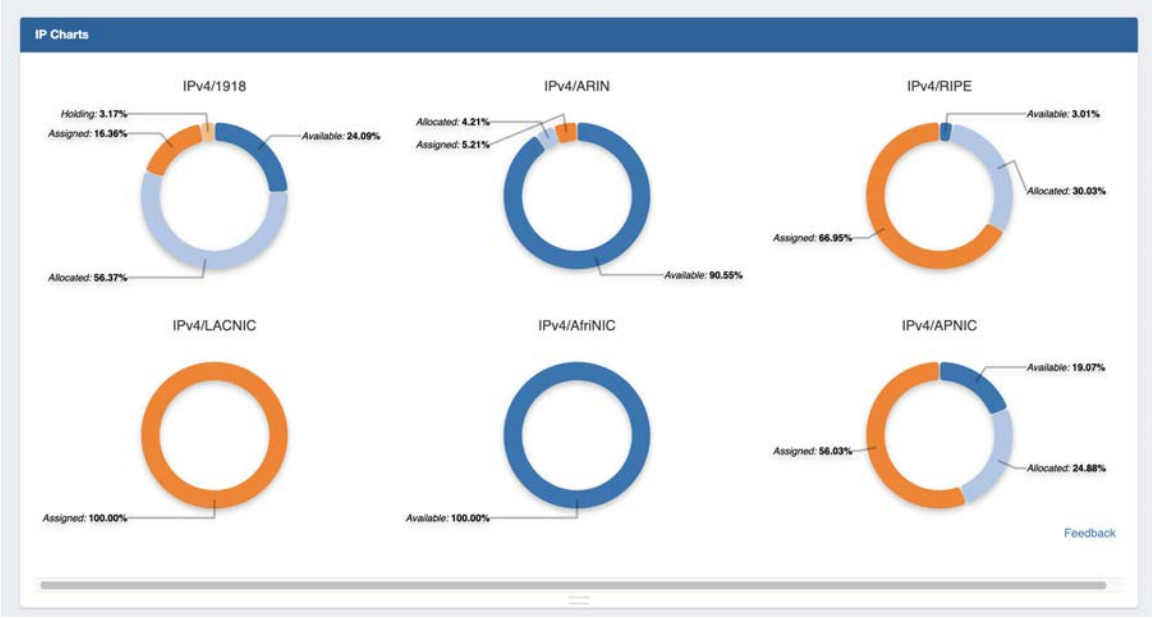
Title: Edits the title of the widget shown on the header.

Orientation: Select "Horizontal" to view the tree in horizontal form, with the top level resource on the leftmost side of the widget, and children expanding to the right. "Vertical" will show the tree with the top level parent at the top of the widget, with children expanding downward.

Resource: A text search box to select the resource that will be the top level resource for the tree.

When done editing, hit "Apply" to save your changes, or "Cancel" to exit without saving.

IP Charts

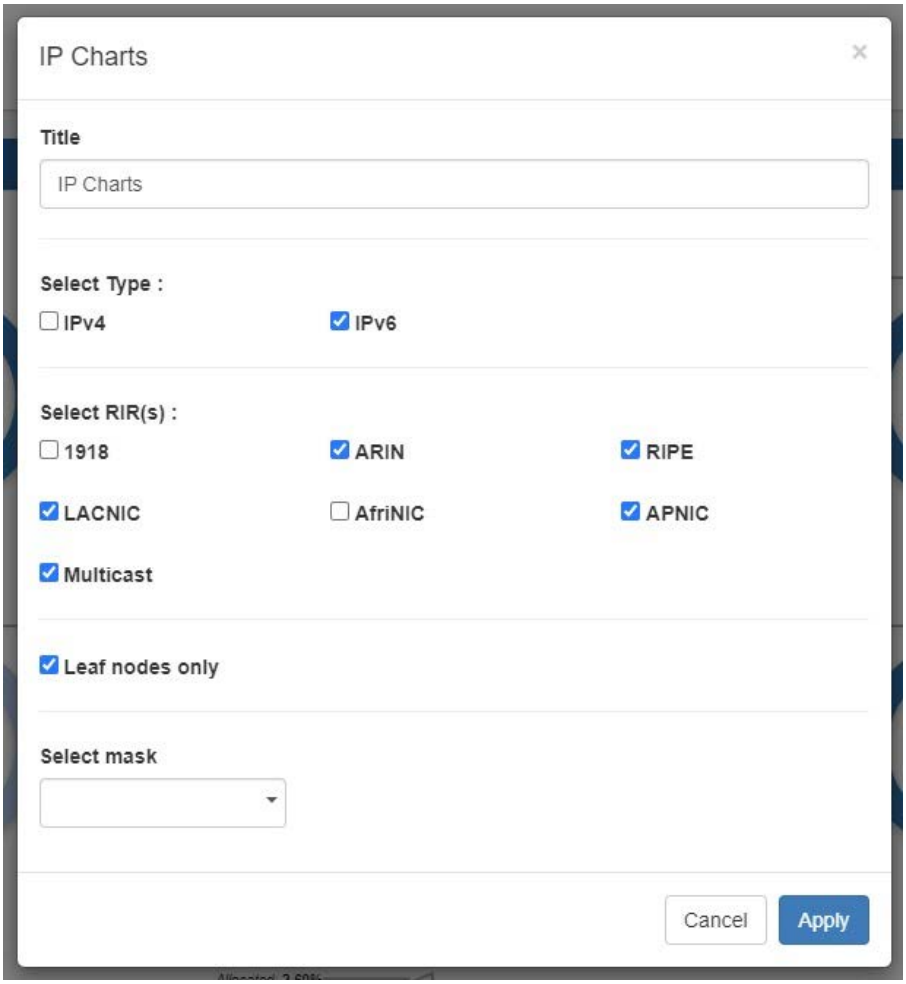


Illustrates the percentage of assigned, unassigned, allocated, and holding tank hosts for the desired combination(s) of space types and RIR(s), for the selected out of the total available hosts in ProVision viewable by the user.

Hovering over a particular status will display detailed data in the center of the chart for that status type.

IP Charts Edit Options:

Users may edit the title, if desired, and select from available space type and RIR(s) to create a customized view.



Title: Edits the title of the widget shown on the header.

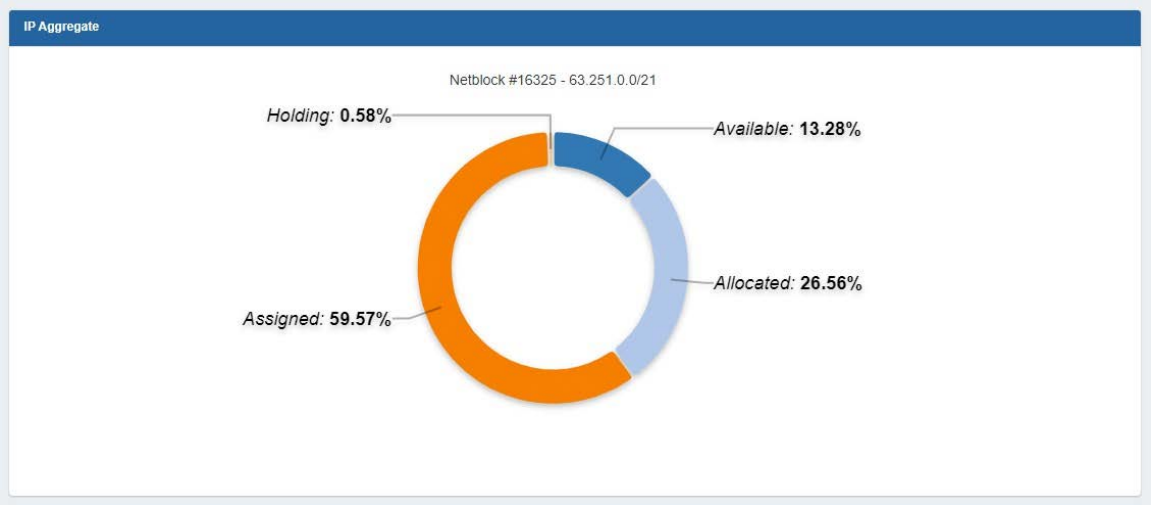
Select Type: Edits the type of IP space displayed in charts.

Select RIR(s): Edits the RIR(s) included in charts.

Leaf nodes only: Limits chart displays to leaf nodes only.

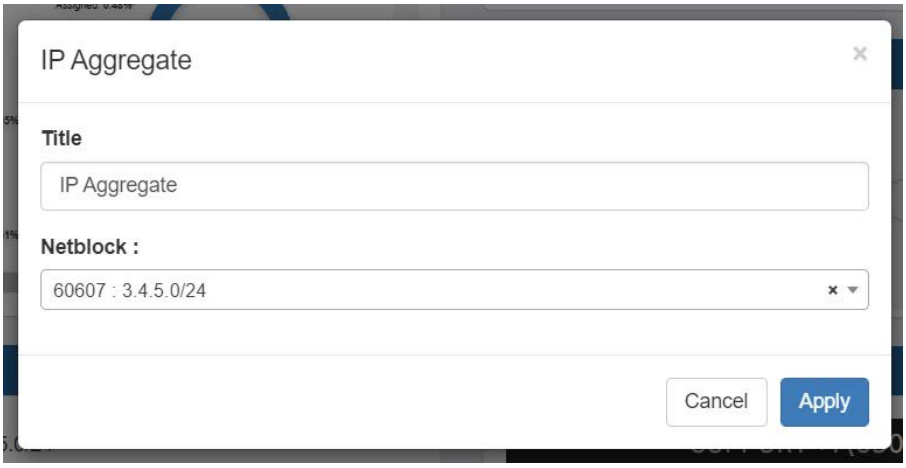
Select mask: Edits the mask included in charts.

IP Aggregate



Illustrates the percentage of assigned, unassigned, allocated, and holding tank hosts for a specific netblock.

IP Aggregate Edit Options:

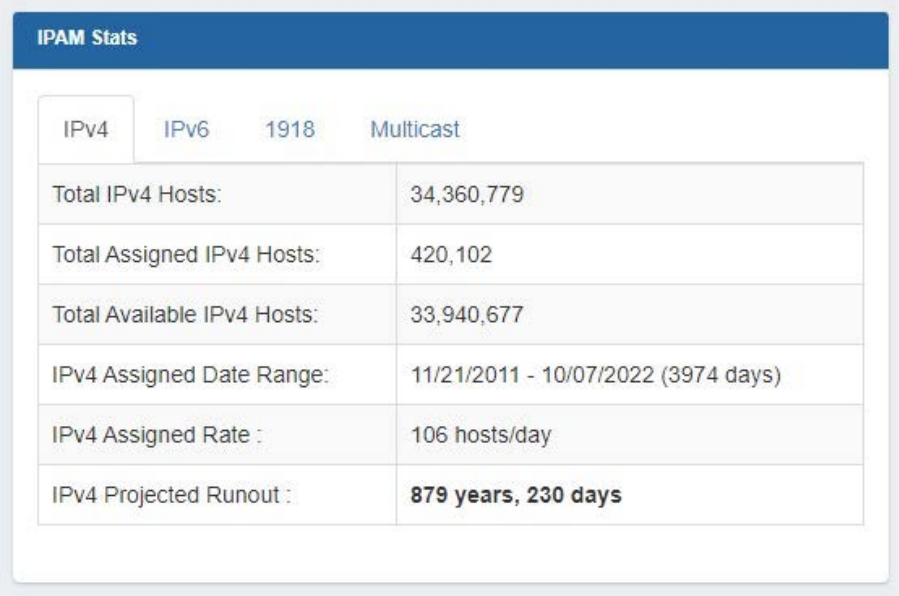


Title: Edits the title of the widget shown on the header.

Netblock: Edits the netblock shown.

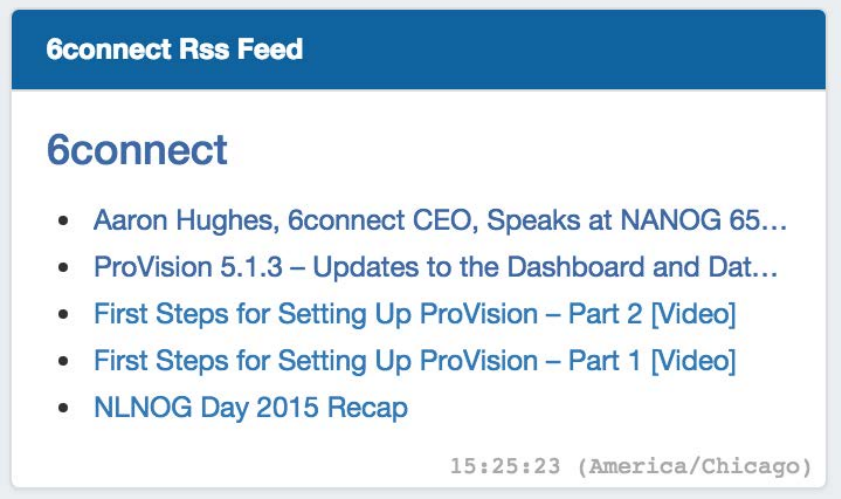
IPAM Stats

The IPAM Stats Widget contains read-only IPAM data on host count by status, assigned date range, assignment rate, and projected runout under three tabs.



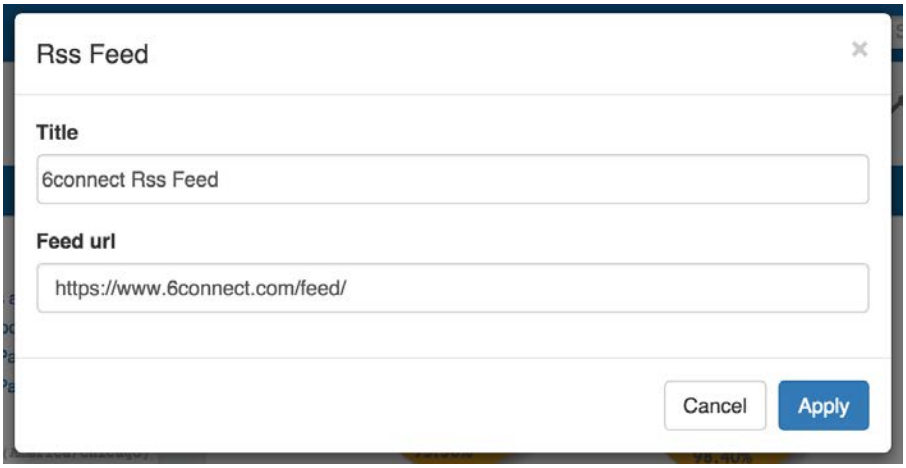
Users may select to view IPv4, IPv6, 1918, or Multicast stats by clicking on the tab for the block type you wish to view.

RSS Feed



Shows the most recent five entries of a selected RSS Feed. Feed links open in a new window when clicked.

RSS Feed Edit Options:



Title: Edits the title of the widget shown on the header.

Feed URL: Edits the URL of the RSS Feed to show.

Status

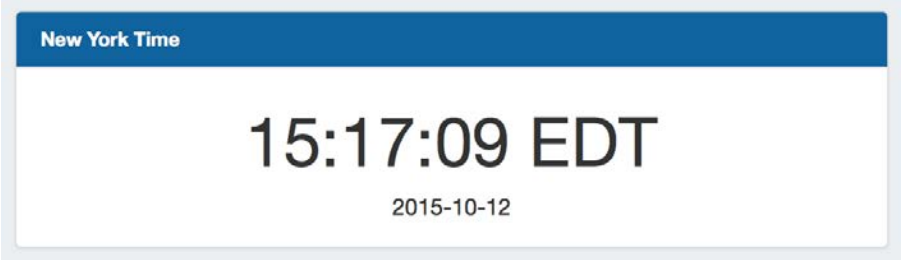


Shows 6connect ProVision status information, including number of user accounts (admin only), number of admin accounts (admin only), and current version number.

Status Edit Options:

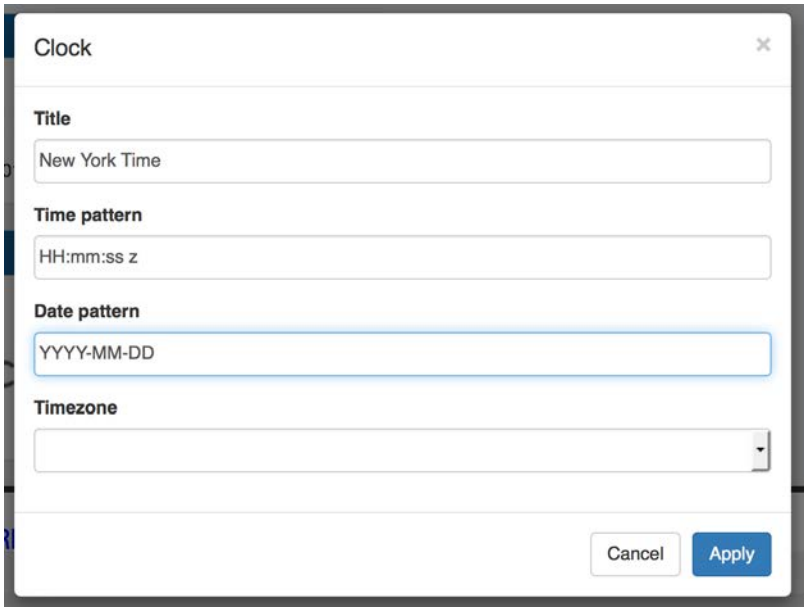
Title: Edits the title of the widget shown on the header.

Clock



Shows the current time for the selected time zone.

Clock Edit Options:



Title: Edits the title of the widget shown on the header.

Time Pattern: Sets the desired format for the current time. Example: "HH:mm:ss z" shows hours, then minutes, then seconds, then time zone.

Date Pattern: Sets the desired format for the current date. Example: "YYYY-MM-DD" shows 4 digit year, then month, then day.

Time Zone: The desired time zone to show the current time for.

Time / Date Patterns

For applicable time / date patterns, see http://momentjs.com/docs/#/displaying/format/

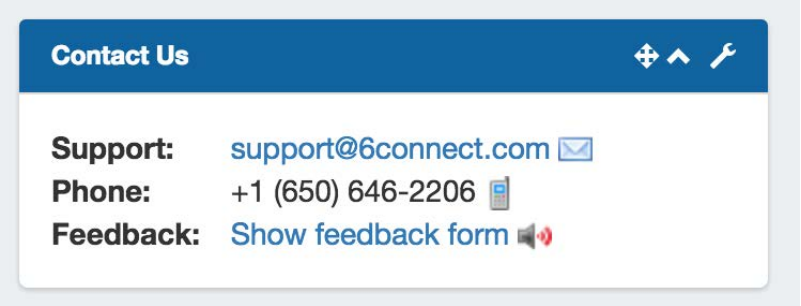
Some common date patterns might be:

Display	Pattern
Wednesday, October 10th, 2015	dddd, MMMM Do, YYYY
10/21/2015	MM/DD/YYYY
October 21, 2015	MMMM DD, YYYY
10-21-15	MM-DD-YY
2015-10-21	YYYY-MM-DD

Some common time patterns might be:

Display	Pattern
15:36:14 EDT	HH:mm:ss z
3:36:12 PM EDT	h:mm:ss A z
03:36:12 pm EDT	hh:mm:ss a z
15:36 -04:00	HH:mm Z

Contact Us



Provides support email, phone, and feedback form information. Only one Contact Us Widget may exist on a dashboard.

Contact Us Edit Options:



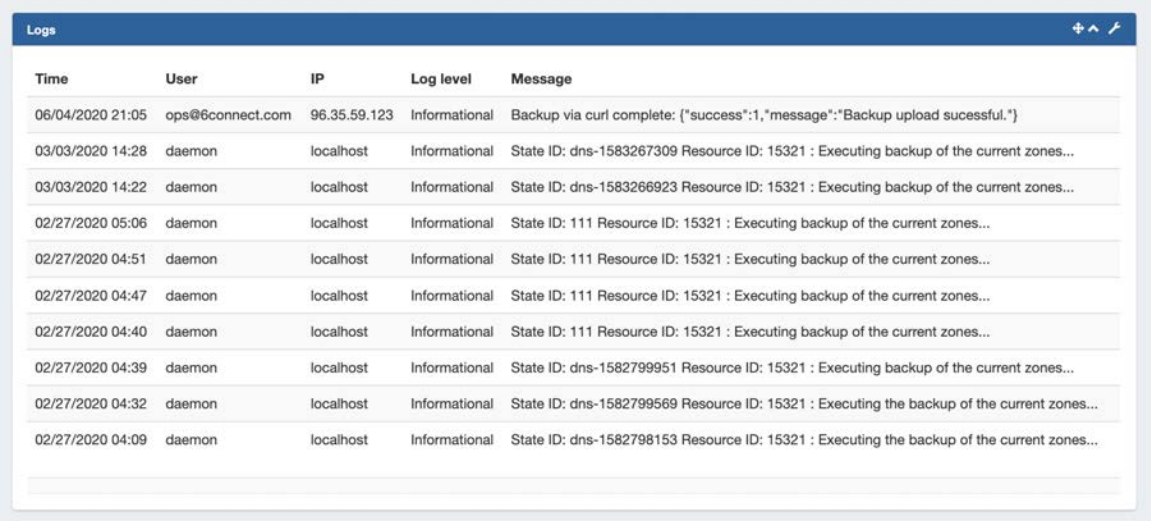
Title: Edits the title of the widget shown on the header.

Feedback Email: Sets the desired email address for the feedback form.

> Note: Support phone number and email address are set from the ProVision Admin settings.

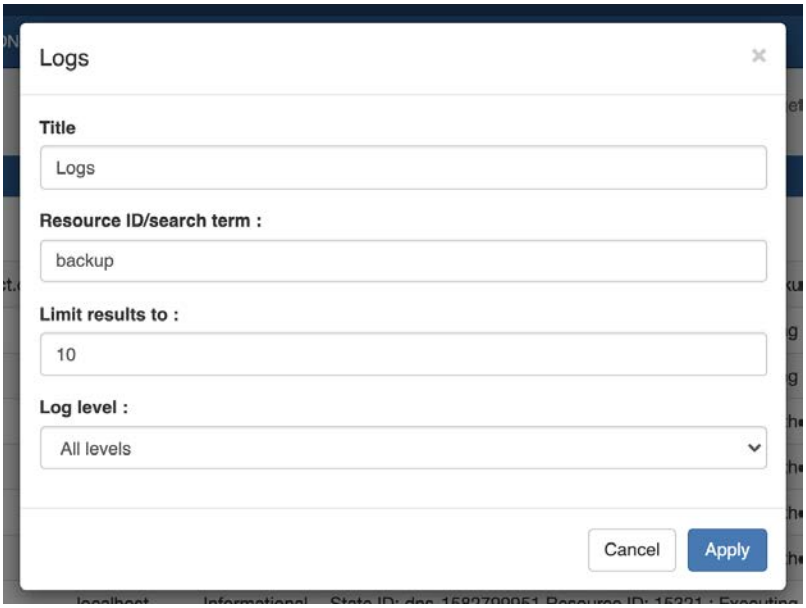
Logs

The Logs Dashboard Widget displays the most recent 'x' number of logs for a specified search term, such as resource name, task, id number, username, and so forth.



Once the Logs Widget has been added to a dashboard, edit it by clicking the wrench icon in the upper right side of the widget.

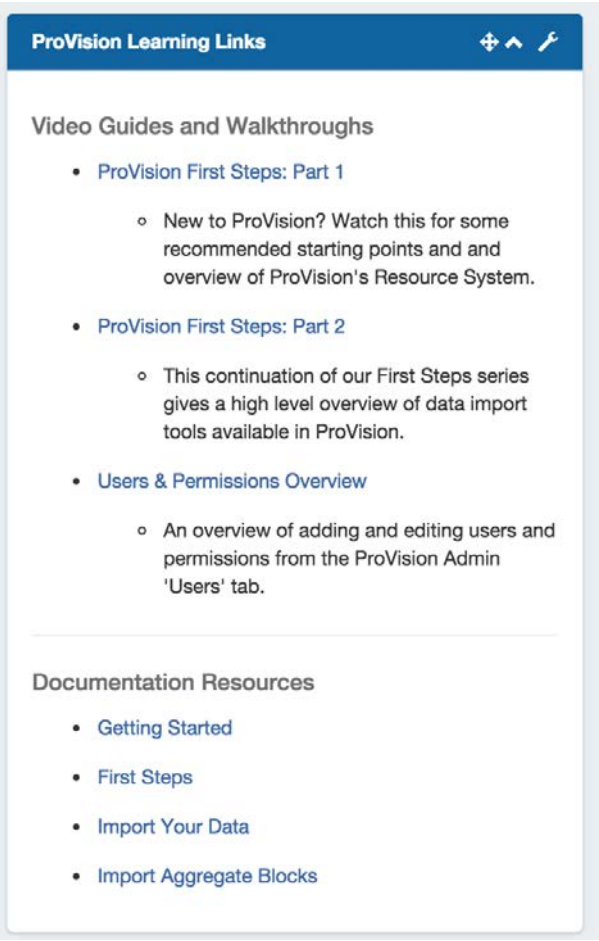
In the Edit menu, you may edit the Logs Widget name, enter a search term, select number of results to display, and select a log level to filter results by.



When complete, click "Apply" to save your changes.

> You can preview or test specific Logs Widget search terms by entering the same term into the Admin "Logs" tab, to verify the desired term and filter set.

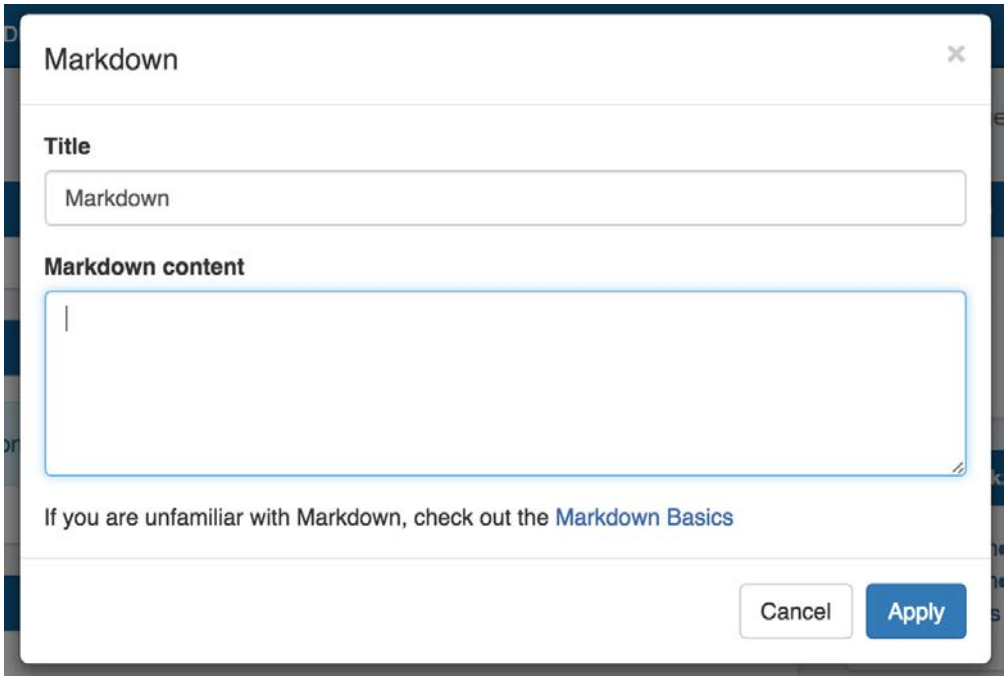
Markdown



The Markdown Widget is a blank slate where users may add links, text, or other content through use of the Markdown language. Multiple Markdown Widgets may exist on a dashboard.

> If you are unfamiliar with Markdown, check out Markdown Basics

Markdown Edit Options:



Title: Edits the title of the widget shown on the header.

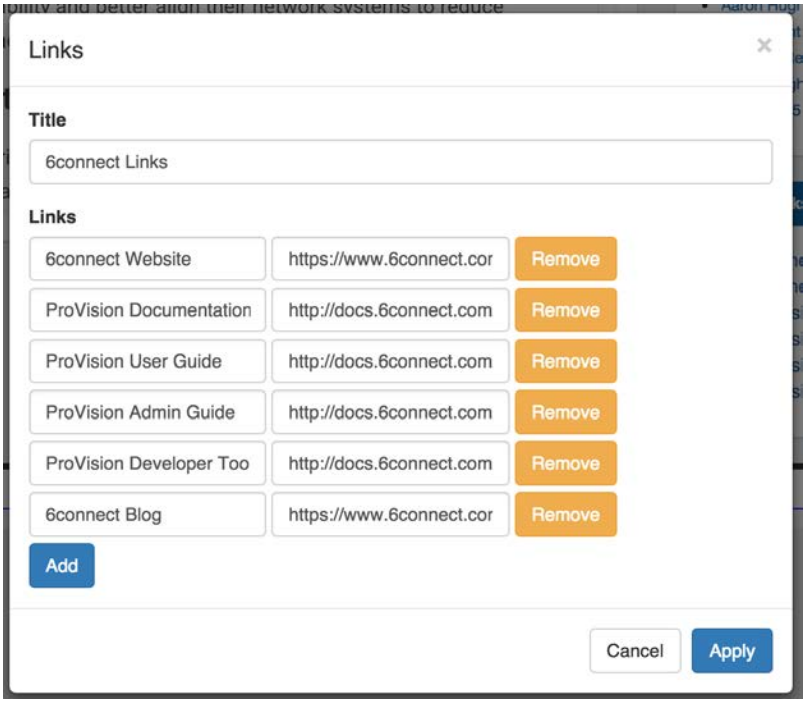
Markdown Content: Area to enter the markdown content.

Links



Provides a list of website links. Multiple Links Widgets may exist on a dashboard.

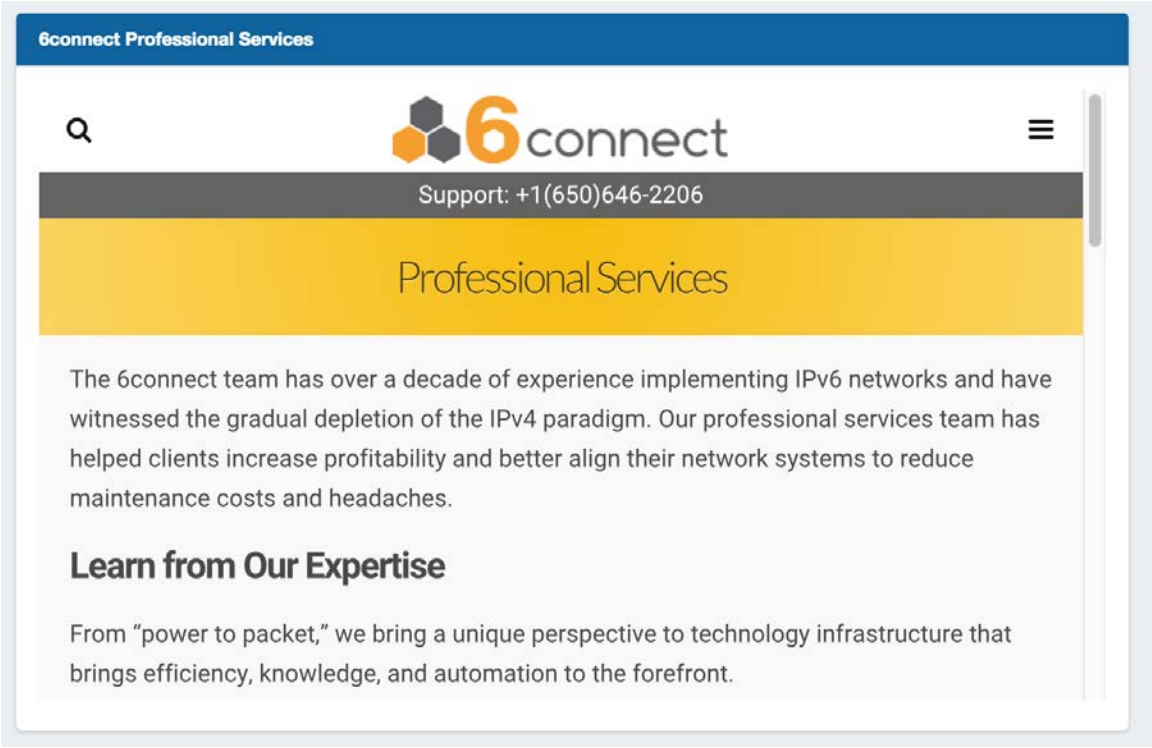
Link Edit Options:



Title: Edits the title of the widget shown on the header.

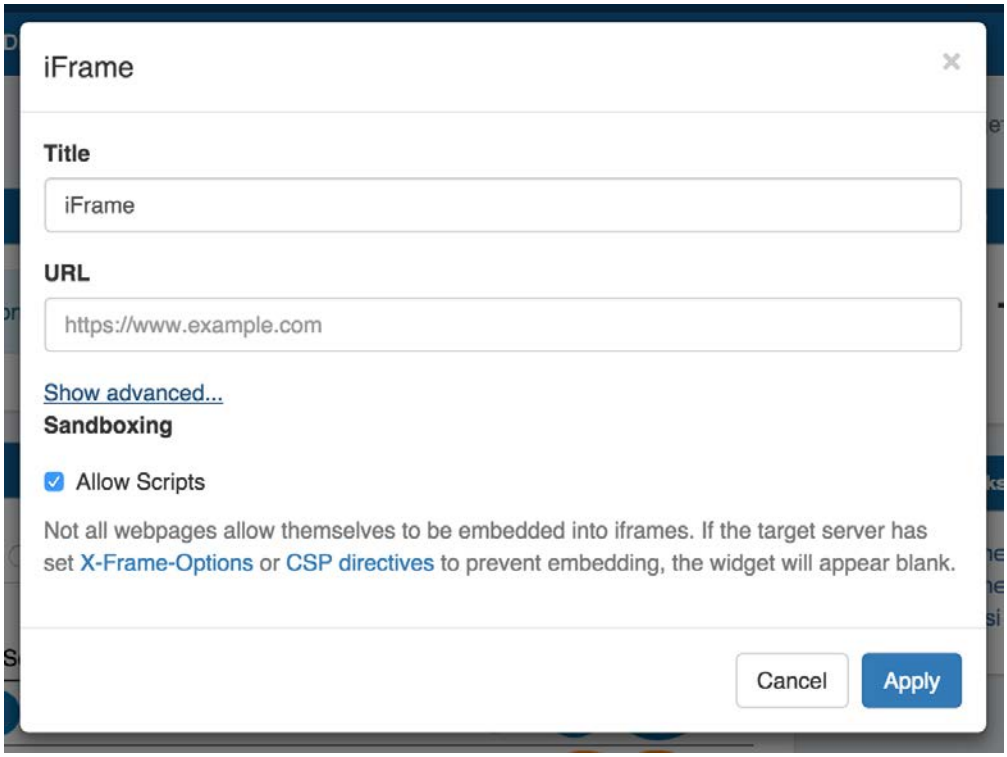
Links: Enter the desired link text, then the URL of the website to link. Click "Add" to add a new link, or "Remove" to remove an individual link. Hit "Apply" to save your changes.

iFrame



Set a https URL to be viewed in an iFrame. Useful to view stats or commonly referenced websites.

iFrame Edit Options:



Title: Edits the title of the widget shown on the header.

URL: Sets the desired https address of the website to display in the frame.

Advanced:

Sandboxing: Allow Scripts: Check to allow scripts.

Not all webpages allow themselves to be embedded into iframes. If the target server has set X-Frame-Options or CSP directives to prevent embedding, the widget will appear blank.

Working with Resources

Working with Resources

- Working with Resources
  - What is a Resource?
  - How to Work with Resources?
  - Additional Information

What is a Resource?

The "Resource" system is tied to the Permissions structure. What this means is that you get granular control on a resource level and can create groups around a single resource or even groups of resources. Since resources can inherit permissions from others - it can be an easy way to categorize generic objects.

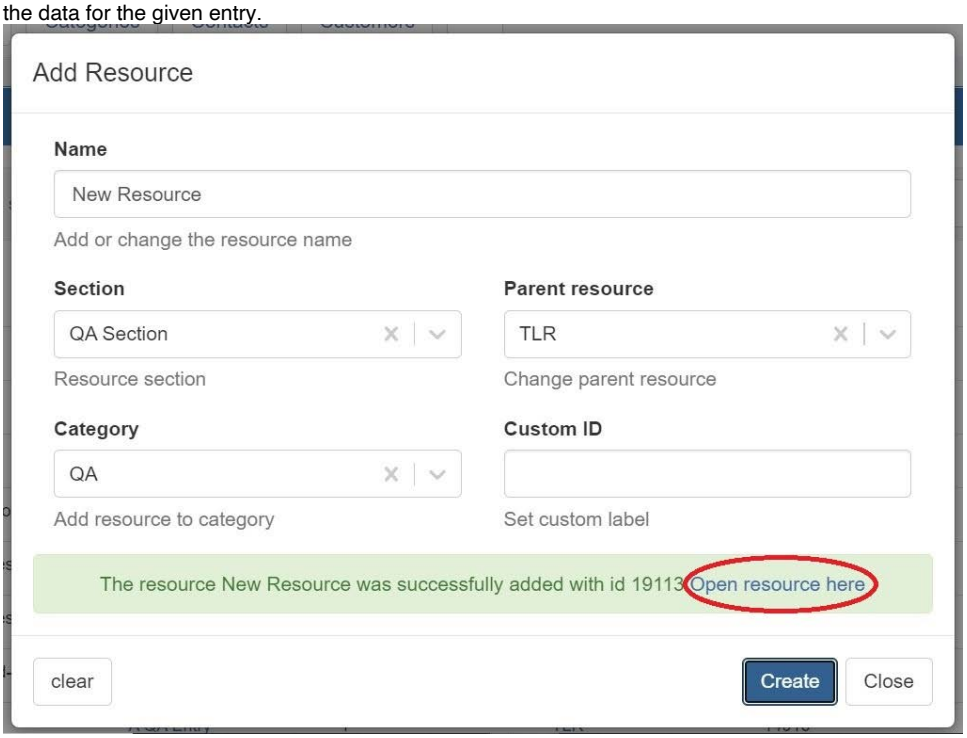
> **WARNING!**
>
> There are key resources that are used by the System that should not be deleted. We have put in some safeguards in the UI, but the API can delete these resources if prompted. The resources that you should not remove are "Holding" and "Reverse". The "Available" resource can be renamed - simply not deleted.

How to Work with Resources?

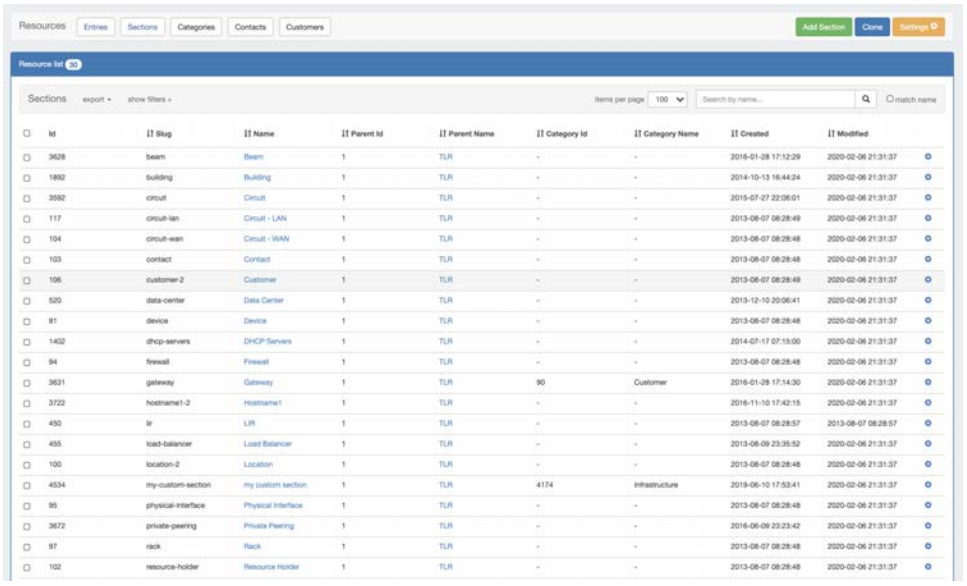
The resource is an entity that users can assign network resources to (IP blocks, hosts, DNS zones, etc.). You can also create hierarchies between resources which allows you to leverage permissions to control who can view and interact with any given resource and its assigned elements. Please note that you can also have resources that do NOT have anything assigned to them regarding network resources. The result of this flexible architecture is that you can work with resources in three ways:

- **Resource Entries:**
  These are the actual resource names. When you click the "Add Entry" button you can customize various elements of the entry and assign the parent resource, section and category from their respective dropdown menus. You may also add a Custom ID if desired.

When done, hitting "Create" and clicking on "Open resource here" will pull up the field set for the chosen section and allow you to enter the data for the given entry.

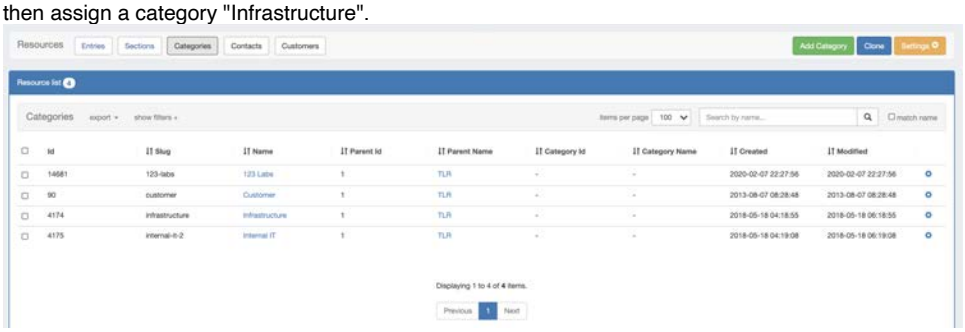


- **Resource Sections:**
These can be anything from "customers" to "firewalls" to "cross-connects". Since you can customize the fields for these elements, you have flexibility in organizing the data. Check out Customizing Sections and Customizing Fields for more details on how to fit these elements to your business.



- **Resource Categories:**
Categories can be used to create some filtered views for given resources and sections. For example, you can create a section called "Resource Holder" and then assign a category "Customer". Then you can view a list of resources that have been assigned to category

"Customer". In the same way, you could also assign a section called "Router" under the parent resource "Corporate Datacenter" and then assign a category "Infrastructure".



Want to customize Sections? Check out Customizing Sections and Customizing Fields for more details!

Some examples:

1) Service Provider

2) Managed Service Provider

3) Datacenter/Colocation Provider

4) Enterprise

Additional Information

- Working with Entries
- Customizing Sections
- Customizing Fields
- Customizing Resource Views
- Gadgets
    - ACP Gadgets
    - Contacts Gadgets
    - Data Storage and Info Gadgets
    - DHCP Gadgets
    - DNS Gadgets
    - IPAM Gadgets
    - Peering Gadgets
    - Resource Gadgets
    - XML Specifications
- Contact Manager

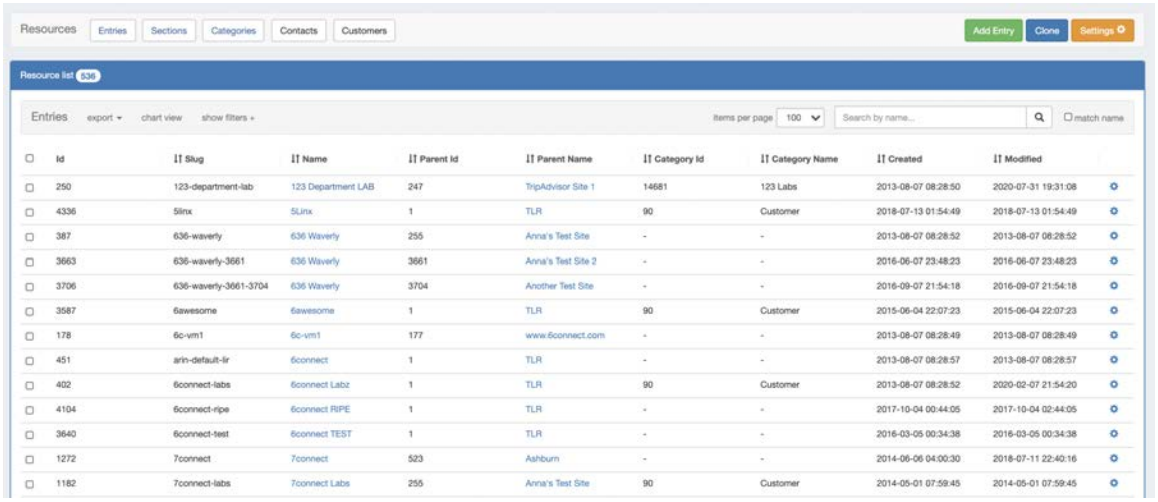
Working with Entries

Working with Entries

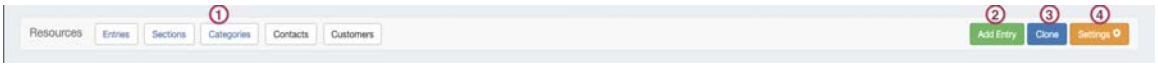
The list of Resource Entries is under the **Resources** Tab. To access it, you may either click on the Resources Tab, or select "Entries" from the Resource Tab dropdown menu.

- Working with Entries
  - Resource Tab / Entry List User Interface
    - Resource Action Menu
      - Action Menu - Single Resource
      - Action Menu - Multiple Resources
  - Chart View
  - The Resource Entry Page (View Resource)
  - Create an Entry
  - Edit or Delete an Entry
  - Export Resource Fields
    - Resource List Export:
    - Multiple Resources Export:
    - Single Resource Export:
  - Add Child Entries
  - Resource Clone
    - To Clone an Entry
  - Additional Information

Resource Tab / Entry List User Interface



Page Header Button Bar:



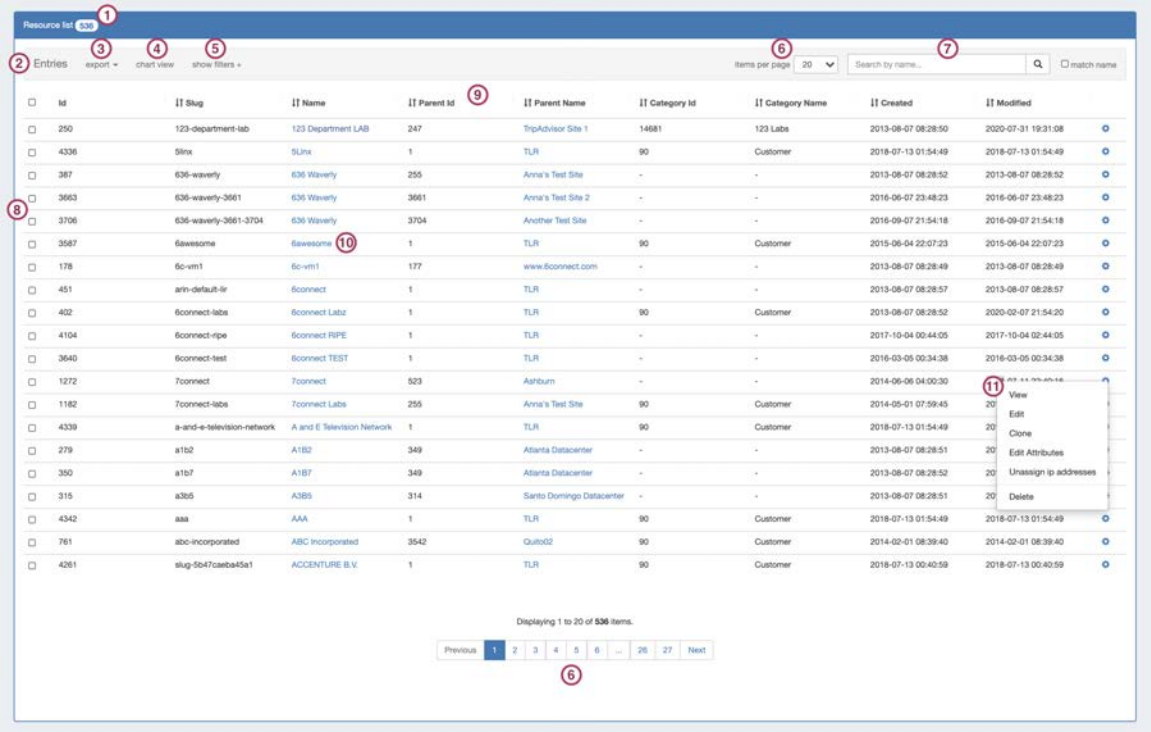
1) List View Buttons: Click each Resource View button to display the desired list. *Entries*, *Section*, *Categories*, *Contacts*, and *Customers* are provided by default, although custom list views may be created and pinned to the button bar.

2) Add Entry Button: Click to add a new entry.

3) Clone Resource Button: Click to clone an existing resource

4) Settings: Click to open up the settings page, where default and custom list filters, settings, column fields, and column order may be customized.

Resource List:



1) List Resource Count: Displays the number of resources in the current list view

2) List View Name: The name of the current view

3) Export Options: Click to export the list to .csv

4) Chart View: Opens a link to Chart View, which graphically shows the entries in filterable, hierarchy form.

5) List Filters: Click to expand list filter options, including Section, Category, Parent Resource, Resource Type, or Attribute Name / Value.

6) Items per Page / Pagination: Set the desired number of resources per page. Pages display at the bottom of the resource list.

7) Search: This text box allows the user to enter in criteria to filter the list of Entries. Click "match name" for an exact name match.

8) Resource Selection Box: Click to select multiple resources to apply bulk changes to. When multiple resources are selected, the actions menu will change to display options to apply to the selected resources.

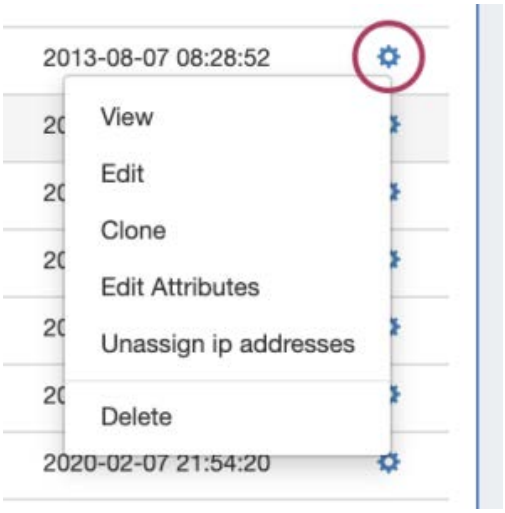
9) Resource Field Columns: Each column displays a resource field. Columns with arrows next to the names may be sorted by ascending /descending values by clicking on the column name. The fields that display, as well as their order, may be customized in "Settings".

10) Resource Links: Clicking on a resource name will take the user to that resource's individual entry page.

11) Action Menu: Right click anywhere on a resource's row to open the Action Menu. The Action Menu (gear icon) gives a list of actions to perform on the resource. If more than one resource is selected, bulk edit actions will display instead.

Resource Action Menu

Action Menu - Single Resource



Opening the Action Menu in the Entry List View for a single resource will bring up the following options:

View: Opens the resource's entry page

Edit: Opens to the resource's Edit options

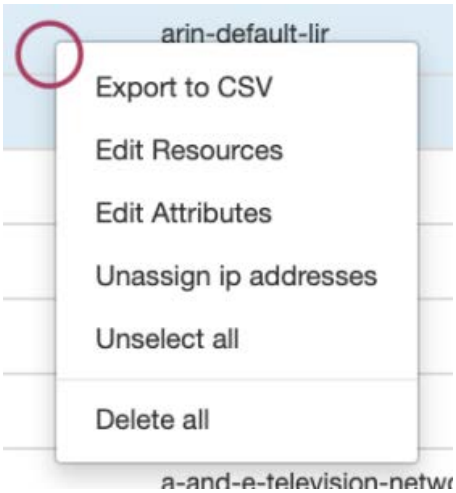
Clone: Opens the clone resource page for the selected resource

Edit Attributes: Opens the edit attributes options to view or update field values for that resource

Unassign IP Addresses: Unassigns all IP addresses assigned to the resource

Delete: Deletes the resource, if appropriate permissions exist.

Action Menu - Multiple Resources



Opening the Action Menu in the Entry List View when multiple resources are selected will bring up the following options:

Export to CSV: Exports the selected resources to .csv

Edit: Opens the resource Edit options, to bulk change all resources

Edit Attributes: Opens the edit attributes options to view or update field values for the selected resources. Note: Attributes will only be able to be changed if the available fields are the same for all selected resources (in general, the resources are of the same section).

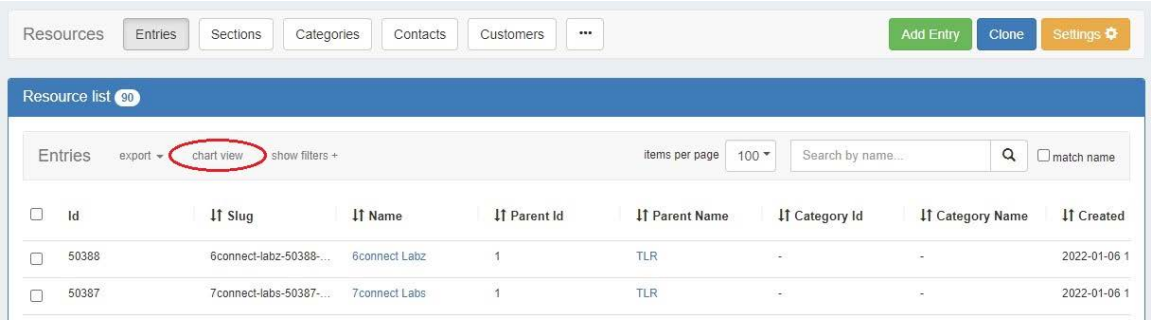
Unassign IP Addresses: Unassigns all IP addresses assigned to the resources

Unselect All: Deselects the resources

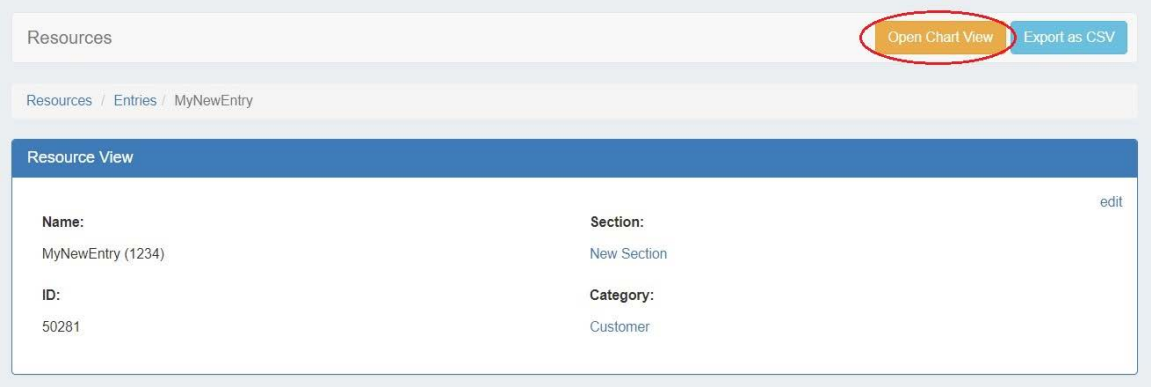
Delete All: Deletes the resources, if appropriate permissions exist.

Chart View

Chart View illustrates the resources created in a node-based tree. It can be accessed from the Resource List by clicking the "chart view" link at the top.

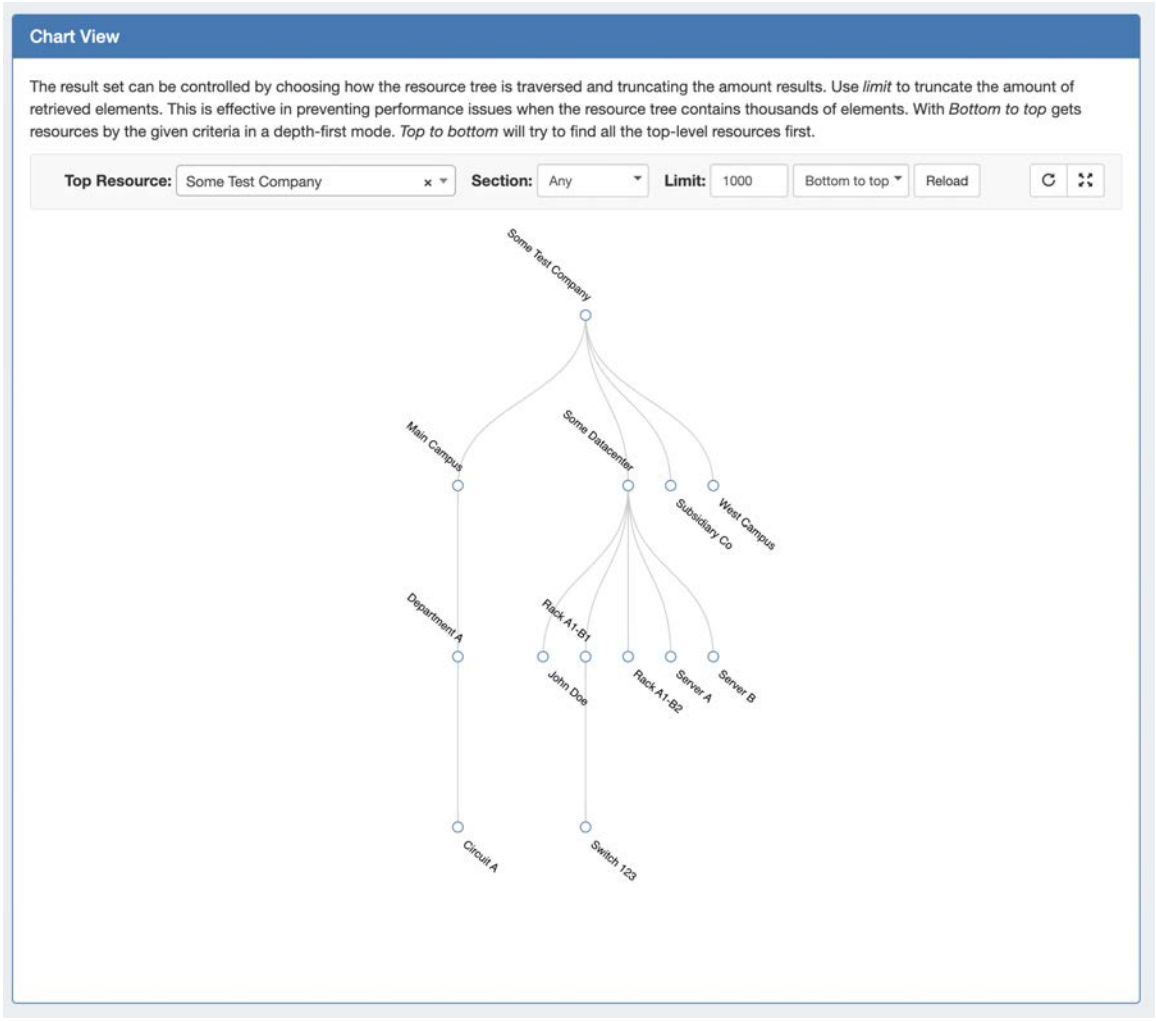


You can also access Chart View from a resource entry page by clicking the "Open Chart View" button at the top. This will automatically position the entry as the "Top Resource" in the chart.



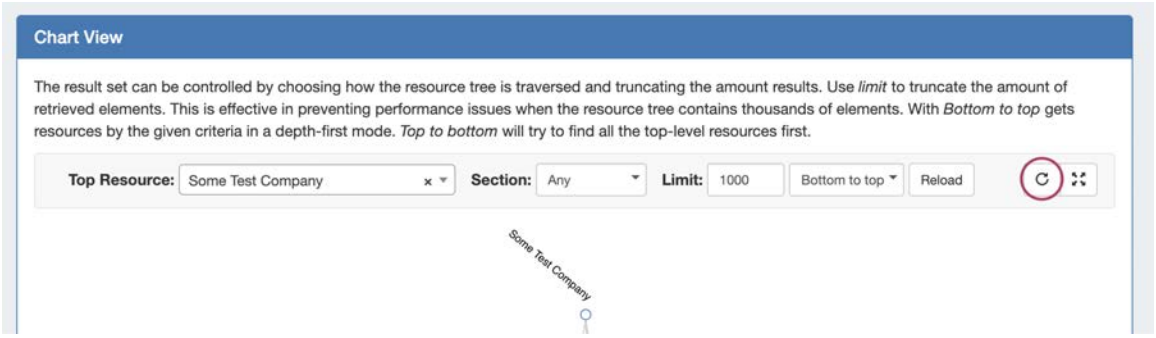
Select the Top Resource, Section Type, and resource limit/loading direction, if desired, then click "Reload".

Users will only be able to view sections of the resource tree on which they have view permissions.

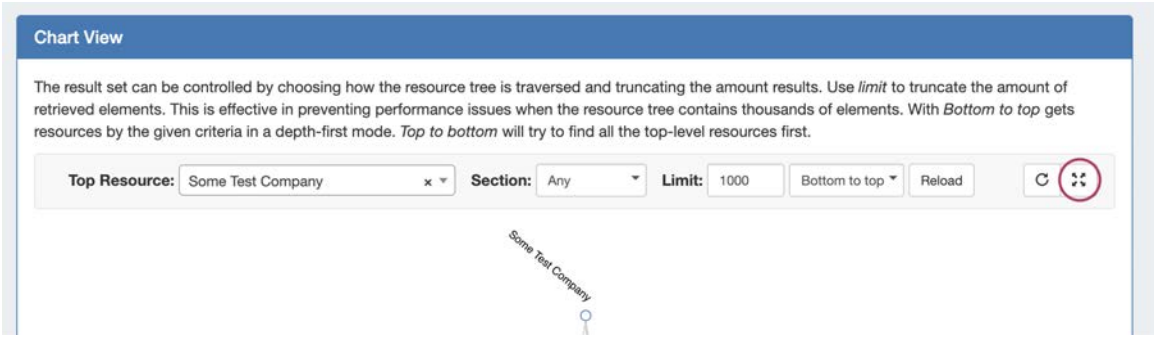


While viewing the main chart, you may:

- View in horizontal or vertical tree mode by clicking the "Switch Chart Orientation" button.

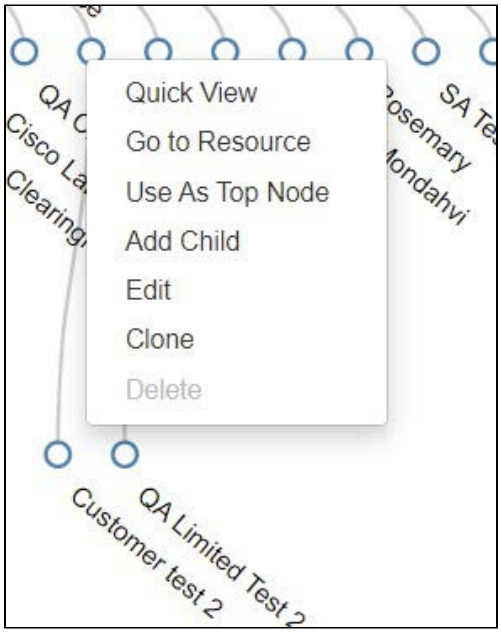


- View fullscreen by clicking the "View Fullscreen" button.



- Left click and drag within the tree view, or scroll wheel in/out to change the area viewed.
- Single or double-clicking on a node with children will collapse or expand the tree at that resource.
- Clicking and dragging a resource node to another resource will relocate the resource to be a child of the resource it is dropped on.

Hovering over a specific resource or node, then right clicking will open a context menu with the following options:



Quick View: Shows summarized details about the resource and its children, and links to the resource entry page(s).

Go to Resource: Opens the resource entry page.

Use As Top Node: Set the current resource as the Top Node of the displayed hierarchy.

Add Child: Opens Add Child modal.

Edit: Opens Edit modal.

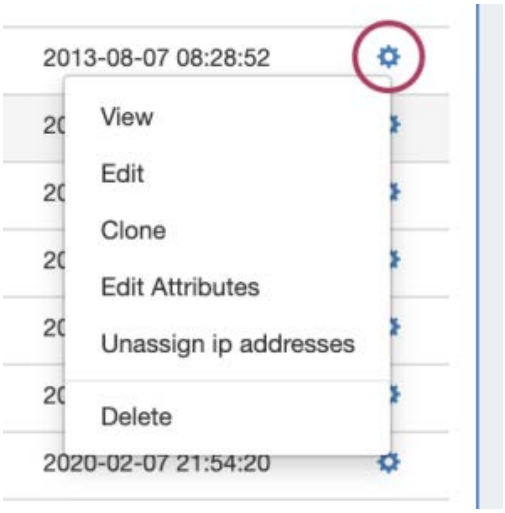
Clone: Opens Clone modal.

Delete: Deletes the resource, if appropriate permissions exist and no child resources/assignments exist under the resource.

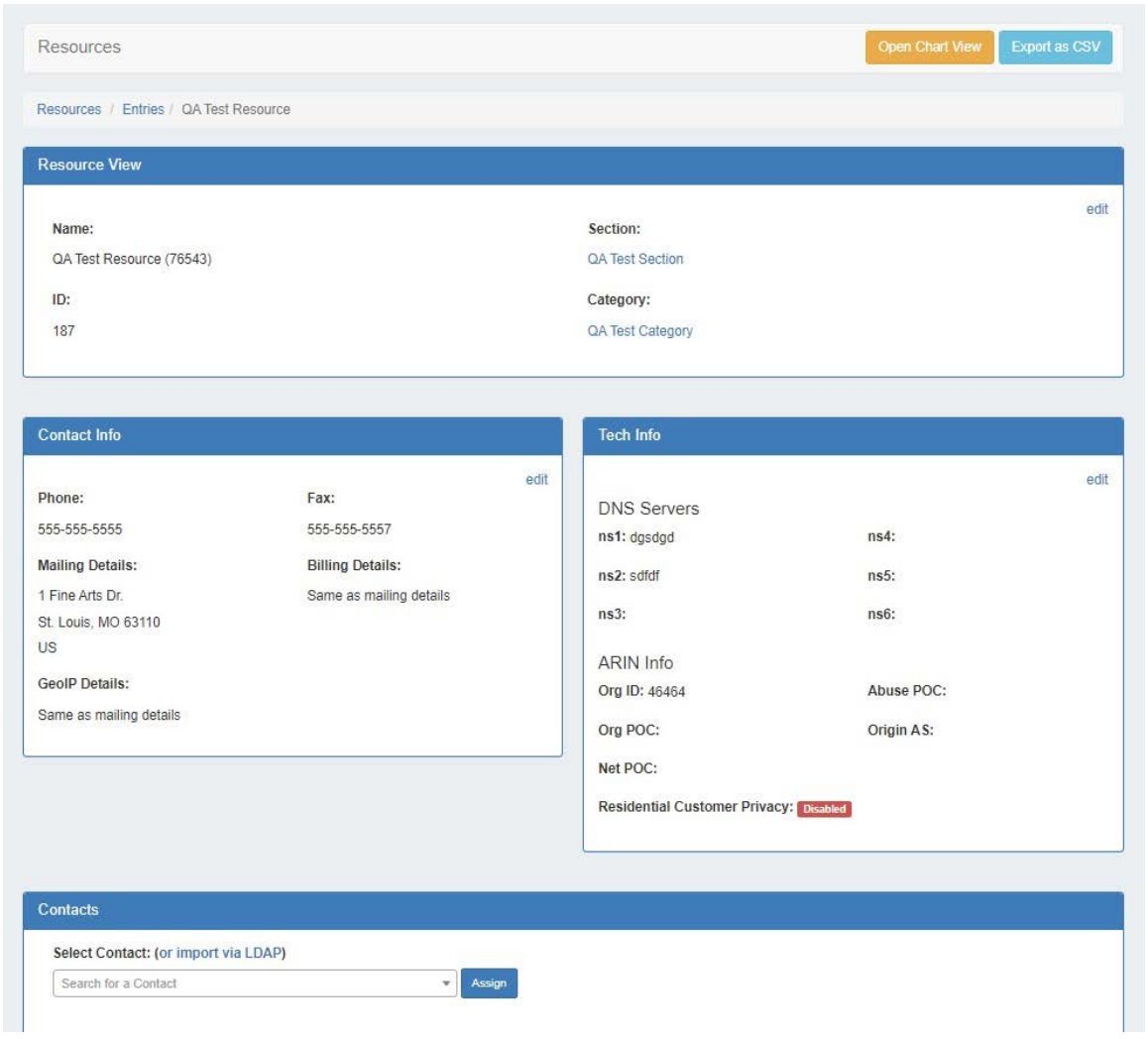
The Resource Entry Page (View Resource)

The Resource Entry Page displays details for an existing resource and any associated gadgets. Here, users may edit the resource's fields, clone the resource, add child resources, and perform gadget-level actions such as assigning and managing IPAM blocks, contacts, generate DNS zones, add field information, and manage peering sessions.

Open the page by clicking on a resource name from the Resource List, or select "View" from the Action Menu for the resource in the Entry List.



The Resource View Gadget displays basic details about the resource, including name, id, section, and category.



Additional information and actions are available to perform for the resource, depending on which gadgets are enabled for the associated section:

Note

A few things to keep in mind on Gadgets:

- Not all gadgets are appropriate for all resource types - some are suited for routers, servers, etc.
- Some gadgets (marked "Legacy") may not be available to new ProVision users or newer versions of ProVision.
- Some gadgets may be specialized for very specific use cases or connect with other products.

Currently Available Gadgets:

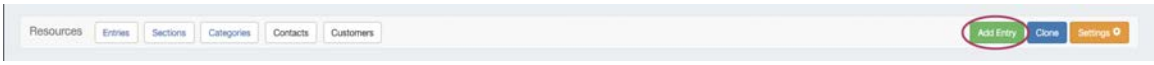
- **ACP ("Workflows") Gadget:** Connector to ProVision's API Composer Platform. Executes selected ACP Workflows.
- **Contact Info**: Displays phone, address, and billing details for the resource.
- **Contacts:** Assigns contacts to the resource from the Contact Manager.
- **DHCP Server Management (Legacy):** Manage a DHCP Server details and pools.
- **DHCP Customer Configuration (Specialized):** Assign and Configure DHCP Pools from APNIC Blocks.
- **DNS**: Lists DNS Zones associated with the resource and links to the zone's DNSv3 page.
- **DNS Autogenerator:** Autogenerates DNS forward and reverse zones for the resource, based on assigned IP Blocks.
- **Document Storage:** Load, View, and Download assorted image or text documents.
- **Field Gadget**: View and Edit data and information fields associated with the current resource.
- **History:** View and filter Log information on an individual Resource level.
- **IPAMv2:** Manage IP Blocks - supports additional functionality over the old IPAM Gadget.
- **Notes:** Type and view short text notes.
- **Peer Groups**: View and assign Router Peer Groups.
- **Peering Sessions:** View and manage peering sessions.
- **Peering VRFs:** Manage Peering VRFs.
- **Resource Linkage Gadget:** Create a reciprocal link to another resource.
- **Resource Linkage - IPAM Linked IPs Gadget:** View the IPs assigned to Linked Resources.
- **Resource View:** Displays the basic resource entry information - name, section, etc. Automatically enabled for all resources.
- **Tech Info:** Display NS and Technical RIR info.

From here, you can work with your selected gadgets, performing tasks such as assigning DNS zones, IP blocks, assign contacts, and more.

See the Gadgets Page for detail on working with individual gadgets.

Create an Entry

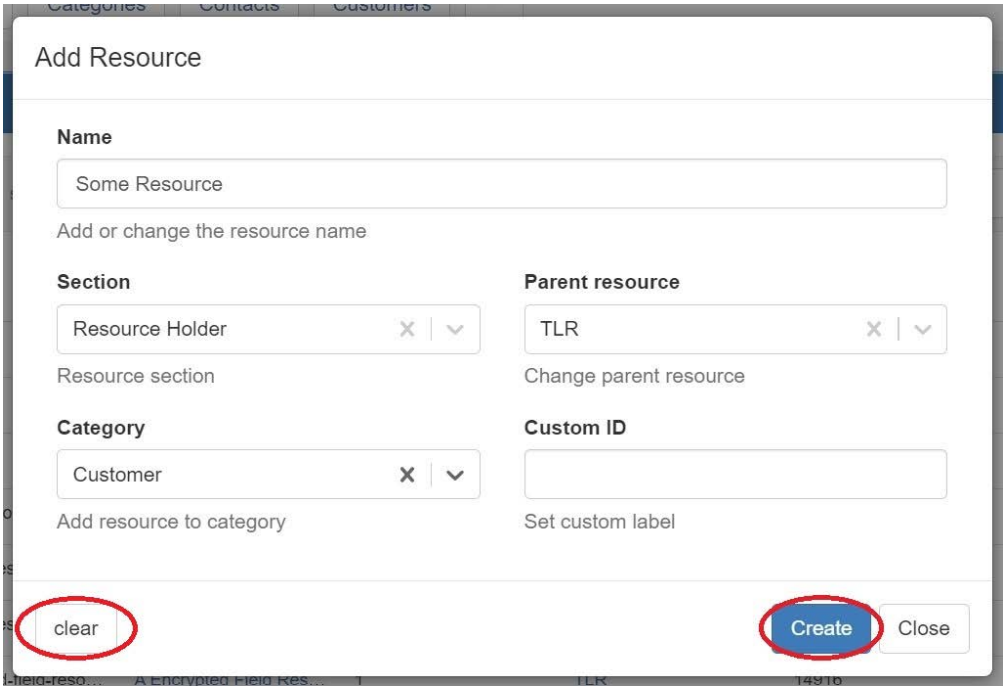
To create a new Entry, click on the "Add Entry" button from the Resource Tab / Entry List Page.



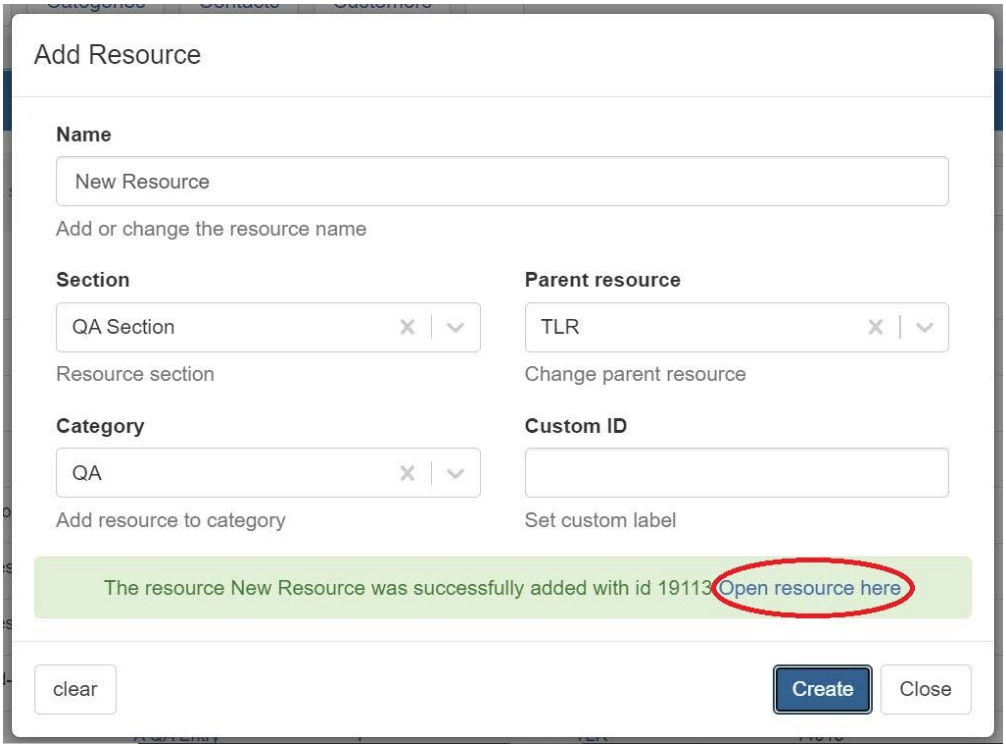
This will take you to the Add Resource screen.

Fill in the Name of your new resource entry, select a section (the chosen section determines what gadgets will show on your new resource's entry page), the parent resource, category, and enter a Custom ID number if desired.

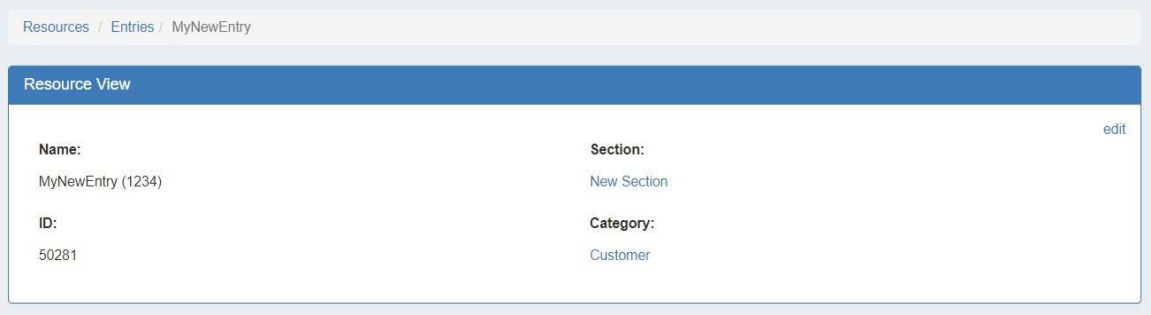
When complete, click the "Create" button. If you wish to exit without saving your changes, click "Close". To add another entry with the same section, category, and/or parent resource, click "Create" again. To add another new entry with different selections click "clear", make new selections, and click "Create".



Open the newly created resource by clicking "Open resource here".



The resource entry page loads in a new tab for that resource, displaying whatever gadgets are enabled for the associated section.

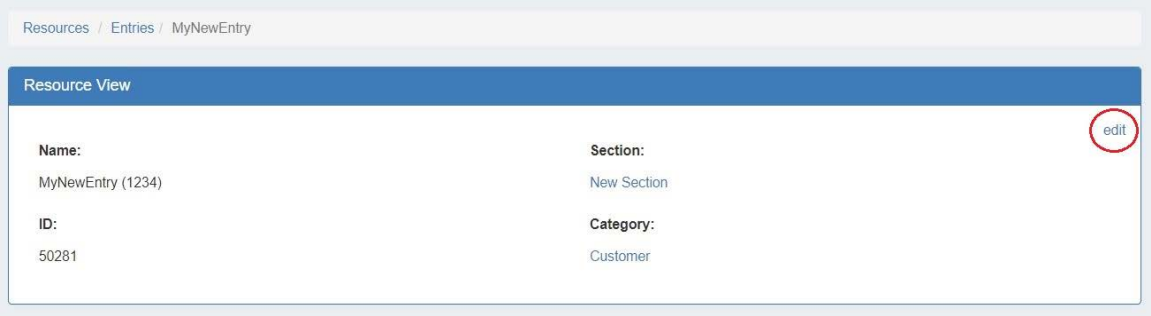


From here, you can work with your selected gadgets, performing tasks assigning IP blocks, contacts, and more.

See the Gadgets Page for detail on working with individual Gadgets.

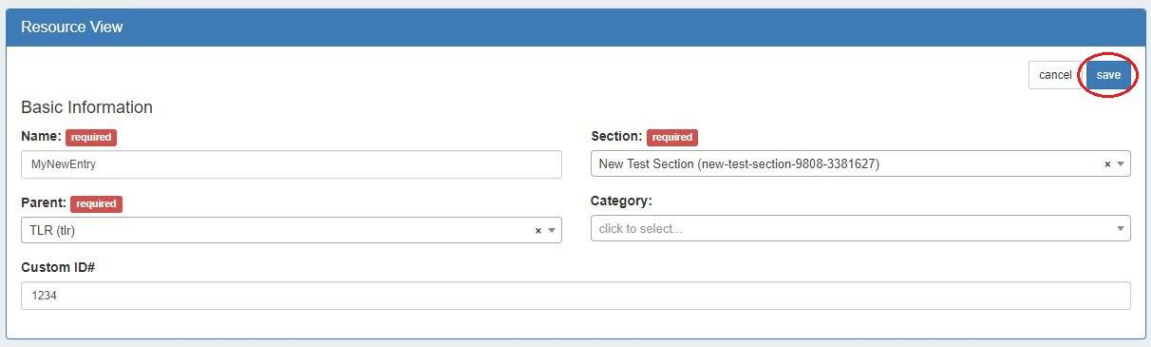
Edit or Delete an Entry

To edit an entry, go to the Resource View Gadget, and select "Edit".

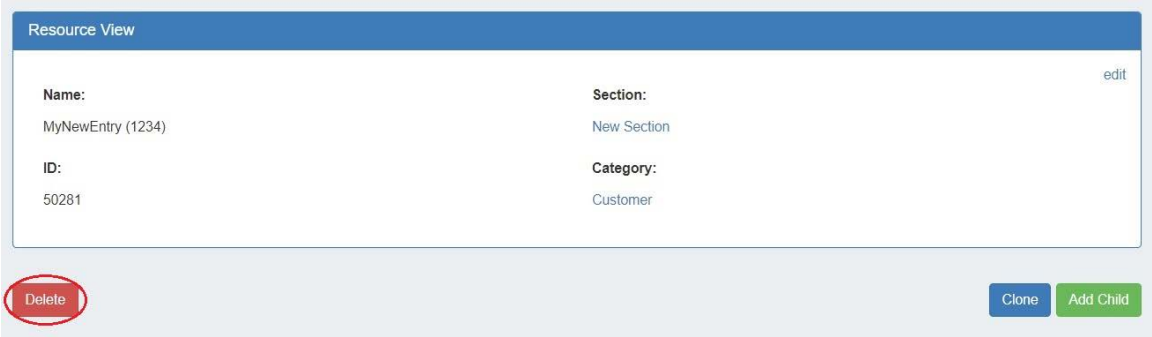


You can edit basic information such as Name, Section, Parent, Category, or Custom ID.

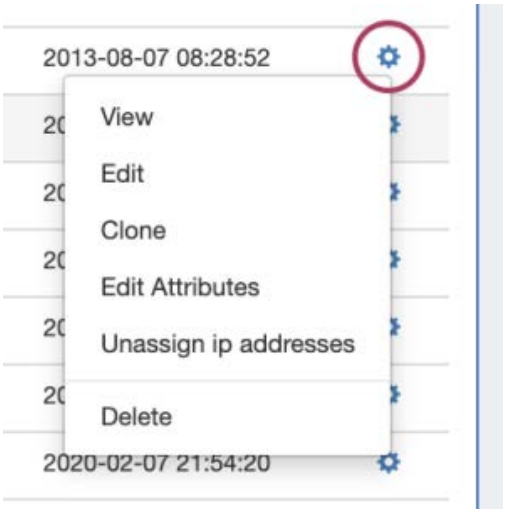
When done, hit the "Save" button.



If you wish to delete the entry, go to the bottom of the page, and select the "Delete" button.



You may also edit or delete an entry from the Resource Entry List, by right clicking on the resource, and selecting "Edit" or "Delete" from the Action Menu.



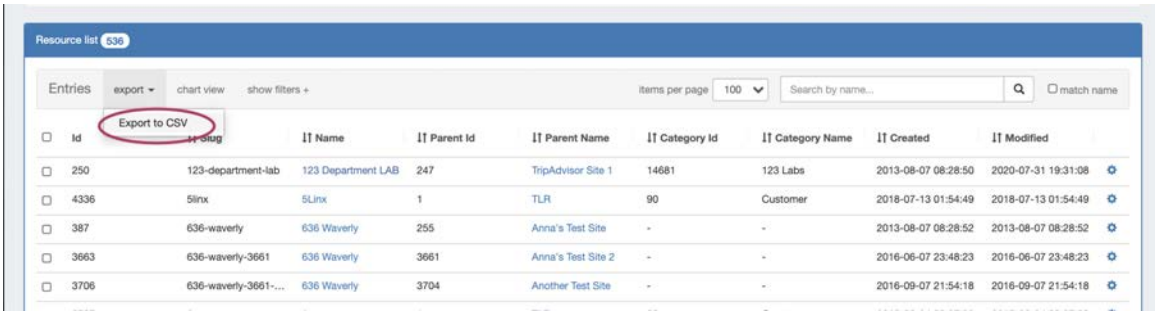
Note

If an entry has children, the delete option will not be available. Child entries must be deleted before a parent entry can be deleted.

Export Resource Fields

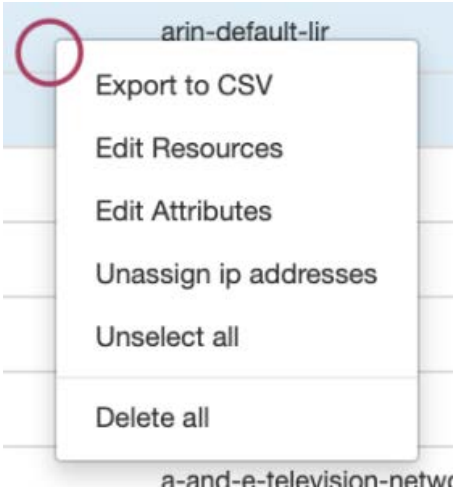
Resource List Export:

To export all resources/ resource fields displayed in a Resource List, select "Export to CSV" from the top header for the desired resource list.



Multiple Resources Export:

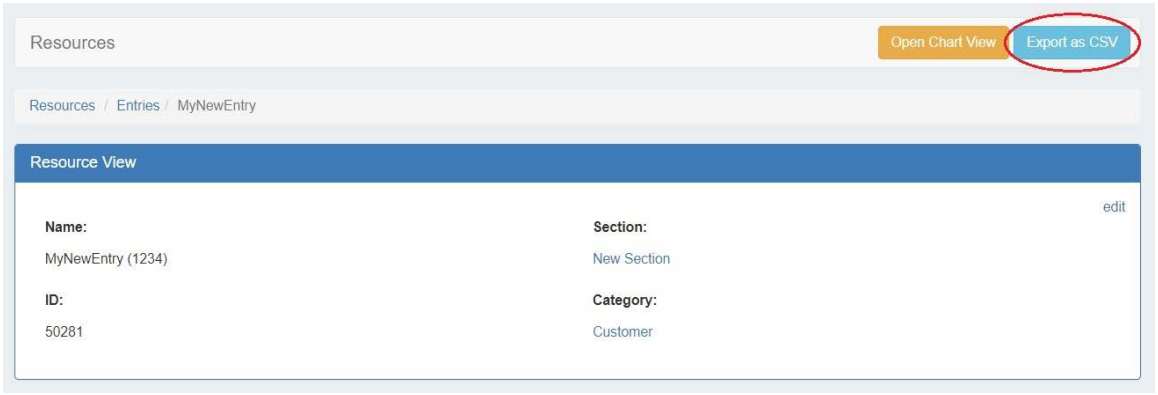
To export multiple resources, select the desired resources from the resource list, then open the action menu and click "Export to CSV".



Single Resource Export:

Resource Entry pages have an "Export As CSV" button that generates a .csv file containing the resource's basic field information.

To export the resource, click the "Export as CSV" button in the header on the resource entry page.



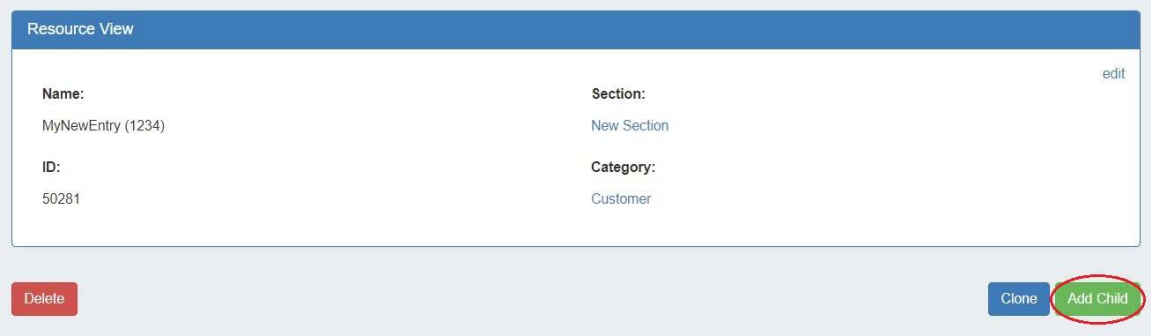
The downloaded .csv file will contain the fields containing values from the Resource Info, Contact Info, Tech Info, and Resource Field Gadget(s), with the field name in the first column, and the field values in the second column.

	A	B	C
1	Name	A QA Entry	
2	Section	Resource Holder	
3	Category	QA	
4	Created	2019-06-27T13:32:02-0700	
5	Modified	2020-01-13T12:34:51-0800	
6	Street 1	123 Main St.	
7	City	Sometown, CA	
8	Zip	12234	
9	Street 1	123 Main St.	
10	City	Sometown, CA	
11	Zip	12234	
12	Phone Main	123456789	
13	Last Billing Date	awd	
14	Country	DZ	
15	Country	DZ	
16	Residential Customer Privacy Enable	TRUE	
17	ns1	ns1	
18	Contract Number	12345	
19	Notes	Test	
20			
21			
22			
23			

Add Child Entries

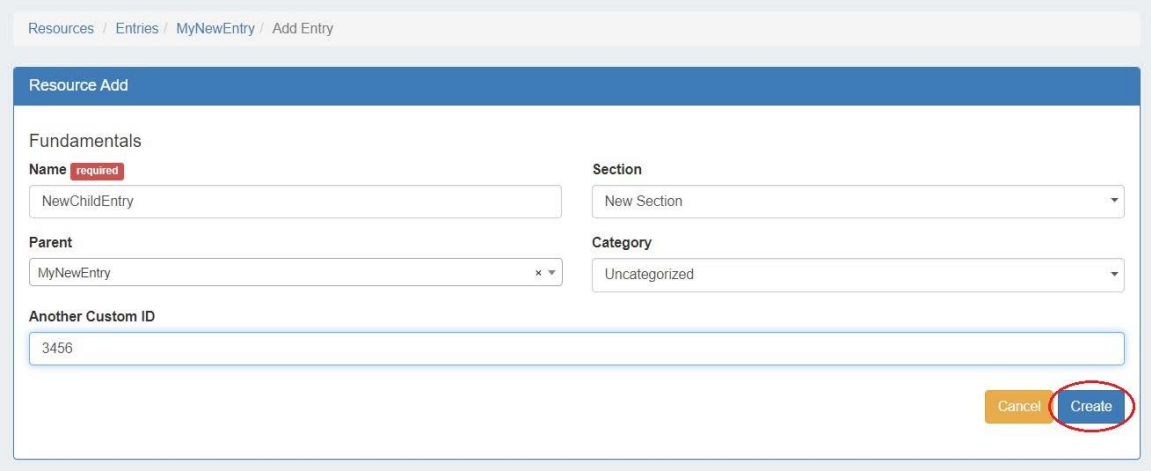
Adding a child entry creates a resource underneath the current resource in the hierarchy.

To add a child entry, at the bottom of the resource entry page, click "Add Child".



This brings up the Add Entry dialog. Looking at the top navigation breadcrumbs, you can see that we are adding an entry underneath the resource "MyNewEntry".

Fill out the Name, Section, Category, and Custom ID (if desired), and hit the "Create" button. The Parent field is pre-selected for you.



Once created, the child entry will show in a list at the bottom of the parent entry page.



Resource Clone

Cloning an entry duplicates the entry and, if desired, any child entries existing under it.

This feature can be used to quickly and efficiently create multiple resources with same format, field information, or similar hierarchy structure. One example may be a datacenter with x number racks with y number of servers on each. One rack, with its servers as child entries could be created, and then cloned until the necessary quantity is reached. As text field information is copied during the clone, changes in individual server information would still need reviewed and updated. Think of cloning as creating a template from an existing resource entry.

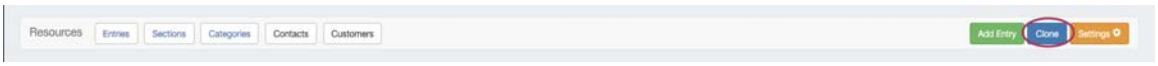
Information Cloned: Format of the original resource (which gadgets are enabled, location, fields), contact / tech information, field information, and (if selected) child entries, and child entry sections, fields, and field information - in general, items that are chosen or input at the entry creation, or input into text fields.

Information not Cloned: IP blocks, DNS zones, uploaded documents - in general, items that are *assigned* to the entry rather than input into fields.

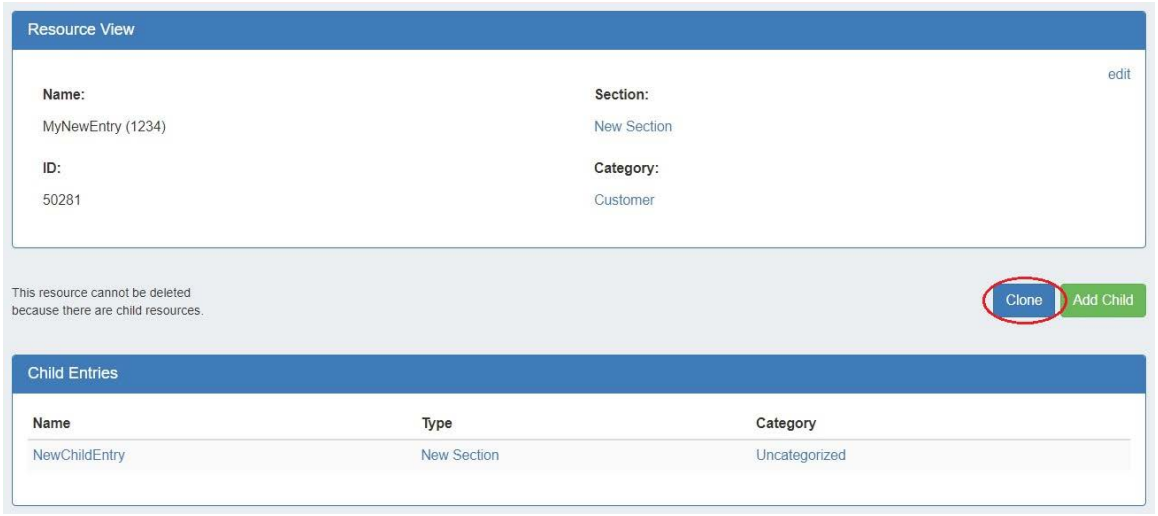
To Clone an Entry

The resource clone feature may be accessed from either the Resources Tab, or from a resource entry page.

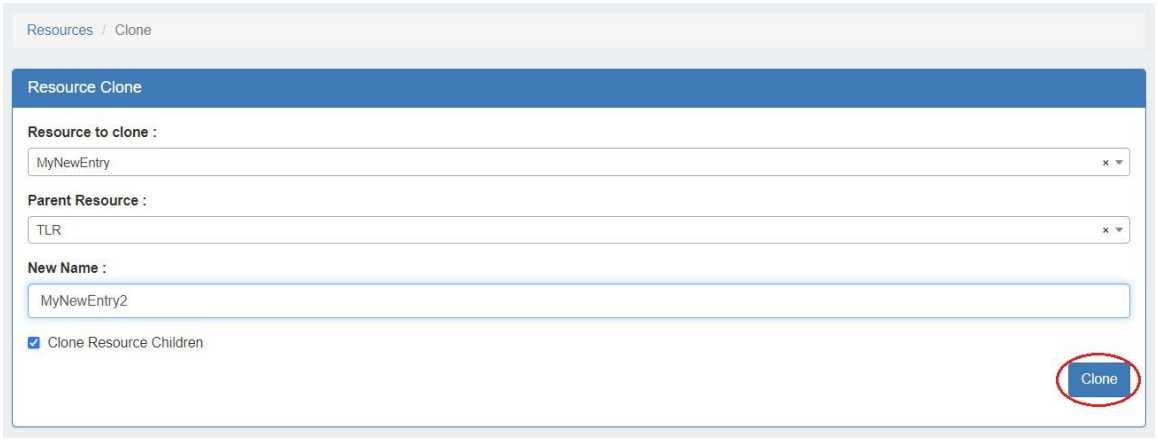
From the Resources Tab, select "Clone". This open the Resource Clone options.



You may also select "Clone" from the bottom of a resource entry page, in which case the entry page you clicked "Clone" from will be automatically selected as the resource to clone.



Once on the resource clone page, enter the resource to clone, parent resource, and the new name for the clone. If you wish for all children of that resource (and their children, if applicable) to be cloned, check the "Clone Resource Children" checkbox. When complete, click the "Clone" button.



To repeatedly clone the resource, simply change the "New Name" field (if you want the subsequent clones to have a different name), and click "Clone" again. You may repeatedly click "Clone" and each click will produce a new clone.

When done, you may click on the link provided for the most recently created clone, or hit the back button from your browser to return to the parent resource.

> **Tip**
>
> Review the cloned resources using the chart view to see the hierarchy structure!

Additional Information

Continue on to the following pages for additional information on working with Resources in Provision:

- Customizing Sections
- Customizing Fields
- Customizing Resource Views
- Gadgets
- Contact Manager

Customizing Sections

Customizing Sections

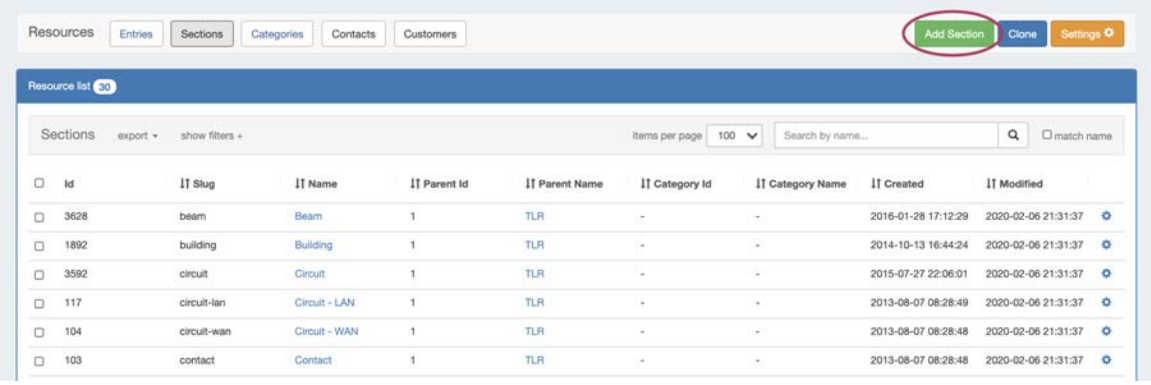
You can create as many sections as you wish (Firewall, Server, VM, Virtual Interface, etc.) and customize the gadgets and fields that apply to each section.

For example, you may not need to track the console port for your virtual firewall, so you would simply not use that field for the "Virtual Firewall" section. This way you can still track the console port for your physical firewalls like normal.

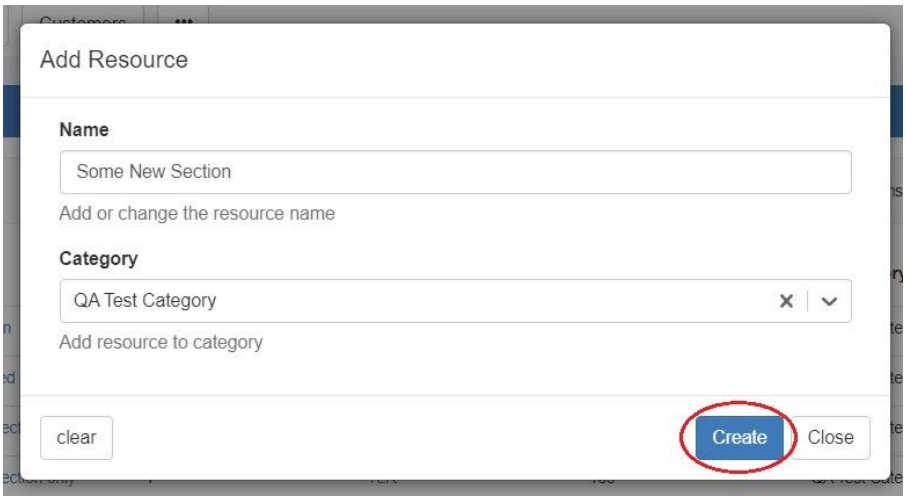
- Customizing Sections
  - Create a New Section
  - Edit a Section
  - Add Fields to a Section
    - Edit Field Data
    - Designate Default Fields
  - Add Gadgets to a Section
  - Additional Information

Create a New Section

Click "Add Section" from the **Sections** view button under the Resources Tab



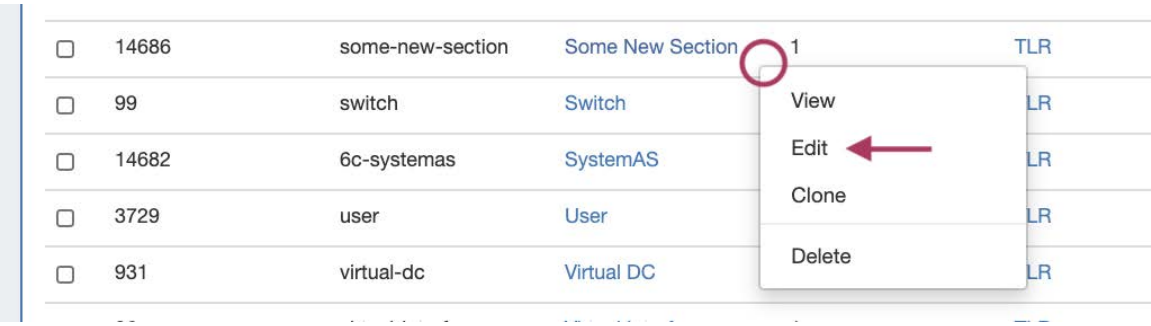
Create a new section by specifying a name and category. Then hit the "Create" button.



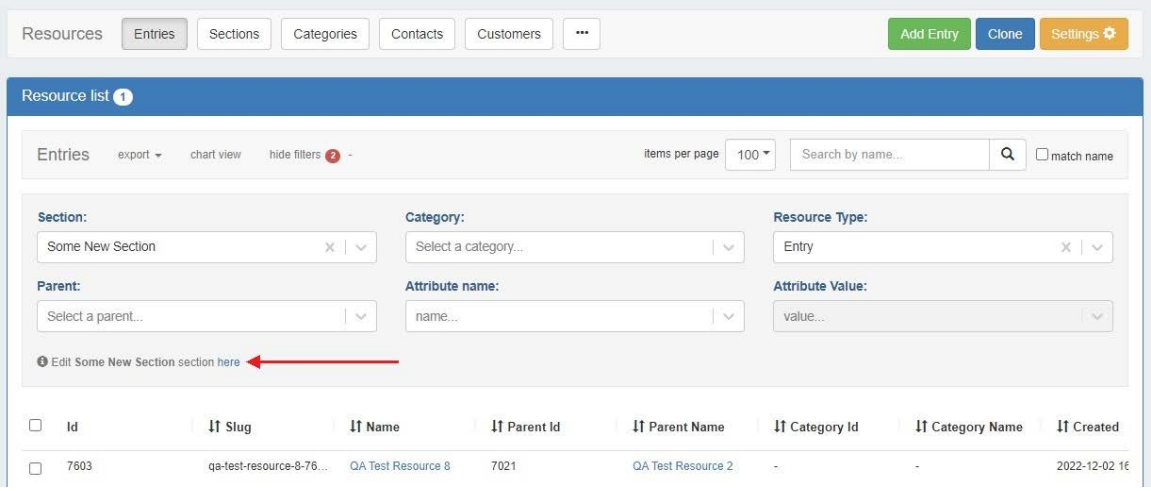
Edit a Section

There are two ways to access the edit section screen.

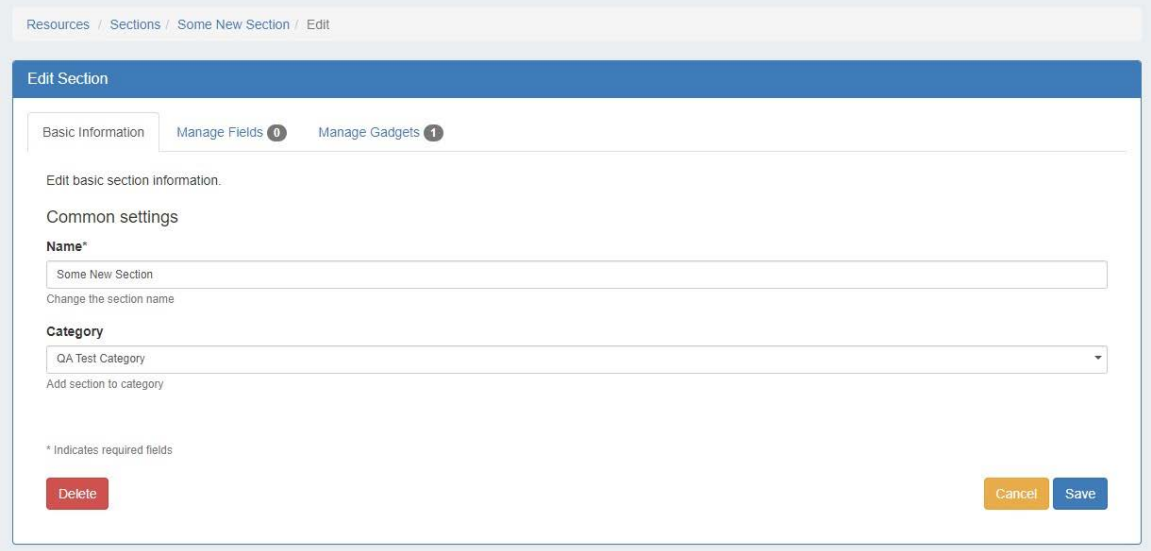
You can manage existing sections by opening the Action Menu for the section, then clicking "Edit".



You can also access the edit screen from the section's entry list. Open the filter panel at top and click the link at the bottom.

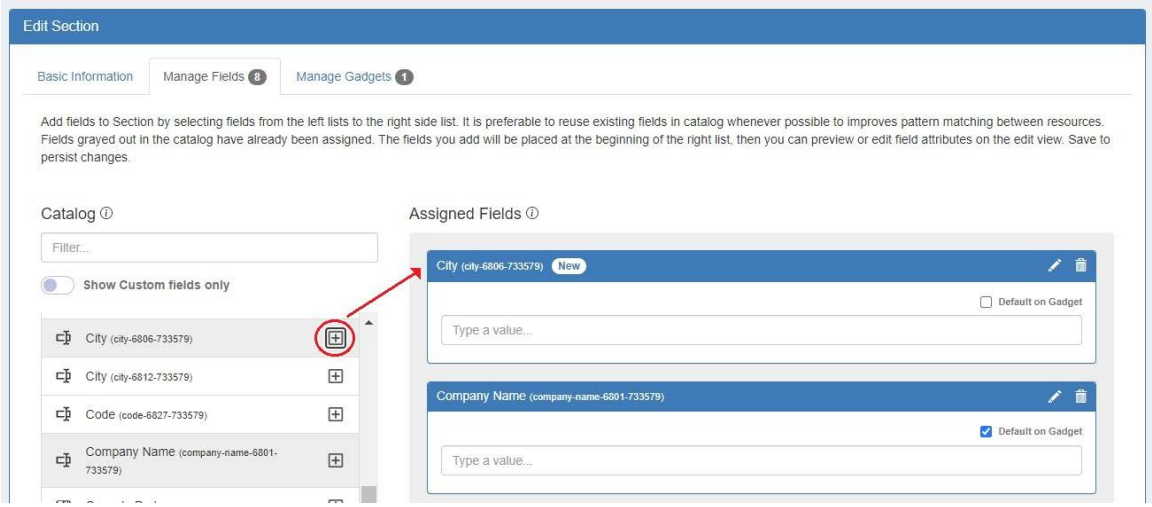


The edit section area is organized into three tabs: "Basic Information", to perform quick edits to the section name or category, "Manage Fields" to update or assign fields to the section, and "Manage Gadgets" to add, edit, relocate, or remove gadgets associated with the section.

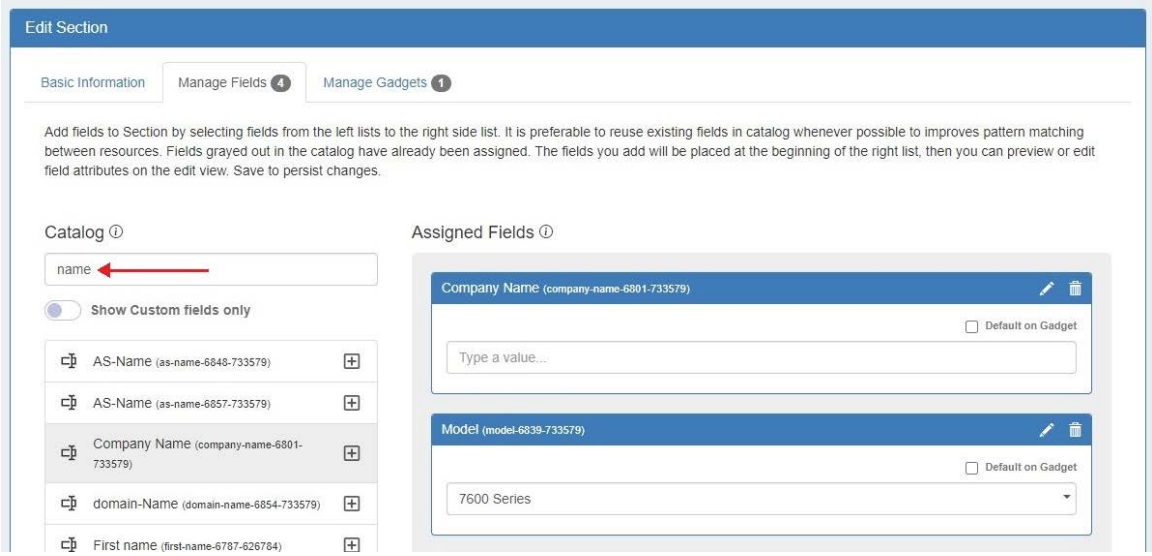


Add Fields to a Section

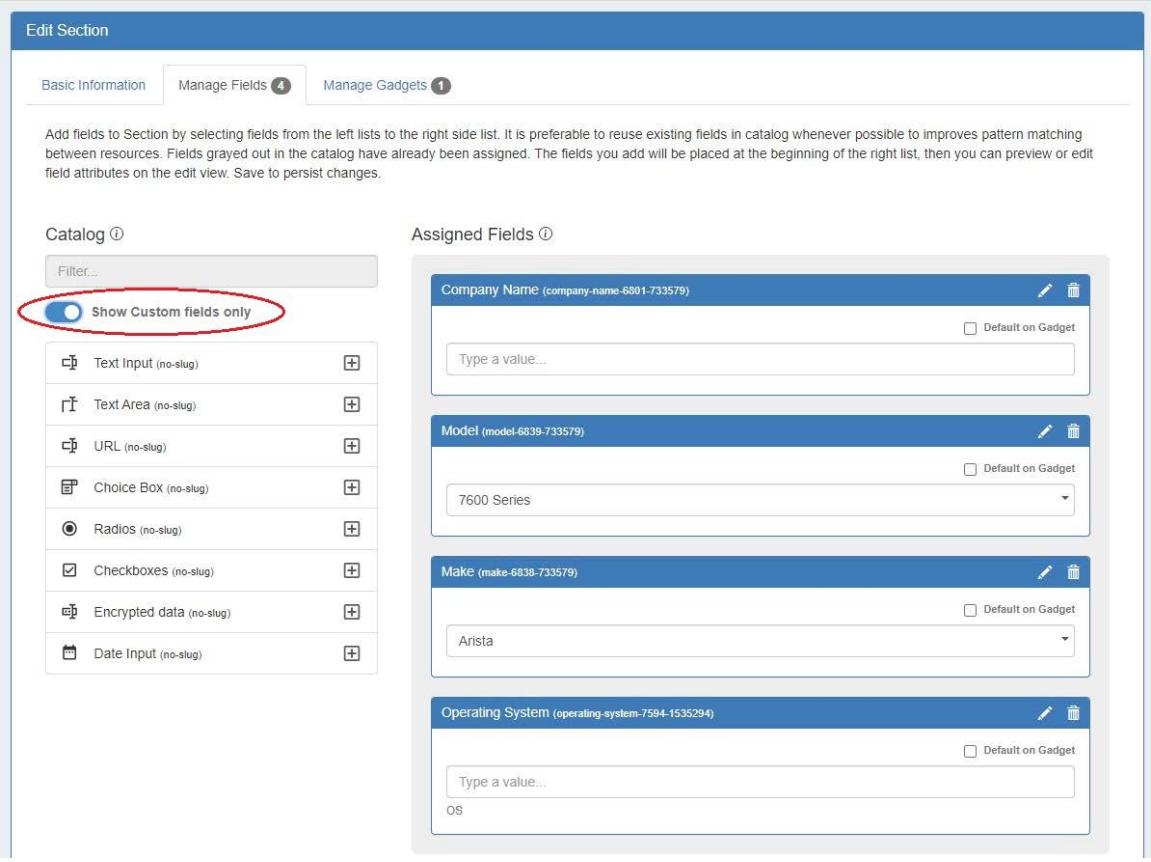
From the Manage Fields tab, you can add new custom fields of different types (text input, text area, choice box, radios, checkbox, encrypted) as well as any existing fields that are available by clicking the + icon next to the field name. See the Customizing Fields page for more details.



To search for an existing field, type a field name into the searchbox. Fields already added to the section are shaded grey. You may add duplicate fields to a section, but this is discouraged and a confirmation message will prompt you to confirm that you wish to add the duplicate field. To remove a field, click the delete (trash can) icon. This will remove the field from the "Assigned Fields" column, but the field will still exist for repeat use.

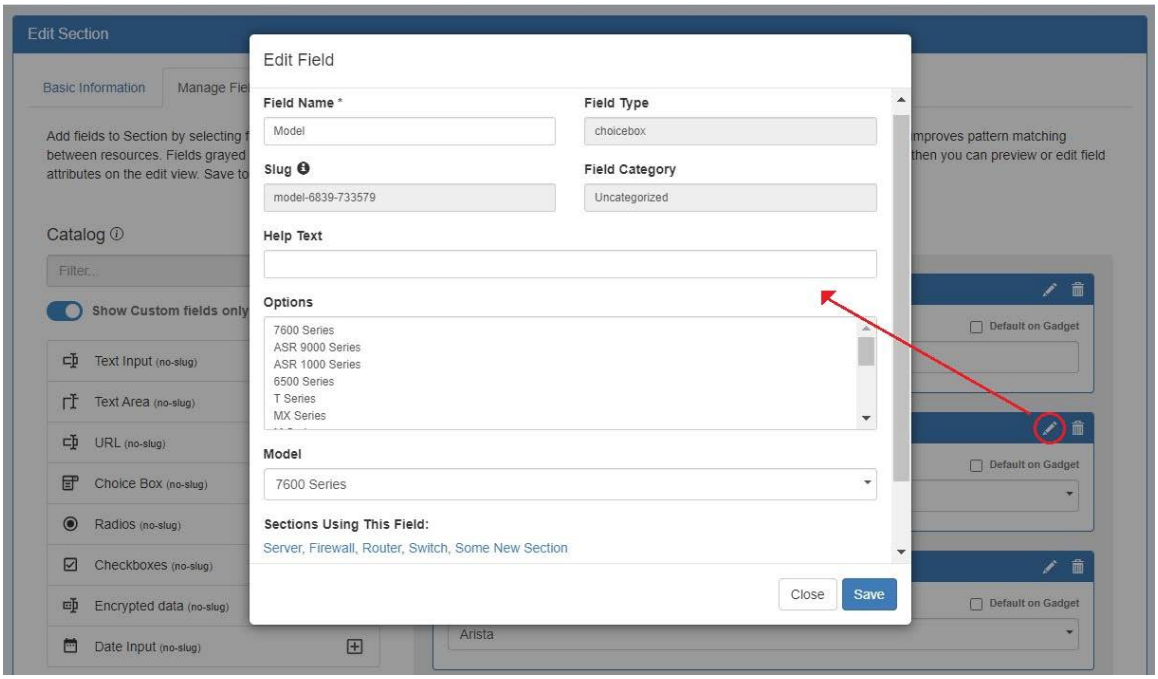


To view only unedited custom fields, enable the toggle below the searchbox. These are fields that do not technically exist yet. Once a blank field is added to a section and customized further (by editing the Field data), it will then have a slug and be added to the Field Catalog for reuse on other sections.



Edit Field Data

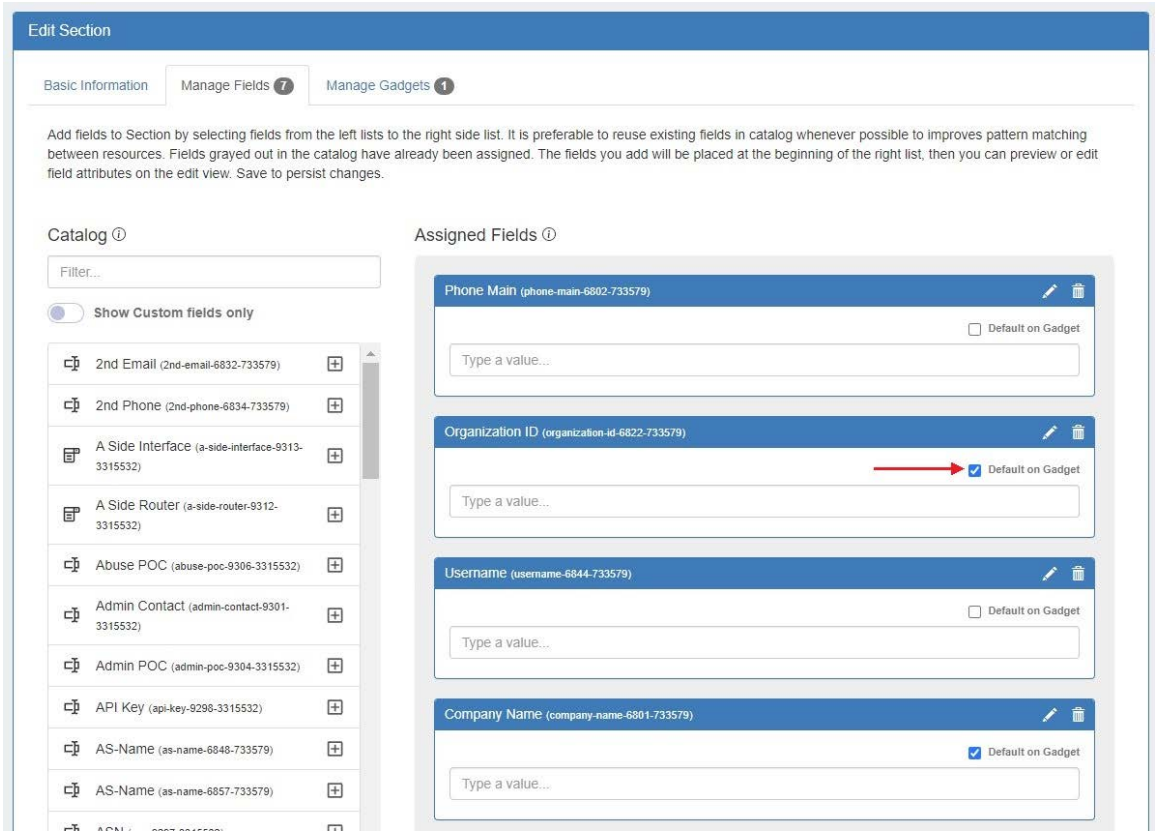
Once fields are added to a section, they may be renamed and have other attributes updated by clicking on the edit icon.



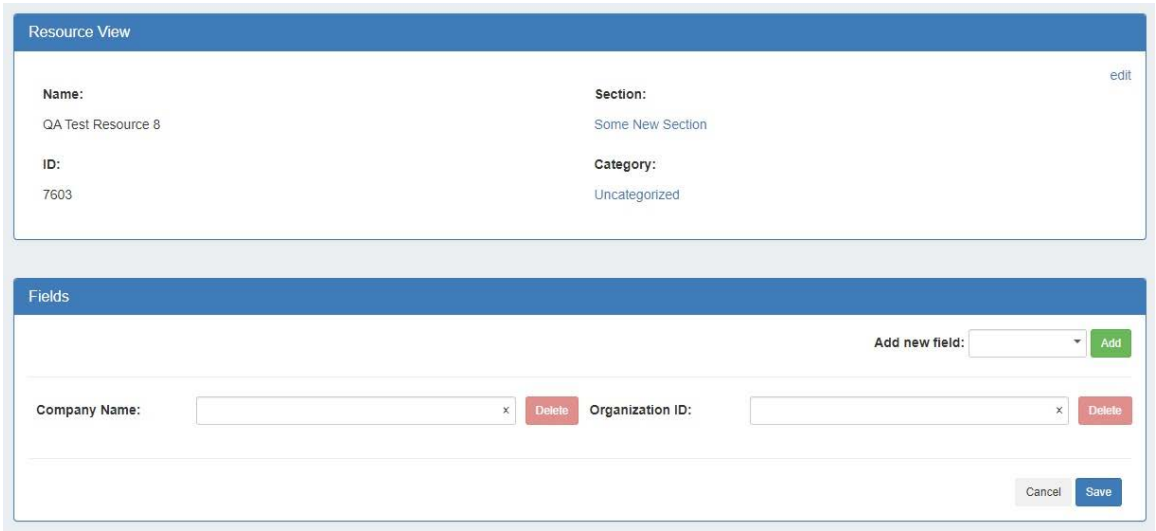
Any fields enabled here will be available to add to the field gadget, if desired.

Designate Default Fields

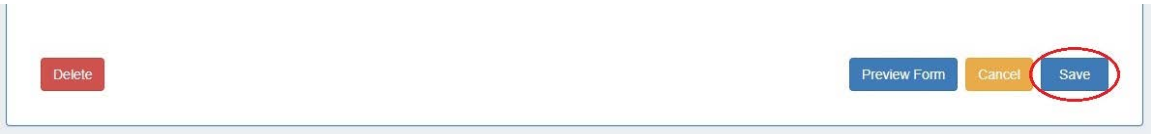
Users can designate fields be auto-added to the Field Gadget for all resources assigned to a section by selecting the checkbox "Default on Gadget".



Default fields cannot be removed from the Field Gadget. Non-default fields will be available to add to the gadget on a per resource basis via the dropdown. See Working with the Field Gadget for more information.

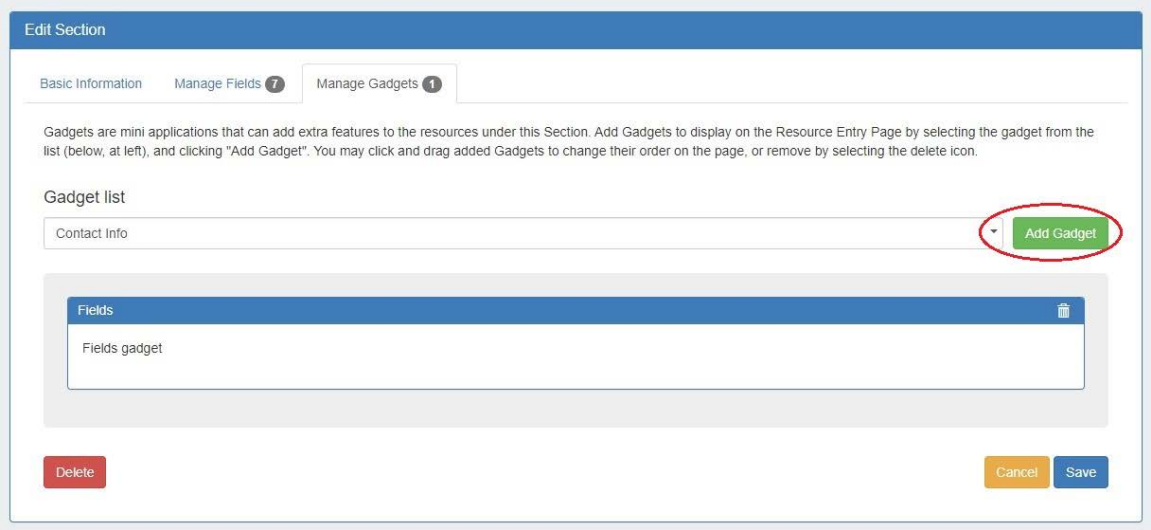


Once you have added the desired fields to a section, click "Save" at bottom right.

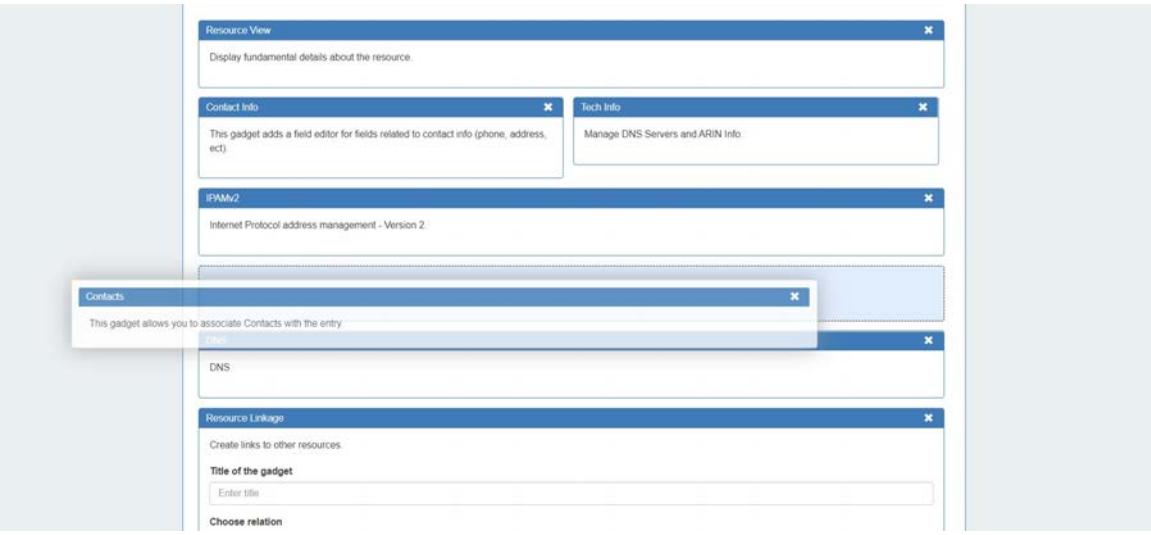


Add Gadgets to a Section

Gadgets are modules of additional functionality that can be added to the UI of a given resource. From the Manage Gadgets tab, simply select the gadget you want to show for that section and hit "Add Gadget".



Once added, you may organize them by dragging into the order you wish them to appear on the page. You may also remove added gadgets by clicking the "delete" icon.



When done, click "Save".

Once added to the section, gadgets will be visible for all resources of that section.

For a detailed list of gadgets and descriptions, see the Gadgets page.

> The "Save" function for each tab is applied independently. If you add or remove fields in the "Manage Fields" tab, then move to the "Manage Gadgets" tab to add or remove gadgets, and then save from there; your gadget changes will be saved, but your field changes will not be saved. You must save from each tab to retain changes to each area.

Additional Information

Continue on to the following pages for additional information on Resources in Provision:

- Customizing Fields
- Gadgets
- Contact Manager

Customizing Fields

Working with Fields

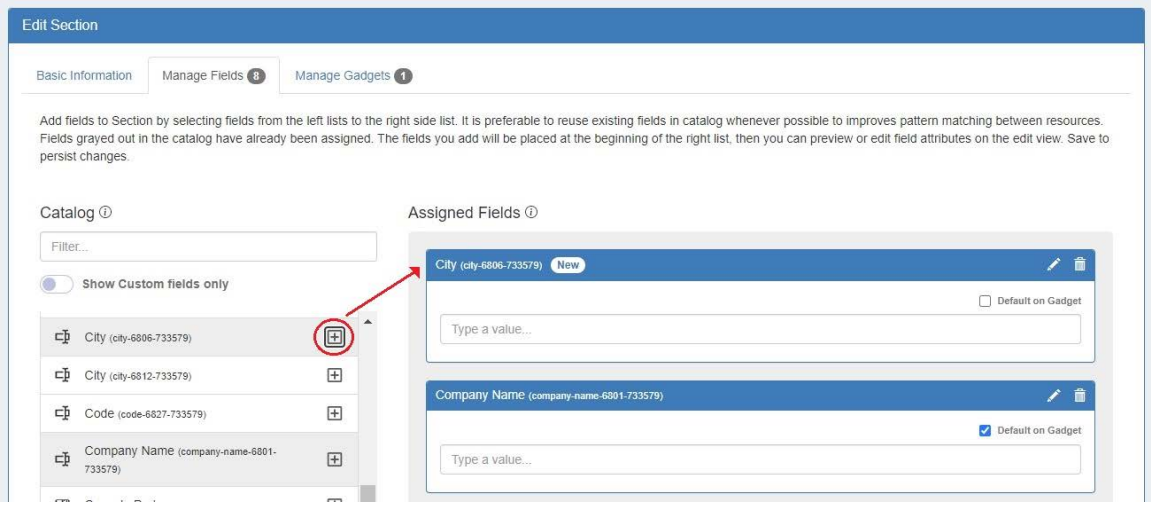
Fields are individual pieces of data that you can associate with a particular section. For example, you may want to have "Operating System", "Make", and "Model" fields for a server or device. ProVision includes many default fields to choose from, but you may also create custom fields and edit fields to suit your needs.

Once a field is added to a particular section, it will be available to add to the Field Gadget for later to edit, manage, or remove.

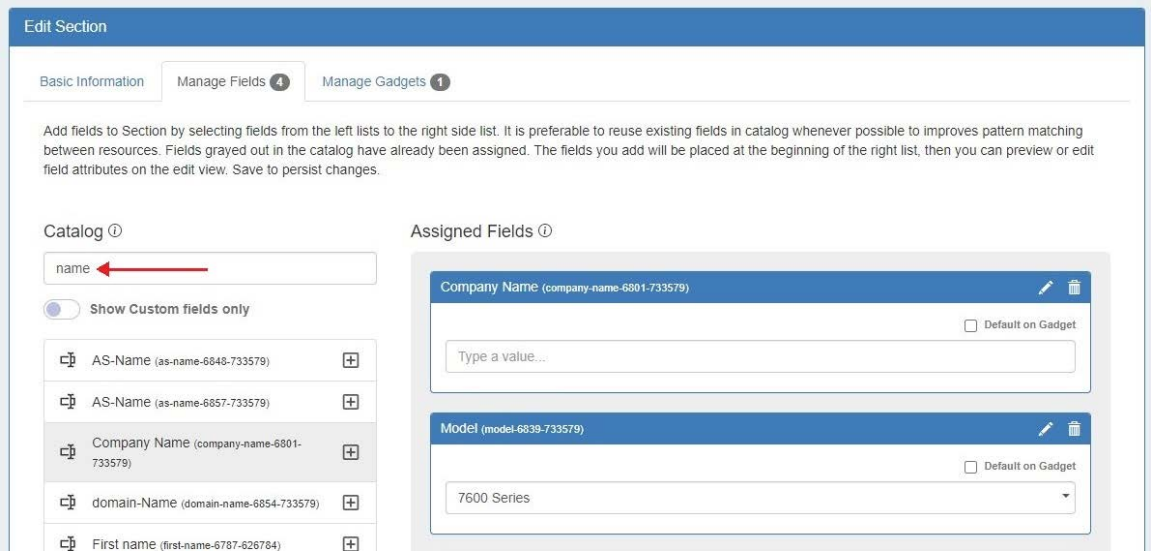
- Working with Fields
  - Add Existing Field to a Section
  - Add New Custom Field to a Section
  - Editing/Removing Fields
  - Previewing Fields
  - Default Fields
  - Using the Field Gadget
    - Manage Resource Fields
    - Exporting Fields
  - Additional Information

Add Existing Field to a Section

To add a field to a section, click on the + icon of a field in the Field Catalog on the left and it will be added at the top of the "Assigned Fields" section on the right. Fields already added to the section are shaded grey. You may add duplicate fields to a section, but this is discouraged and a confirmation message will prompt you to confirm that you wish to add the duplicate field.

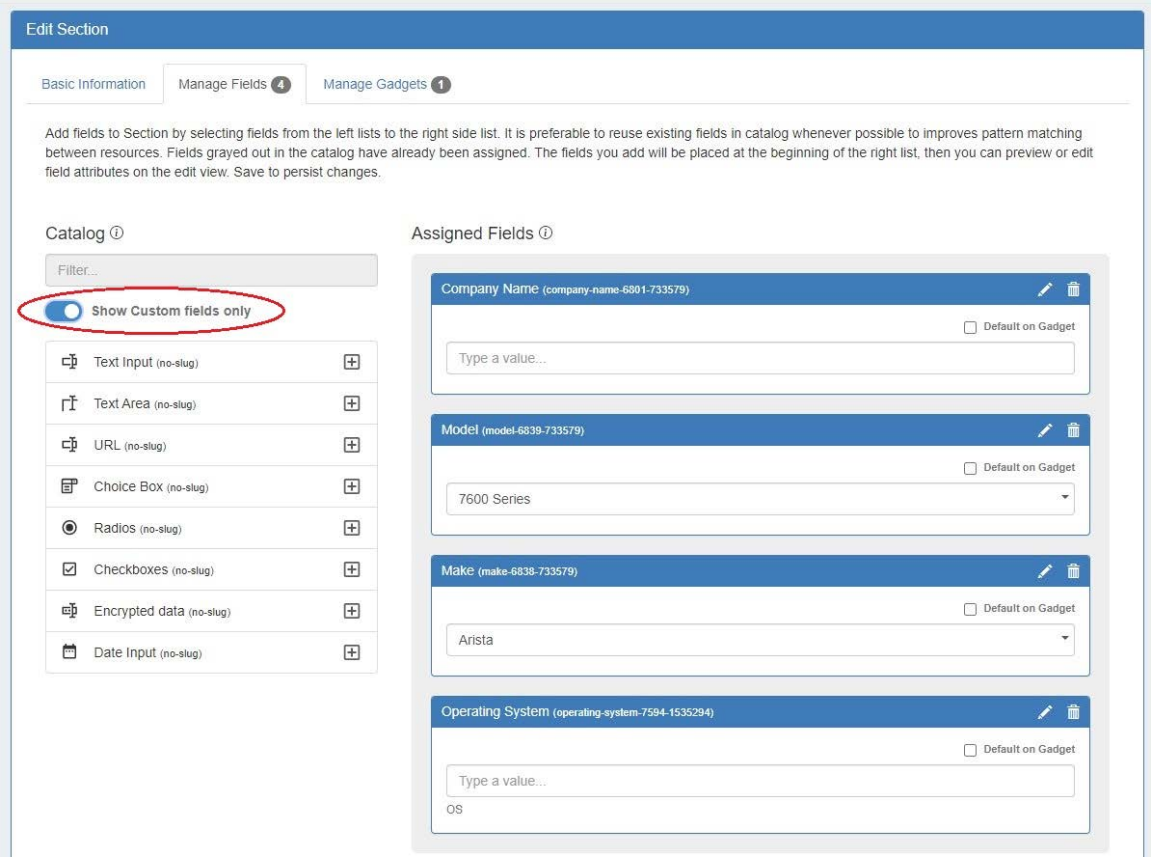


To search for a specific field, type a field name into the searchbox.



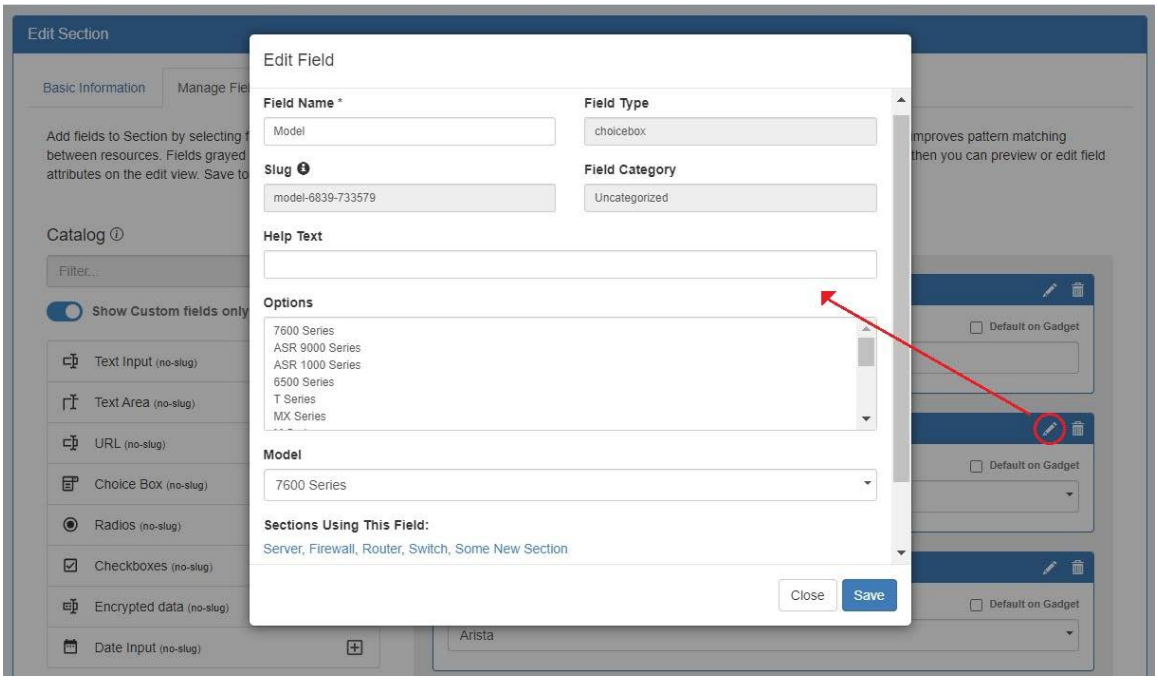
Add New Custom Field to a Section

Users can add custom fields of various types (text input, text area, choice box, radios, checkbox, encrypted) to a section. To view only unedited custom fields, enable the toggle below the search box.



Editing/Removing Fields

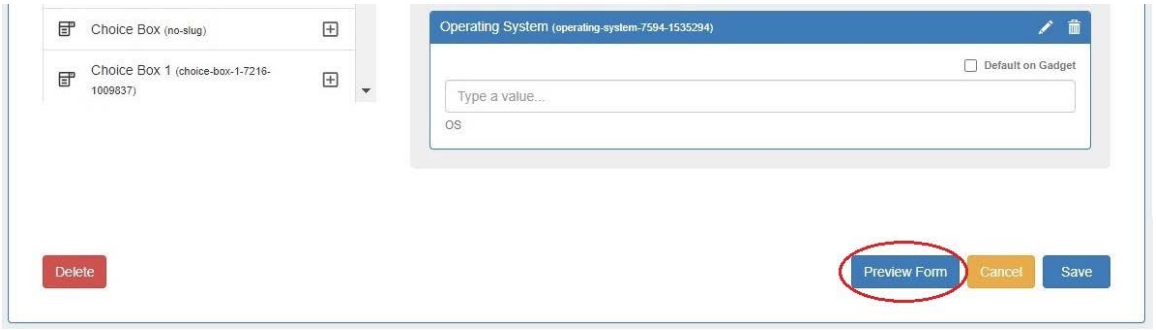
Once fields are added to a section, they may be renamed and have other attributes updated by clicking on the edit icon.



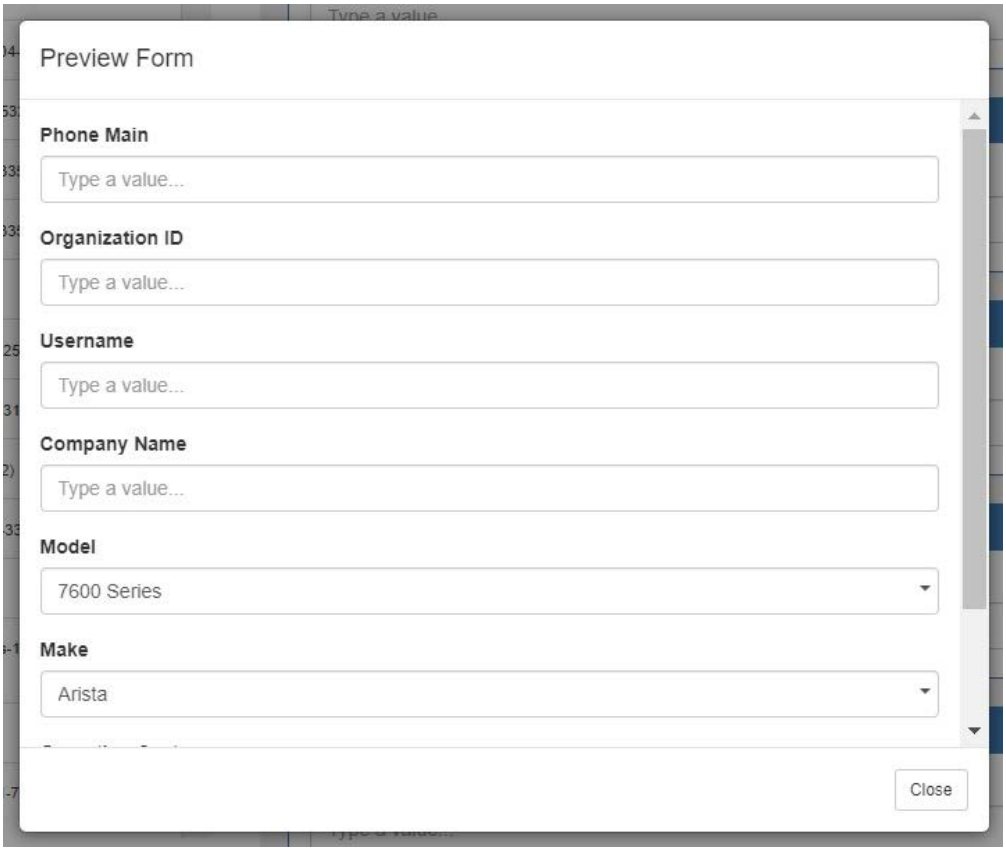
To remove a field, click the delete (trash can) icon. This will remove the field from the "Assigned Fields" column, but the field will still exist for repeat use.

Previewing Fields

Fields can be previewed by clicking the "Preview Form" button at lower right.

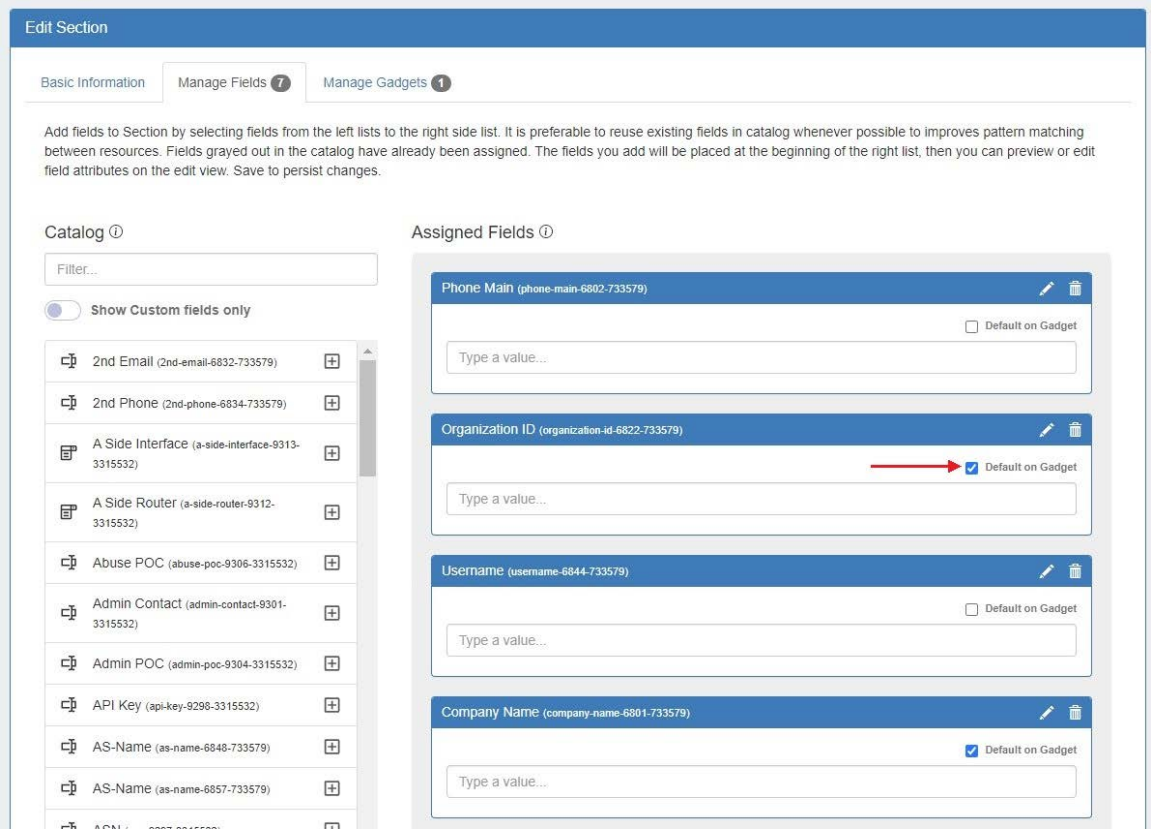


This will open a modal where you can view and test how fields will look and behave.



Default Fields

Users can designate fields to be auto-added to the Field Gadget for all resources assigned to a section by selecting the checkbox "Default on Gadget" once a field has been added to the Assigned Fields column.



Using the Field Gadget

The Field Gadget displays the information fields that have been added to the section, and have been added for the specific resource that is being viewed.



Users may add enabled fields to the resource, edit field values, and remove fields from the resource through this gadget.

Manage Resource Fields

The Field Gadget and the individual fields must both be enabled and added to the resource's section before they can be used in the Field Gadget on the resource entry page.

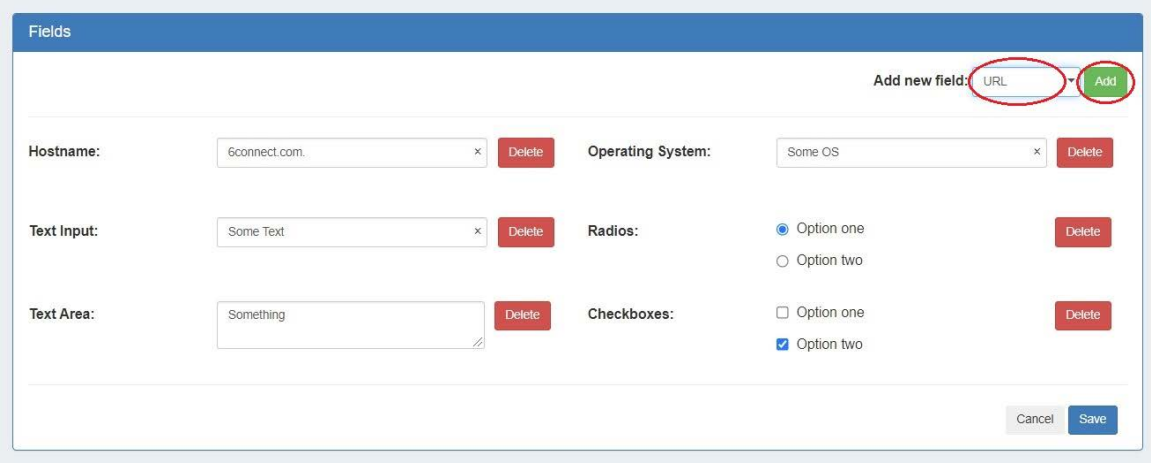
Once the fields are added to the section, they will be available to add to the Field Gadget for any resource of that section, from the Field Gadget's "Add New Field" dropdown.

To Add, Edit, or Remove fields, click the "Edit" Button at the bottom right corner of the Field Gadget.

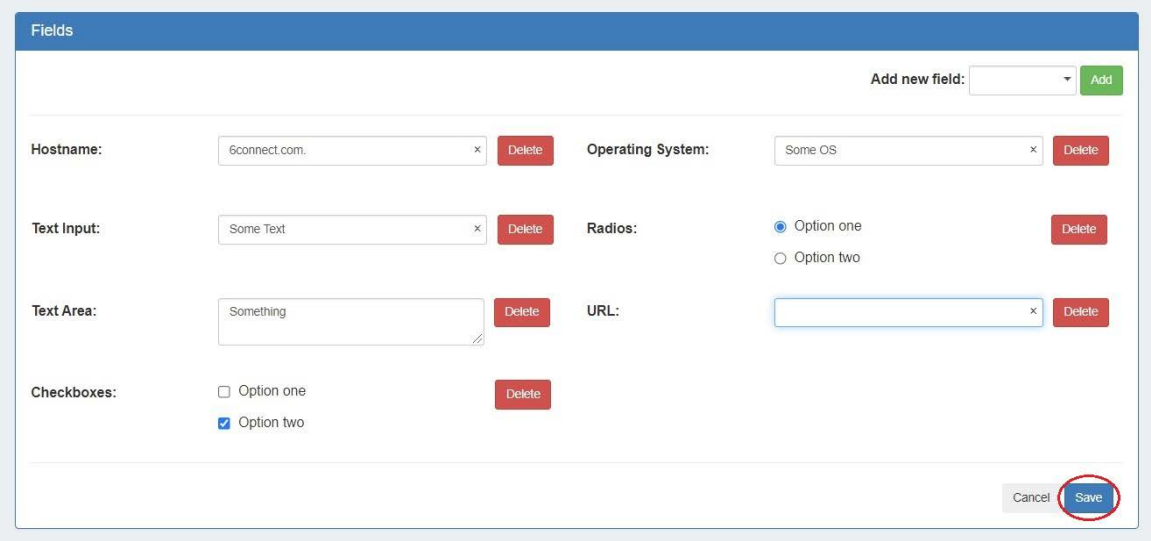


To add an available field to the gadget, select one of the available fields from the "Add New Field:" dropdown, then click "Add".

Once added, the field will be available to edit or remove.



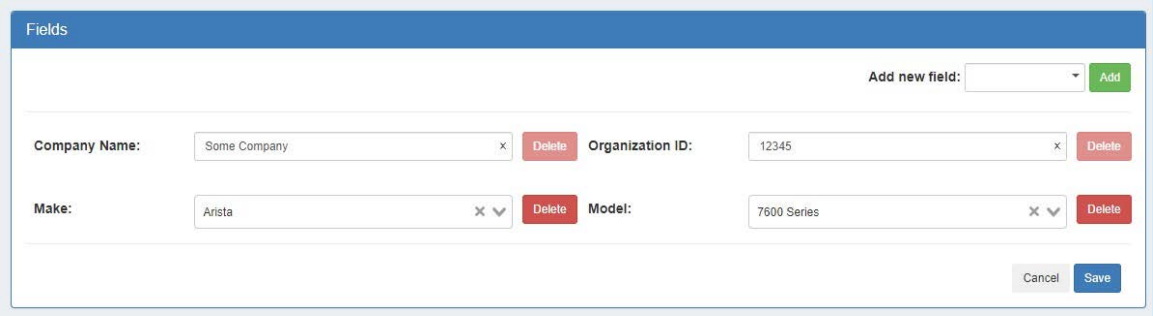
Edit the field value(s) by typing into the input box, and/or selecting the desired option, then click "Save". You may also remove a field from the gadget by clicking "Delete" - it will be available to re-add later, if needed.



When done with your edits, click "Save" to return to view mode.

A Note on Default Fields

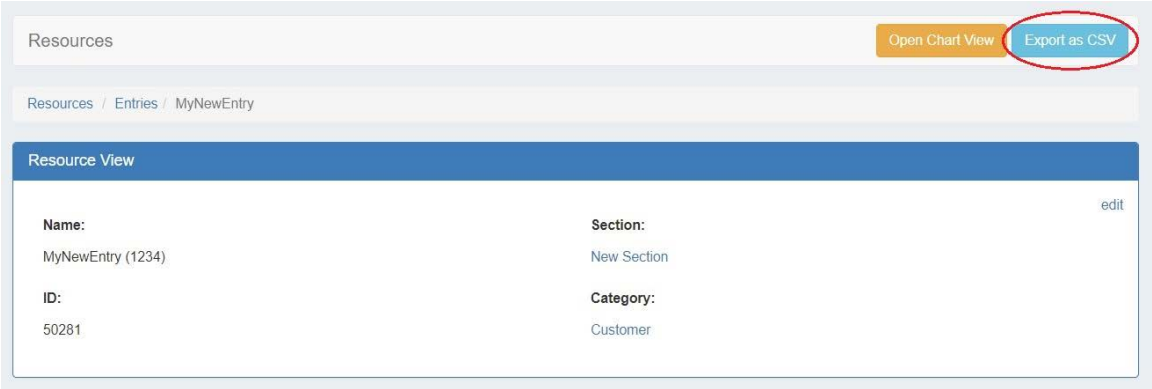
Because default fields cannot be removed from the Field Gadget, the "Delete" button for these fields appears slightly shaded.



Exporting Fields

Resource entry pages have an "Export As CSV" button, which generates a .csv file containing the resource's basic field information.

To export the resource, click the "Export as CSV" button in the header on the resource entry page.



The downloaded .csv file will contain the fields containing values from the Resource View, Contact Info, Tech Info, and Resource Field Gadget (s), with the field name in the first column, and the field values in the second column.

	A	B	C
1	Name	A QA Entry	
2	Section	Resource Holder	
3	Category	QA	
4	Created	2019-06-27T13:32:02-0700	
5	Modified	2020-01-13T12:34:51-0800	
6	Street 1	123 Main St.	
7	City	Sometown, CA	
8	Zip	12234	
9	Street 1	123 Main St.	
10	City	Sometown, CA	
11	Zip	12234	
12	Phone Main	123456789	
13	Last Billing Date	awd	
14	Country	DZ	
15	Country	DZ	
16	Residential Customer Privacy Enable	TRUE	
17	ns1	ns1	
18	Contract Number	12345	
19	Notes	Test	
20			
21			
22			
23			

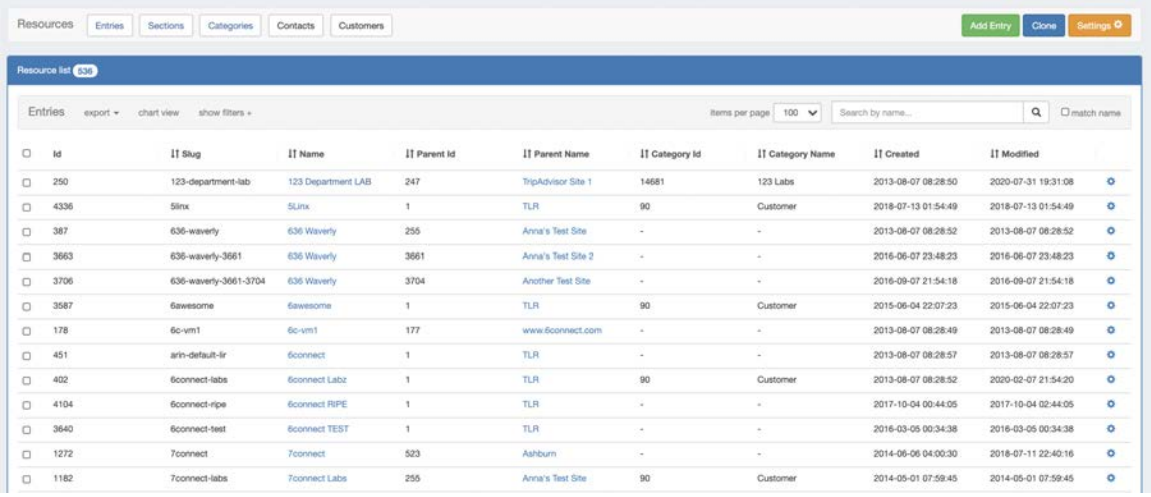
Additional Information

Continue on to the following pages for additional information on Resources in ProVision:

- Gadgets
- Contact Manager

Customizing Resource Lists

Customizing Resource Views



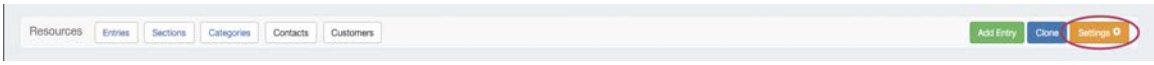
The list of Resource Entries is under the **Resources** Tab. To access it, you may either click on the Resources Tab, or select "Entries" from the Resource Tab dropdown menu.

Five resource view lists are provided by default, including "Entries", "Sections", "Categories", "Contacts", and "Customers", and users may either edit the provided views or create additional custom views from variety of filter and attribute column options.

- Customizing Resource Views
  - Resource List Views Settings
    - Default Views
    - Resource View List
      - Filter
      - Pin / Unpin
      - Create a New View
      - Clone an Existing View
      - Delete an Existing View
    - Set Default Filter Values
    - Set Default Columns
      - Select Field(s) to Add
      - Toggle Column Visibility
    - Reorder Columns
    - Remove Columns
    - Resize Columns / Additional Options
    - Rename Columns
  - Additional Information

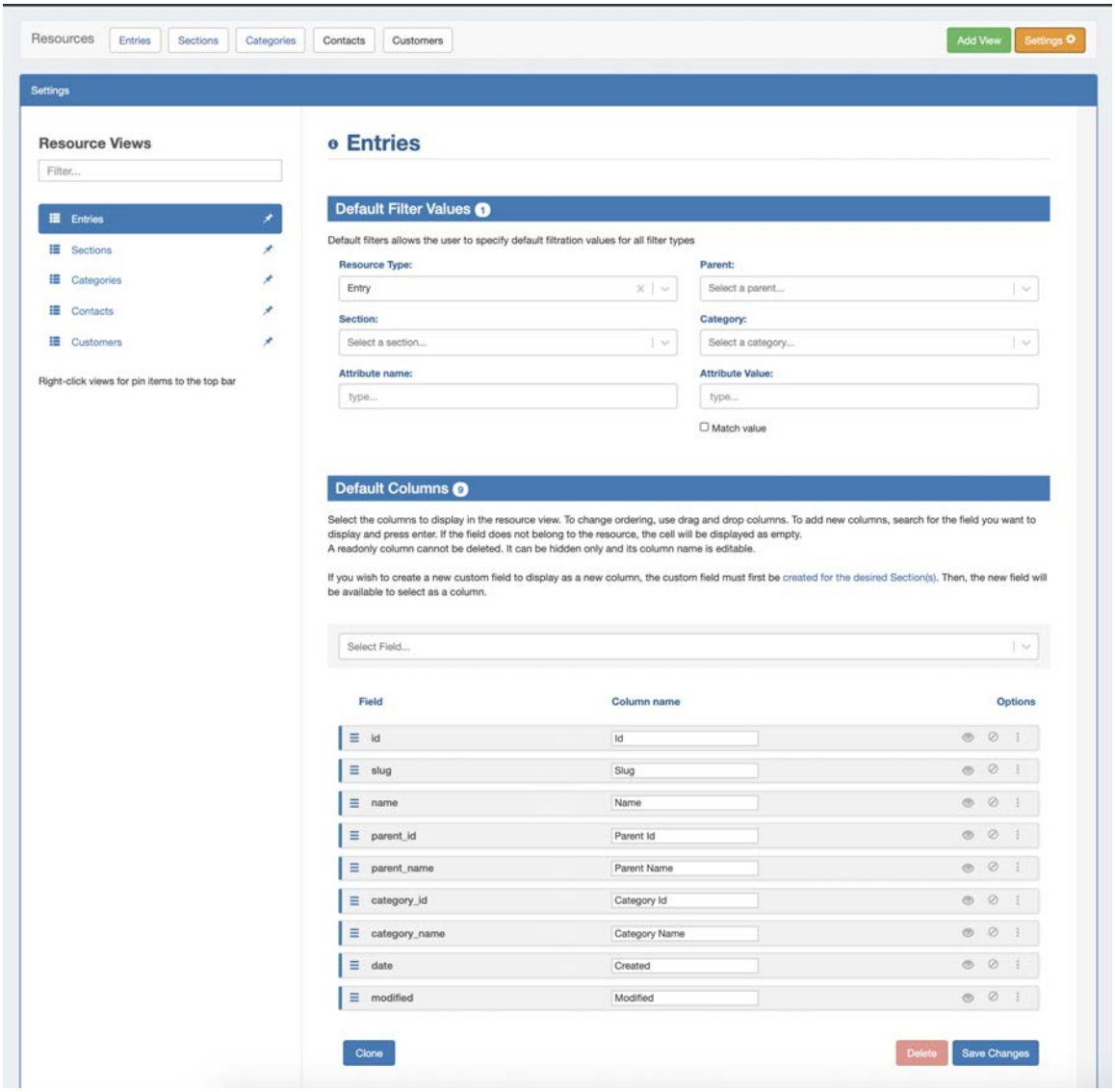
Resource List Views Settings

To view, edit, or create resource views, click on "Settings" from the Resource List header bar.



The settings page consists of three main areas: A list of existing resource Resource Views on the left sidebar, the Default Filter Values for the selected Resource View at the top center, and the Default Field/Column settings at the bottom center.

These settings may be changed for any Resource View, including the default Views. You may also create a new view at any time by clicking "Add View" at the top page header.



Default Views

Five default Resource Views are provided, and are automatically pinned to the top header bar for quick access:

Entries: Displays resource entries. Applied filter: Resource Type = Entry

Sections: Displays sections. Applied filter: Resource Type = Section

Categories: Displays categories. Applied filter: Resource Type = Category

Contacts: Displays contacts. Applied filter: Resource Type = Contact

Customers: Displays the customer list. Applied filter: Category = Customer

For all of the default views, the default column fields include:

- Id (id)
- Slug (slug)
- Name (name)
- Parent Id (parent_id)
- Parent Name (parent_name)
- Category Id (category_id)
- Category Name (category_name)
- Created (date)
- Modified (modified)

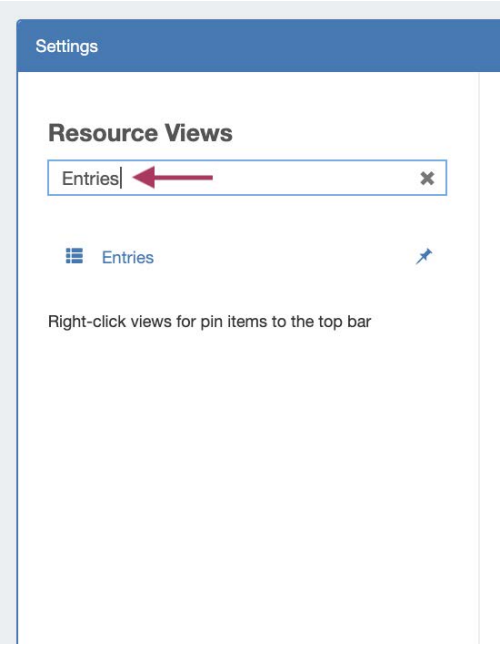
Users may edit the filters or default column settings to customize any of the default views, as well as pin/unpin the view to the header bar. However, the name may not be changed or the view deleted.

Resource View List

All existing views are listed on the left sidebar of the page under "Resource Views".

Filter

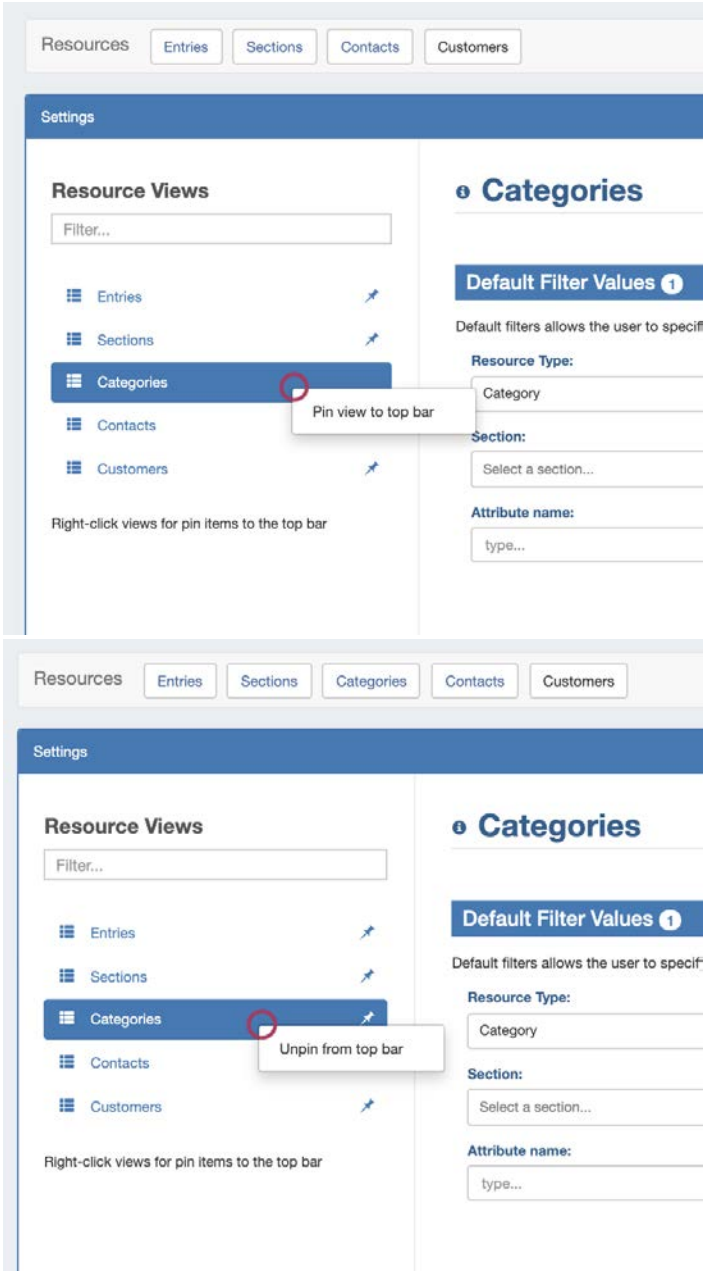
To filter the view list, type all or part of the view name into the search bar, and the list will filter down to relevant results.



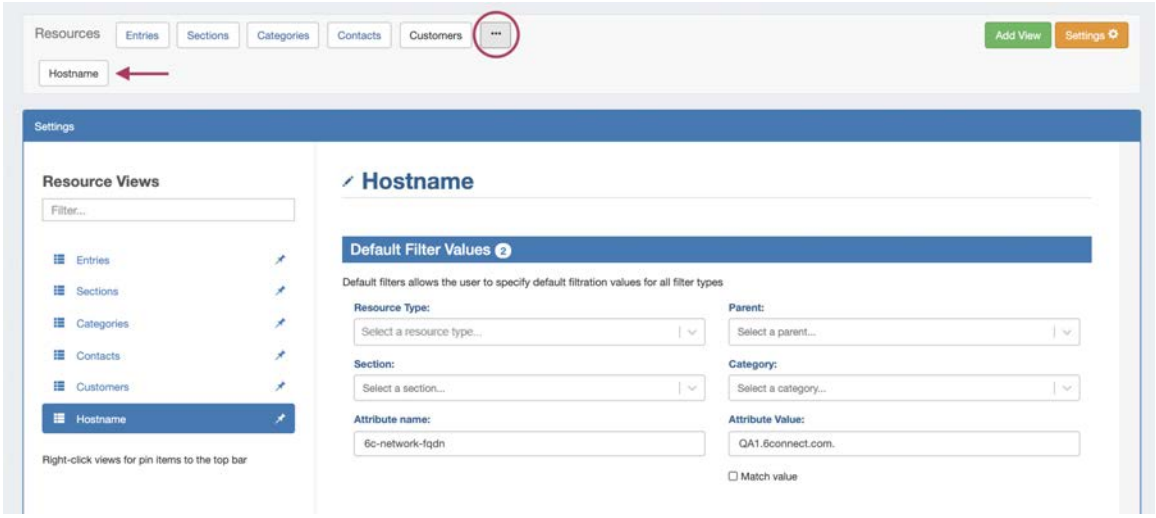
Pin / Unpin

To Pin / Unpin a Resource View to the top header bar (where it will display as a button), right-click on the view, then select:

"Pin to top bar" to add a bar button for the view, or "Unpin from top bar" to remove an existing header button.

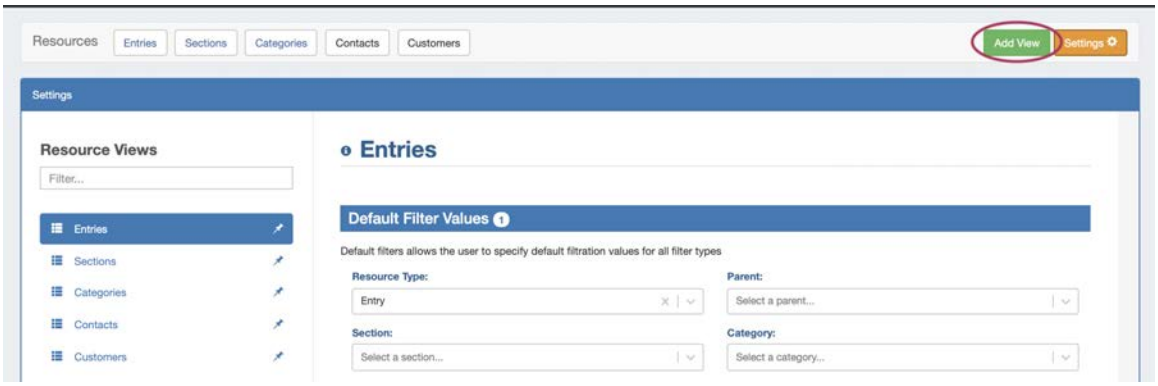


If custom views are pinned, they will be visible in a second button row by clicking the expand (...) button in the page header:

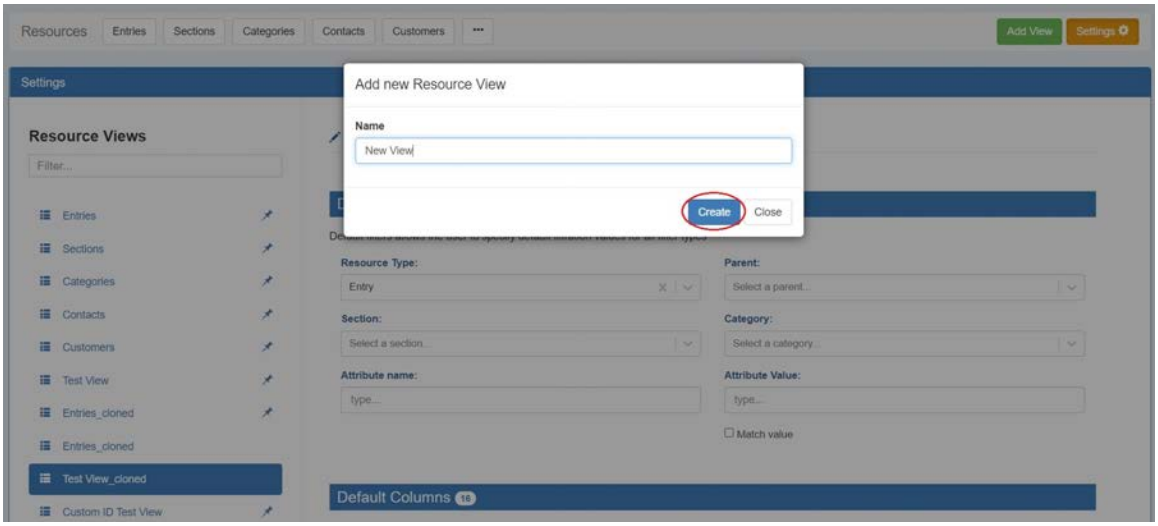


Create a New View

To add a new Resource View to the list, click "Add View" at the right side of the header bar.



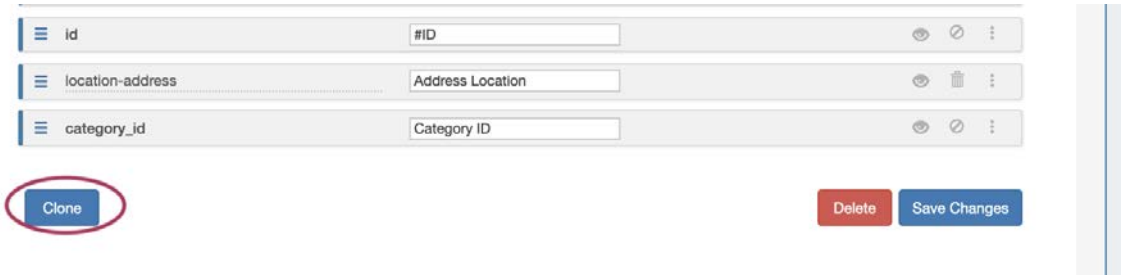
Create a new view by specifying a name. Then hit the "Create" button. The new view will be added to the view list, with no default filters applied and standard default columns enabled.



Click on the new view in the list to select it. From here you can apply specific filters to the view, display field attributes as columns, and adjust column order visibility.

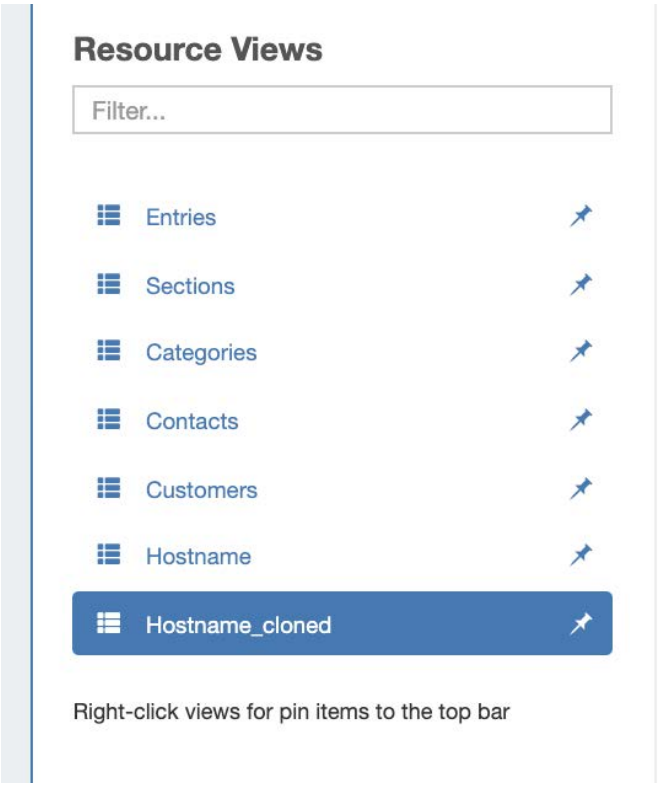
Clone an Existing View

You may clone an existing Resource View by opening the view, scrolling to the bottom of the view settings, then clicking "Clone".

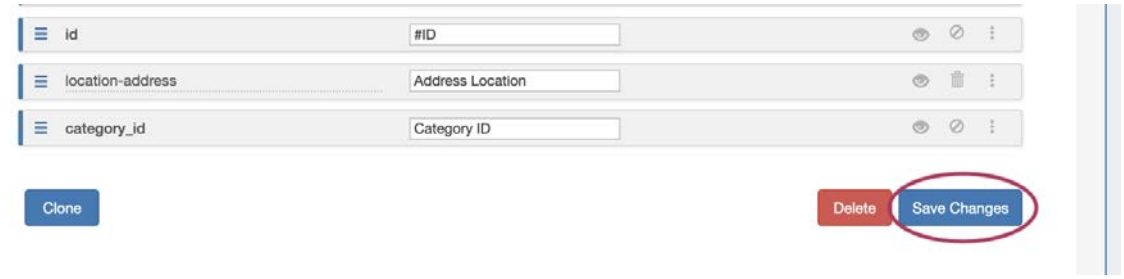


The view will be cloned, along with all of its existing filter and column settings.

The new view will be named "(Previous View Name)-cloned", and will immediately be added to the Resource View list.



If further edits are needed to the view, edit the filters and/or columns as desired, and click "Save Changes".



Delete an Existing View

User-created Views may be deleted by clicking the "Delete" button at the bottom right of the view settings.

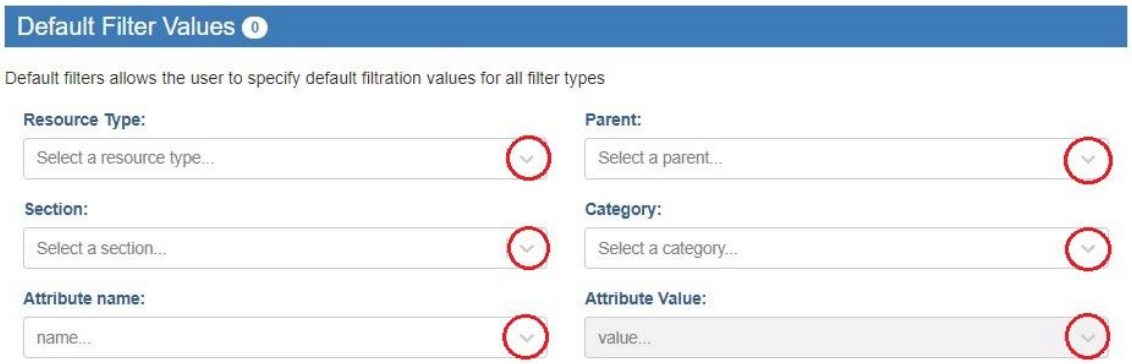


Default views may not be deleted.

Set Default Filter Values

Default filter values allow you to fine-tune which resources display in your Resource View. If you'd like to have all resources visible in your view, you may leave all fields blank, or enter any combination of filters to narrow down the resulting list.

You may even restrict your view to only show those resources that have a particular value for an attribute, by entering the attribute (field) name obtained from the resource's section setup, and the specific value for that attribute that the resource should have.



Available filter values include:

Resource Type: Choose from Section, Entry, Category, or Contact.

Parent: Enter a parent resource to limit the list to only resources with that parent.

Section: Select a resource section, such as Resource Holder, Server, Rack, VM, or any custom section from your ProVision instance.

Category: Select an existing category, such as Customer, Internal, or any custom category that has been created.

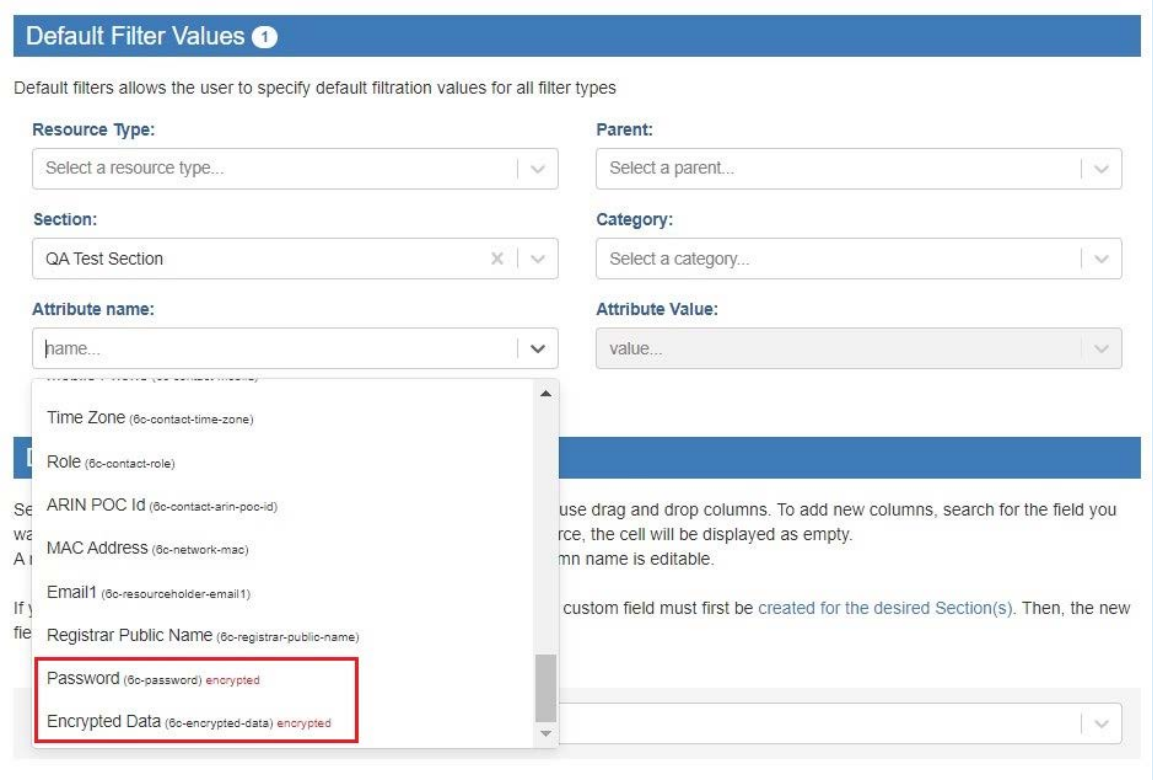
Attribute Name: Select an attribute name to limit the results to only resources with that attribute.

Attribute Value: Select an attribute value to limit the results to only resources with that value for the attribute. The attribute value filter results are limited to the attribute selected in the "Attribute Name" filter.

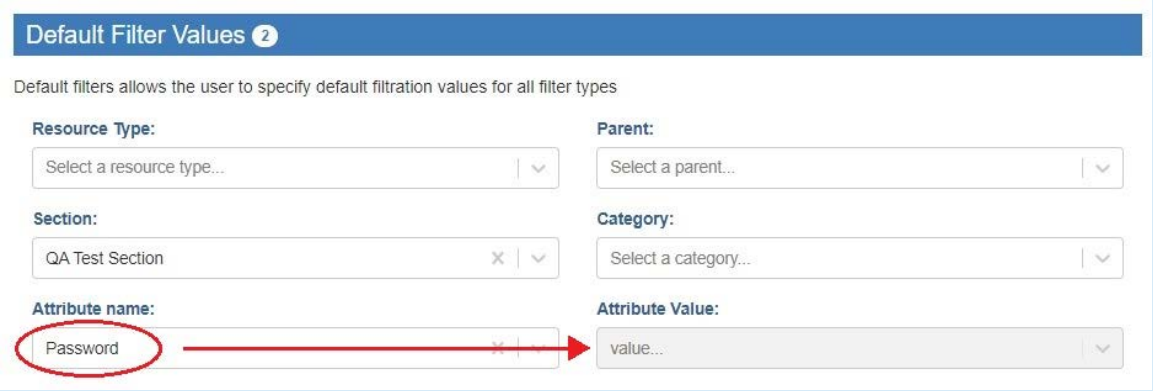
Once you have selected the desired filter(s) for your view, be sure to click "Save Changes" at the bottom of the page!

Attribute Filters and Encrypted Attributes

Encrypted attributes, such as "Password" and "Encrypted Data", can be searched via the Attribute Name filter. But users may not filter encrypted attributes by a specific attribute value. These attributes are designated as "encrypted" in the Attribute Name filter dropdown.

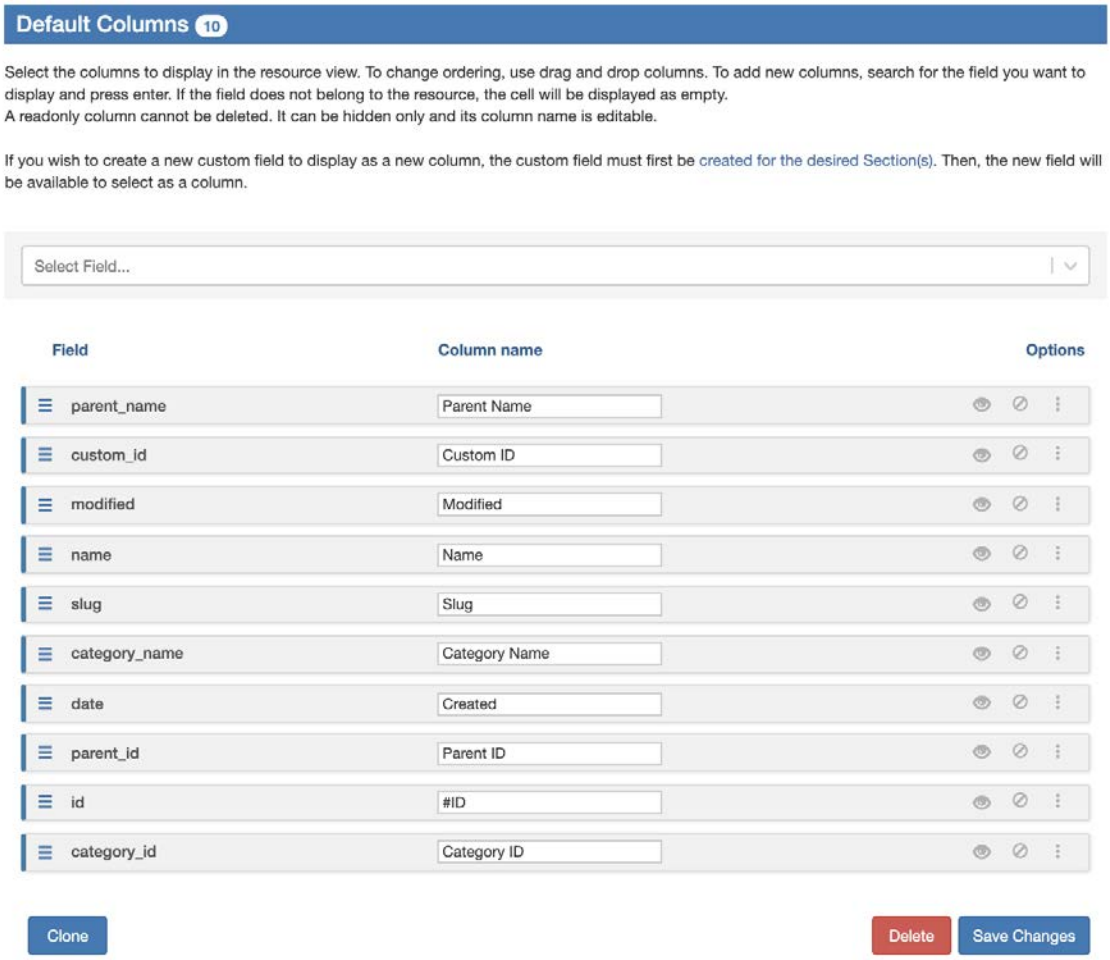


The Attribute Value filter is disabled when an encrypted attribute name is selected.



Set Default Columns

Default Column settings allow you to choose which resource fields are displayed as columns, as well as the column order, name, and visibility settings.



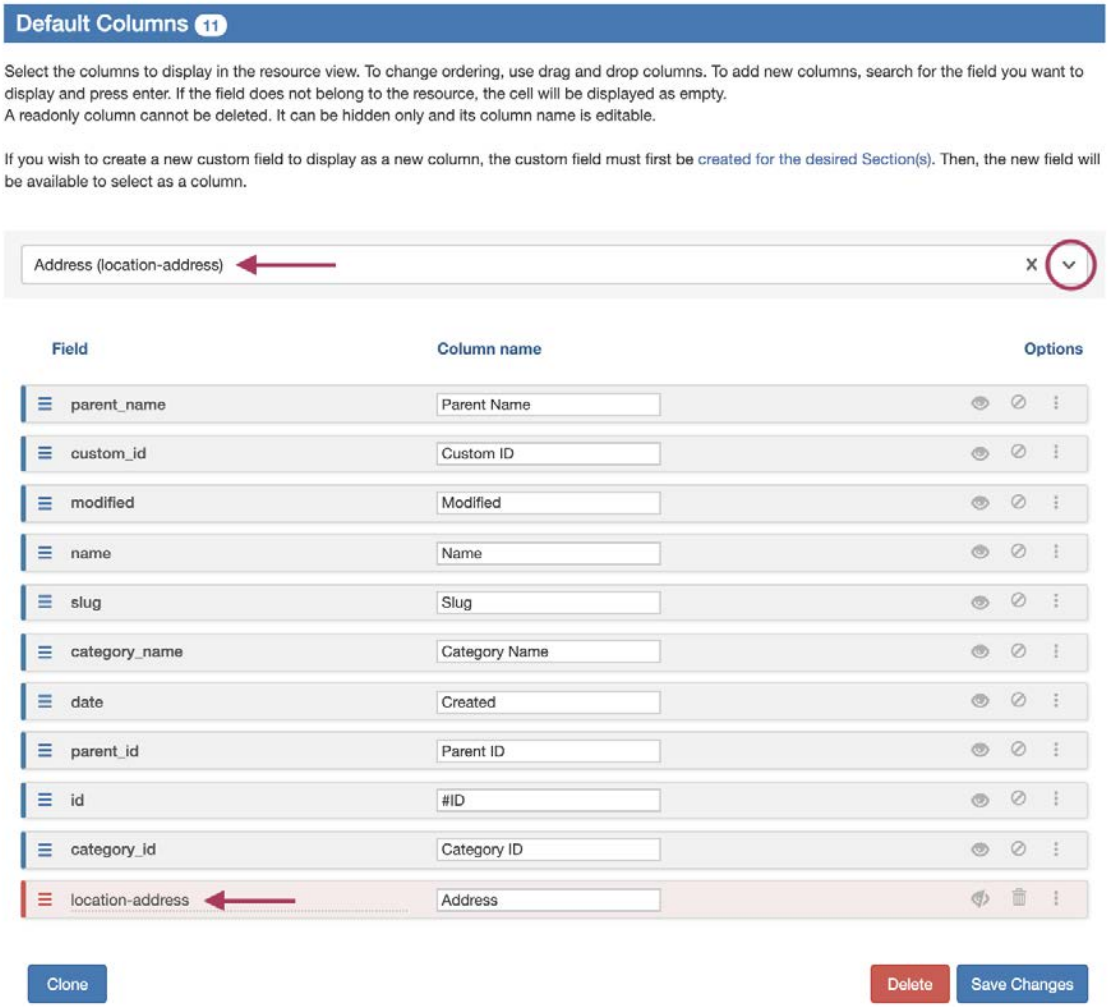
For all of the default views, the default column fields include:

- Id (id)
- Slug (slug)
- Name (name)
- Parent Id (parent_id)
- Parent Name (parent_name)
- Category Id (category_id)
- Category Name (category_name)
- Created (date)
- Modified (modified)

These default columns may be reordered, renamed, or be hidden, but they may not be deleted. You may, however, hide any unwanted columns and add custom fields to display only the specific information you wish to see in your view.

Select Field(s) to Add

You may add any existing resource field as a column for a view. In the "Select Field" input box, click and search for the field name you wish to add:



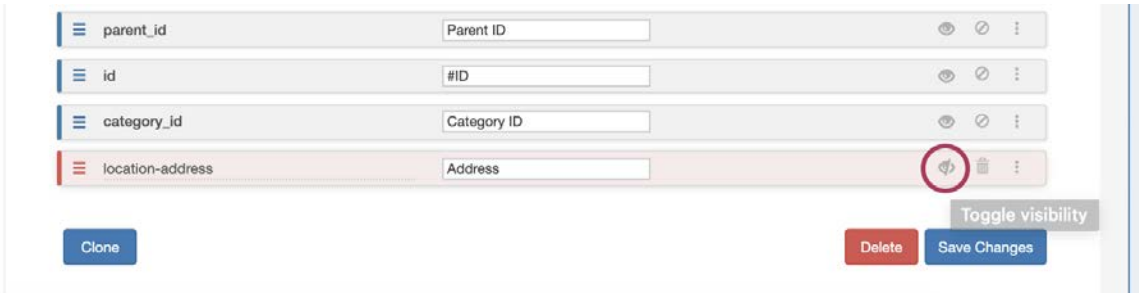
Once selected, the field will automatically be added to the bottom of the column field list, and automatically set with visibility to "off".

> **Create New Fields**
>
> Note: If you would like to create a new custom field to display as a column, you must first create the field for the desired section. Then, the new field will be available to select as a column.
>
> For additional information on creating fields, see Customizing Sections and Customizing Fields.

From here, you may add or edit additional fields, or click "Save Changes" to save your changes.

Toggle Column Visibility

To toggle column visibility on or off, click the "eye" icon on right side of the field row.

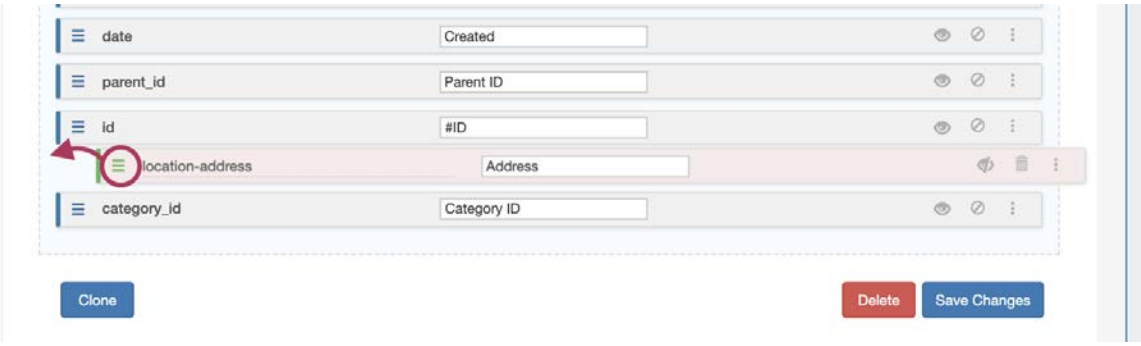


Fields that have visibility turned off will display as a red bar, whereas visible fields will be grey bars.

Reorder Columns

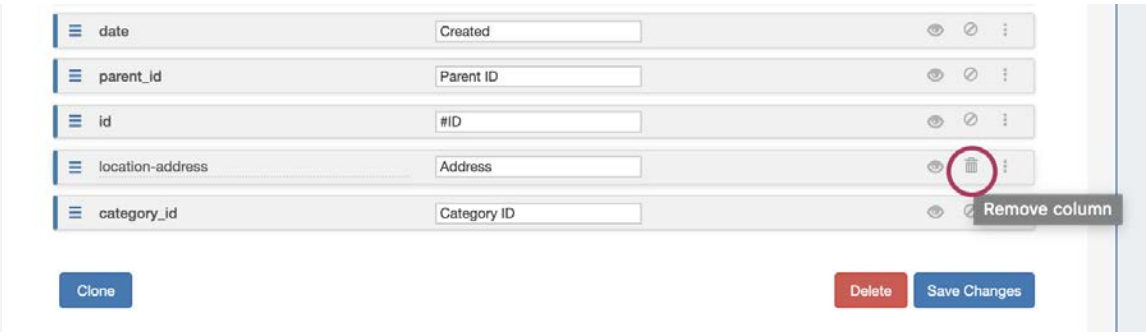
To reorder columns, click on the "list" icon (three horizontal lines) on the far left of the field bar, then drag the bar to the desired location in the list.

Release the mouse button when it is placed in the new location.



Remove Columns

Default columns are not able to be removed (you may hide visibility, instead), but user-added columns may be removed by clicking on the "delete" icon (trash can) for the desired field.

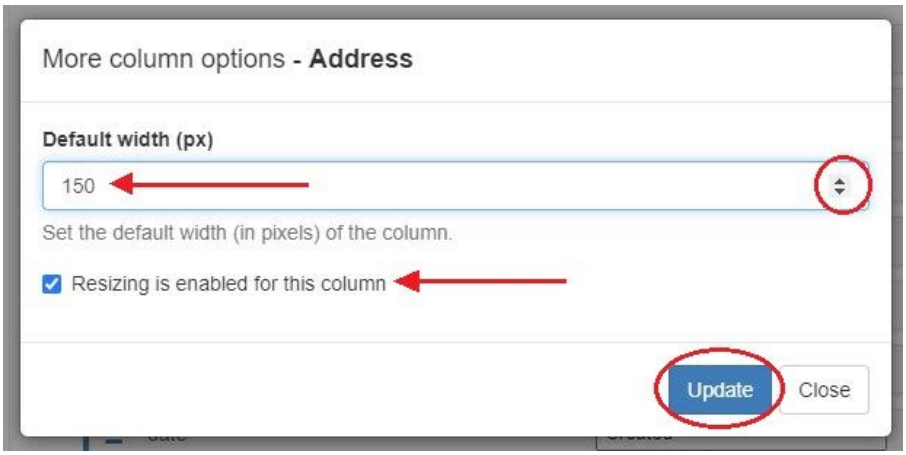


Resize Columns / Additional Options

Additional options exist to manage column sizing and behavior. Click the menu icon (three dots) on the right side of the field bar.



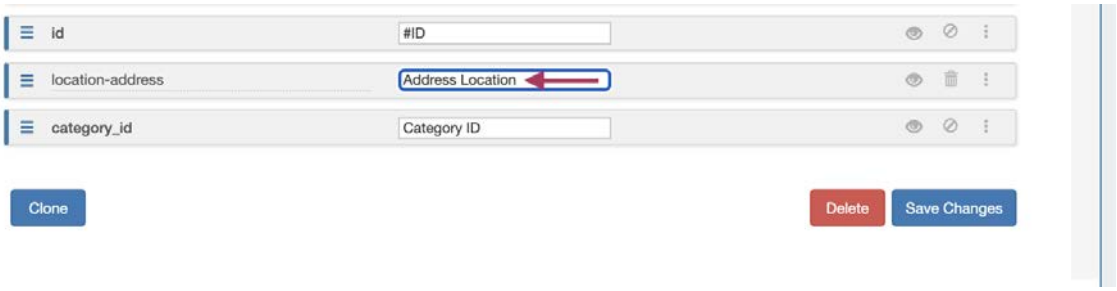
This opens the "More Options" box. From here, you can set a specific default pixel width for the column, or enable/disable drag resizing in the field view.



When done, click "Update", or click "Close" to exit without saving your changes.

Rename Columns

The display name for any column may be renamed by simply clicking inside the name box, and typing your changes.



When done, click "Save Changes".

Additional Information

See the following pages for additional information on working with Resources in ProVision:

- Working with Entries
- Customizing Sections
- Customizing Fields
- Customizing Resource Views
- Gadgets
- Contact Manager

Gadgets

Gadgets

- Gadgets
  - What are Gadgets?
    - Adding Gadgets to a Section
  - Available Gadgets
  - Creating your own Gadgets
  - Additional Information

What are Gadgets?

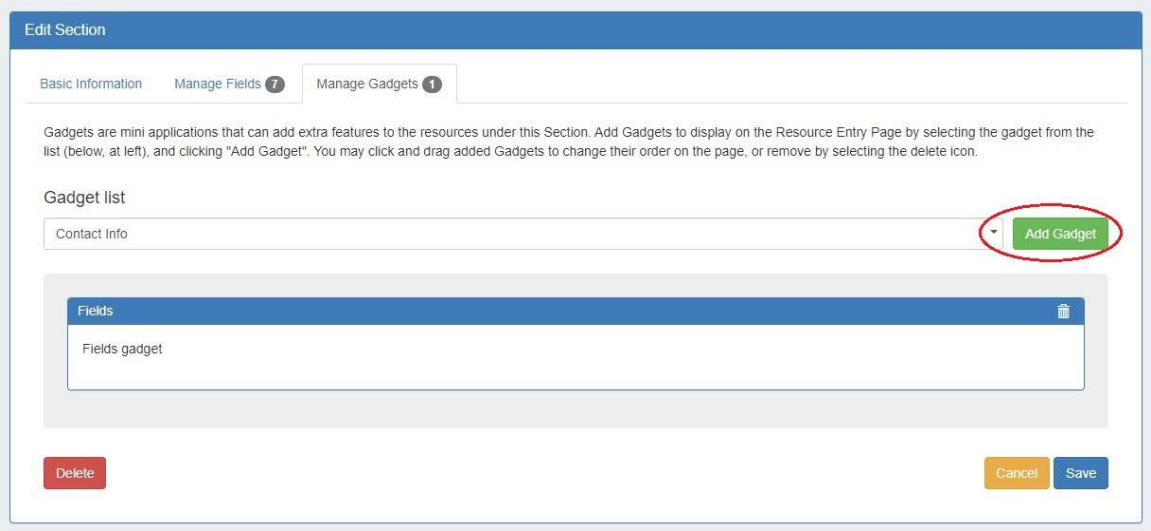
Gadgets display on the Resource Entry page, providing information or actions for various modules. They are best described as self contained webapps; widgets but with more power. Gadgets can have their own fields, HTML templates, and even accompanying scripts and stylesheets. They can interface with the API to display simple information such as the resource section, or they can perform much more complex functions, such as IP assignment in the IPAM Gadget.

Gadgets are enabled per section, so that the gadgets that display in the UI may be different for various section types - A resource with the "Server" section would have different display and functionality needs than a resource using the "Resource Holder" resource.

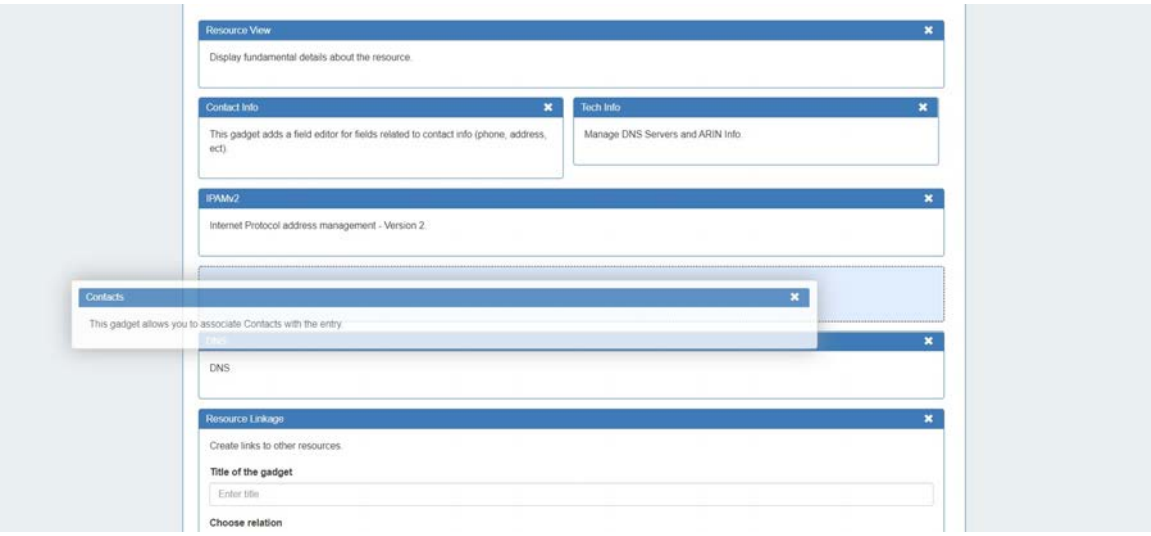
Adding Gadgets to a Section

In order to display on a resource entry page, Gadgets must first be added to a section - see Customizing Sections for detailed instructions.

When editing a section, navigate to the "Manage Gadgets" tab, select the gadget you want to show for that section, and hit "Add Gadget".



Once added, you may customize the order you wish them to appear on the page by dragging and dropping into the desired order.



When done, click "Save". Once added to the section, gadgets will be visible for all resources of that section.

To view the gadgets, open the resource entry page for any resource under that section.

For additional details on editing sections and enabling gadgets, see Customizing Sections.

Available Gadgets

A number of gadgets are available to add to the resource entry page, and support various modules. For details on each available gadget, see the following section:

- ACP Gadgets
- Contacts Gadgets
- Data Storage and Info Gadgets
- DHCP Gadgets
- DNS Gadgets
- IPAM Gadgets
- Peering Gadgets
- Resource Gadgets
- XML Specifications

Creating your own Gadgets

6connect provides XML specifications for users interested in creating their own gadgets for ProVision. See the XML Specifications section linked below for more information.

- XML Specifications

> User created gadgets are not supported at this time and the specification below could change without notice. If you want to make your own gadget, please get in touch so we can help you

Additional Information

Continue on to the following pages for additional information on Working with Resources:

- Contact Manager

ACP Gadgets

ACP Gadgets

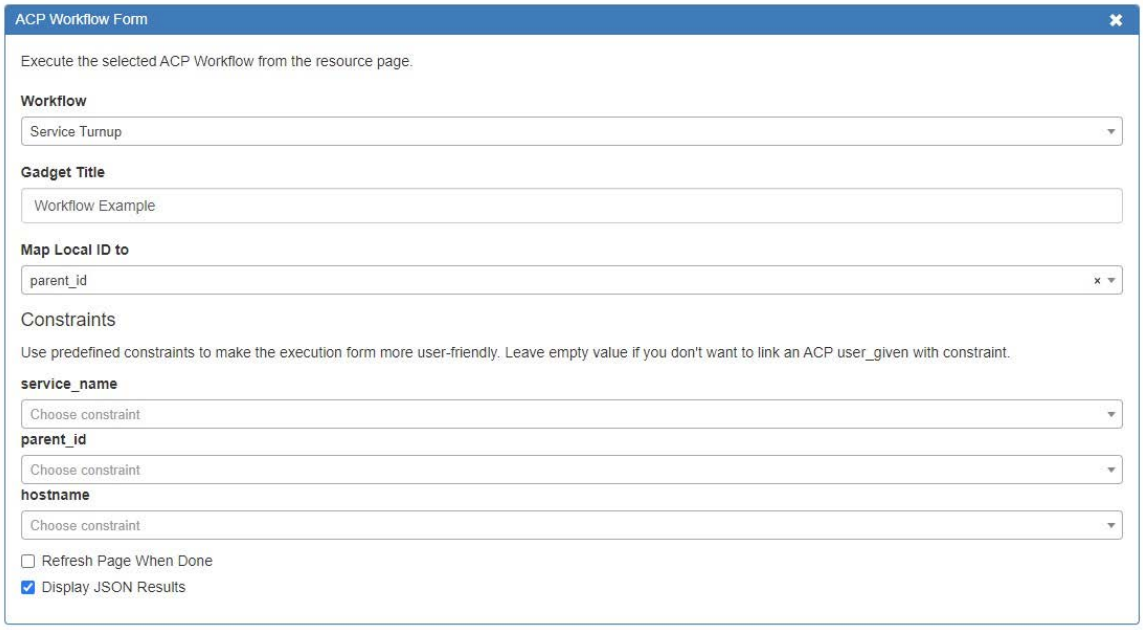
6connect's API Composer Platform (ACP) is a vendor-agnostic toolbox for developing interconnected endpoint workflows using data from one or more API service providers, separate from ProVision. ACP serves as a universal 'glue layer' for API-driven development, to standardize and streamline endpoint automation logic, save developer time, and increase the overall robustness of API-driven code. ACP is available as a separate product.

The gadget(s) listed below interface with ACP.

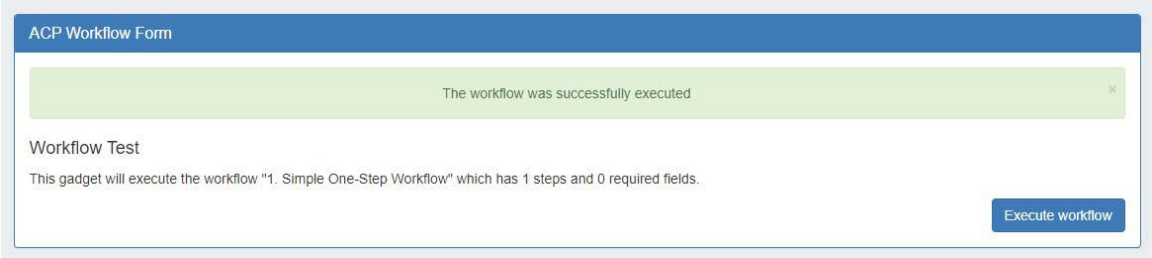
- ACP Gadgets
  - ACP ("Workflows") Gadget
    - Setting up ACP Access in ProVision
    - Configuring the ACP Workflow Form
    - Working with the ACP Workflow Form

ACP ("Workflows") Gadget

The ACP Workflow Form is a gadget connecting 6connect's ACP (API Composer Platform) with the ProVision interface to run workflows.



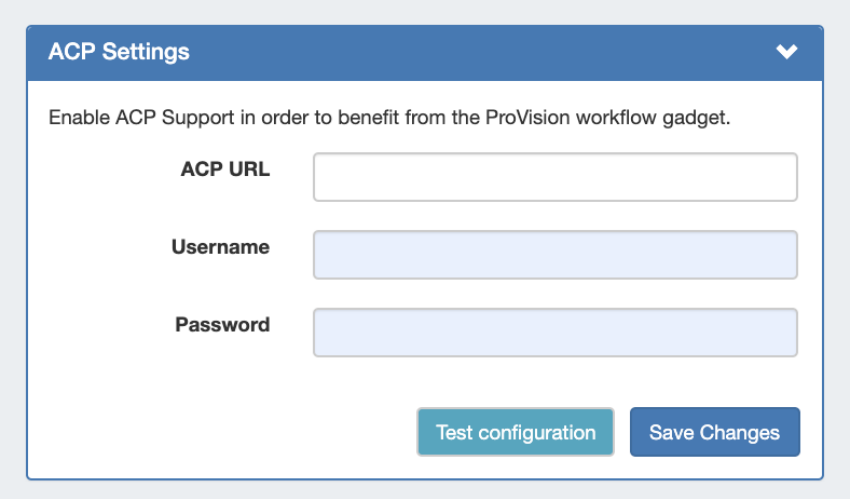
It allows users to specify and execute workflows created in the ACP product on a resource entry page.



See below for additional details on setting up and working with the ACP Workflow Form:

Setting up ACP Access in ProVision

Before using the ACP Workflow Gadget, you must set the ACP URL and user credentials in Admin Admin Settings.



Enter the ACP URL for a licensed ACP instance, then provide the ACP Username and Password for the user that should be used to execute workflows.

To verify the account, click "Test Configuration" - you will be notified whether the account is valid.

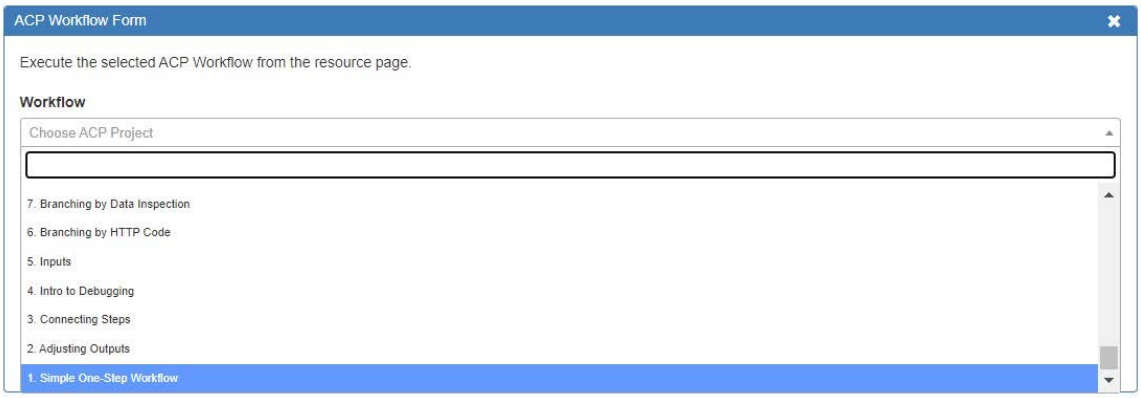
When done, click "Update".

After setup, the ACP Workflows Gadget will load with the available Workflows from your ACP instance, and can be configured to select which workflow and inputs you wish to use.

Configuring the ACP Workflow Form

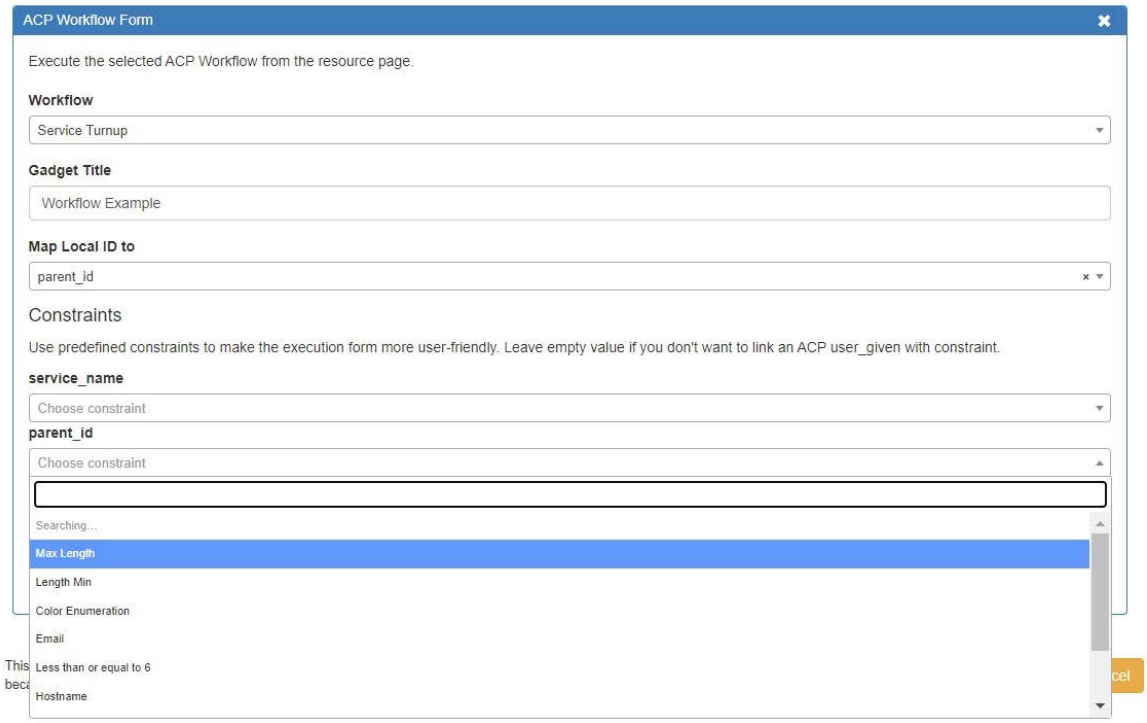
The ACP Workflow Form is accessed from the Edit Section page, under "Manage Gadgets".

Once ACP settings have been added to Admin Preferences, the "ACP Workflow Form" Gadget can be added to a section, containing fields to select the desired workflow to run, title, and map input options.



Select a Workflow, then edit the title to display on the gadget and map input options. Input options will vary according to the selected workflow.

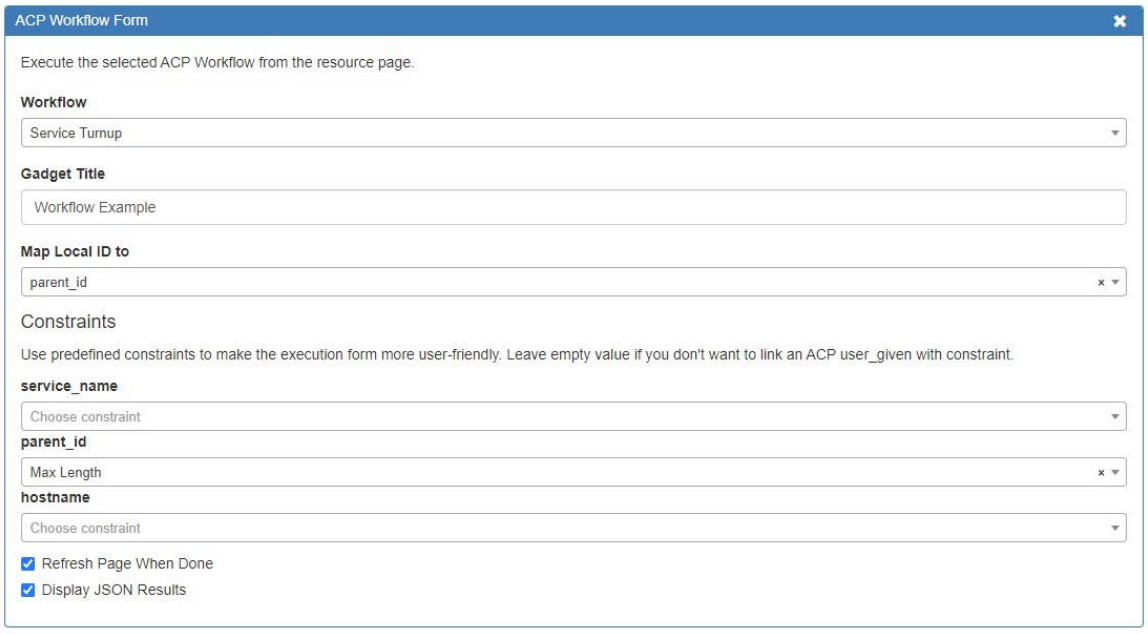
Registered constraints can be applied to default input fields. See Constraints for more details.



Note

The Constraints Tab is only available to Admin level users. See Constraints for more details.

You may also choose to refresh the page once the workflow execution is complete, and/or show JSON results.



Multiple forms may be added to a section, in order to run additional workflows or optional settings. When complete, click "Save".

Working with the ACP Workflow Form

Once enabled, the gadget will show on the resource page for any resource of the section type.

Input the field data necessary for the workflow - here, it's adding a hostname - then click "Execute Workflow" to process the chain of workflow calls.



If "Display JSON Results" has been enabled, a display modal will appear showing the JSON response of the executed workflow.



When done reviewing the response, click "Close".

If the page has not refreshed, you will see a message informing you whether the workflow has successfully executed.



In this example, a "Customer Turn-Up" workflow was selected (created in ProVision's ACP product) that performed six functions with one button click. The successful "Execute" for "Customer Turn-Up" created a new customer resource entry, assigned IPv4 and IPv6 blocks to them, created a DNS zone for the hostname, and lastly created 'A' and 'AAAA' records for the zone.

Contacts Gadgets

Contacts Gadgets

Contact gadgets display contact information for the current resource, or link to contacts specified in the Contact Manager.

- Contacts Gadgets
  - Contact Info
  - Contacts
    - Contacts Action Menu:

Contact Info

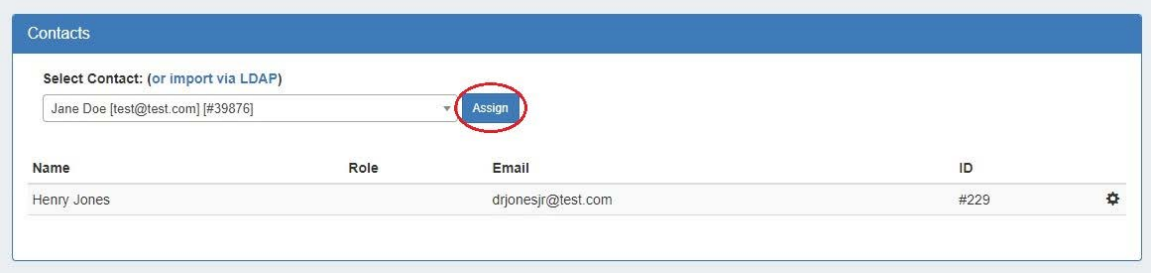
This gadget is used on the Resource Holder section type. In the Contact Info Gadget, you can track information such as mailing / billing addresses, phone number, and fax number for that resource. You may also add a separate GEO IP address, if desired.



Contacts

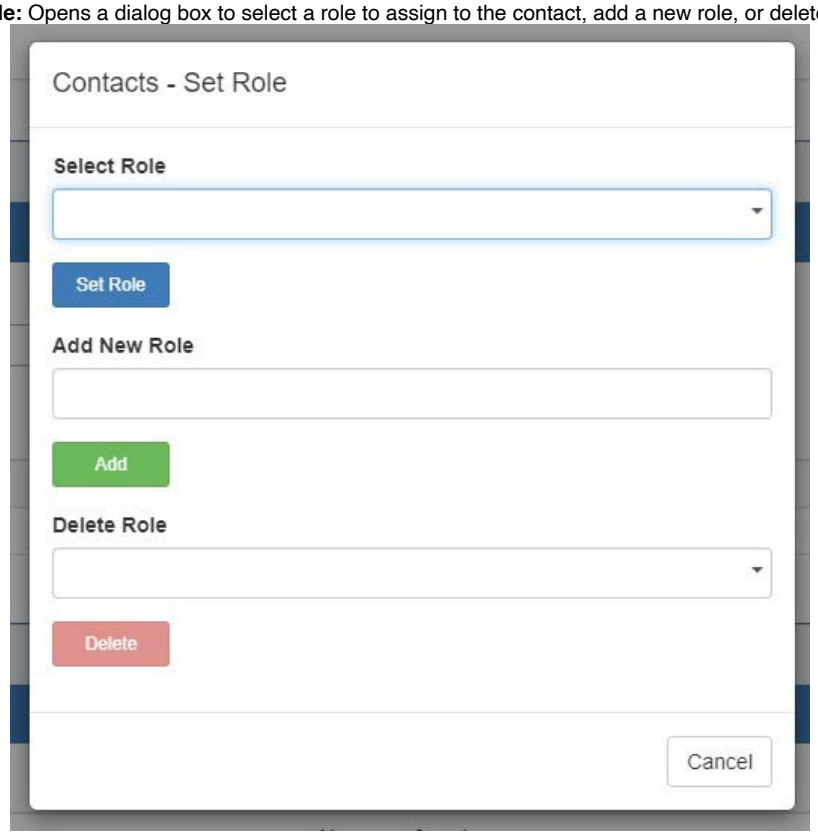
The Contacts Gadget may be used on any section type to assign a contact (from the Contact Manager) to a resource.

To assign a contact, search for and select the desired contact in the search box, then click "Assign". The contact will show in the list below.



Contacts Action Menu:

The Action Menu (gear icon) in the Contacts Gadget has three options:

- **Set Role:** Opens a dialog box to select a role to assign to the contact, add a new role, or delete an existing role.
  - 

- **Unassign:** Unassigns the contact from the resource.
- **View:** Redirects to the contact's detail page in the Contact Manager.

Refer to the Contact Manager page in the documentation for more detail on working with the Contacts Gadget and the Contact Manager.

A Note on Permissions

The ability to view and assign a contact to a resource is restricted by the parent assigned to the contact upon creation. If a user does not have permissions for a contact's parent resource, that contact will not be able to be viewed / assigned via the gadget.

Data Storage and Info Gadgets

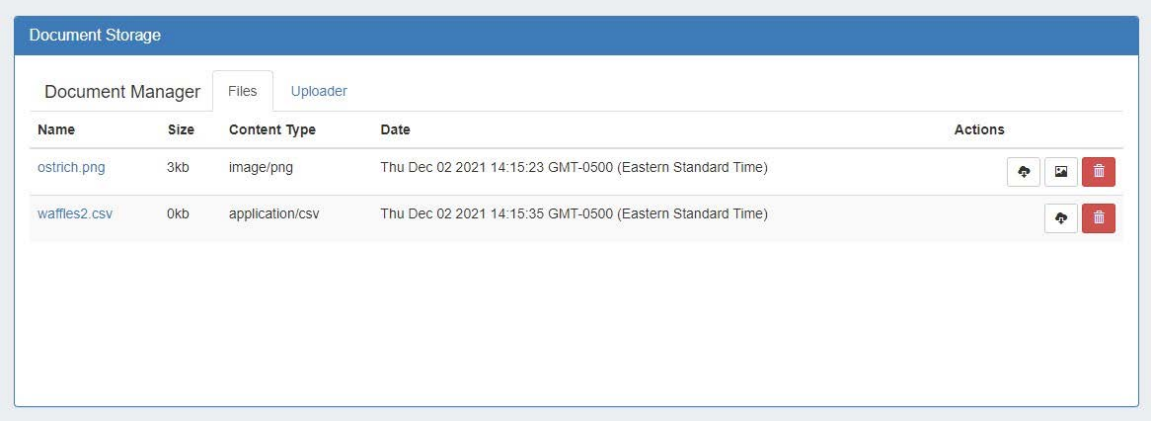
Data Storage / Info Gadgets

The gadgets listed on this page are not necessarily directly associated with a specific module, but are used for viewing, storing, or combining different types of data into a utilitarian informational gadget.

- Data Storage / Info Gadgets
  - Document Storage
    - Upload Files
    - Download Available Files
  - Encrypted Data Gadget
    - Working with the Encrypted Data Gadget
  - Notes
  - Tech Info

Document Storage

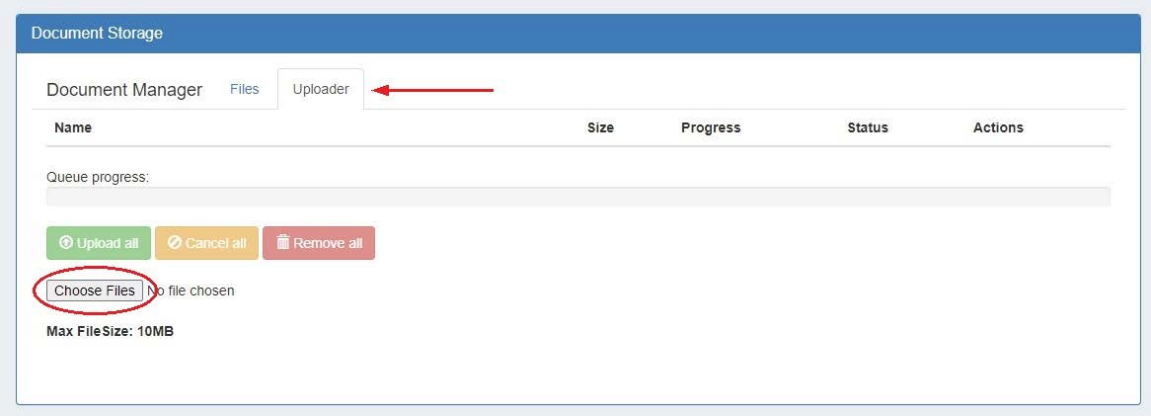
The Document Storage gadget allows you to upload documents to a resource, and have those documents accessible to download from the cloud to your local machine. It may be enabled on any section type.



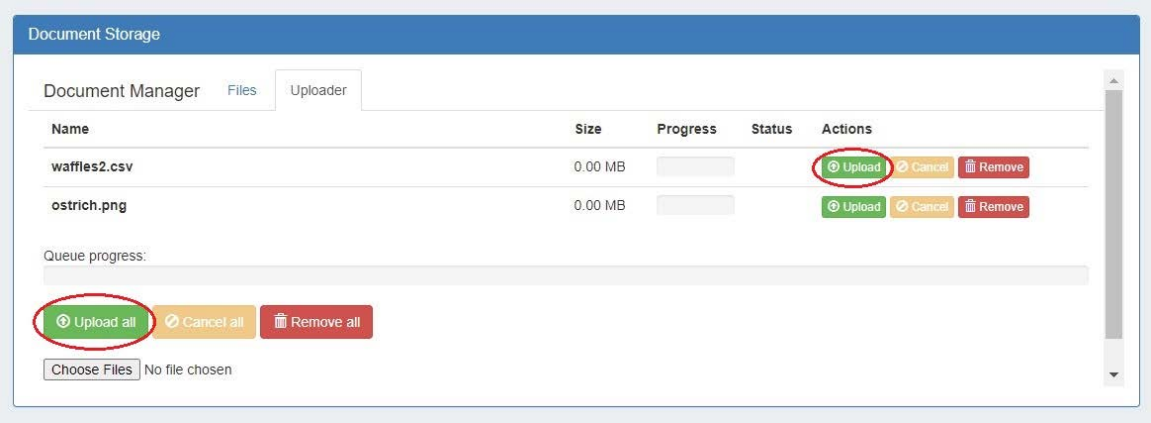
Upload Files

First, ensure the Document Storage Gadget is enabled for the section type. Then, select the "Uploader" tab under the Document Manager Gadget.

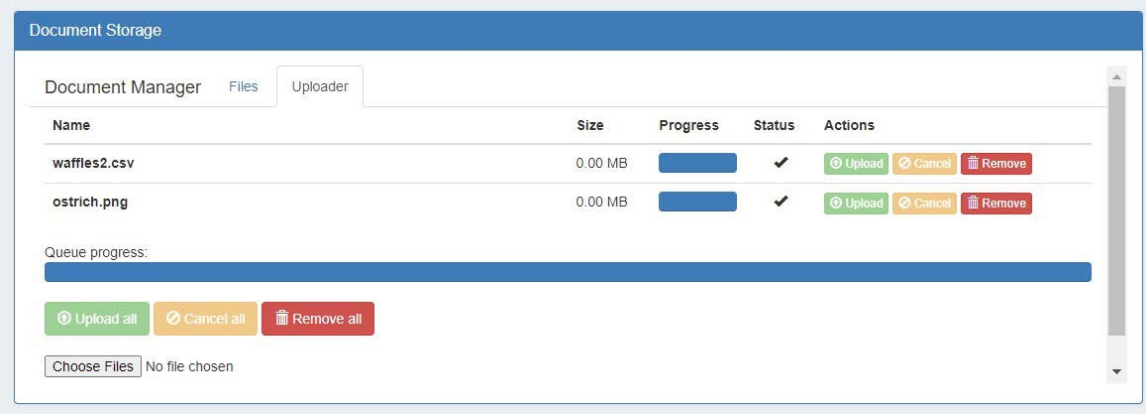
Click on the "Choose Files" button, and select the file(s) you would like to upload.



The selected files will show in a list under the Uploader tab. To upload the file(s), click on either the "Upload" button adjacent to the file to upload the individual file, or the "Upload All" button to upload all files listed. You may also choose to remove files from the upload list, or cancel.



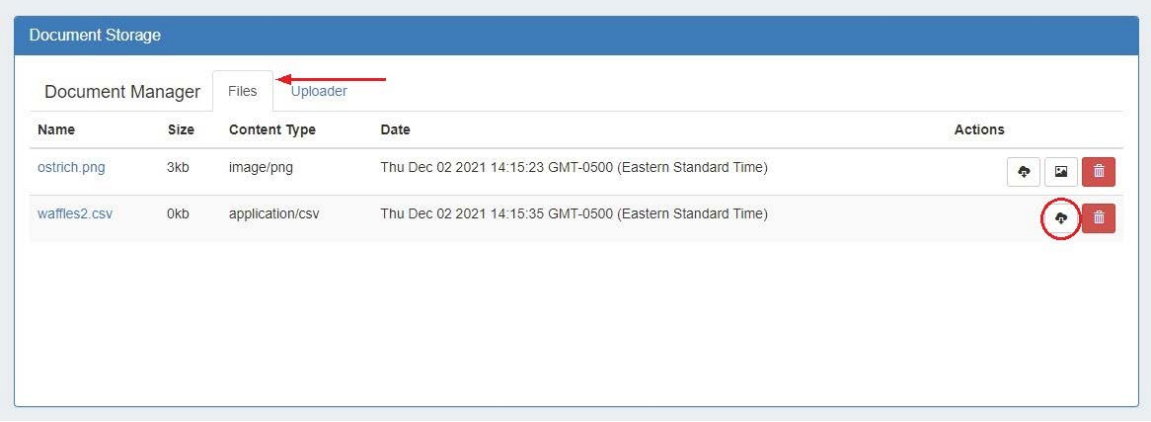
Once the progress bar is filled in, your upload is complete! Your files will show under the "Files" tab.



Download Available Files

Successfully uploaded files are listed under the "Files" tab of the Document Manager Gadget. From here, you can see the file name, size, type, date, and available actions.

To download a file to your local machine, ensure you are on the "Files" tab, then click on the "Download from Cloud" icon.



If a file is no longer needed, you may delete the file from the Document Manager by clicking on the Delete (trash can) icon.

Note: The uploader has a file size limit of 14mb, files above this size will not successfully upload.

Encrypted Data Gadget

The Encrypted Data Gadget allows you to store sensitive information in an encrypted format.



Working with the Encrypted Data Gadget

First, ensure the Encrypted Data Gadget is enabled for the Section type. When first added the gadget will display empty with an "Edit" button available.



Click "Edit" to change the title and enter data into the text area.



After you click "Save" the gadget will display obscured text with a green "Decode" button. The data will only display as plain text when "Decode" is clicked by a user with update permissions for the resource.



Clicking "Decode" also allows you to edit the field data or gadget title again.

Notes

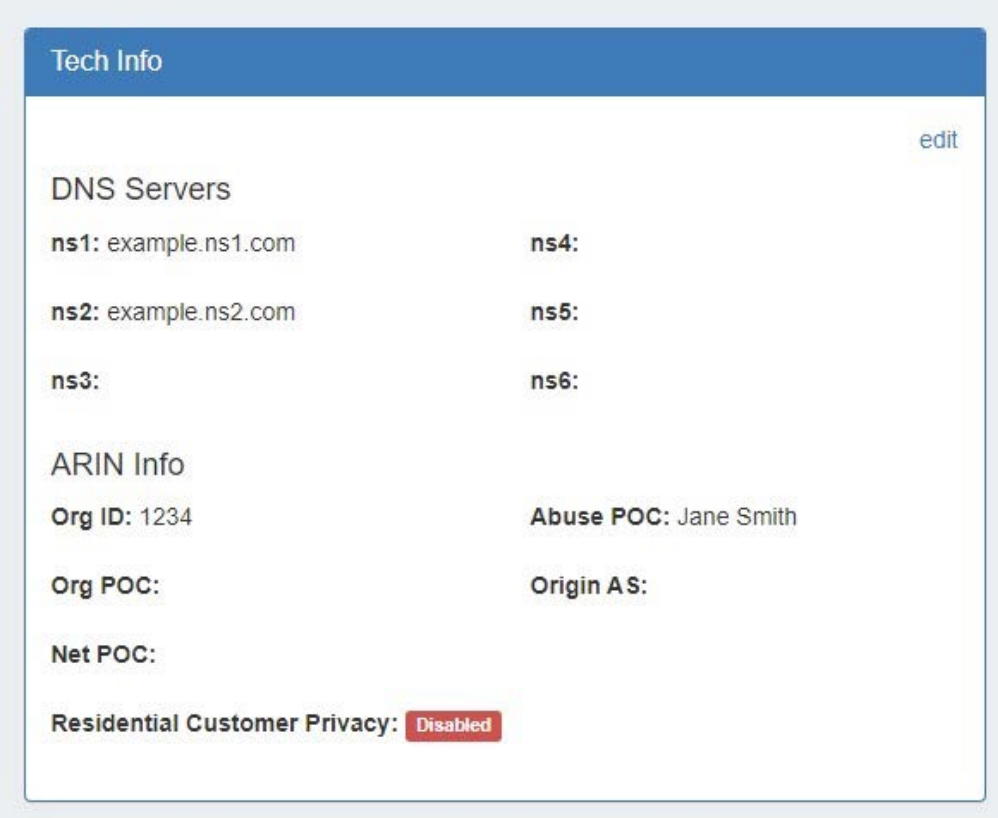
The Notes Gadget is a simple text area box, where you can save text notes relevant to the resource.

To save a note, just click inside the note box, type the desired notes, and click the "Save Notes" button.



Tech Info

This gadget is used on the Resource Holder Section type, and allows you to list DNS servers, ARIN information, and enable/disable customer privacy.



DHCP Gadgets

DHCP Gadgets

The following gadgets are available to support DHCP.

- DHCP Gadgets
  - DHCP Server Management (Legacy)
  - DHCP Customer Configuration
    - Before You Begin
    - Working with the DHCP Customer Configuration Gadget

DHCP Server Management (Legacy)

> The DHCP Server Management Gadget has functionally been replaced by the **DHCP** Tab updates in version 7.0.0.
>
> Although the DHCP Management Gadget may still be used, we recommended checking out the **DHCP Groups**, **DHCP Servers**, and **DHCP Pools** pages instead for an improved user experience.

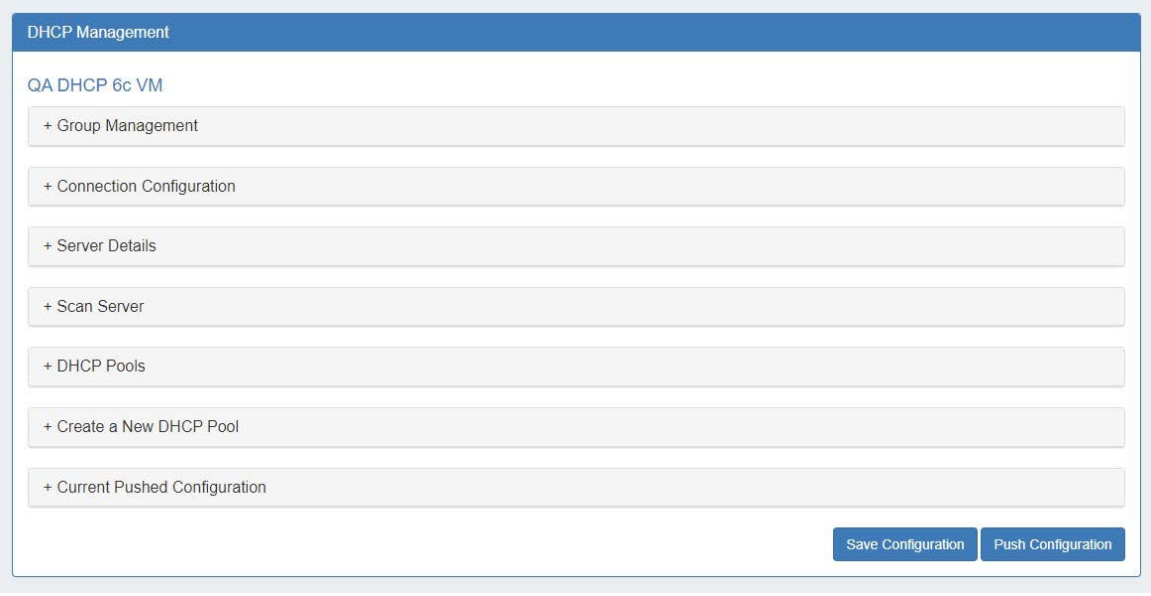
The DHCP Server Management Gadget should be used with the "Server" Section.

When initially added to the section, it will show in the "Off" configuration:



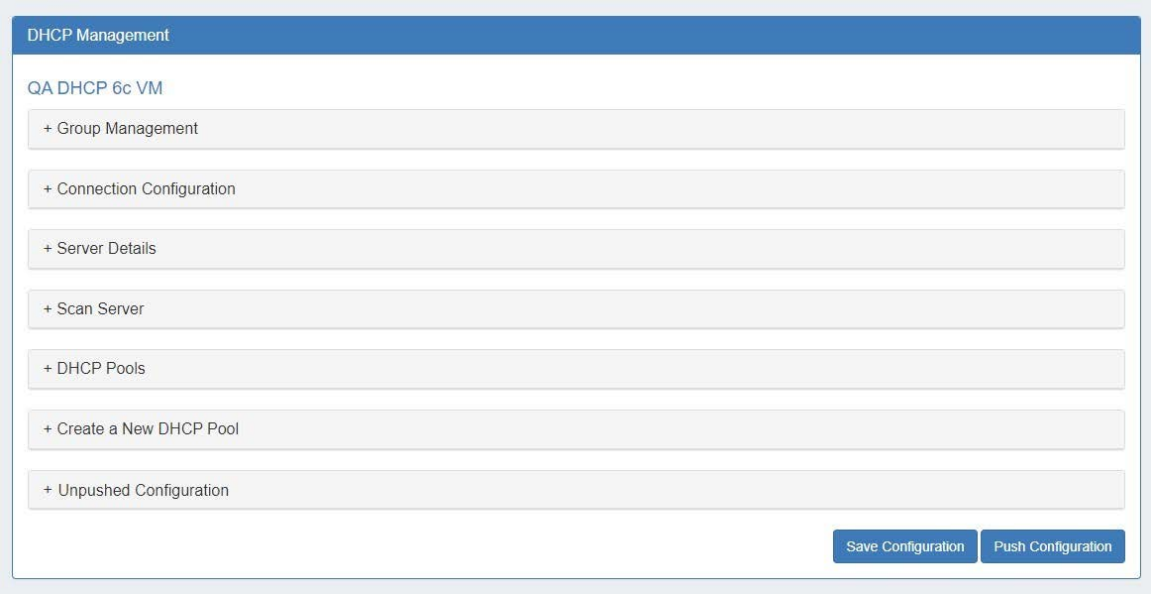
To enable the DHCP Management Gadget, select the "On" radio button next to "DHCP Services", and click the "Update" button.

The DHCP Management Gadget in the "On" configuration:



Each of the sections in the DHCP Management Gadget - Group Management, Connection Configuration, Server Details, Scan Server, DHCP Pools, and Create a New DHCP Pool - may be expanded to change settings in each area.

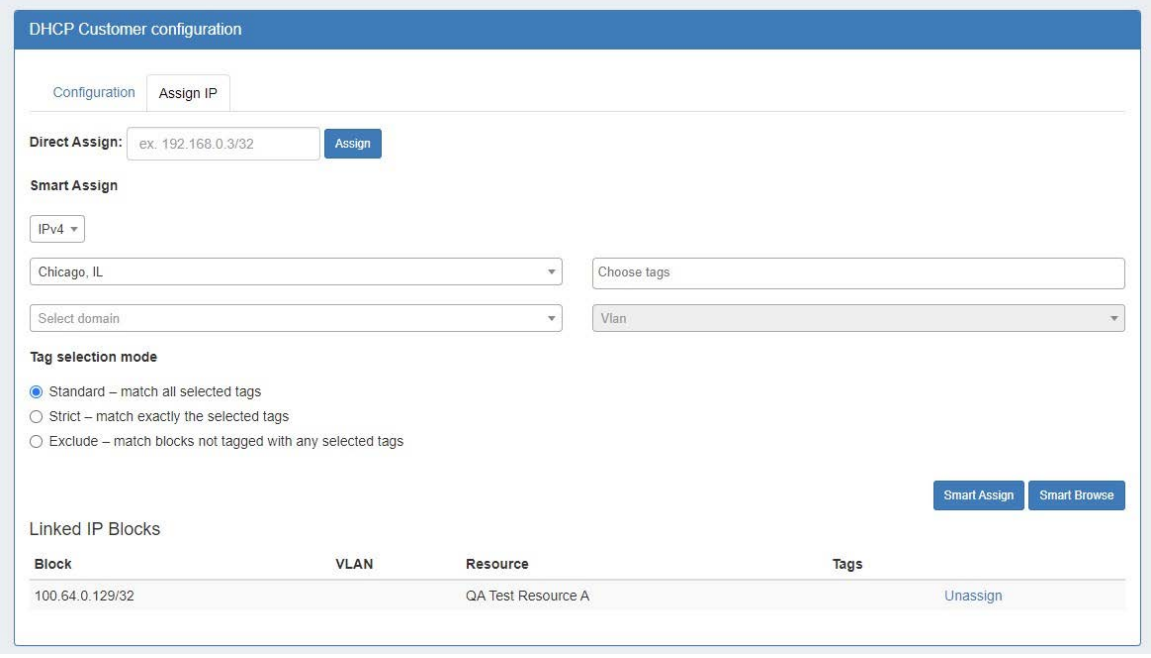
Additional sections may appear in the gadget once unpushed or pushed configurations are saved:



For detailed information on working with the DHCP Management Gadget, see DHCP Tab - Working with DHCP Gadgets.

DHCP Customer Configuration

The DHCP Customer Configuration Gadget allows users to assign IP aggregates to the DHCP server pools and generates DHCP Server Configuration changes depending on the tag(s) and DHCP options selected.



These configurations are then sent to the associated DHCP server Management Gadget as "Unpushed Configurations", where they may be held until a manual or schedule push occurs.

Before You Begin

Before using the DHCP Customer Configuration Gadget, the following should be set up in ProVision:

- The associated DHCP server should be created in ProVision and set up in the DHCP Management Gadget or DHCP Tab - DHCP servers list (See: DHCP Tab).
- Add the DHCP Customer Configuration Gadget to the desired section. You may want to create a specific "DHCP Customer" section for DHCP customer entries (See: Customizing Sections).
- Have, or set up APNIC Aggregates for DHCP use from the **IPAM** Tab with the desired IP space type, Region(s), Tags, and any desired VLAN criteria. Regions are a required field when assigning IPs from the DHCP Customer Configuration Gadget. Any APNIC aggregate may be used for DHCP, so you may want to create a "DHCP" IPAM tag to help denote the desired aggregate(s).
- If you are planning on Direct Assigning the DHCP blocks in the Customer Configuration Gadget, ensure that the desired blocks in the DHCP are split to individual /32 or /128 size. Smart Assign and Smart Browse will automatically split the block to assign the correct size.

Working with the DHCP Customer Configuration Gadget

Associate with DHCP Server

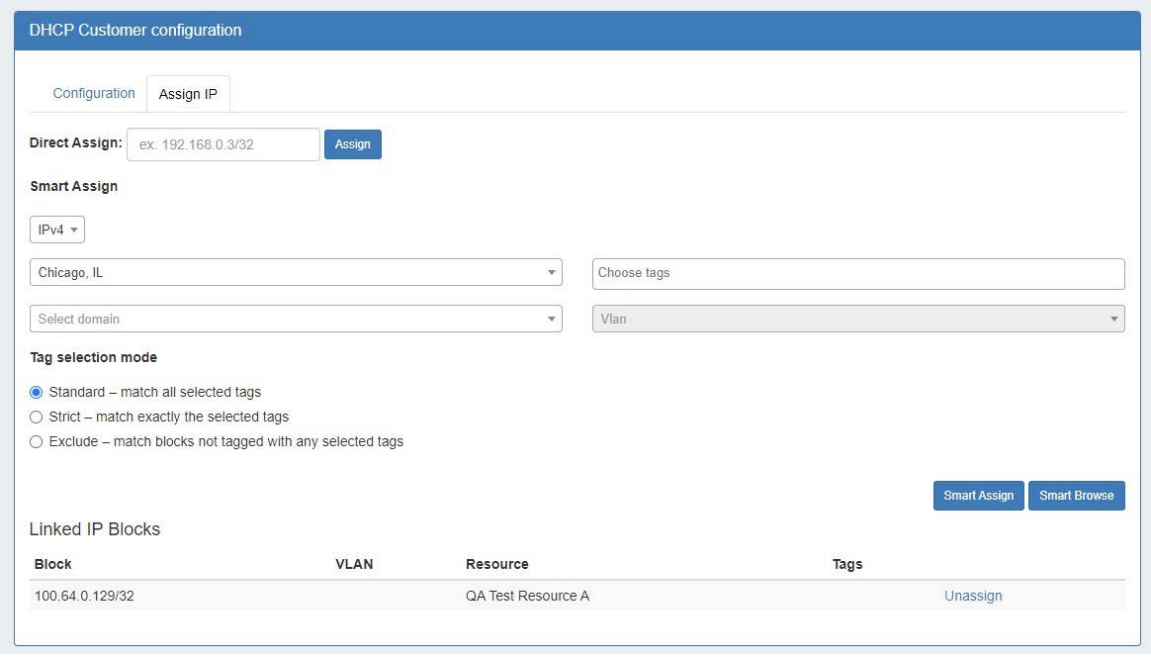
Once the gadget is enabled, the first step is to associate it with an already-created DHCP server in ProVision. Select the DHCP server to link to, and click "Continue".



Assign IP's

Next, Assign IP's for pools from DHCP aggregates. You may Direct Assign, Smart Assign, or assign from Smart Browse based on the selected criteria.

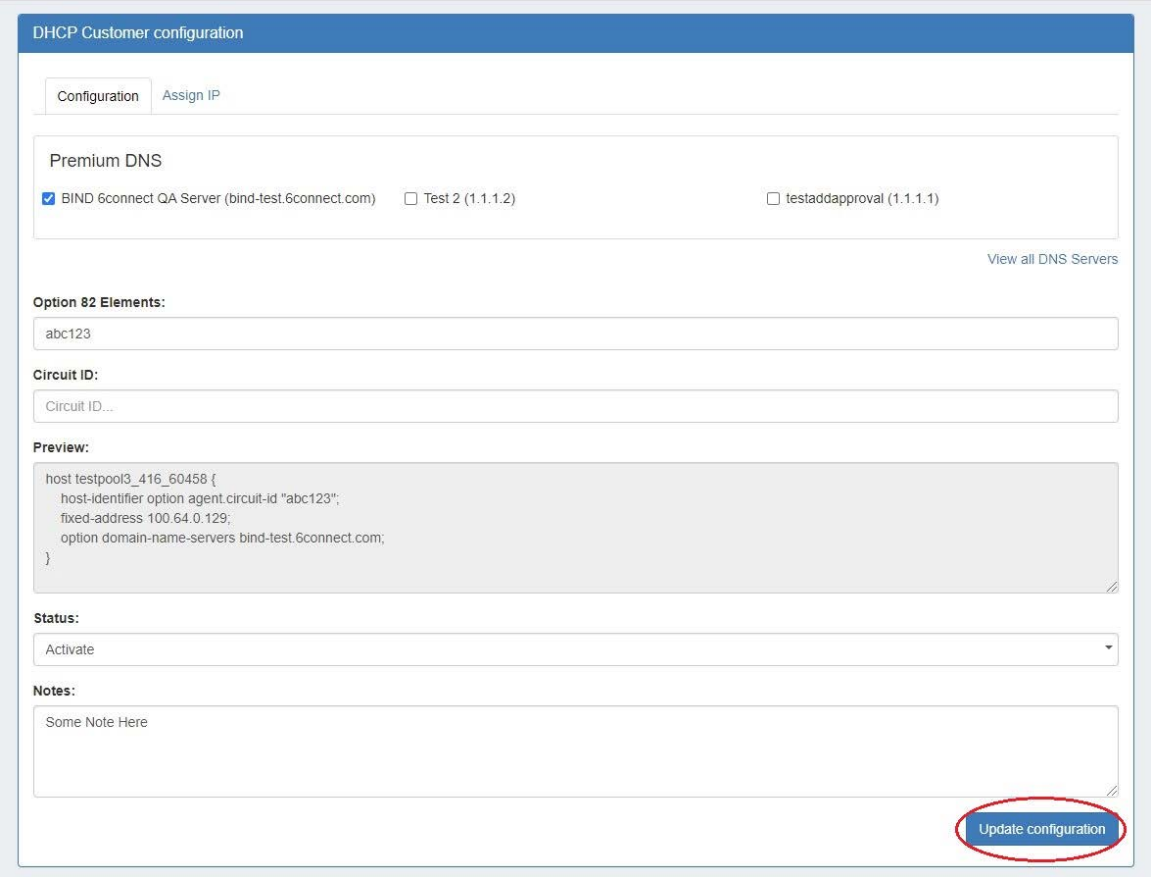
Once assigned, a pool name will be automatically generated under "Resource". Pools may be unassigned by clicking the "Unassign" button.



Set up Configuration

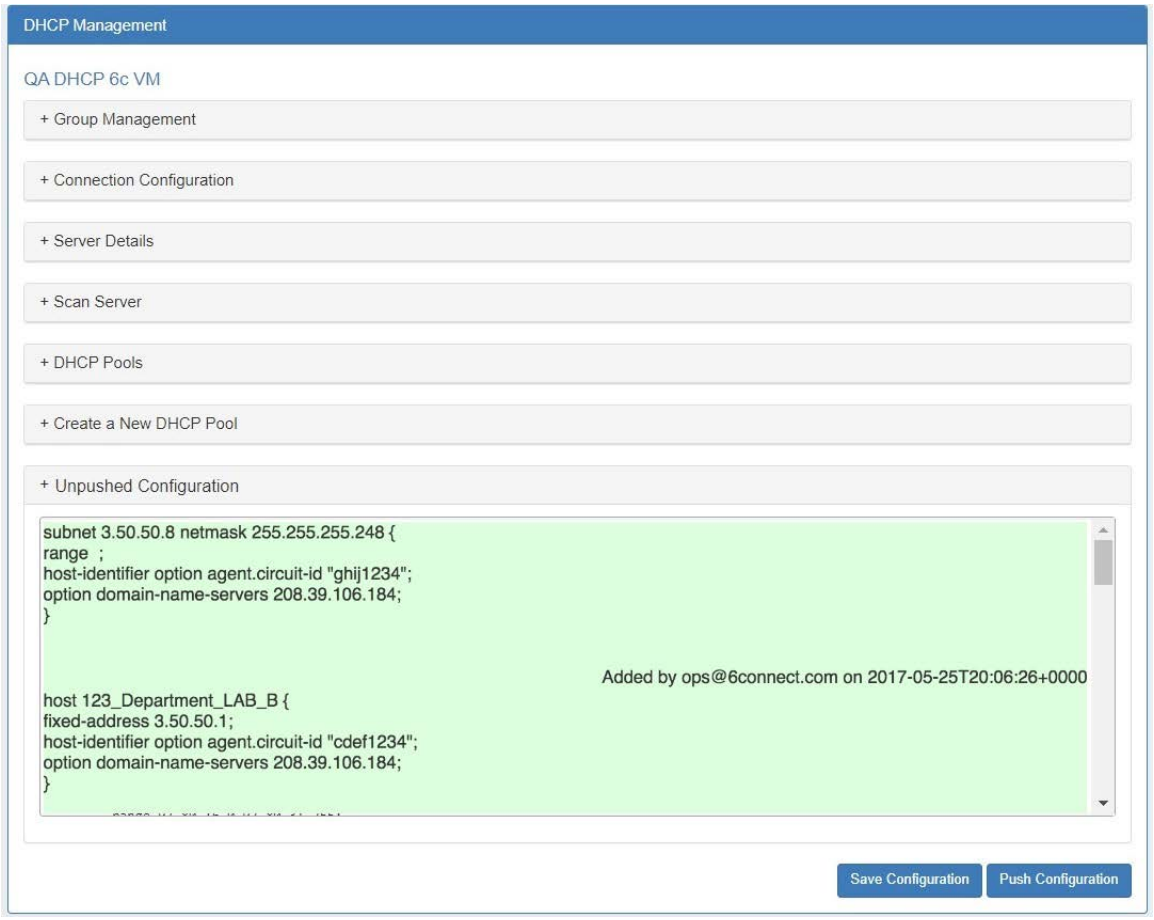
Once IP's have been assigned, the "Configuration" tab will appear. Click on the tab, and then select or deselect the DNS server associated with the Customer, add Option 82 Elements, Add Circuit ID text, and add notes if desired. Use the "Preview" field to confirm the accuracy of the data, and select the status as "Activate" or "Terminate".

When done, click "Update Configuration". The configuration will be sent to the associated DHCP server's DHCP Management Gadget.



Review and Push Configuration Updates

When a configuration has been saved from the DHCP Customer Configuration Gadget, it will appear as an "Unpushed Configuration" in the DHCP Management Gadget for the DHCP Server. If you expand that option, you will see the config elements highlighted – red are config elements that will be deleted, green are config elements that will be added.



At this point, an Admin user may manually push the updated configuration, or use a scheduled DHCP push task to automate the pushes.

DNS Gadgets

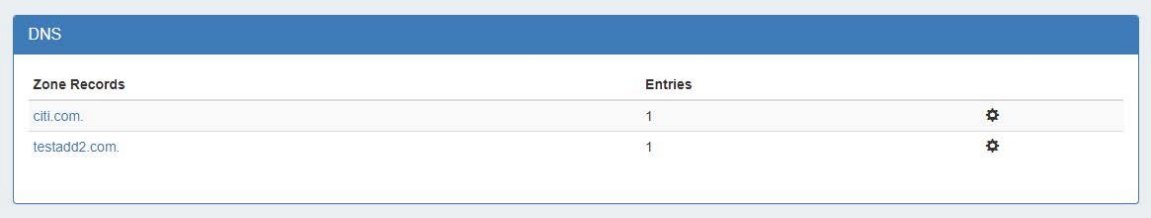
DNS Gadgets

The following gadgets are available to support DNS.

- DNS Gadgets
  - DNS Gadget
  - DNS Autogenerator
    - Enabling the DNS Autogenerator
    - Before you Begin
    - Working with the DNS Autogenerator

DNS Gadget

This gadget is used on the Resource Holder section type. The DNS Gadget shows zones that have the current Resource Holder set as their parent, and provides links to the zone's View Zone page.

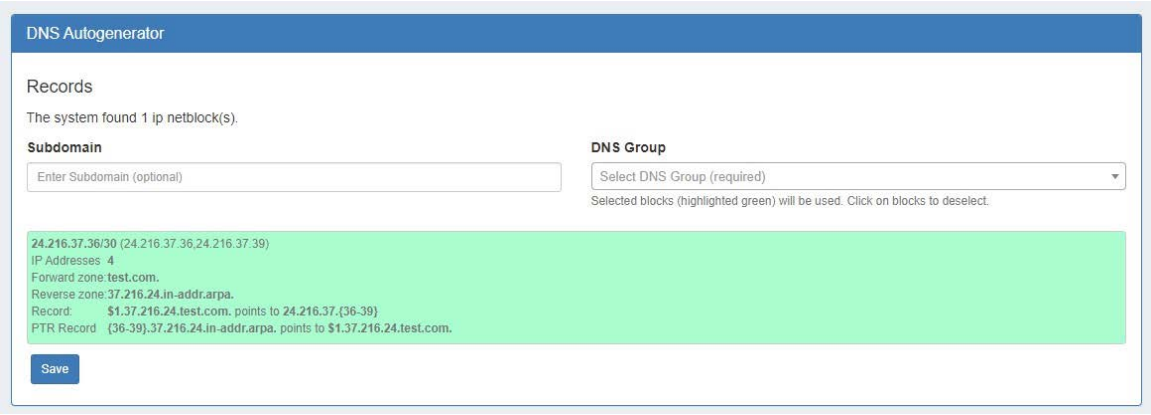


To go to the View Zone page, you may either click on the zone name, or click on the Action Menu (gear icon) and select "View Zone".

For more information on DNS functions and managing zones, refer to the documentation for the DNS Tab.

DNS Autogenerator

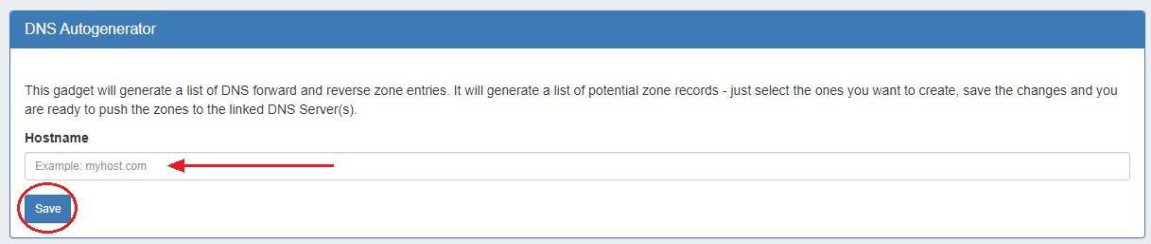
The DNS Autogenerator Gadget uses a Hostname to generate a list of DNS forward and reverse zone entries based on the blocks assigned to the resource in the IPAM Gadget It will generate a list of potential zone records - just select the ones you want to create, save the changes and you are ready to push the zones.



Enabling the DNS Autogenerator

To set up this gadget, ensure that the section of the resource has the DNS Autogenerator Gadget added to the section. (See: Customizing Sections).

Once the gadget is added to the resource, enter a Hostname and click "Save".

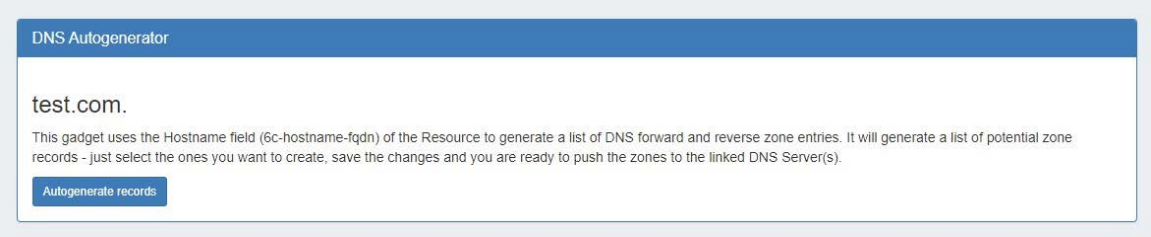


Before you Begin

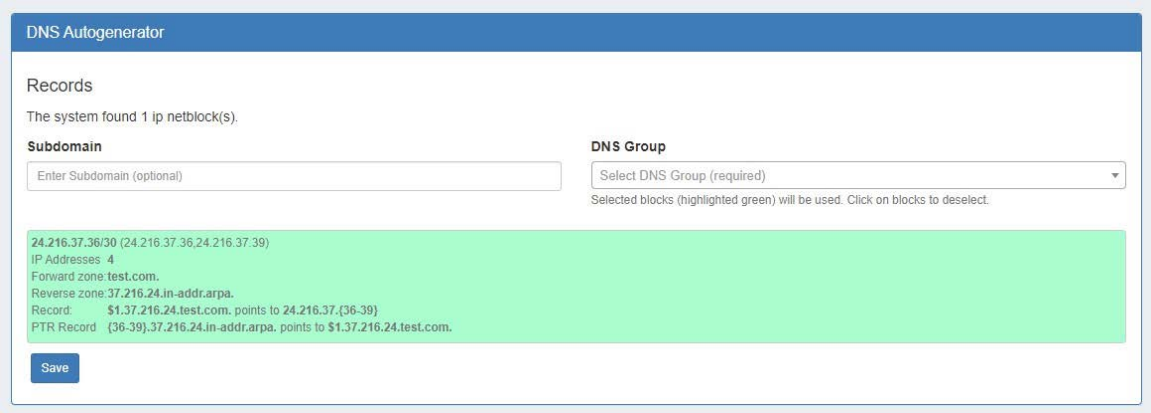
Before starting, check that the blocks assigned to the resource in the IPAM Gadget are correct and up-to-date - the Autogenerator uses these blocks to create the records. If using a DNS group other than "Default" to hold zones, ensure that the desired DNS group to hold the generated records has been set up. (See: Working with DNS Groups).

Working with the DNS Autogenerator

One enabled and a Hostname attached, the DNS Autogenerator Gadget will initially show a short description, the hostname, and a button to "Autogenerate Records".

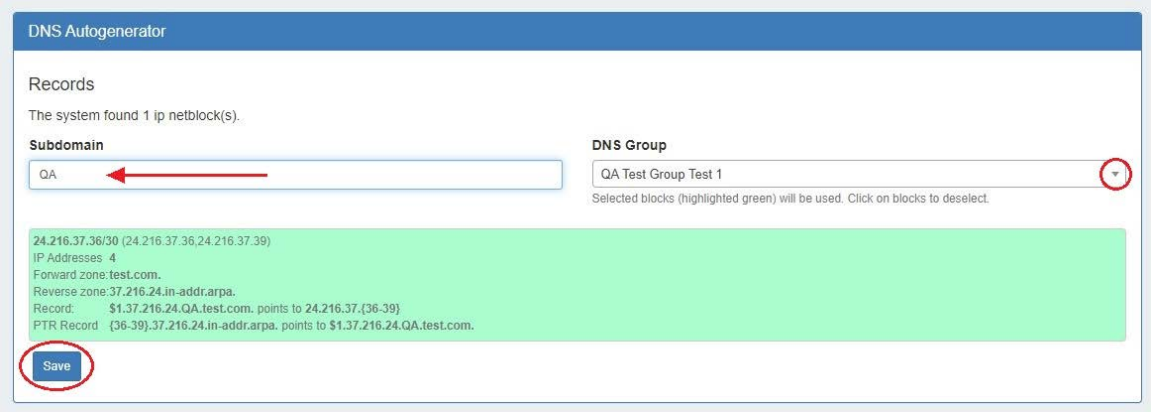


When ready, click the "Autogenerate Records" button. The gadget will search through the blocks in the IPAM Gadget and provide a list of found blocks.



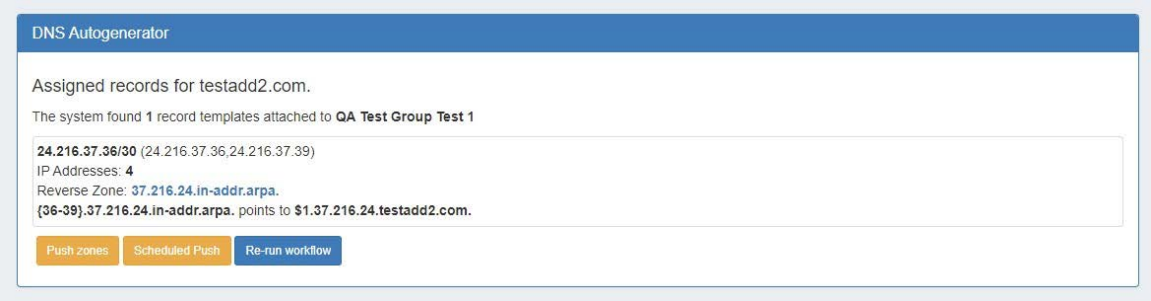
Add Subdomain / DNS Group

Next, add in a subdomain if desired (optional), and select the DNS group to hold the records (required). Click on the listed blocks to select (highlighted green) or deselect (grey) for DNS zone / record creation.



Save and Push

Finally, hit the "Save" button at the bottom of the gadget - the selected forward and reverse DNS records will be created and added into the DNS Group, viewable in the DNS Tab.



At this point, you may choose to immediately push the autogenerated zone(s), schedule a push, or re-run the workflow to edit the subdomain or group.

IPAM Gadgets

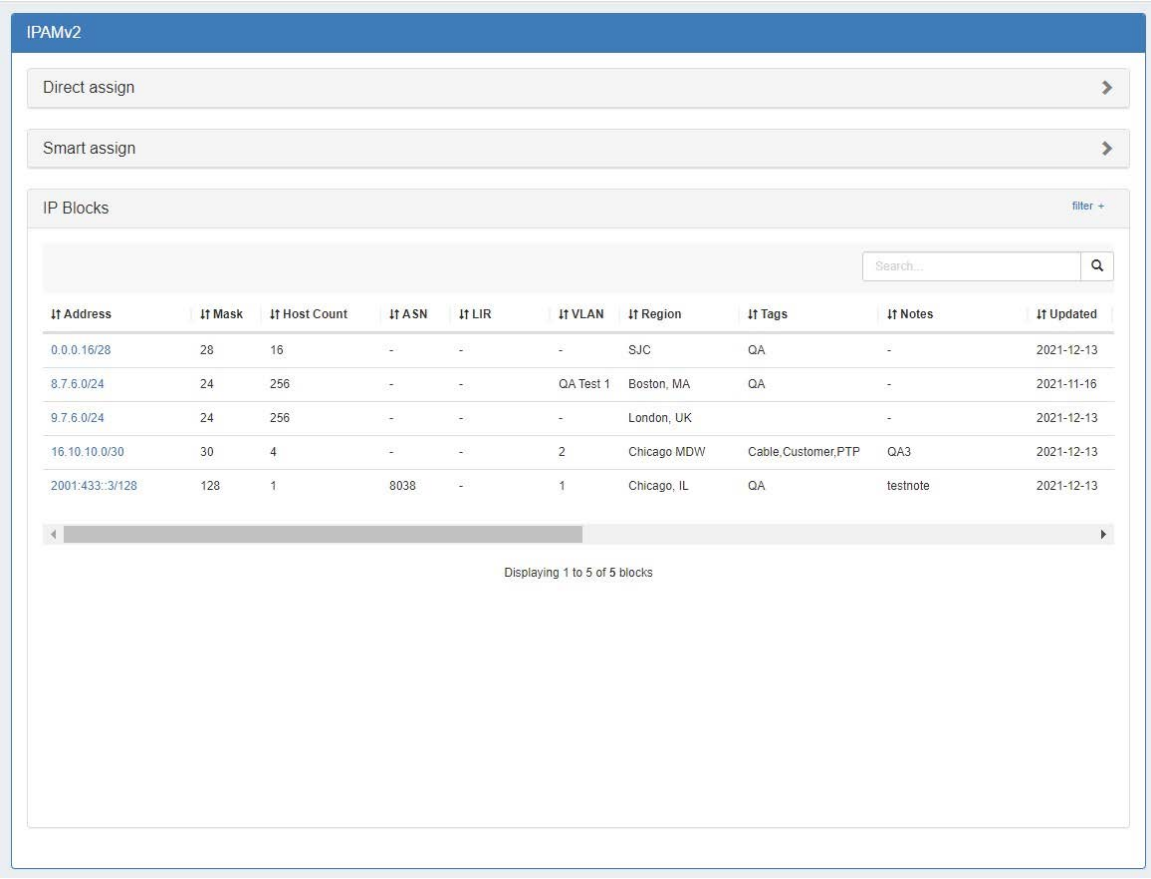
IPAM Gadgets

The following gadgets are available to support IPAM.

- IPAM Gadgets
  - IPAMv2 Gadget
    - Direct Assign
    - Smart Assign / Smart Browse
      - Predefined Filters
      - Smart Assign Templates
    - IP Blocks List
      - View Blocks
      - Manage Assigned Blocks
      - Edit Multiple Blocks
      - Autogenerate Reverse Zone
- Additional Information

IPAMv2 Gadget

The IPAMv2 Gadget is used on the Resource Holder section type, and allows you to view, assign, and manage blocks for that resource.



The IPAMv2 Gadget provides pagination, advanced filters, sortable columns, reverse zone generation, customized column order/names, and custom data fields.

Using this gadget, you can assign blocks via Direct Assign, Smart Assign, or Smart Browse, as well as edit and manage blocks assigned to the resource.

The IPAM Gadget may also be used as a reference for other gadgets. The "DNS Autogenerator" and "Linked IP Blocks" gadgets use the IPAM Gadget - Blocks List to generate content and perform operations associated with those gadgets.

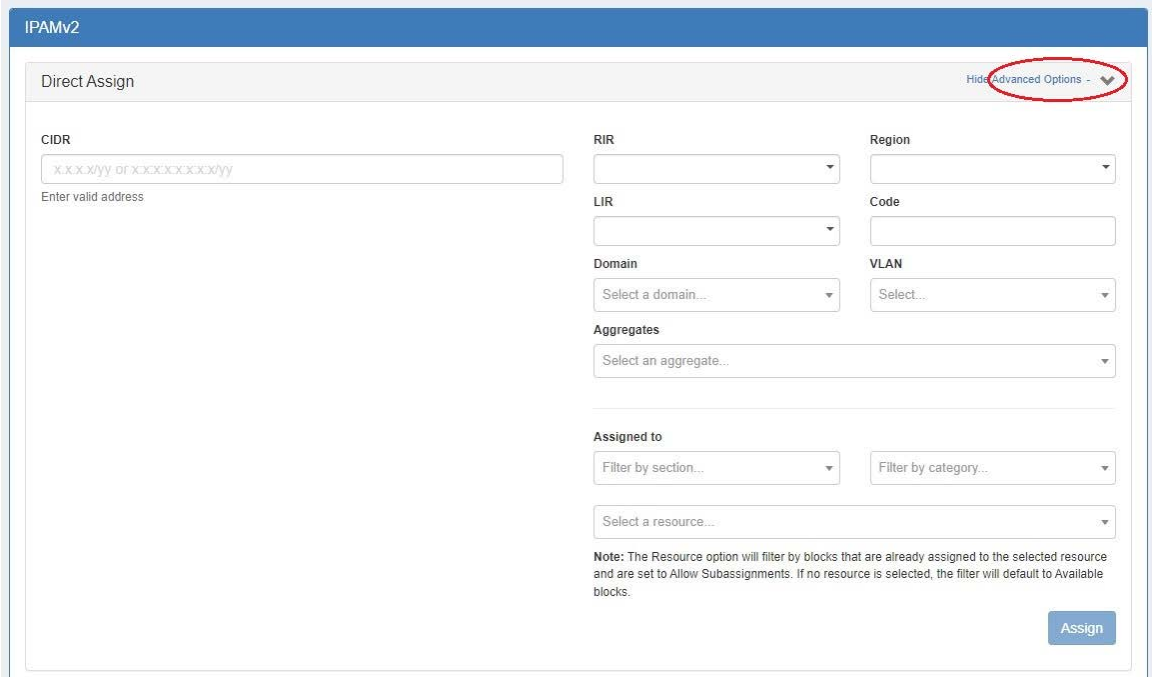
A basic overview of the gadget is covered in this section, however, more detail on specific tasks may be available under IPAM Tab and Working with IP Blocks.

Direct Assign

Direct Assign blocks with a CIDR address, with or without additional filtering options. In cases where duplicate blocks exist, using the filter options with Direct Assign allows you to specifically control which of the duplicate blocks is assigned.

To assign a sub-assignable block, select the resource under which the block is allocated. Section and category filters are available to further filter the resource selector. If the provided CIDR / filter criteria do not match any available blocks, but do match one or more sub-assignable blocks, a list of sub-assignable block suggestions will notify the user of suitable resources to select.

To open the Direct Assign section of the gadget, click the expansion caret in the upper right section. Clicking "Advanced Options" next to the caret will show/hide optional additional filter criteria to apply to direct assign. Enter the desired CIDR and filter criteria, then click "Assign".



For additional details on working with direct assign, see: IPAM Tab and Working with IP Blocks

Smart Assign / Smart Browse

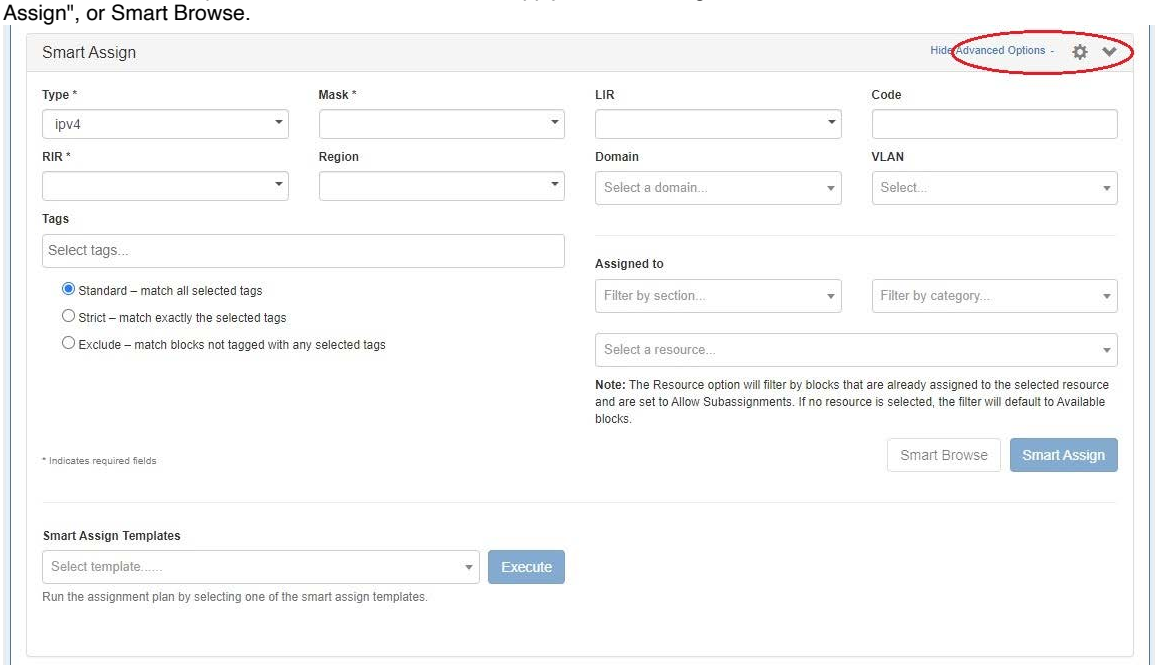
Smart Assign blocks by providing block criteria and Smart Assign will find suitable blocks and assign the first available block that matches the filter criteria.

Required fields for Smart Assign are: "Type", "RIR", and "Mask". Additional fields, such as "Region", "VLAN", "LIR", "Resource" (for blocks that allow subassignments), custom code, and "Tag" information are optional but may help narrow results.

To assign a sub-assignable block, select the resource under which the block is allocated. Section and category filters are available to filter the resource selector. If the provided filter criteria do not match any available blocks, but do match one or more sub-assignable blocks, a list of sub-assignable block suggestions will notify the user of suitable resources to select.

Smart Browse using the the filter options to bring up a browsable list of blocks meeting that criteria, from which you may review results and select blocks to assign / assign out of. If the provided filter criteria do not match any available blocks, but do match one or more sub-assignable blocks, a list of sub-assignable block suggestions will notify the user of suitable resources to select.

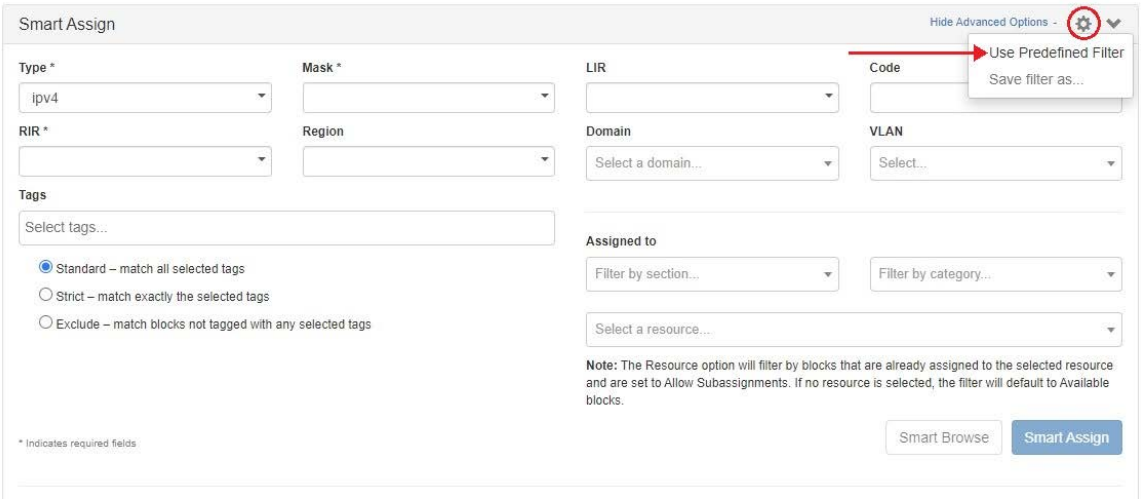
To open the Smart Assign section of the gadget, click the expansion caret in the upper right section. Clicking "Advanced Options" next to the caret will show/hide optional additional filter criteria to apply to Smart Assign / Smart Browse. Enter the desired filter criteria, then click "Smart Assign", or Smart Browse.



For additional details on working with Smart Assign / Smart Browse, see: IPAM Tab and Working with IP Blocks.

Predefined Filters

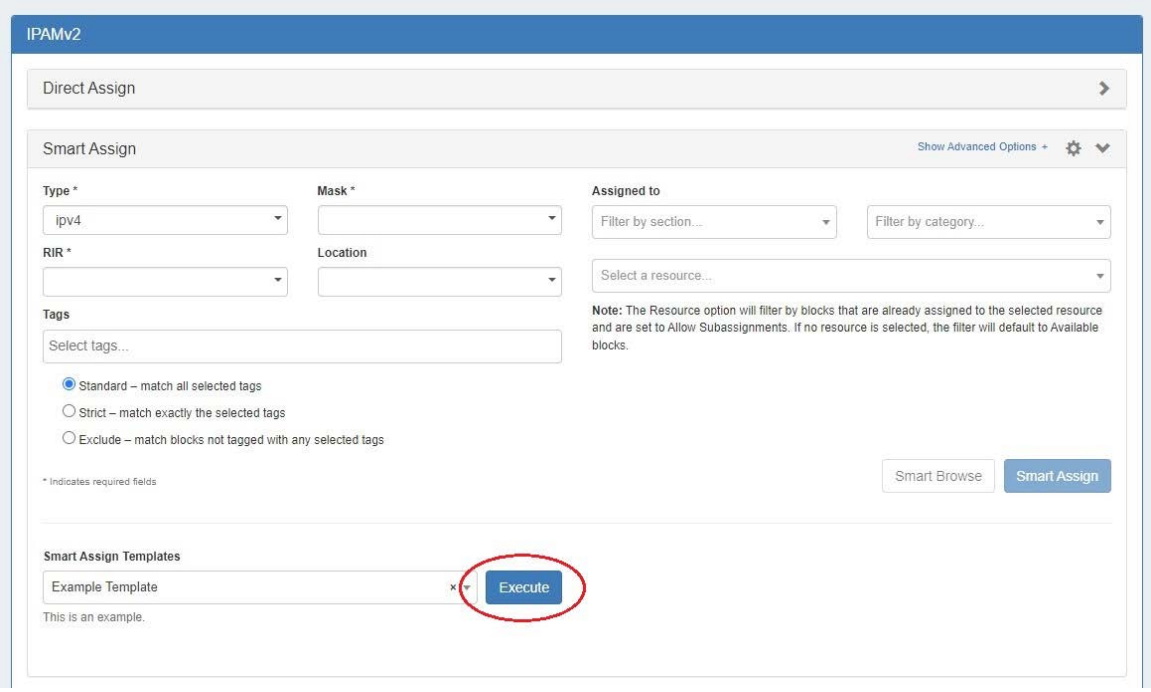
Commonly applied Smart Assign / Smart Browse filter criteria can be saved for repeat use as Predefined Filters, accessible through the gear menu.



For more detail see Working with IP Blocks - Common Tasks --> Working with Predefined Filters.

Smart Assign Templates

To run a smart assign template from the IPAM Gadget, expand Smart Assign and select the template from the "Smart Assign Templates" dropdown and click "Execute".



For information on setting up a smart assign template (Admin only), see Smart Assign Templates.

IP Blocks List

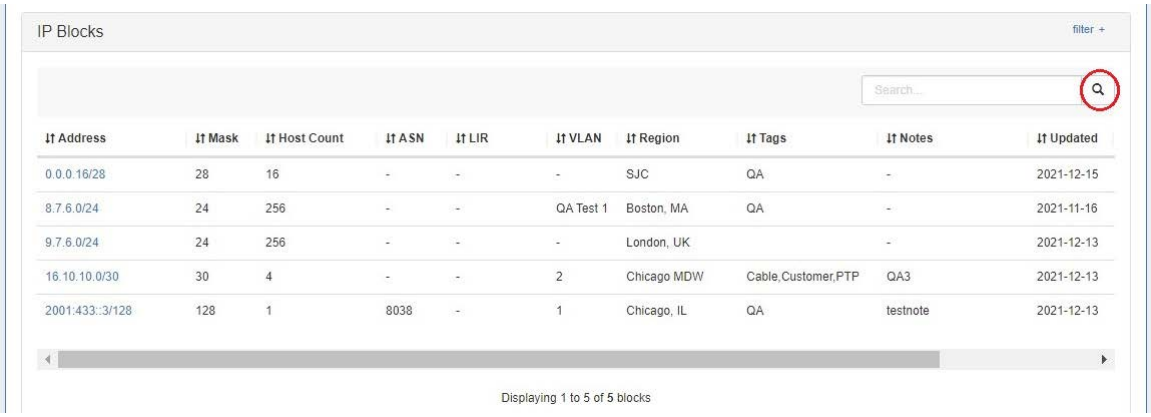
The IP Blocks list displays the CIDR and attributes for all blocks assigned to the resource. The included columns and column order may be customized in IPAM Lists Management.

From the block list, blocks may be reviewed, filtered, sorted, managed, edited, and used to autogenerate a reverse zone.

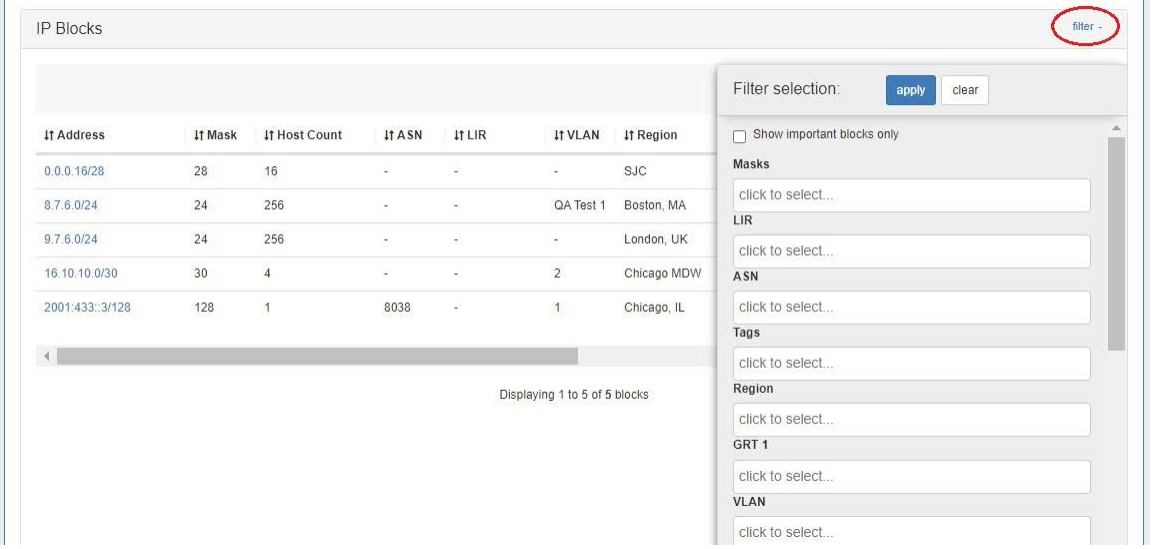
View Blocks

View, search, filter, and sort Assigned Blocks for the resource via the "IP Blocks" list:

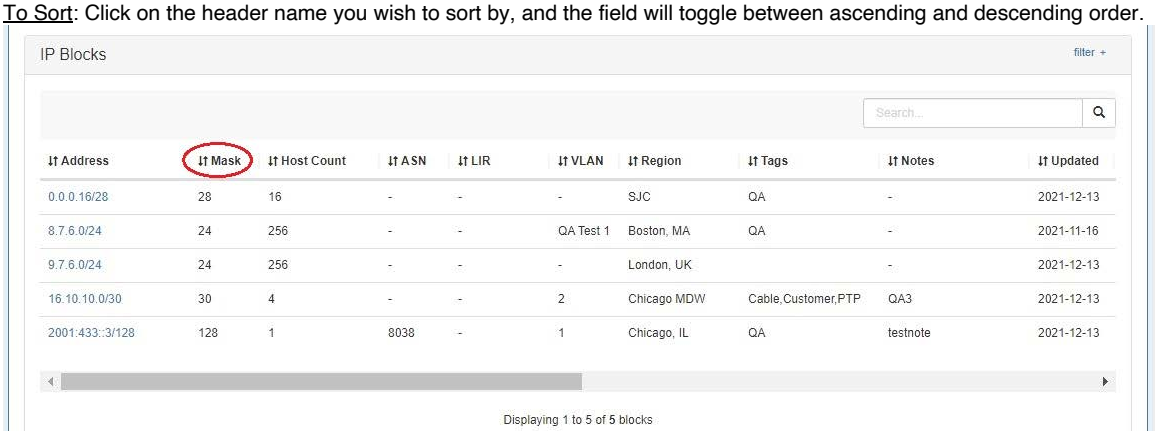
To Search: enter a full or partial CIDR, assigned resource name, or other search term into the search box at the top of the list and click the search icon.



To Filter: click the "filter" link in the top right area of the header to open filter options. Enter your desired criteria and hit "Apply".

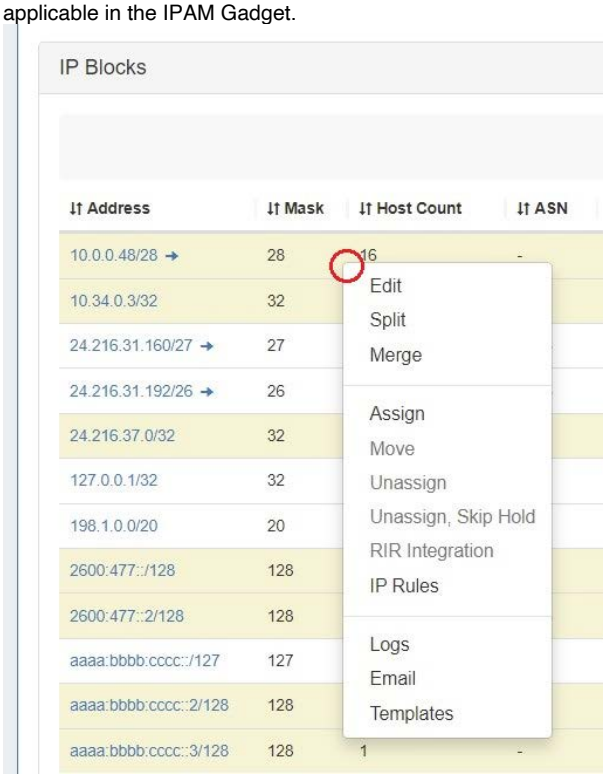


To Sort: Click on the header name you wish to sort by, and the field will toggle between ascending and descending order.



Manage Assigned Blocks

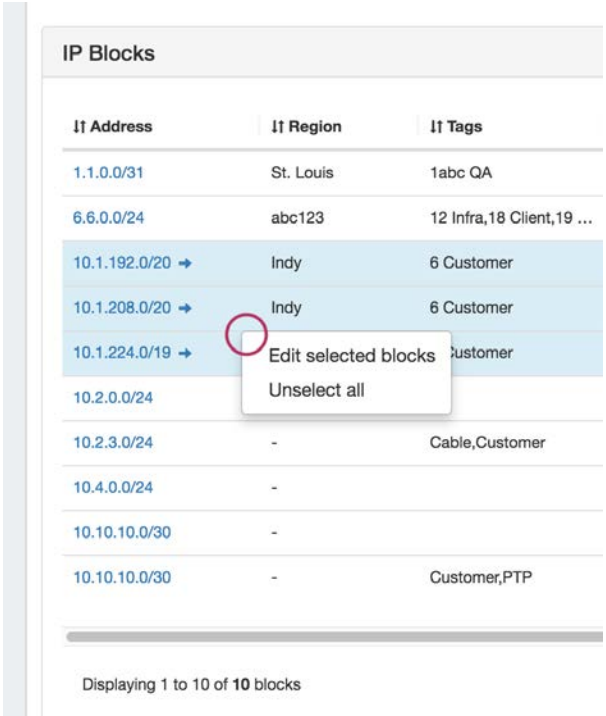
Manage for the resource by going into the "IP Blocks" list, and using the Action Menu (Gear Icon) to perform actions for the selected block. All options available in IPAM Manage for a block are also available in the IPAM Gadget Action Menu, although the "Templates" option will be applicable in the IPAM Gadget.



Edit Multiple Blocks

Edit two or more blocks at a time by shift-clicking or cmd-clicking to select multiple blocks, then right click to show the multi-block Action options.

Select "Edit", and the Edit Block Attributes screen will display to edit all selected blocks..



Make the desired updates to the blocks, then click "Save".

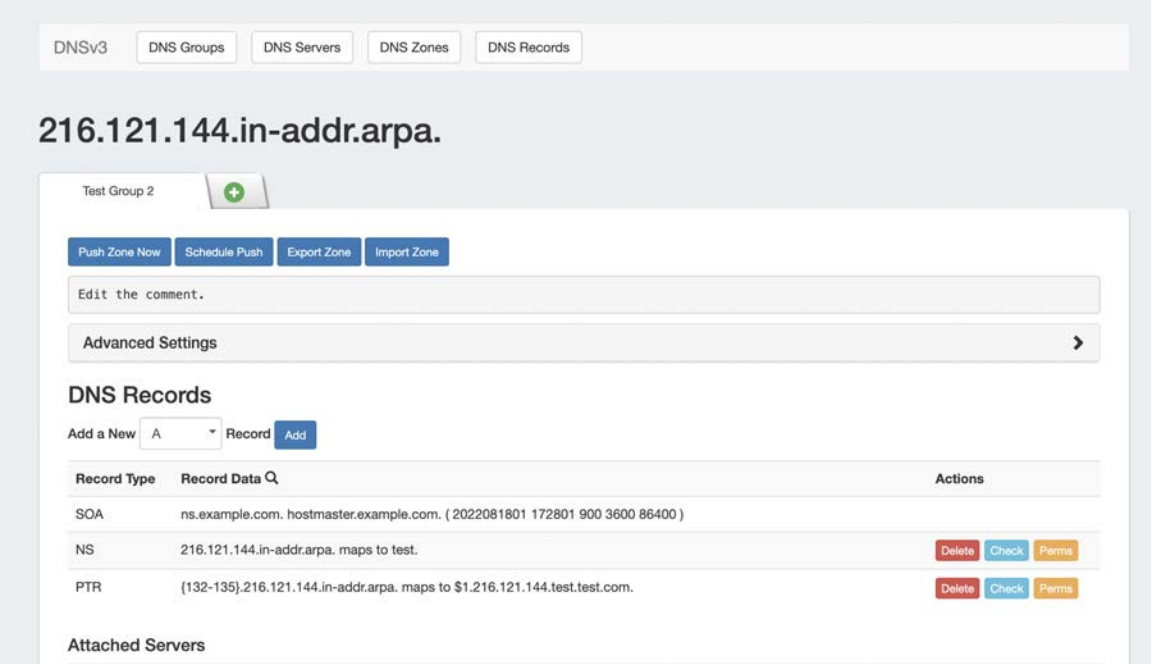
For more information on assigning and managing blocks, see Working with IP Blocks - Assigning IP Space.

Autogenerate Reverse Zone

Autogenerate a reverse zone from an IP Block by clicking on the CIDR link in the block list.



The reverse zone will be created for the block, and the Zone View page will load, displaying further information.



For more information on DNS zones, see: DNS Tab and Working with DNS Zones.

Additional Information

See the following pages for additional information on working with IPAM and blocks:

Expand all Collapse all

Peering Gadgets

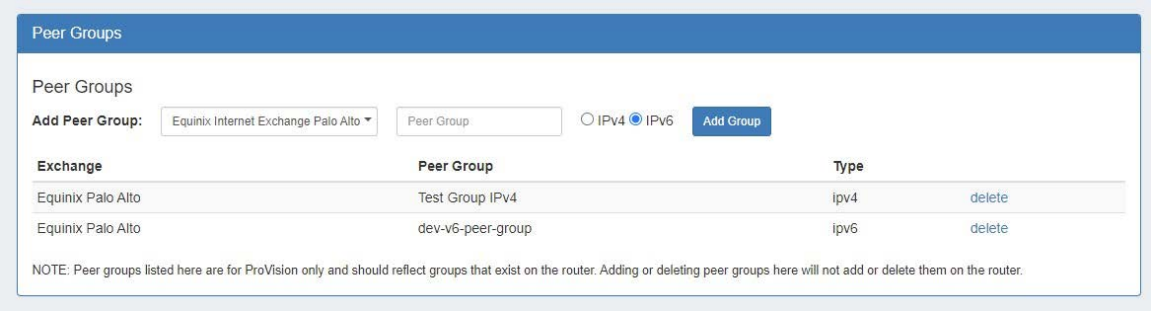
Peering Gadgets

The following gadgets are available to support Peering.

- Peering Gadgets
  - Peer Groups
  - Peering Sessions
  - Peering VRFs
    - Working with the Peering VRFs Gadget

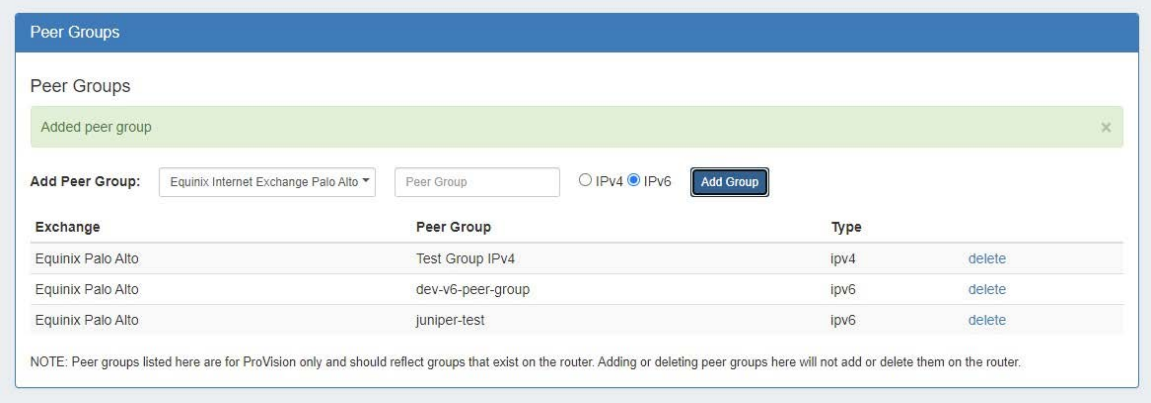
Peer Groups

The Peer Group Gadget allows you to add peer groups for IPv4 and IPv6 for a selected exchange from a router's resource entry page.



To do this, simply select the exchange, type in a peer group name in the text box, select IPv4 or IPv6, the click "Add Group".

Peer groups added from this gadget will be then be available to select in the "Add Session" dialog box in the Peering Tab.



Note

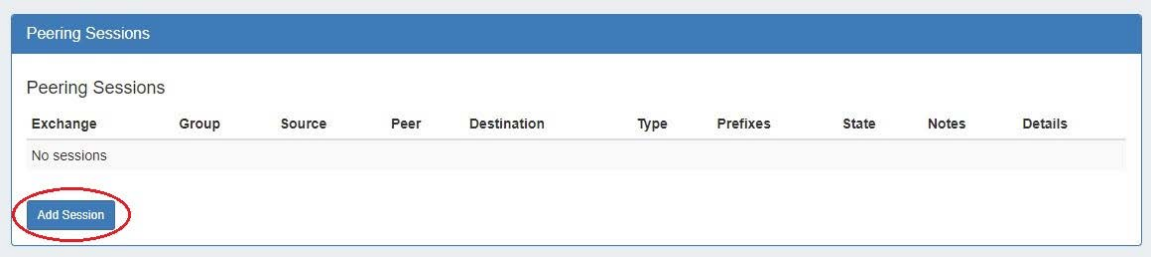
Peer groups listed in the gadget are for ProVision only and should reflect groups that exist on the router.

Adding or deleting peer groups from the gadget will not add or delete them on the router.

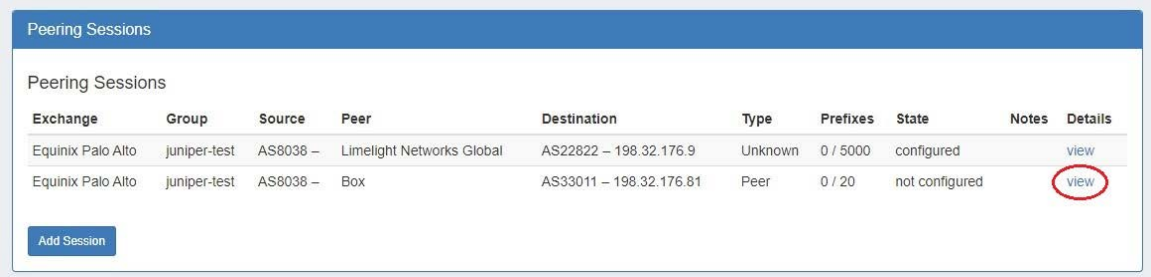
For additional information on Peering, see Peering.

Peering Sessions

This gadget is used on the Router section type. From here, new sessions may be added by clicking on the "Add Session" button, then entering session information into the "Create New Session" page.



Existing sessions may be managed by clicking on the "View" link for the session, bringing up the peering session details page.



For additional information on Peering, see Peering.

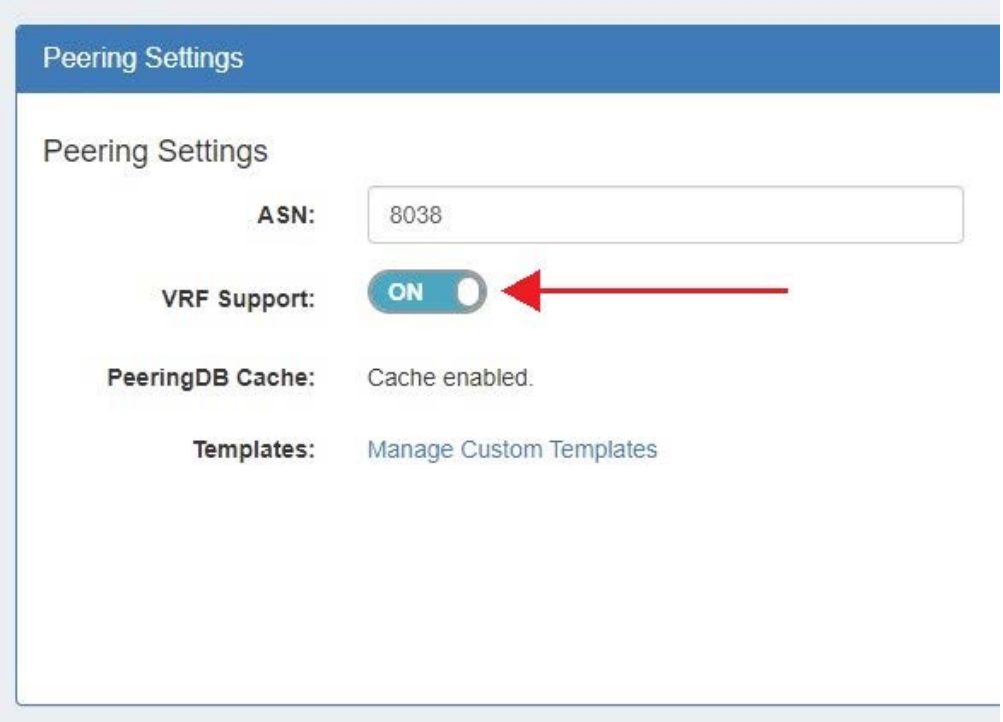
Peering VRFs

The Peering VRF Gadget allows you to add VRFs from a router's resource entry page.



Working with the Peering VRFs Gadget

Enabling "VRF Support" in the Admin home page under "Peering Settings" will automatically add the VRF gadget to the router section.



The VRF gadget will then be accessible in a router's resource entry page.



To add a VRF, type the VRF name and ASN, then hit "Add VRF".

To delete a VRF, click on "delete" next to the VRF entry in the gadget.

Once VRFs are set up for a router, the source ASNs for the associated VRFs will appear in the Source ASN dropdown when adding or editing a session for that router from the Peering Tab.

> Peering VRF currently only supports Cisco routers.

Resource Gadgets

Resource Gadgets

The gadgets listed on this page support the resource system, through either displaying resource info, fields, or properties of linked resources.

- Resource Gadgets
  - Field Gadget
    - Before You Begin
    - Working with the Field Gadget
  - History Gadget
  - Resource Linkage Gadget
    - Working with the Resource Linkage Gadget
  - Resource Linkage - Linked IPs Gadget
  - Resource View
    - Working with the Resource View Gadget

Field Gadget

The Field Gadget displays the information fields available for the section and added to the specific resource that is being viewed on the resource entry page.

Users may add enabled fields to the resource, edit field values, and remove fields from the resource through this gadget.

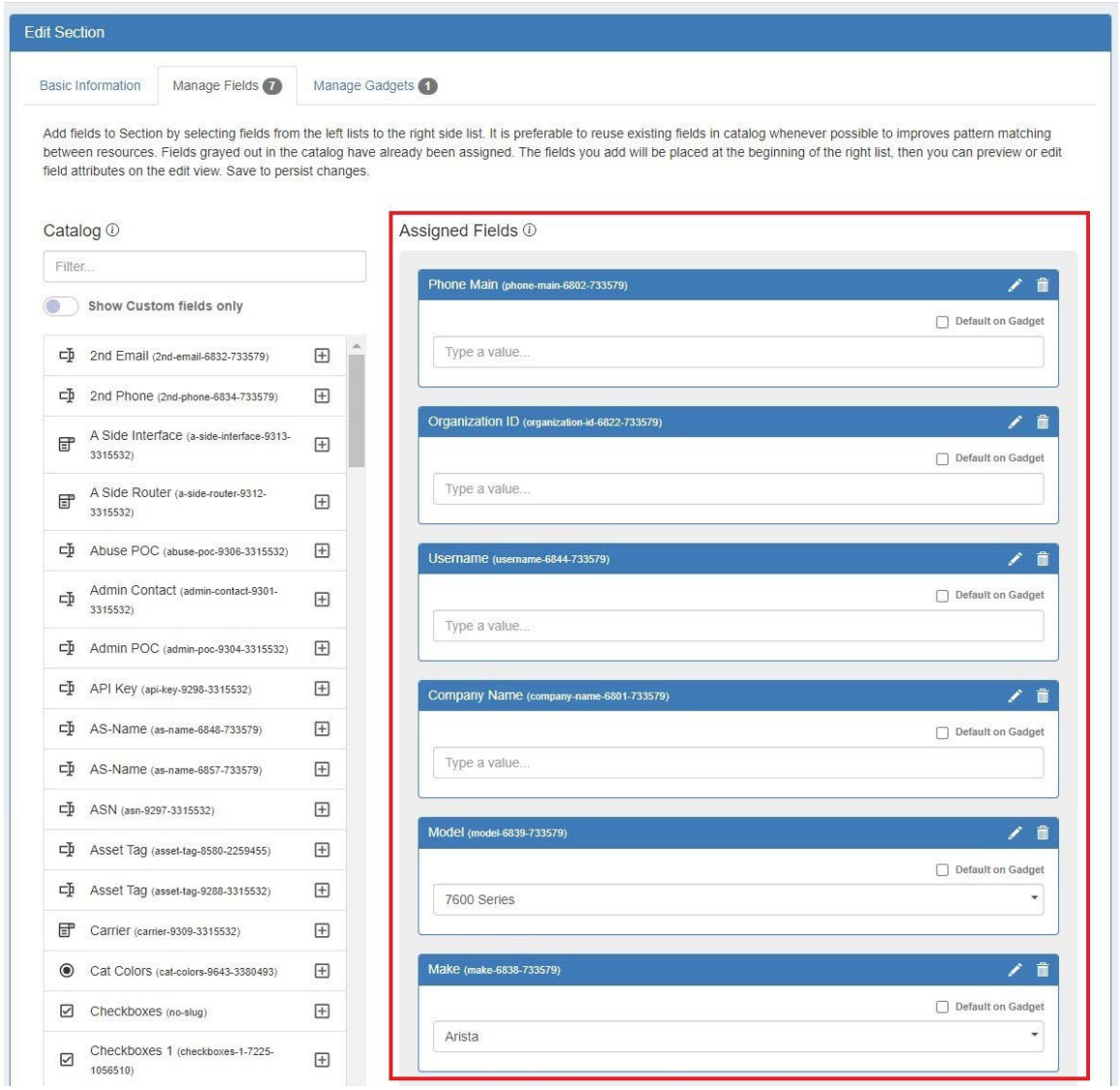


Before You Begin

First, ensure that the Field Gadget has been added to the section - see Adding Gadgets to a Section or go to Customizing Sections for detailed instructions.

Then, fields must be enabled and added to the resource's section in order to be used in the Field Gadget. See Customizing Fields for detailed instructions.

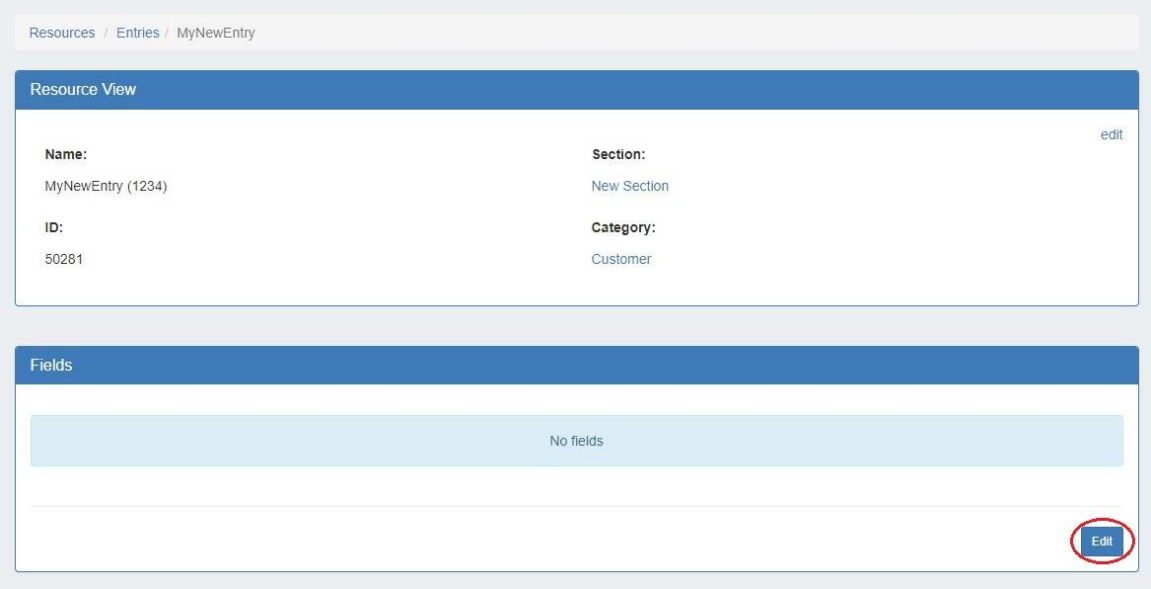
Fields assigned to a section (pictured below) will be available to add to the Field Gadget for any resource of that section.



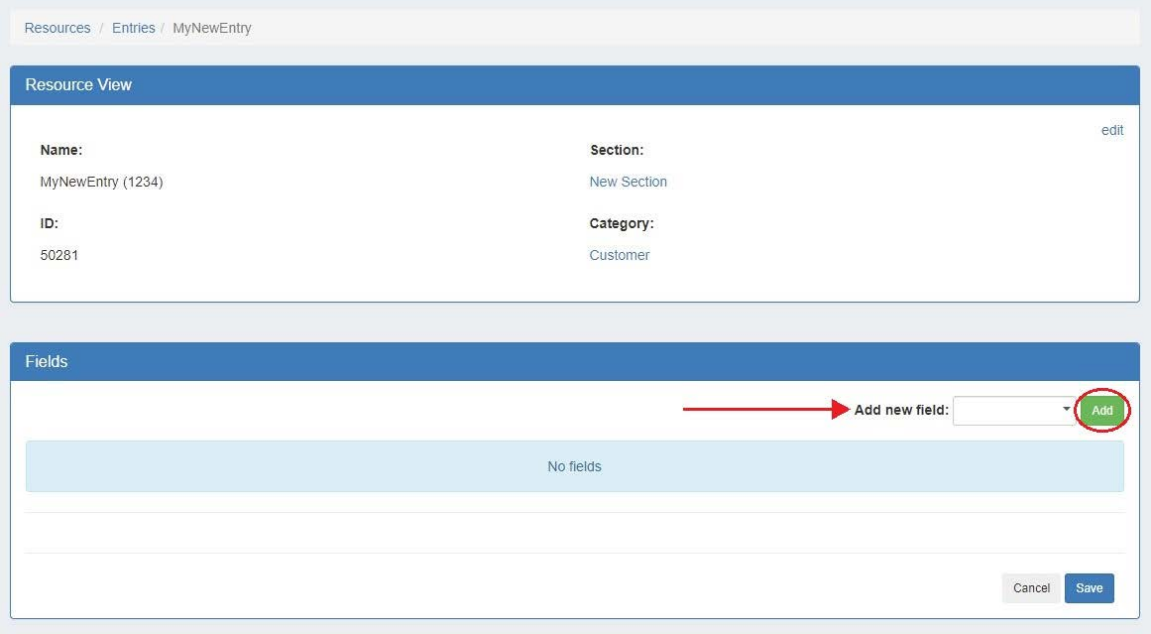
Working with the Field Gadget

Once the Field Gadget has been added, and fields have been enabled for a section, the Field Gadget will display on the resource entry page for a resource of that section.

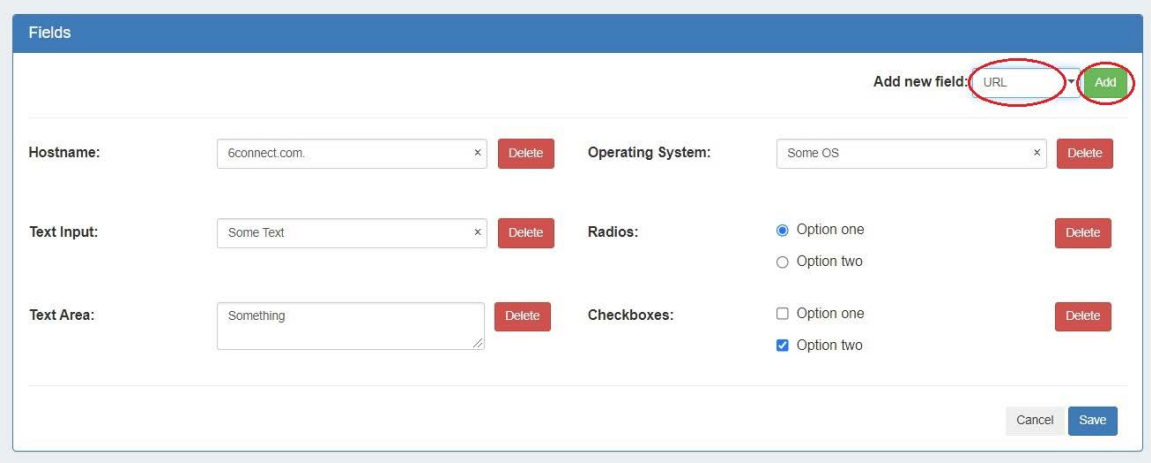
To add all or some of the enabled fields to the gadget, navigate to the resource entry page, and click the "Edit" Button at the bottom right corner of the Field Gadget.



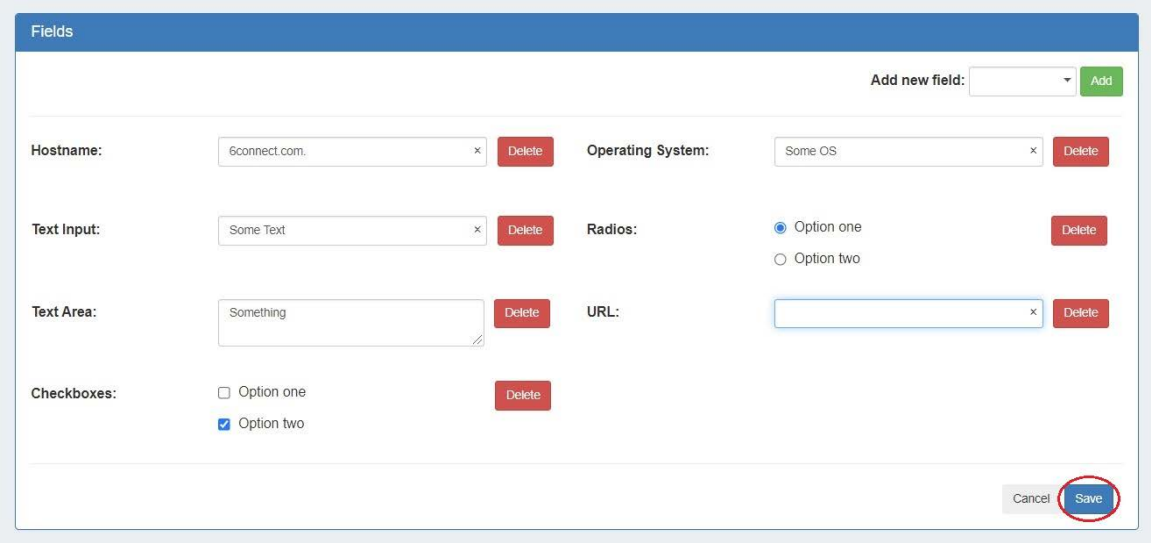
Then, next to "Add New Field:", select one of the available fields from the dropdown, and click "Add".



Continue to add the desired fields to display for this specific resource.



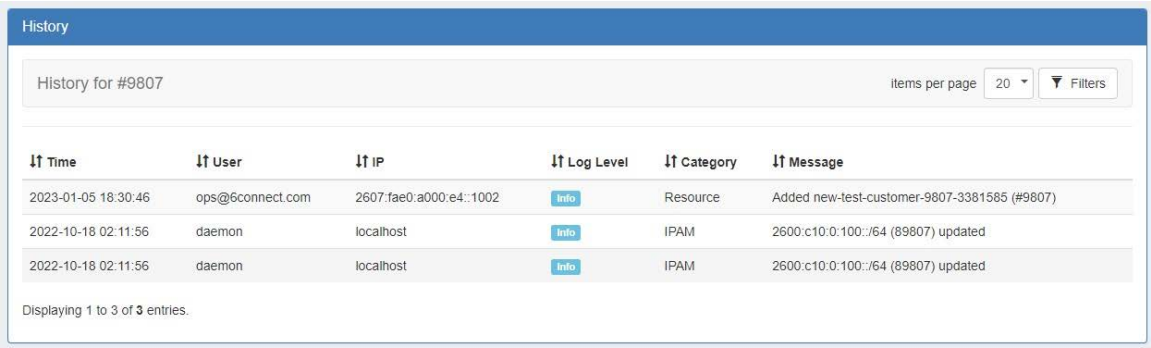
Once added, the field will be available to edit or remove. Edit field value(s) as desired, then click "Save". Fields that are assigned to a section and enabled as "Default on Gadget" are not removable from the Field Gadget. See Customizing Fields for more detail on default fields.



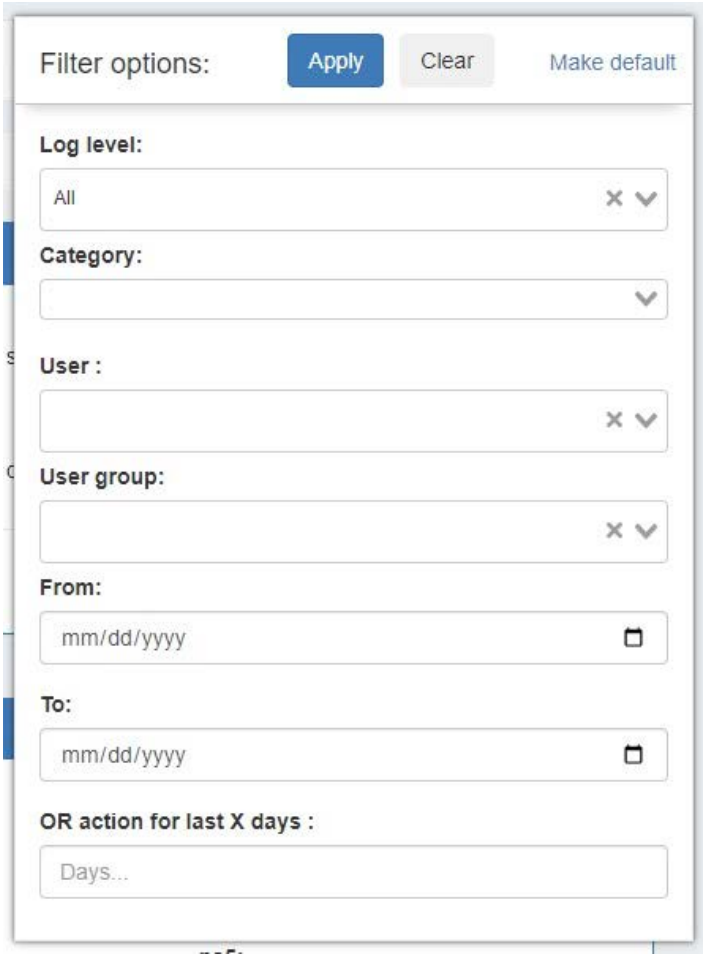
> The Encrypted Data field can be used to store passwords or other sensitive data in encrypted format. When added to the Field Gadget, this field will display obscured text with a green "Decode" button. The data will only display as plain text when "Decode" is clicked by a user with update permissions for the selected resource.

History Gadget

The History Gadget displays Log information on an individual Resource level.



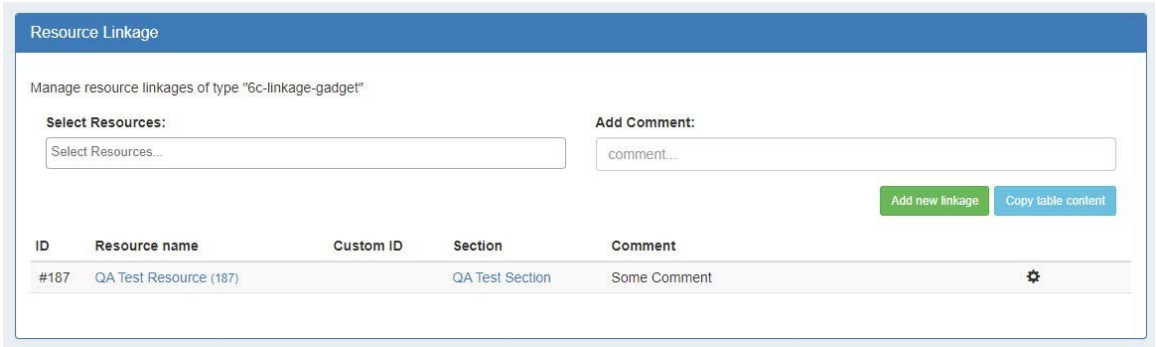
Log activity can be filtered by clicking the "Filters" button at upper right. Logs may be filtered by log level, category, user, user group, and date. Filters can be saved as the default gadget view by clicking "Make default".



Resource Linkage Gadget

The Resource Linkage Gadget allows you link a resource to other resources, and display the links in one place, without needing a hierarchy relationship. This gives you more flexibility to centralize data without requiring direct relationships. By default, all links created in the Resource Linkage Gadget are reciprocal.

The Resource Linkage Gadget also provides information to the Linked IPs Gadget - Resources linked here will have their IP block information displayed in the Linked IPs Gadget.

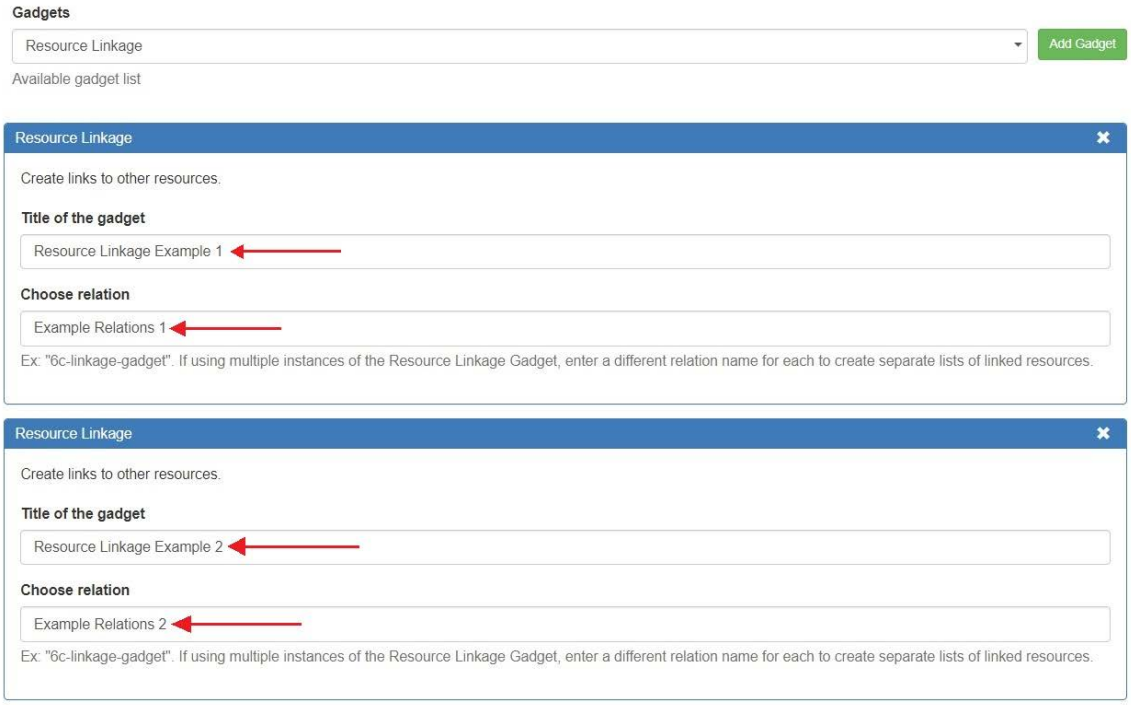


Working with the Resource Linkage Gadget

To use the Resource Linkage Gadget, first, ensure that "Resource Linkage" is enabled under "Manage Gadgets" for the section type of the resource being used.

Multiple Resource Linkage gadgets can be added to a section. Use the "Choose relation" field to enter a different relation name to create separate lists of linked resources.

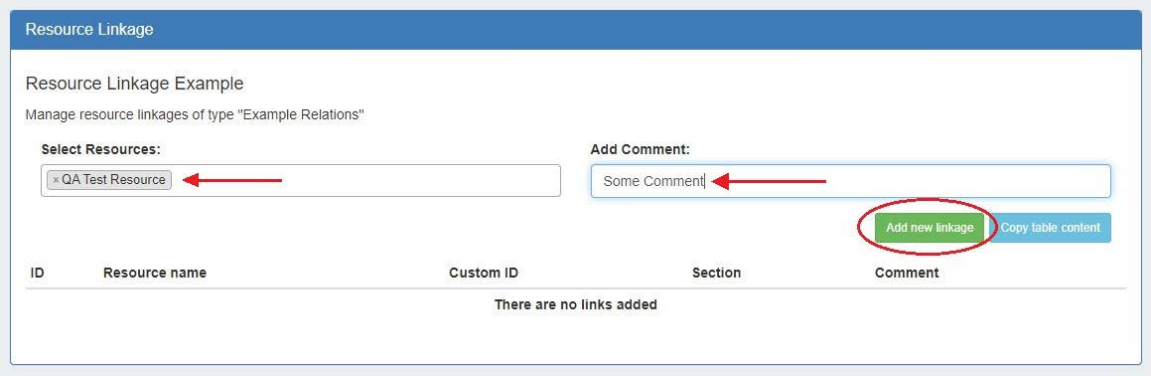
> The relation name is a user-created description for the group of linked resources under that instance of the gadget, so you may enter any unique descriptive term desired, such as "Internal Resources", "Customer Resources" and so on.



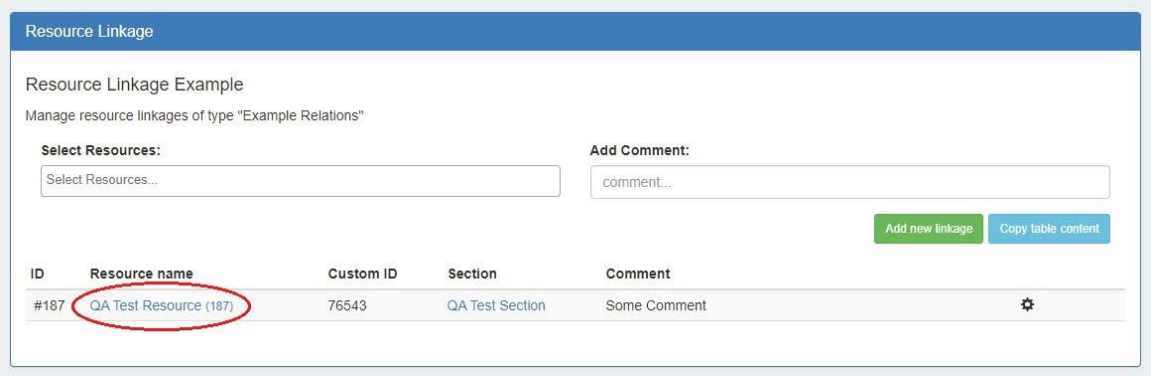
At this step, an empty Resource Linkage Gadget is displayed on the resource's entry page.

Add a New Resource Link

To add a new link select the desired resource from the dropdown, type in a note, and click "Add new linkage". A reciprocal link will be created, and the linked resource will show in the resource list for the gadget.



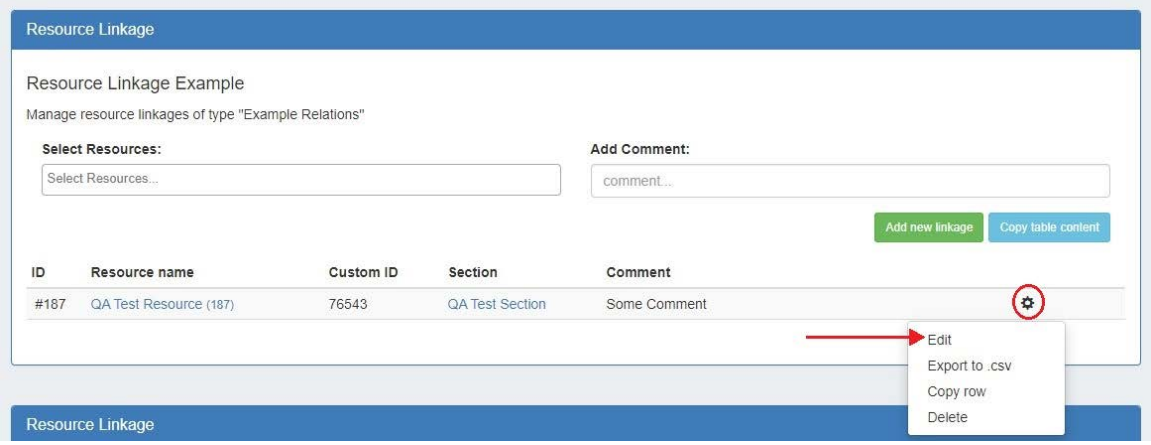
To follow the link, simply click on the resource name for the linked resource.



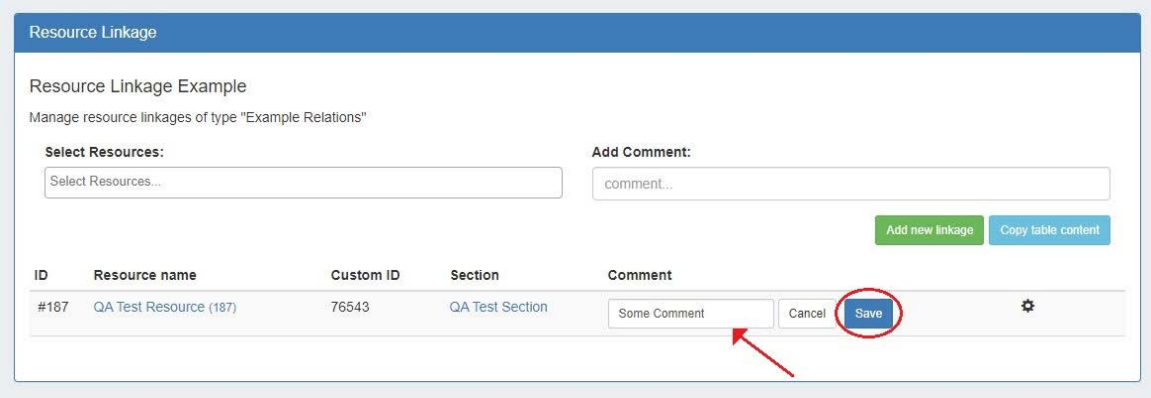
Once a resource link has been created, you may also edit the comment or delete the link.

Edit a Resource Link

Editing a link allows for changes to be made to the associated comment - just click on the action menu (gear icon) for the link, then select "Edit".



Type in the desired comment change, and click "Save" when complete. Or, you may exit out by clicking "Cancel".

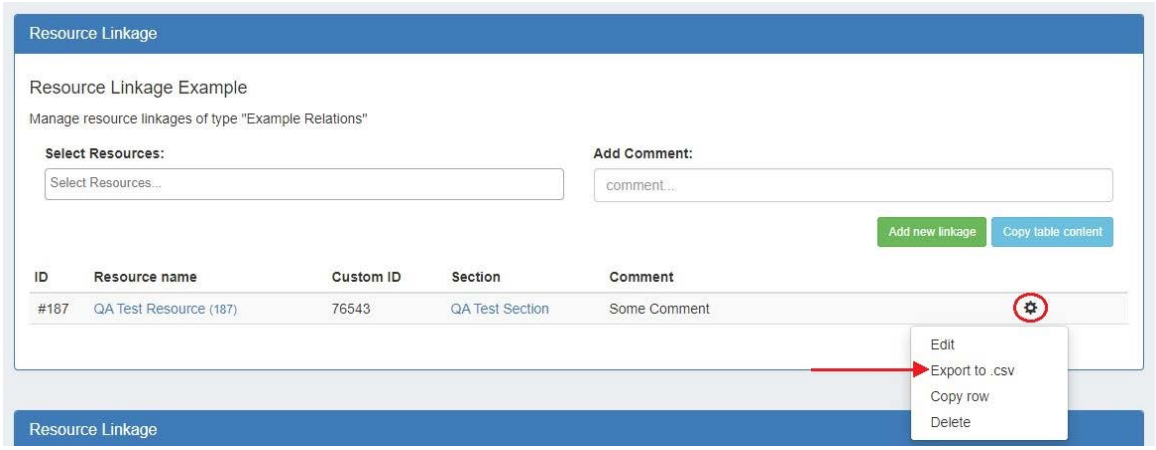


Export Linked Resource Fields to .csv

Resource field data for a linked resource may be exported to a .csv file. This includes basic resource metadata, such as the resource's Name, Section, Category, Created Date, and Modified Date.

If the resource also contains data in custom resource fields (fields that have been added to the Resource Field Gadget, and filled in), those fields will also be contained in the export.

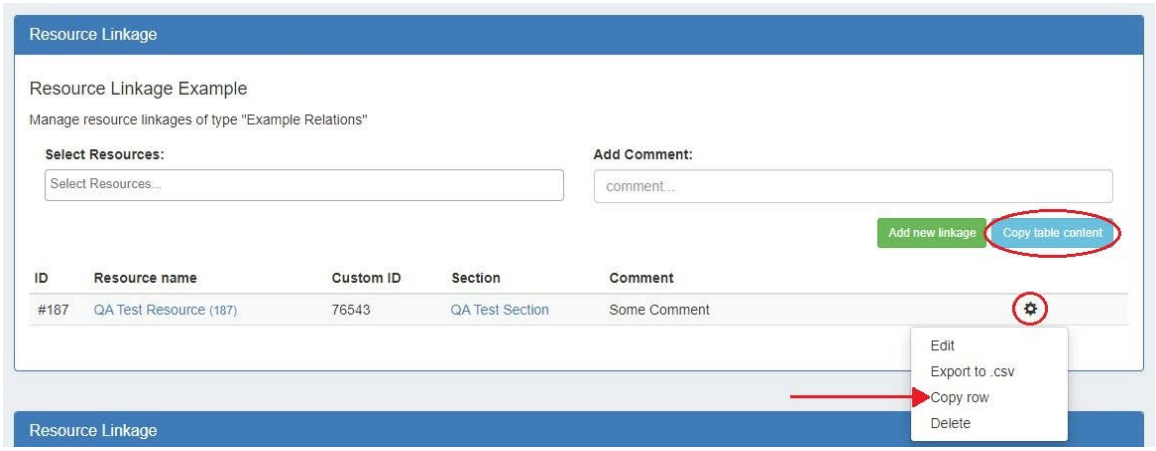
To export, click on the action menu and select "Export to .csv" - the file will download via your browser.



Copy Link Data

You may copy either a single row of data, or the entire table, to the clipboard to paste into another application.

To copy the entire table, click "Copy table content" at the top of the gadget. To copy only a single row, open the action menu (gear icon) for the row, and select "Copy row".

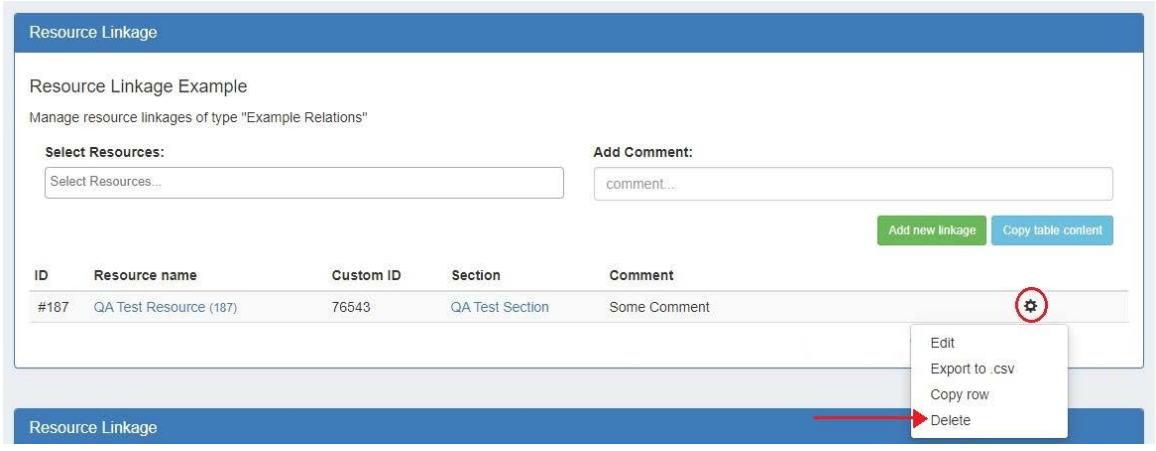


Then paste the data into the desired application.

Delete a Resource Link

To delete a resource Link, click the "Delete" button for the desired link in the list, and confirm the delete in the message that appears.

Deleting a resource link also deletes the reciprocal link from the other resource's page.

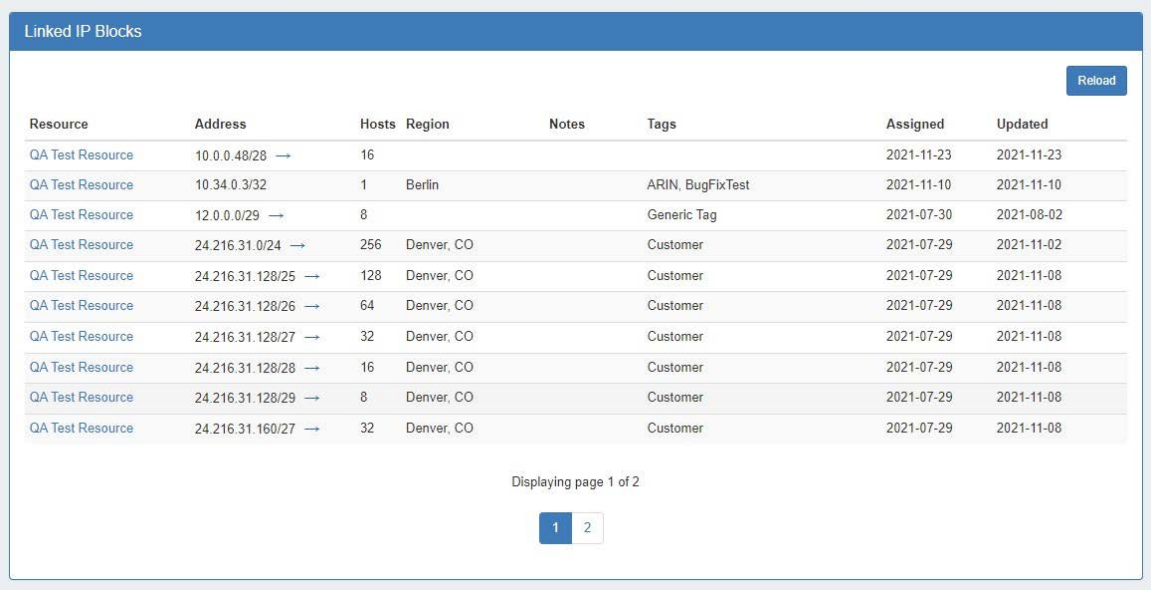


For additional information on working with sections and fields, see Customizing Sections and Customizing Fields.

Resource Linkage - Linked IPs Gadget

The Linked IPs Gadget lists IP blocks assigned to resources linked under the Resource Linkage Gadget, with a link to the resource holder.

Block information may be refreshed by clicking the "Reload" button to check for changes.



Resource View

This gadget is automatically enabled for all resources. The Resource View displays and provides links for the section and category for the resource. It also allows you to edit this information.

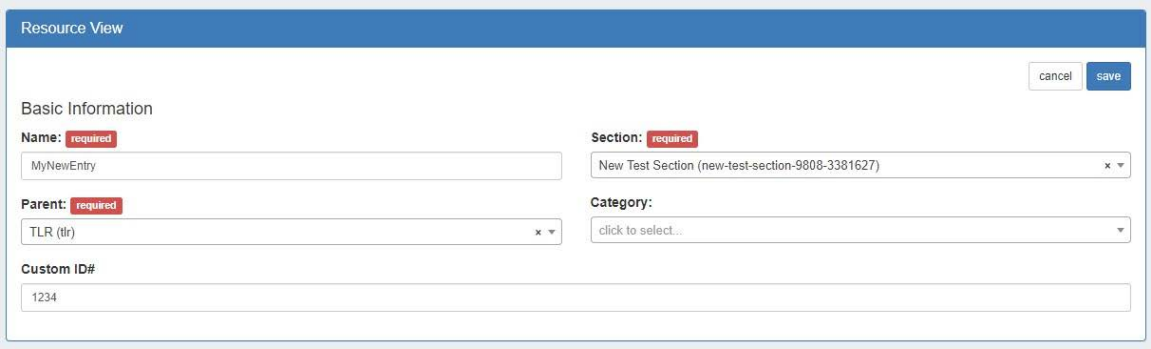


Working with the Resource View Gadget

Click "Edit" to change basic details for the resource.



Hit "Save" to save your changes.



The Resource View Gadget is automatically available on all resources, but in order to move the gadget you will need to add it to a section from the "Manage Gadgets" dropdown menu along with other section gadgets. This does not add a duplicate gadget, it simply gives you the ability to change the display order by dragging and dropping the gadget.

XML Specifications

XML Specifications

THIS IS AN EXPERIMENTAL FEATURE

User created gadgets are not supported at this time and the specification below could change without notice. If you want to make your own gadget, please get in touch so we can help you.

- XML Specifications
  - XML Specification
    - Implemented Tags
    - Example
    - Fields

XML Specification

The XML gadget specification is based on the Atlassian Gadgets.

Implemented Tags

The implemented tags and corresponding attributes are:

- ModulePrefs

  Description
  - title
  - width - "full" or "half" are the only options for now
- ContentSources
  - type - "file" uses the file given in src, "html" uses the content in the tag (eg. Content type="html"This is the content/Content)
  - src - relative filename or url
- Source
  Fields
  - type - "css" or "javascript"
  - src - relative filename or url
- Field
  - slug

Example

```
<?xml version="1.0" encoding="UTF-8" ?>
<Module>
    <ModulePrefs title="Contact Info" width="half" />
    <Description>This gadget adds a field editor for fields related to contact info (phone, address, ect).<
/Description>
    <Content type="file" src="template.html" />
    <Sources>
       <Source type="javascript" src="script.js" />
    </Sources>
    <Fields>
       <Field slug="6c-resourceholder-phone-main" />
       <Field slug="6c-resourceholder-phone-fax" />
    </Fields>
</Module>
```

Fields

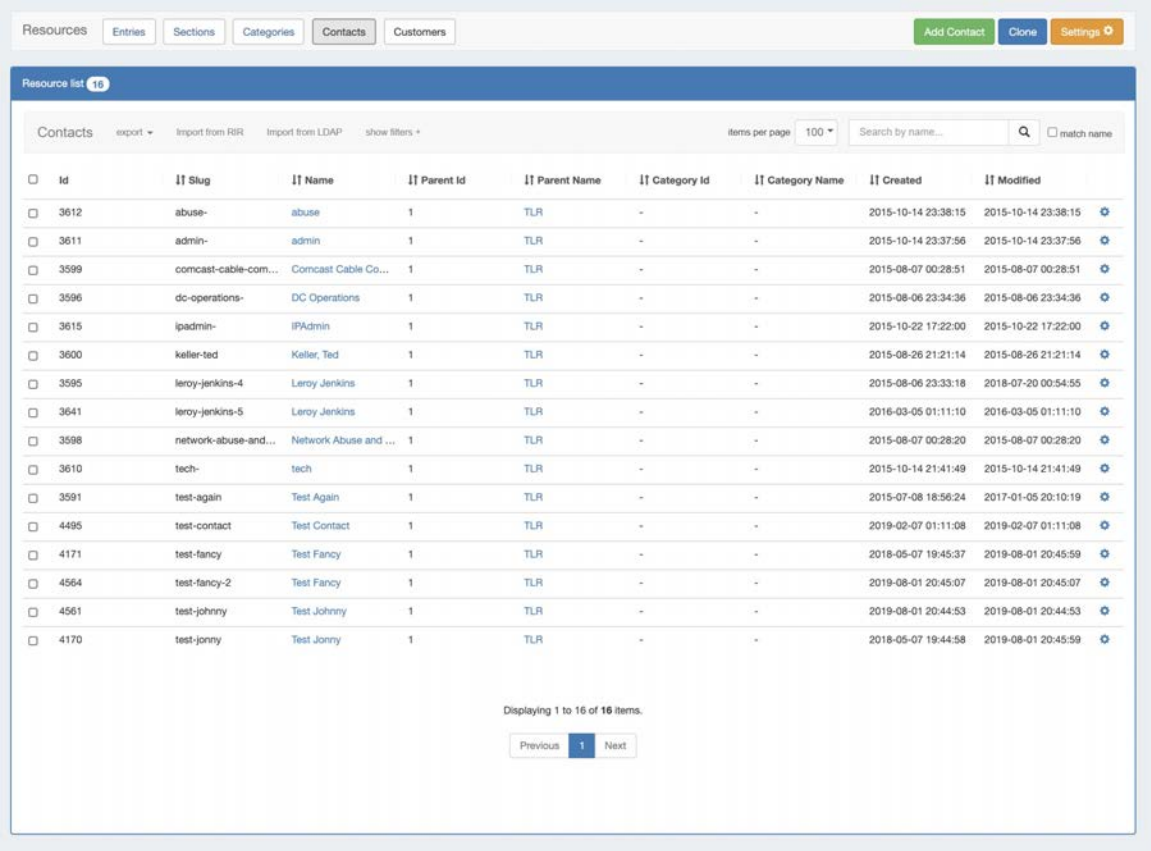
If a gadget uses fields, you can optionally add the slug of the field in this section to hide it from the main field list.

This can be very useful and make your Resource Sections easier to work with. If the fields are not hidden, this can lead to long lists of redundant data in multiple places and can cause confusion. However, all viewing and editing of the field will have to be done through the gadget. If your gadget uses a field in a read-only manner, then you should **not** add it to the gadget's manifest because that would prevent users from editing the field data through the standard edit page.

Contact Manager

Contacts

View the Contacts List by clicking "Contacts" from the **Resource** Tab, or from the Resource Tab dropdown menu, under "Contacts". The Contacts List displays existing contacts and provides options to import new contacts into ProVision. You can create new contacts manually, or import contacts from RIR. Contacts may then be assigned to resources through the Contacts Gadget.



- Contacts
  - Working with Contacts
    - View Contact Details
  - Create New Contact
  - Import Contact from RIR
    - 1) Select RIR / Type
    - 2) Enter Point of Contact Handle
    - 3) Verify and Add
  - Import Contact from LDAP
  - Edit or Delete Contact
- Working with the Contacts Gadget
  - Assigning a Contact to a Resource
    - Assign the Contact
    - Create a Contact Role
    - Assign a Role to a Contact
    - Delete a Role from the Roles List
  - Unassign a Contact
  - View the Contact Details Page

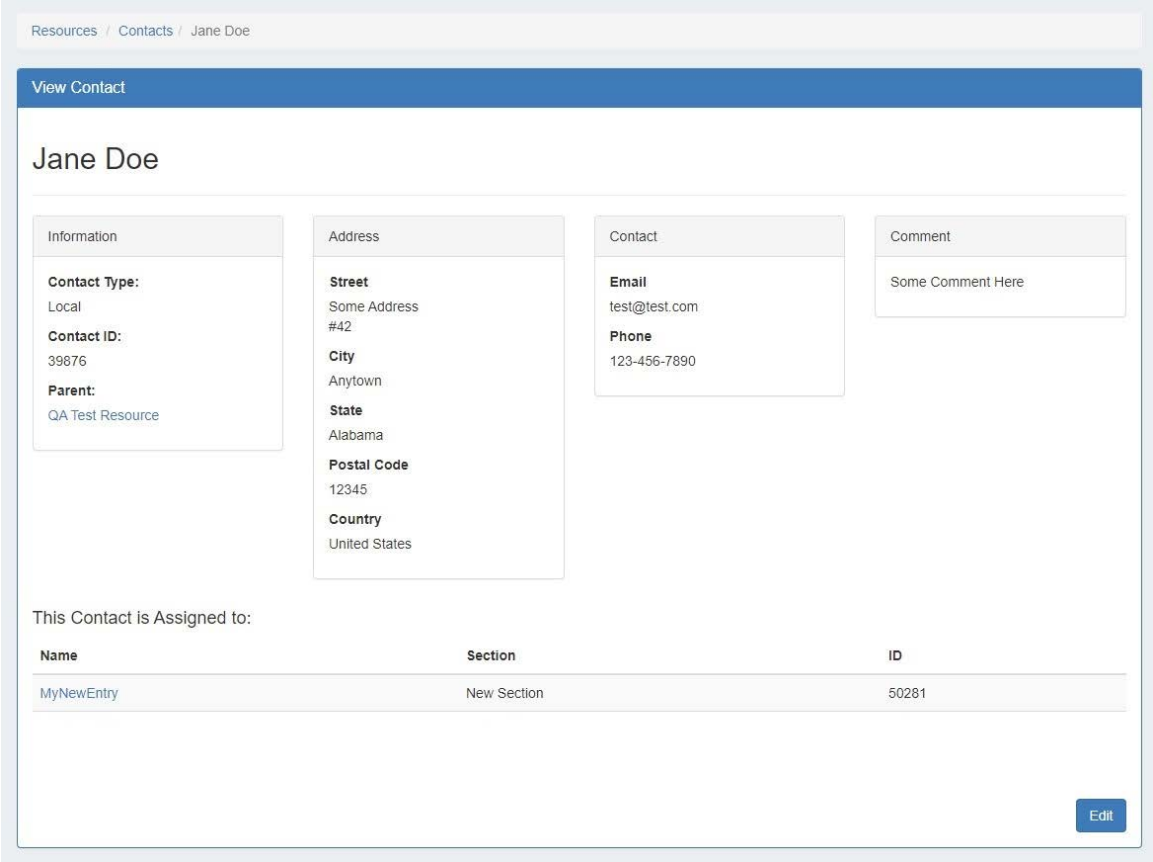
Working with Contacts

View Contact Details

To view the contact details, click on the contact's name in the Resource Contact List. You will be taken to the contact details page.

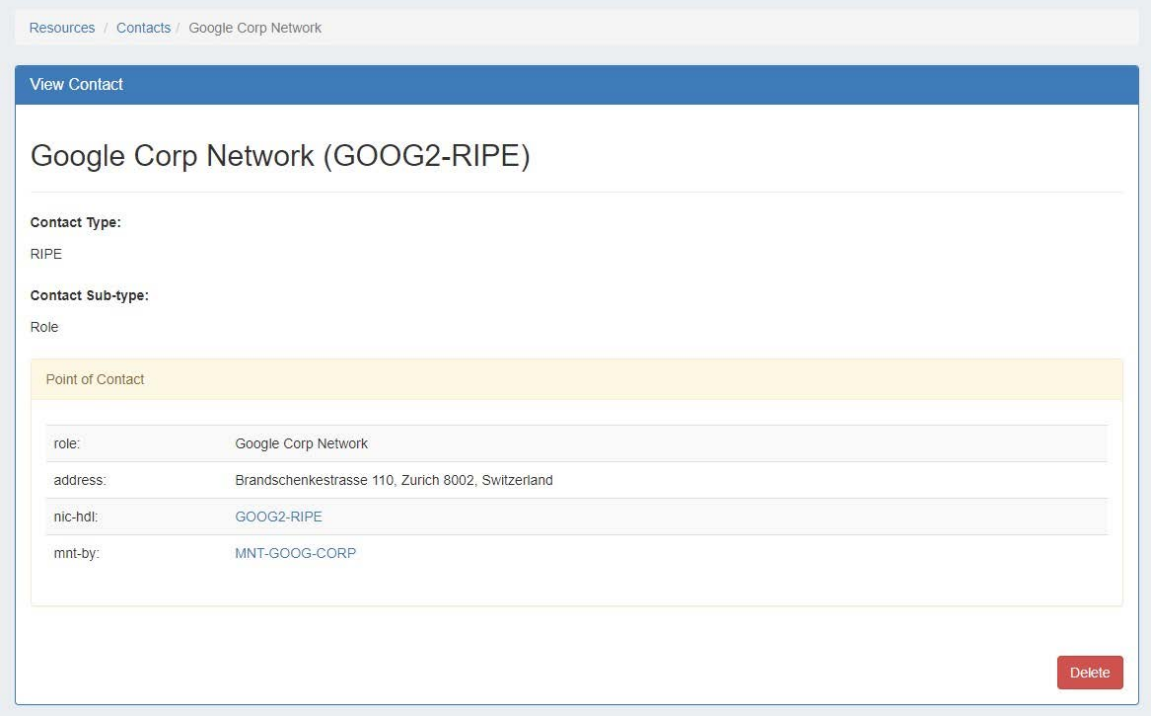
A local contact created in ProVision will have modules shown for Address, Email/Phone, and Comments, as well as a list of any resources that contact is assigned to via the Contacts Gadget.

You may edit or delete a Local contact by clicking the "Edit" button at the bottom of the page.



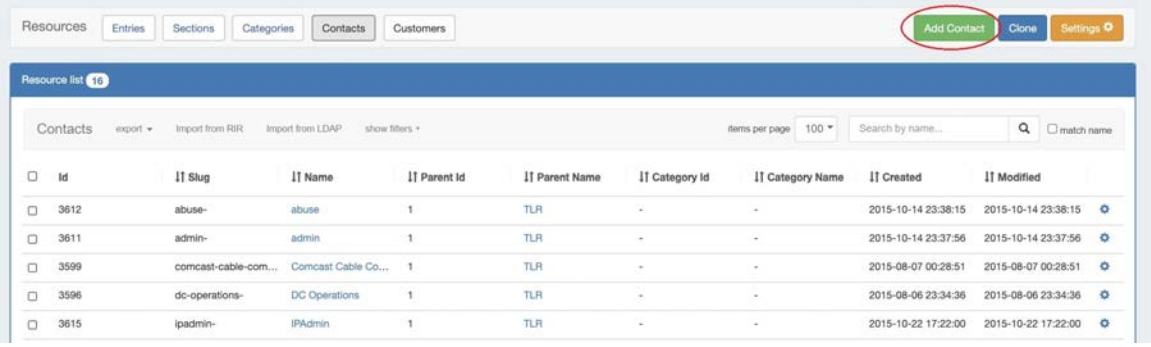
A contact imported from a RIR will have its details shown as determined by the imported RIR module - this data is not editable in ProVision.

You may delete the contact by clicking the "Delete" button at the bottom of the page.

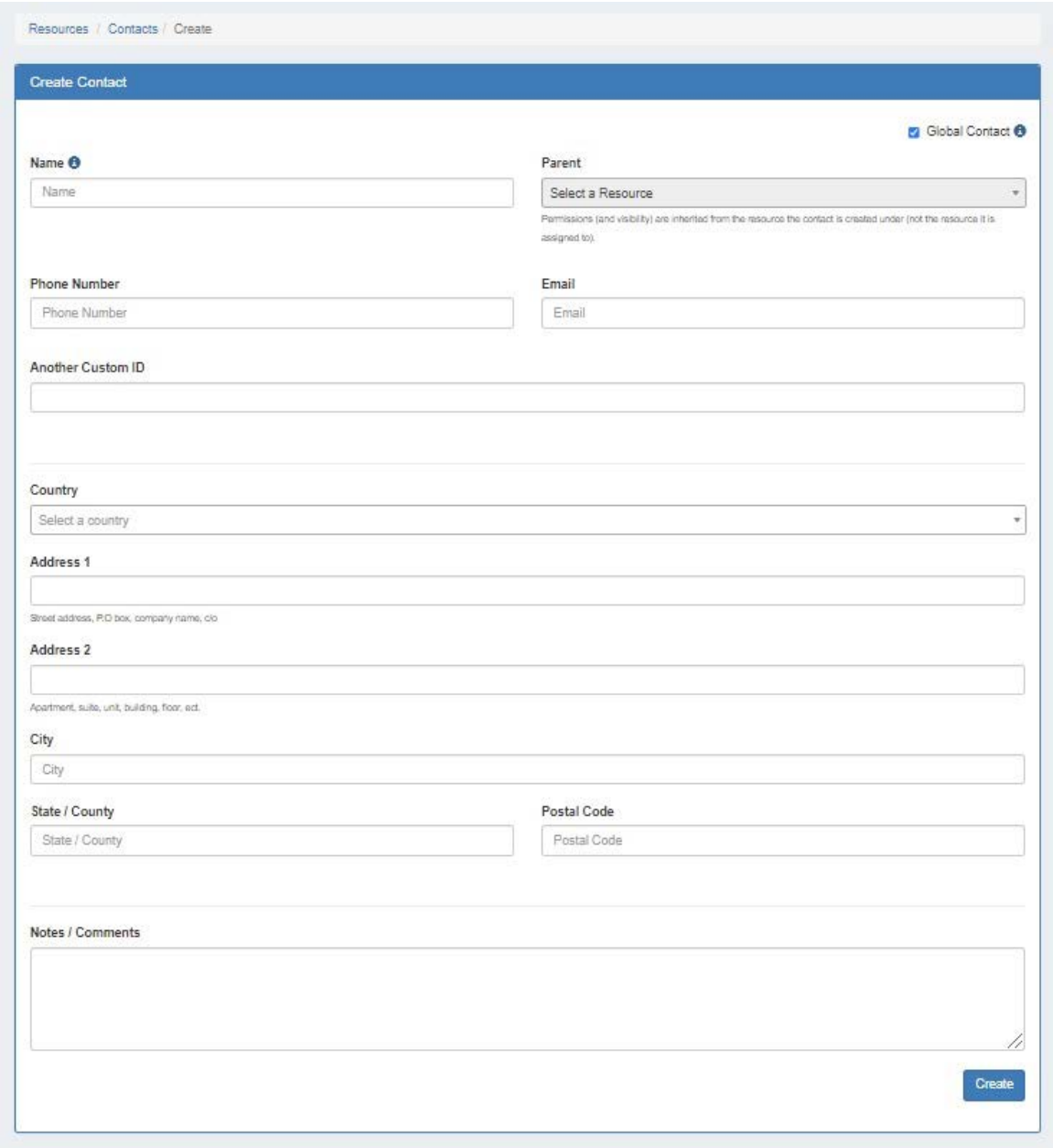


Create New Contact

You can manually create a new contact by clicking on "Add Contact" from the Contacts List View.



Fill in the contact's information for Name, Parent Resource (if desired), Phone, Custom ID, Email, Address, and Comments if desired.

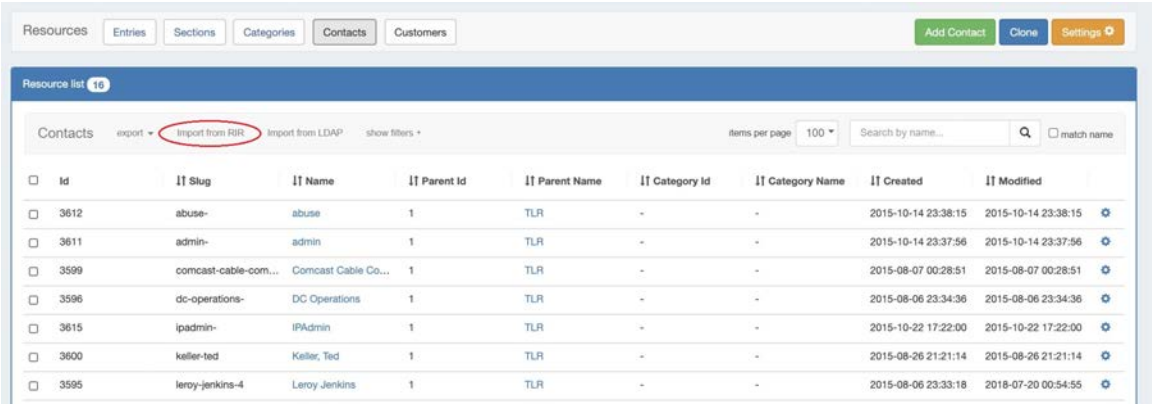


When done filling out the information fields, hit the "Create" button to save your contact.

> **Parent**
>
> The parent field relates the contact to a resource's permissions structure, only allowing users with permissions for that resource to view and assign the affiliated contact(s). To allow the contact to be viewed globally, check the "Global Contact" box above the Parent Field.

Import Contact from RIR

To import a contact from ARIN or RIPE, click the "Import from RIR" button from the contacts page.

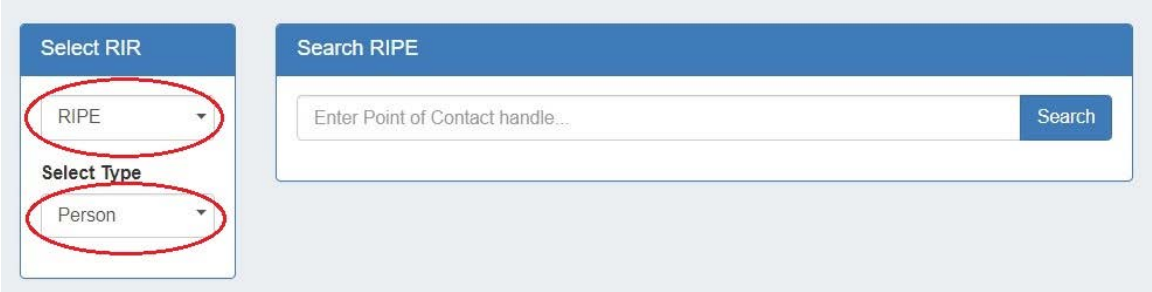


1) Select RIR / Type

Once on the the Import from RIR page, on the left hand side of the page select the RIR from which you wish to import - ARIN or RIPE.



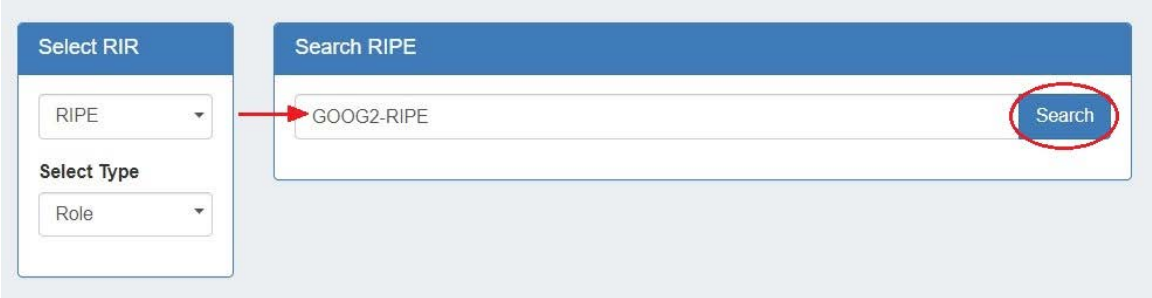
If you select RIPE, you will also be prompted to choose whether you are importing a "Person" or "Role".



2) Enter Point of Contact Handle

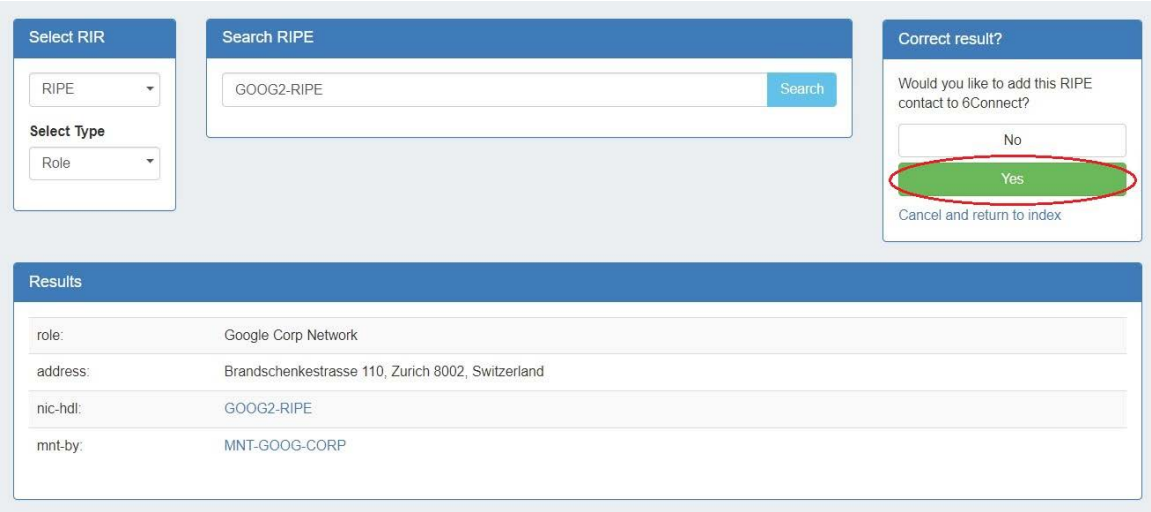
After selecting the RIR / Type (if applicable), enter the ARIN or RIPE Point of Contact Handle for the contact you are importing, then click "Search".

> Point of Contact Handle is the only search term that is valid. Attempting to search by name or keyword is not valid, and will return an error.



3) Verify and Add

If the search is successful, the found contact information will display at the bottom of the screen. If this is the information you wish to add into ProVision, click the "Yes" button on the right hand side of the page under "Would you like to add this RIPE contact?". Otherwise, you may hit "No" to decline adding, or cancel and return to the index.

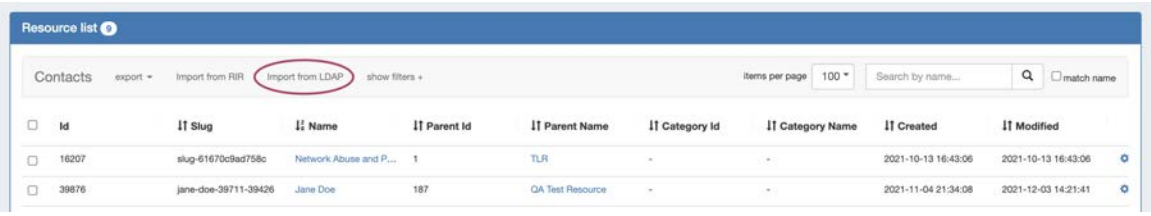


Import Contact from LDAP

> Import LDAP Contact requires that an LDAP authentication server is enabled and setup in Admin Settings, and access credentials to be provided prior to import.

First, ensure that the LDAP authentication server is enabled and setup in Admin Settings, and access credentials provided.

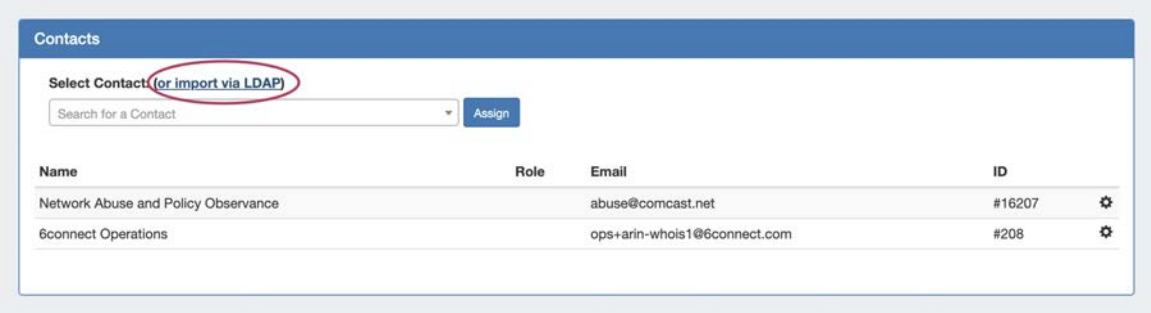
Then, from the Resource Tab Contacts List, click the "Import from LDAP" button at the top of the list.



Use the search box to find an LDAP contact and click the "Import Contact" button.



You may also access LDAP Import from the Contacts Gadget, if preferred.

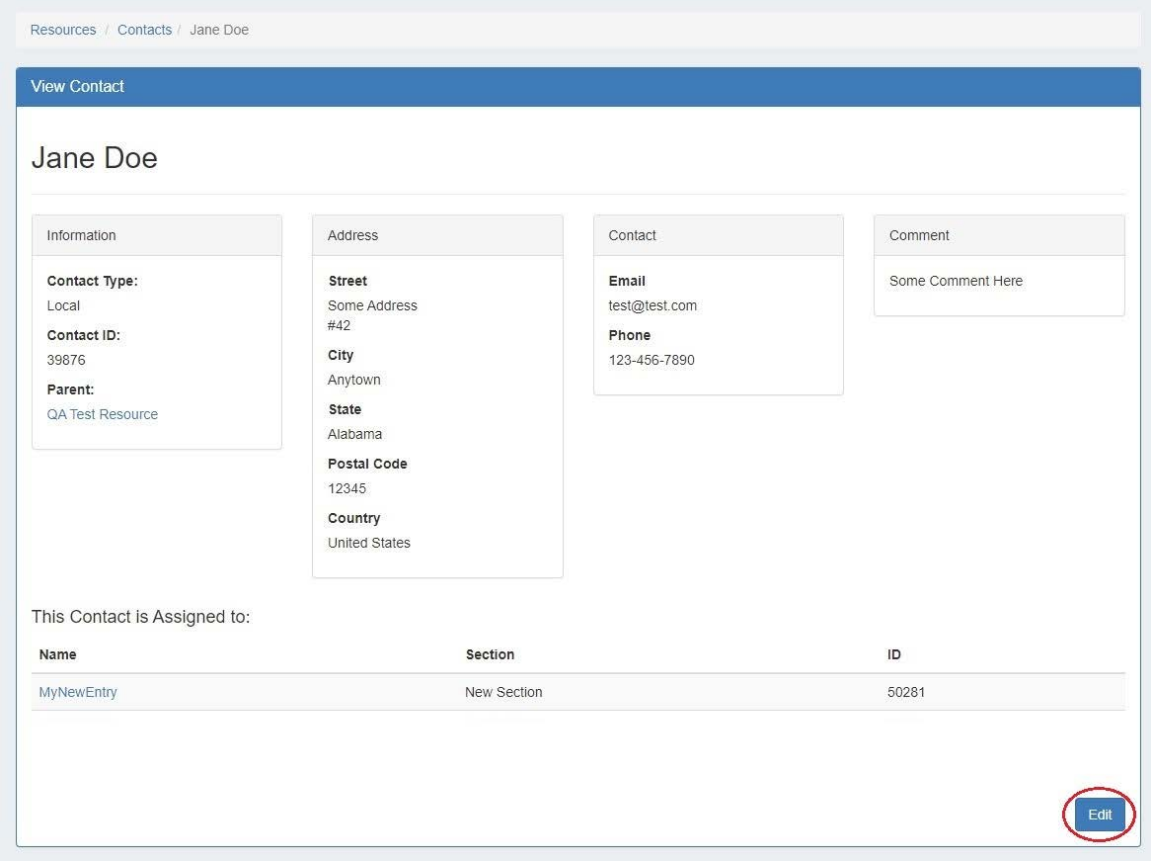


Once imported, the LDAP contact will be available to add to the Contacts Gadget and will show in the Users List.

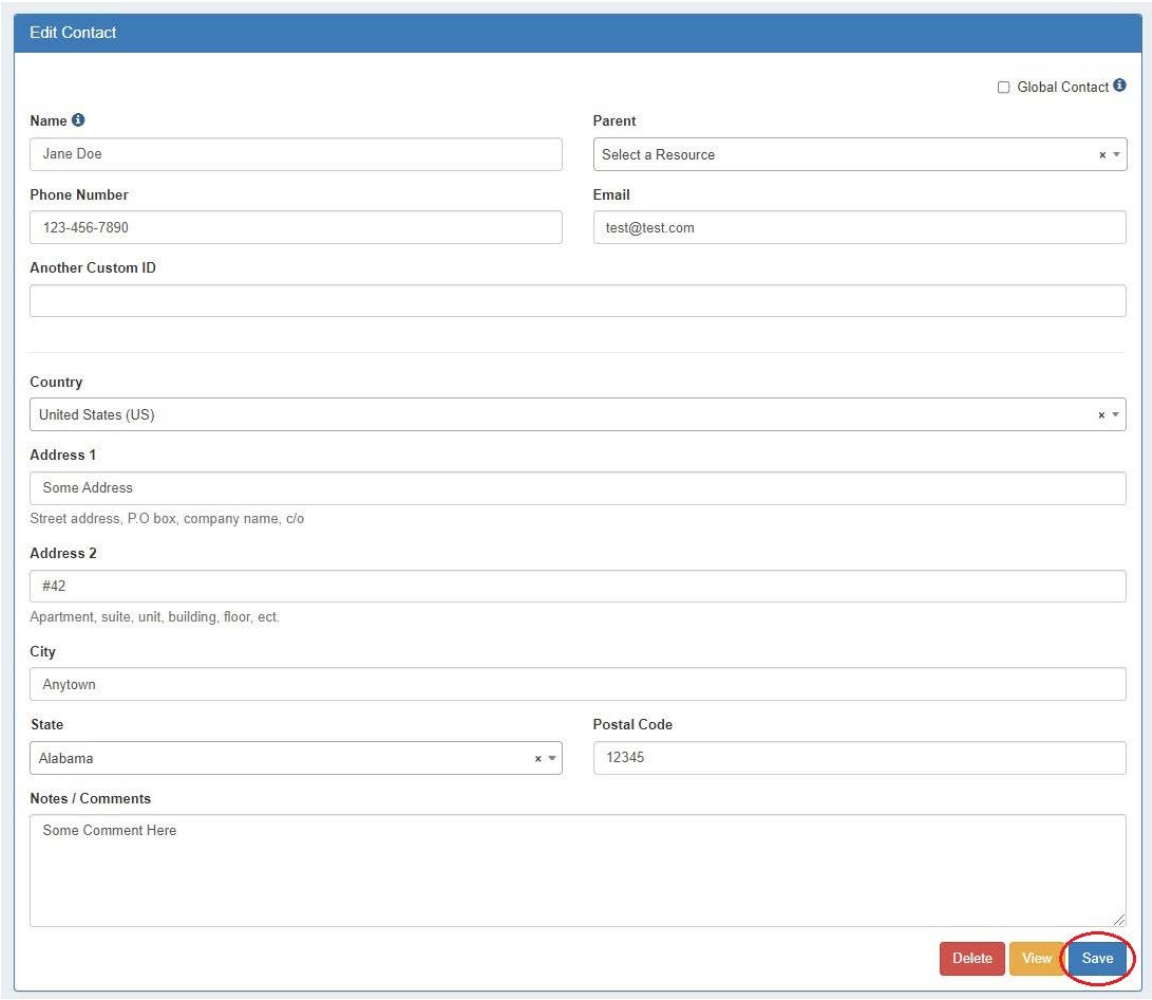
> Note: The Scheduler task "LDAP - Sync LDAP Contacts" must be manually created at the desired interval in order to automatically update the LDAP user based on the server information. This task updates imported LDAP users with any changes made on the LDAP server.

Edit or Delete Contact

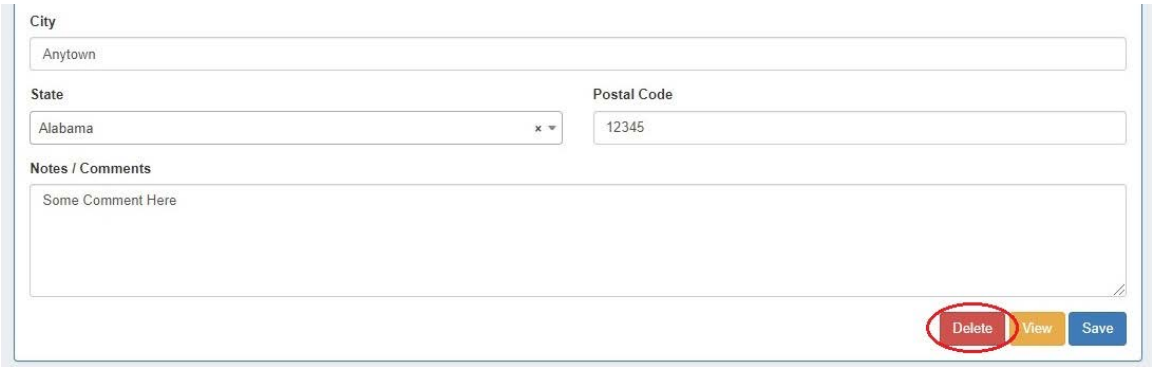
To Edit or Delete a base contact, click on the contact's name in the contact list to go to its detail view page. From there, click "Edit".



This will take you to the detail information page, where you may edit fields as desired. When done editing, hit "Save" to save your changes, or "View" to cancel without saving and view the contacts list.



To delete the contact, click the "Delete" button while in the contact details page.



Working with the Contacts Gadget

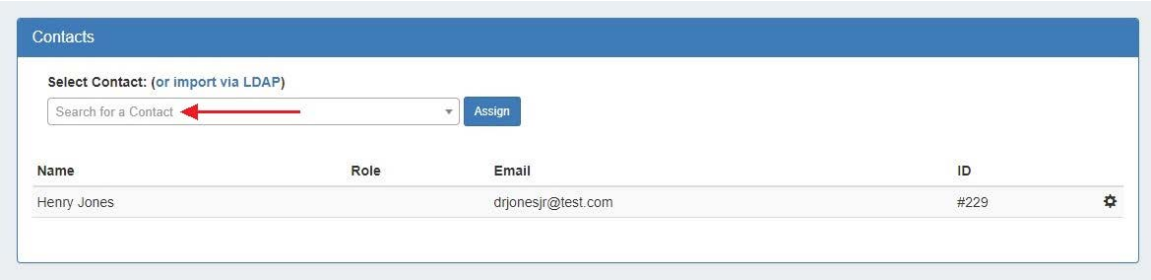
Assigning a Contact to a Resource

Contacts may be assigned to a resource through the Contacts Gadget. To add a gadget to a Resource's Entry page, see Customizing Sections and Gadgets.

Once the Contacts Gadget has been added to the desired section, go to the resource entry page for the resource you wish to assign the contact to, and navigate to the Contacts Gadget.

Assign the Contact

In the Contacts Gadget, search for a contact by typing the first few letters of the contact name in the search box, then click on the desired contact.

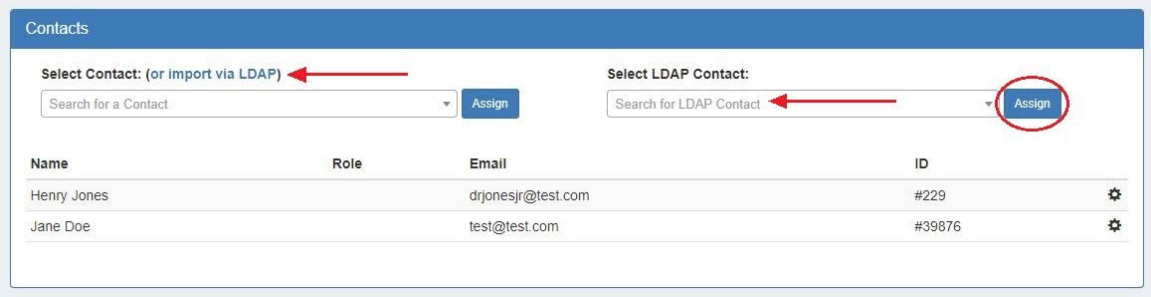


Then hit "Assign".



The contact will show in the list below.

You can also import and assign a contact via LDAP from the Contacts Gadget. Click on "import via LDAP" and a separate search box will appear. Search for an LDAP contact and hit "Assign".

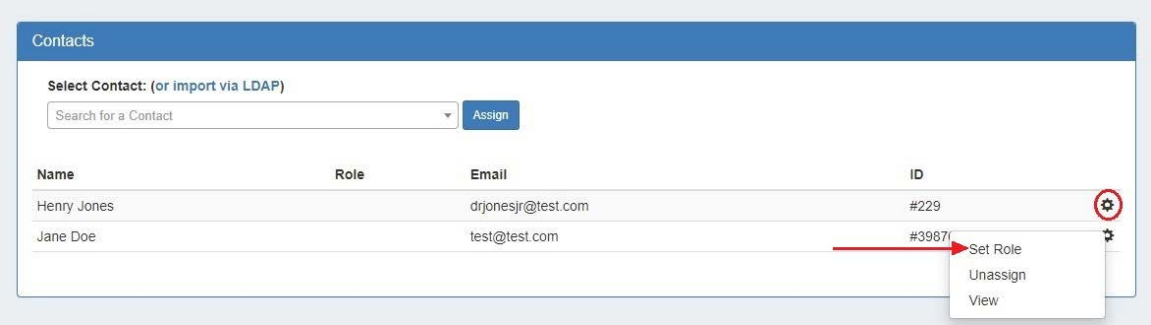


The contact will be imported and assigned to the resource. If a contact has already been imported, a notification will appear and the gadget will assign the contact to the resource, but the contact will not be imported again.

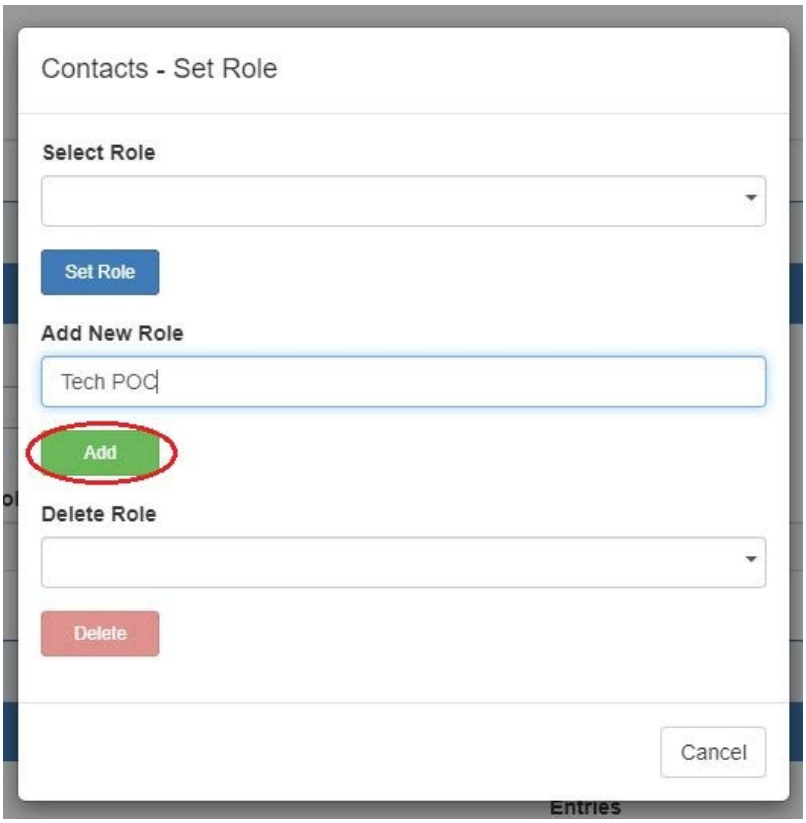
Create a Contact Role

Once a contact has been assigned, you can create and set a role for the contact by clicking on the Action Menu (gear icon).

Then, select "Set Role".



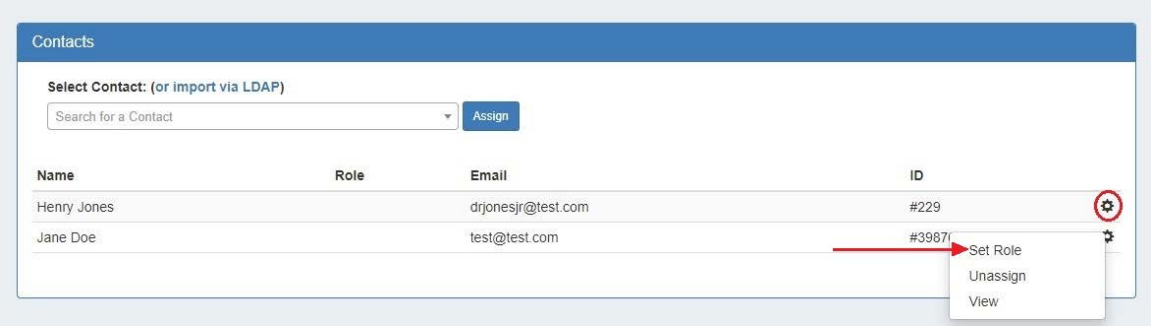
Under the "Add New Role" section, type in the desired tole name and click the "Add" button.



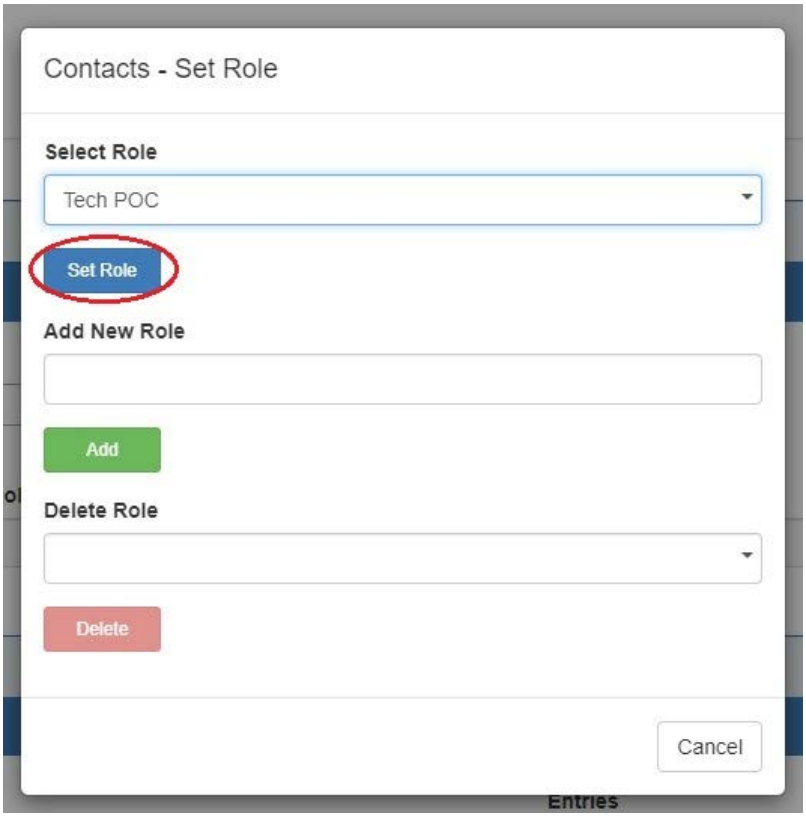
Assign a Role to a Contact

Once a contact has been assigned, you can set a role for the contact by clicking on the Action Menu (gear icon).

Then, select "Set Role".

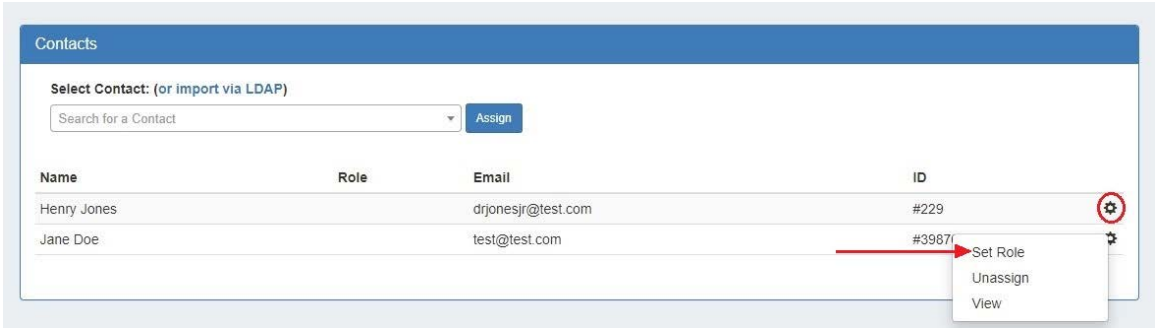


Under the "Select Role" section, choose the desired role from the dropdown list, and click the "Set Role" button.

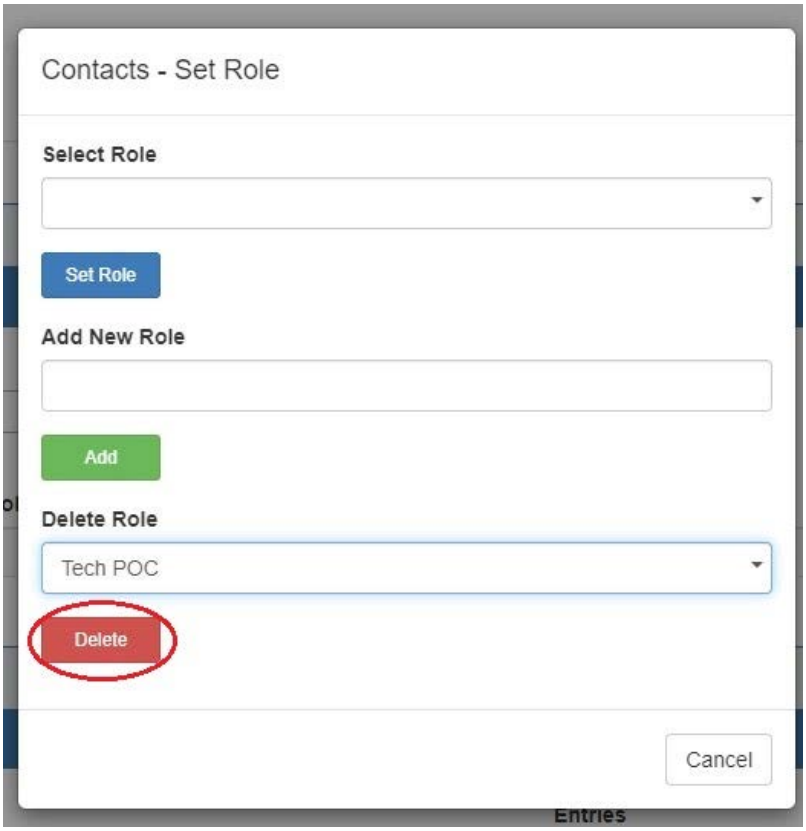


Delete a Role from the Roles List

Select "Set Role"



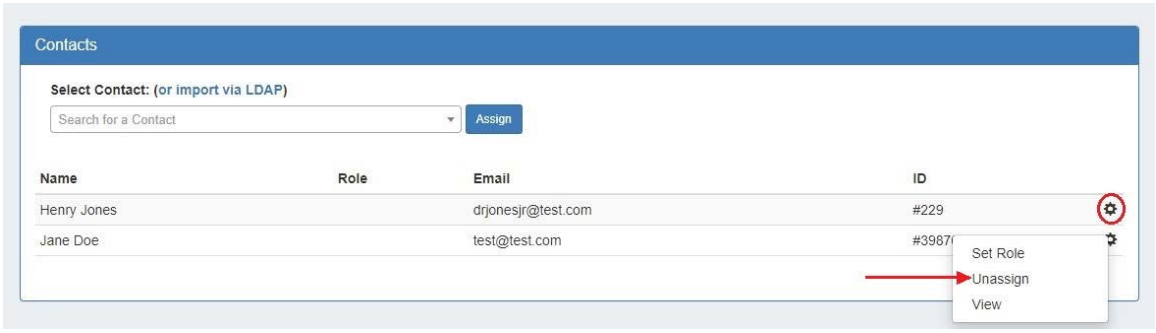
Under the "Delete Role" section, choose the desired role from the dropdown list, and click the "Delete" button.



This removes the role from the "Select Role" list.

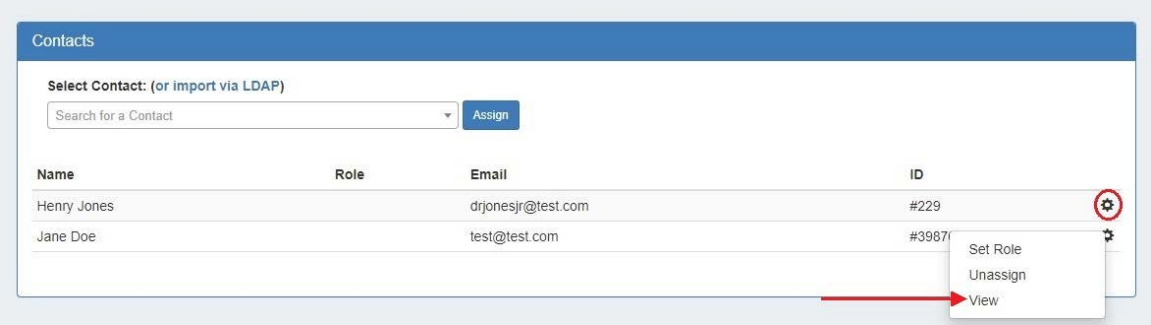
Unassign a Contact

To unassign a contact from a resource, in the Contacts Gadget click the Action Menu, then select "Unassign".



View the Contact Details Page

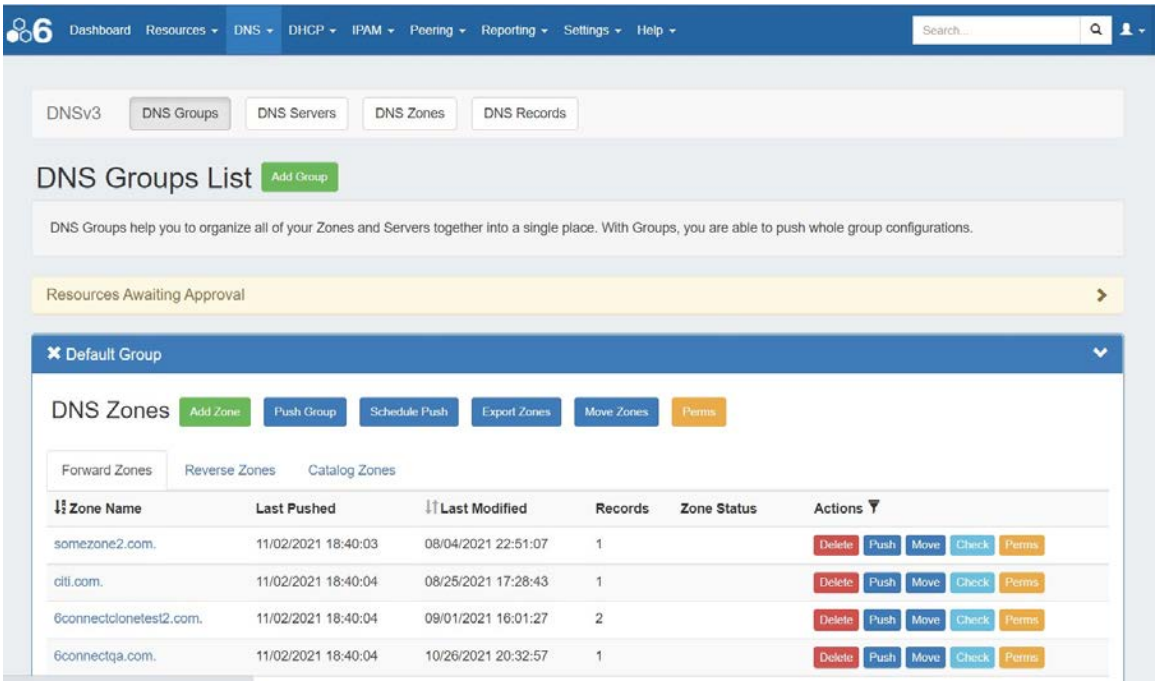
To view the contact's details, click the Action Menu, then select "View". You will be redirected to the contact's detail page.


Contacts
Select Contact: (or import via LDAP)
Search for a Contact
Assign
Name
Role
Email
ID
Henry Jones
drjonesjr@test.com
#229
Jane Doe
test@test.com
Set Role
Unassign
View

DNS Tab

DNSv3

ProVision's DNSv3 combines server management, group organization, and zone management under the **DNS** tab.



The DNS tab contains four sub-tabs: **DNS Groups, DNS Servers, DNS Zones, and DNS Records**.

The **DNS Groups** tab is where DNS groups, zones, ACL's, and default SOA values are managed. The DNS tab Groups List allows you to create, view, and manage groups of DNS servers and zones. Using groups, you can configure and push selected combinations of zones at one time.

The **DNS Servers** tab is only accessible to Admin users, and contains functions for adding, updating, and managing DNS servers as well as scheduling server tasks. For Admin-level DNS tasks, see DNS Administration and Working with DNS Servers.

The **DNS Zones** tab lists all the zones able to be viewed by the user, in the same format as on the DNS Groups page, but without the group organization. The Zone List allows you to view, add, delete, and push individual DNS zones.

The **DNS Records** tab list all records viewable by the user, in a filterable list to expedite search, editing, and managing records. New records may also be added from this page.

- DNSv3
  - DNSv3 Overview
    - DNS Permissions
      - Permission Shortcut Button ("Perms")
    - DNS Approvals
  - DNSv3 Workflow
  - Additional Information

DNSv3 Overview

DNSv3 organizes ProVision's DNS system into a more unified and accessible interface, combining both admin and non-admin DNS tasks together under the DNS tab.

In DNSv3, zones are gathered under DNS groups, servers are attached to those groups, and Nameservers, Default SOA values, and ACLs are managed at a per-group level. Users can then view and manage groups, individual zones, default SOA values, ACLs, attach servers, and perform pushes all on the same page.

DNS Permissions

DNSv3 incorporates DNS zones and groups into the Resource System. Zones and groups are resources just like Customers, Servers, Routers, or Contacts (See The Resource System for a more detailed explanation of resources in ProVision).

This allows for DNS zones and group permissions to be managed similarly to other resources, where users with resource permissions (Create / Read / Update / Delete) on the parent resource of the DNS group can create groups and zones, manage those groups and zones, push (if a server is attached), and delete.

A user with full resource permissions on a DNS server, as well as the parent resource of a group, may view and attach that server to a group.

Users with Admin permissions can access the DNS servers area under the DNS tab manage DNS server creation, edits, and deletion.

For more information on setting up permissions groups, see Users & Permissions.

Permission Shortcut Button ("Perms")

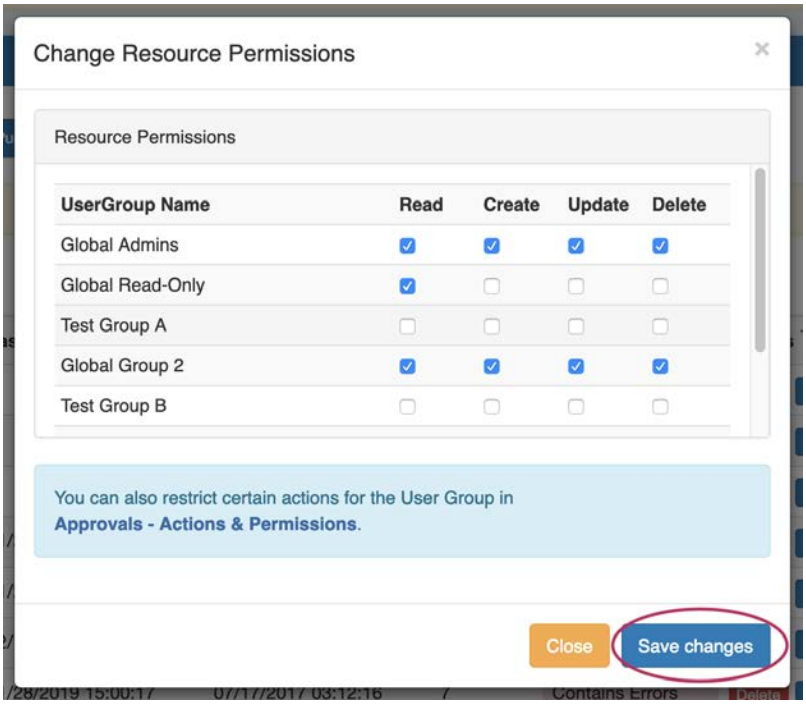
Throughout DNS, a shortcut permissions button ("Perms") is available on a per-item level, accessible only to Admin users.

This permissions button allows for direct, point-of-use permissions adjustments to DNS groups, servers, zones, and records. It uses the same CRUD permissions and groups available in the Admin Users tab, but removes the need to remember and search for the DNS item name.

To open the Change Resource Permissions module, click on the "Perms" Button for any DNS item.



Edit the CRUD permissions for any user group by clicking the checkbox for the desired group and permission type. When done, click "Save Changes". The permission changes will be also be reflected in the Admin User tab Group settings.

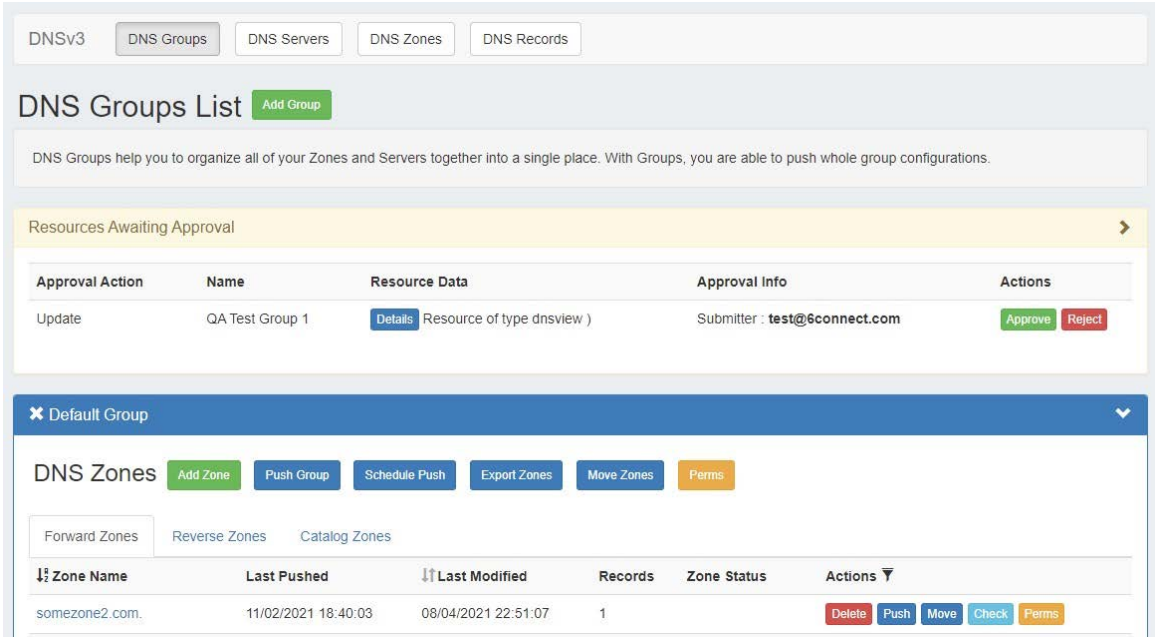


DNS Approvals

The Approvals module stores and queues DNS actions made by selected User Groups, and sends those actions to a Pending Changes list for administrative review. Later, an administrator (or combination of administrators) can approve or reject these stored actions.

Approvals is primarily set up and managed via the Admin Approvals Tab. See the ProVision Admin Guide - Approvals Tab for details on setting up and using Approvals from the Administrative viewpoint.

In the DNS Tab, a "Resources Awaiting Approval" module will display near the top of DNS Groups, DNS Zone Lists, and DNS Servers pages, if a change has been submitted on that page that is pending approval.



Users who submitted a change for approval will see the details of their change request in this module.

Admin users with permissions to approve or reject the request will have the option to Approve or Deny the change.

DNSv3 Workflow

DNSv3 revolves around groups. Zones are gathered under groups, servers attached to groups, and pushes may be done on a per group level. Thus, the first workflow step in DNSv3 is to set up one or more DNS groups. A "Default Group" is automatically provided in ProVision, but other groups may be desired to organize zones and default values.

To create a new DNS group, click the "Add Group" button from the DNS Groups tab. Enter the desired default values for the group, and save. If only using the Default Group, ensure the default parameter values are set as needed. For more information, see Working with DNS Groups.

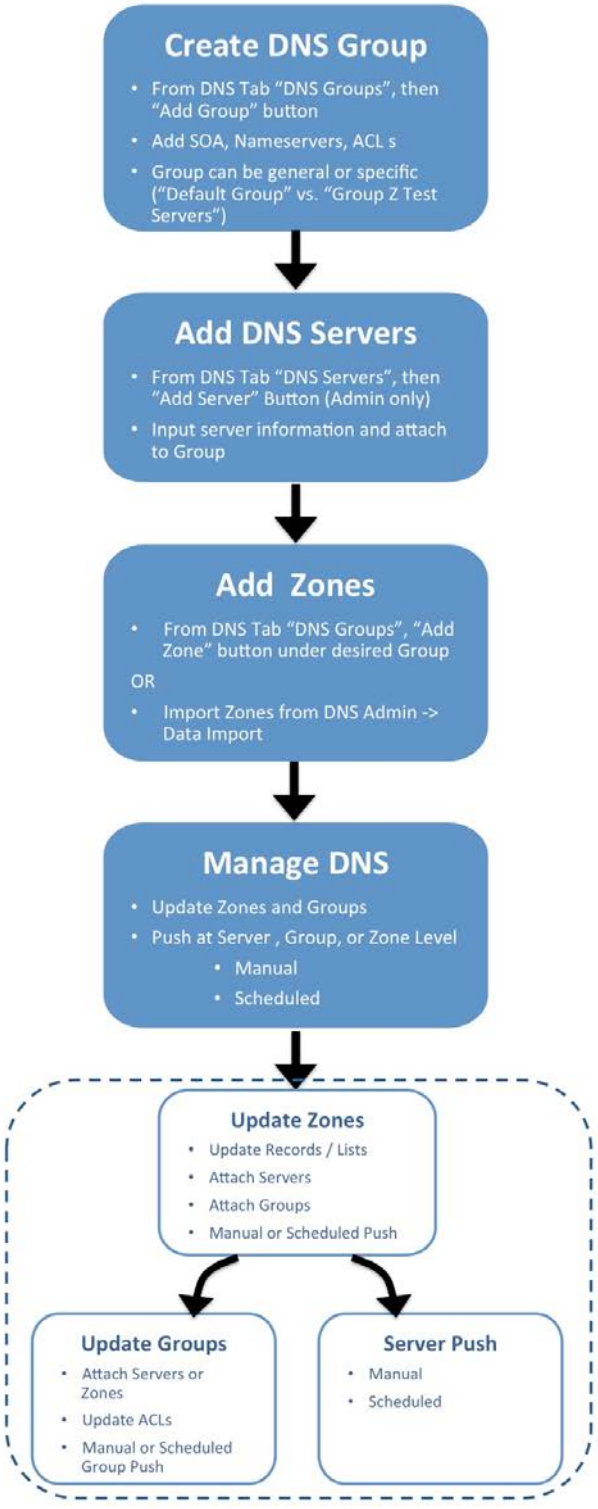
After groups have been set up, DNS servers should be added or settings verified. Admin users may add DNS servers from the DNS Servers tab "Add Server" button. Input the server information and save. Existing servers may be reviewed and edited by clicking on the server name in the DNS Server List. Once a server is created in ProVision, it may be attached to any DNS group under the group's "Attached Servers" module. Attaching a server to a group will allow for zones in that group to be pushed to the attached server(s). See Working with DNS Servers.

Next, add zones to your groups. Zones may be manually added under each group by clicking the "Add Zone" button in the DNS Groups or DNS Zones tabs, or it may be imported via DNS Importers into a selected group. Add the zone and record information, and save. See Working with DNS Zones for additional information.

Zones may only exist once per group, but may be duplicated under multiple groups. Zones may also be moved from group to group as needed.

At this point, all major components of the ProVision DNS system have been added - from here management tasks take over. Zones may be updated and moved to or from groups; Groups may be edited with different default values or servers, and pushes maybe be performed for an individual zone, a full group, or for an entire server. Pushes may be manual or scheduled for a future time through the Scheduler.

DNS WORKFLOW



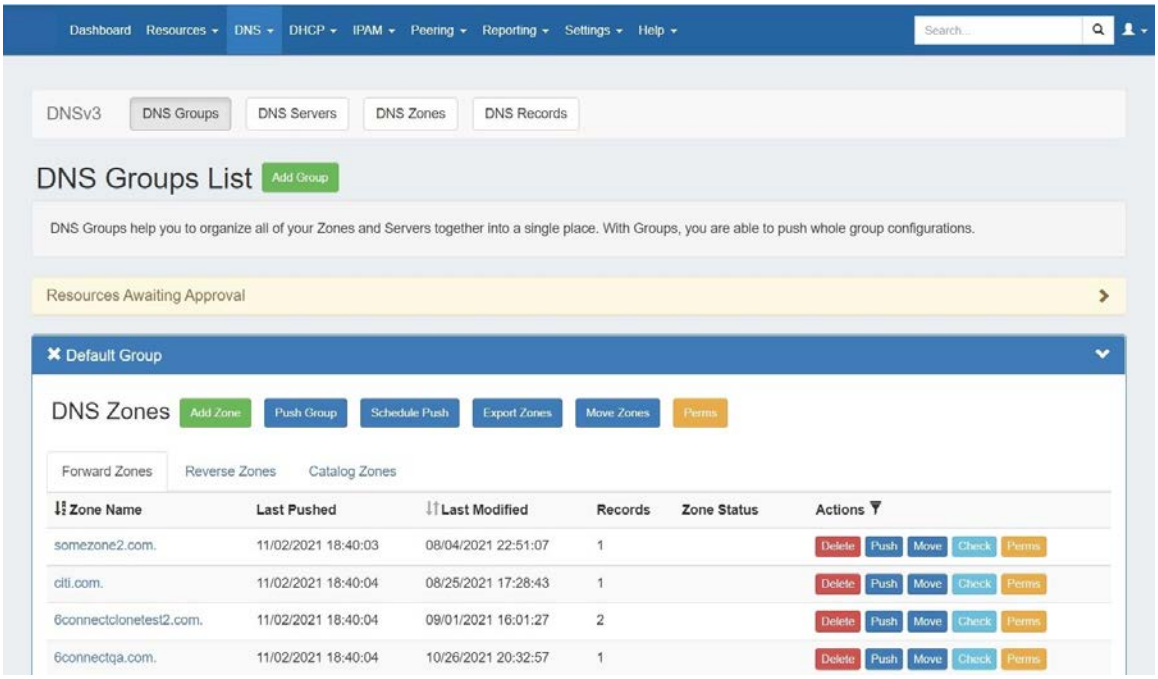
Additional Information

- Working with DNS Groups
- DNS Zones Overview
- Working with DNS Zones
- Working with DNS Records

- DNS Administration
- Importing Your Data
- Import DNS Zones

Working with DNS Groups

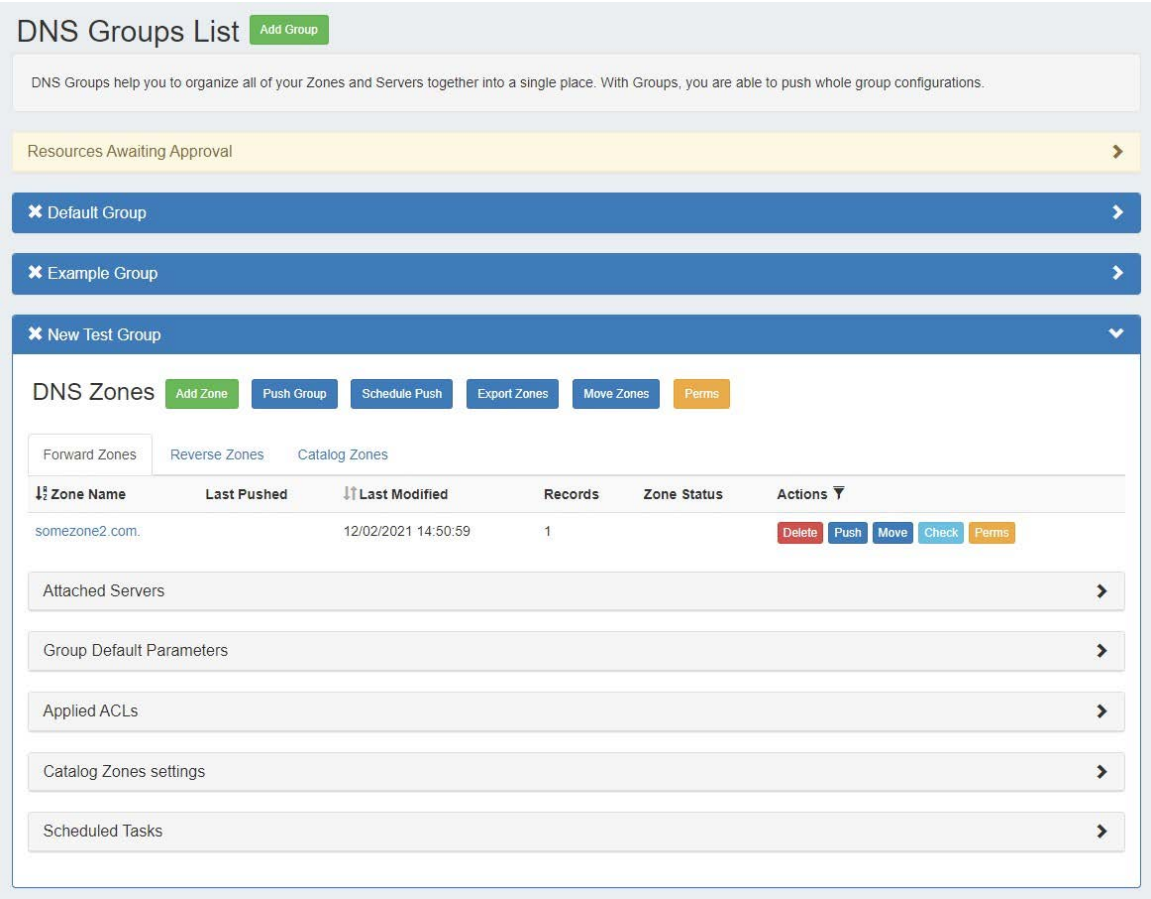
DNS Groups



The DNS tab **Groups List** allows you to create, view, and manage groups of DNS servers and zones. Using groups, you can configure and push selected combinations of zones at one time.

- DNS Groups
  - DNS Groups List Interface
- Working with DNS Groups
  - Add a Group
    - Create a Group
    - Navigating a Group
  - Edit a Group
    - Edit a Group Name
    - Edit Attached Servers
    - Edit a Group's Default Parameter Values
      - Edit Group Advanced Settings
      - Edit Nameservers
      - Edit Push Policy
      - Edit SOA Values
      - Save Changes
  - Add Zones to a Group
  - Pushing a Group
    - Manual Group Push
    - Scheduled Group Push
  - Delete a Group
  - Export a Group
  - Move a Group
  - Using the Templates Group / Cloning Zones to a Group
    - Create your template zone
    - Clone Template to a Different Group
  - Additional Information

DNS Groups List Interface



1) Add Group Button: Opens a dialog for creating a DNS group

2) Resources Awaiting Approval Module - Group Level: Lists pending DNS group level approval events either submitted by, or able to be approved/rejected by, the current user.

3) Group Container: The group container header shows the group name. Expand or close the group container by clicking on the expansion arrow (>) on the far right of the header. Clicking on the X will delete the group and all zones included in the group. Rename the group by clicking on the name, then typing the desired changes and clicking outside of the name.

Group Actions:



4) Add Zone Button: Opens a dialog for creating a DNS zone under that group.

5) Push Group Button: Pushes all zones in the group.

6) Schedule Push Button: Schedules a push of all zones in the group to the selected day and time. Requires the scheduler tab / cron tasks to be enabled.

7) Export Zones: Exports all zones in the group into a .zip file.

8) Move Zones: Moves all zones in a group.

9) Perms (Admin): Provides a shortcut for Admin users to change the group/user permissions for the DNS group.

10) Resources Awaiting Approval Module - Zone List Level: Lists pending DNS Zone List level approval events either submitted by, or able to be approved/rejected by, the current user.

11) Zone List: Forward and reverse zones included in the group.

12) Forward / Reverse Zones Tabs: Shows zone list containing only forward or reverse zones, respectively.

13) Zone Name (Sortable): The name of the zone. Clicking on the zone name will open the zone details window, showing individual records. Clicking on the "Zone Name" header will sort the zone list by ascending or descending by name.

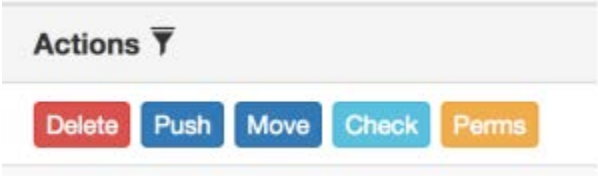
14) Last Pushed: The date and time the zone was last pushed.

15) Last Modified (Sortable). The date and time the zone was last modified. Clicking on the "Last Modified" header will sort the zone list by most / least recent modification date.

16) Records: How many records are in the zone.

17) Zone Status: Will notify if the zone or server connection contains errors, after a check has been performed (by clicking on the "Check" button). Clicking on the "Contains Errors" message will provide additional details on the error.

18) Actions: The actions that may be performed on each zone:



19) Delete: Deletes the zone from ProVision and removes the entry in ProVision conf file on the remote server(s) (the user will also receive a prompt to confirm they wish to complete the action)

20) Push: Pushes the zone to the associated server.

21) Move: Moves the zone to a different group.

22) Check: Performs a check on the zone, notifying the user if errors or warnings are present for the zone.

23) Perms (Admin): Provides a shortcut for Admin users to change the group/user permissions for the zone.

24) Attached Servers: Sets the server that zone and group pushes will be sent to. Click on the header title or > to expand or collapse. Admins and users with server/group parent permissions may view, attach, or detach a server from the group.

25) Group Default Parameters: Click on the header title or > to expand or collapse. Edit default group settings including nameservers, SOA values, and Push Policy.

26) Applied ACLs: Click on the header title or > to expand or collapse. Add or detach ACLs to the group.

27) Catalog Zone Settings: Click on the header title or > to expand or collapse. Enable / Disable Catalog Zones. Enabling Catalog Zone exports all zones inside the group into a new catalog zone, so that slave servers can receive zone changes.

28) Scheduled Tasks: If a scheduled push has been set up for the group, the task information will show in a "Scheduled Tasks" module. Click on the header title or > to expand or collapse. Review or delete scheduled group pushes.

Working with DNS Groups

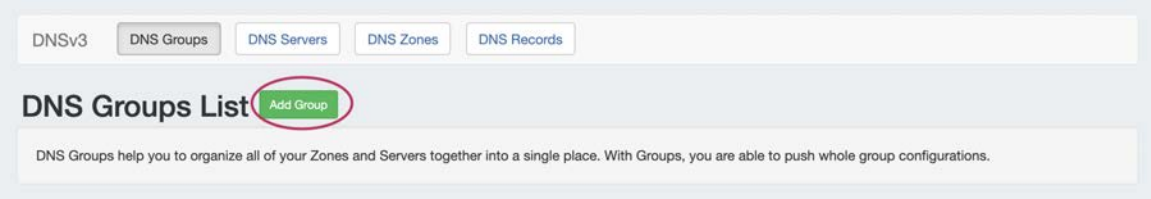
DNS groups allow for organizing multiple zones together and linking those zones with one or more servers. Default nameservers, SOA values, and ACL's are set at the group level, so different groups may have their own default values. Zones may be pushed individually, as a group, or at the server level.

ProVision automatically designates a Default Group for zones to be imported or added to, as well as a "templates" group for holding pre-DNSv3 templates or to hold new zones created as templates. Creating additional groups is completely optional.

Add a Group

DNSv3 automatically contains two groups - one Default Group to contain existing or imported zones, and a Templates Group, containing zones mimicking DNS templates. Additional groups may be added or removed at any time, and zones may be freely moved or duplicated between different groups as needed.

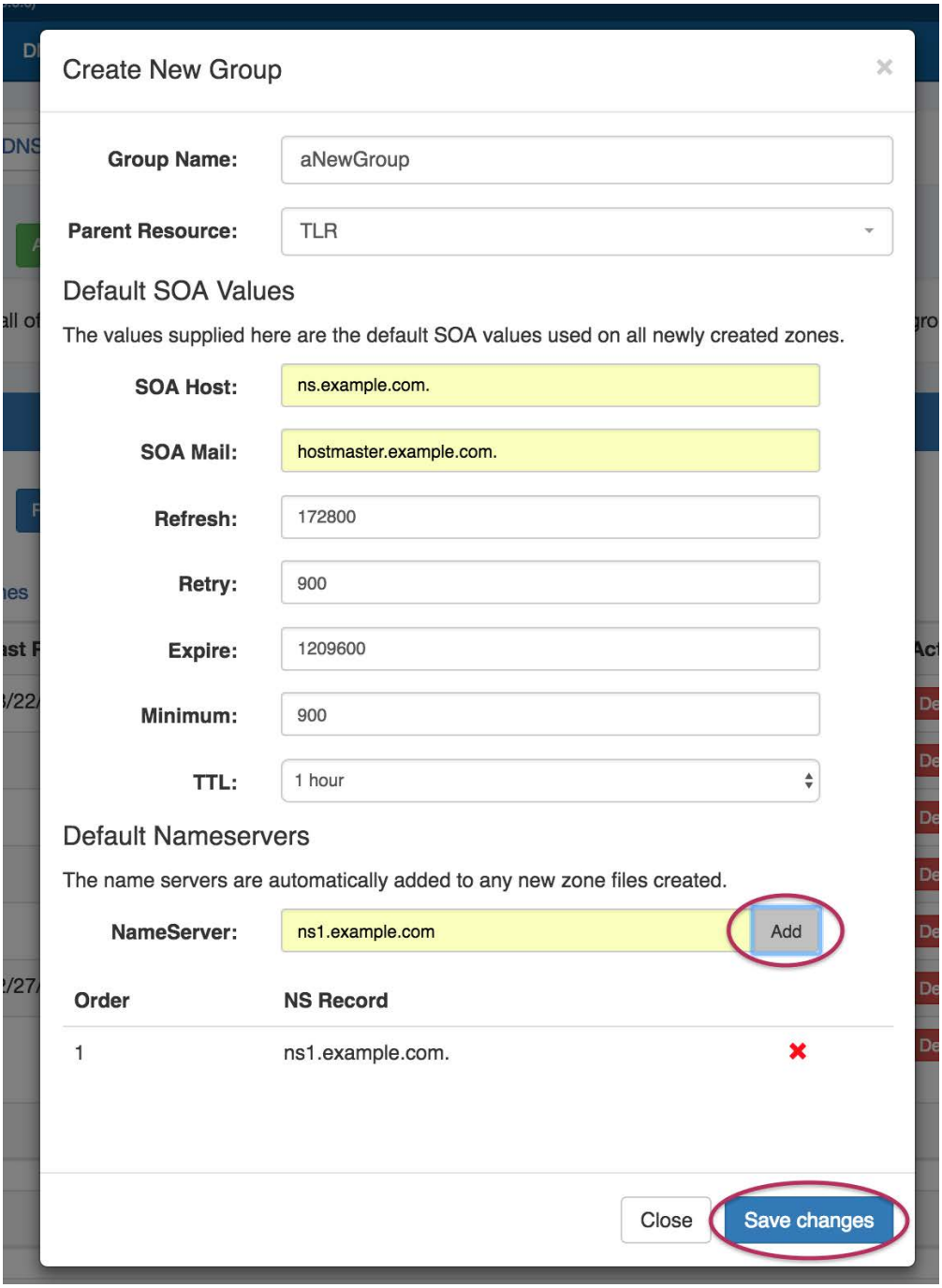
To create a new Group, from the DNS Tab, select the DNS Groups sub menu. Then, click the "Add Group" button next to "DNS Groups List".



This will open the "Create New Group" dialog.

Create a Group

In the "Create New Group" dialog, enter the desired group name, select a parent resource, enter the default SOA values, and add a default Nameserver (type the NS, then click "Add").

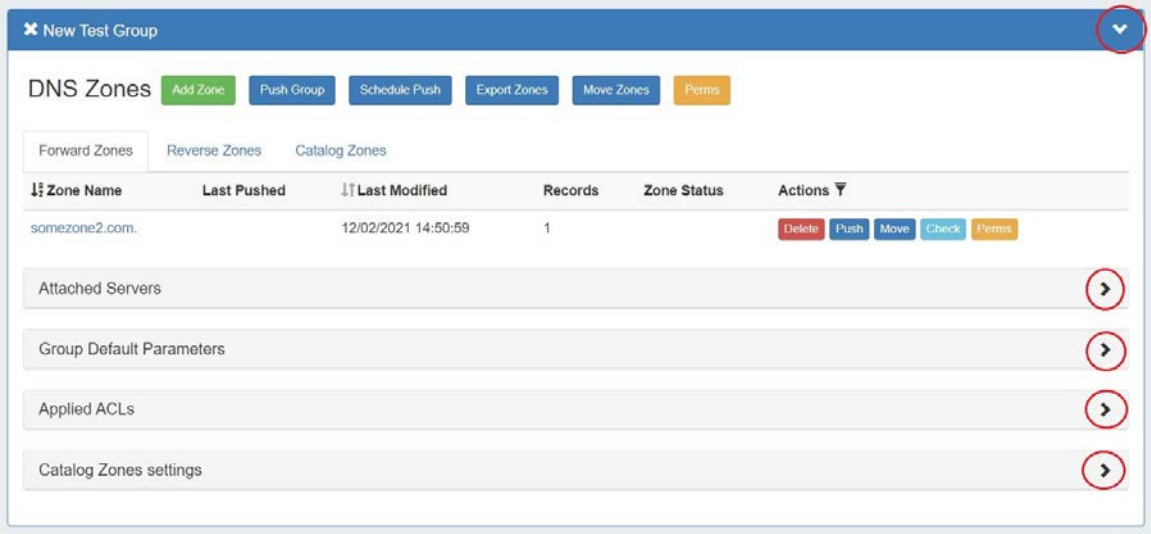


Click the "Save Changes" button when complete. The new group will be added to the DNS Groups List.

Navigating a Group

Open the group container for the new group by clicking on the expansion arrow at the top right corner of the header.

Information for Attached Servers, Group Default Parameters, Applied ACLs, and Catalog Zones settings may also be viewed and edited by clicking on the expansion arrows for each section.



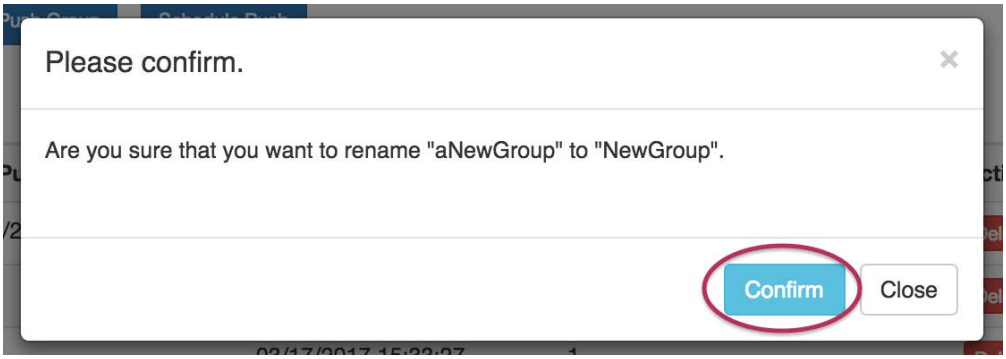
Edit a Group

Edit a Group Name

Edit the name for a group by clicking inside the group's name. A highlight box will appear around the name, and a cursor inside the box.



Edit the text as desired using your mouse or arrow keys to navigate through the text. When complete, click anywhere outside of the name box, and a confirmation dialog will appear.



Click "Confirm" to save your changes, or "Close" to exit without saving.

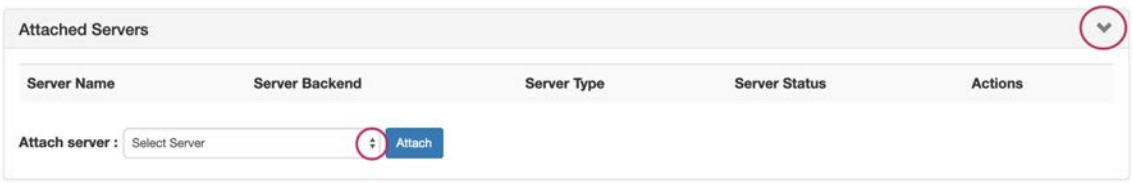
Edit Attached Servers

Users may attach or detach servers from a group if they have either of the following permission types:

- TLR Admin permissions
- Full permissions on both the DNS server(s) and the parent resource set for the DNS group

If either condition is met, the user may view and attach/detach the applicable server(s) to a group.

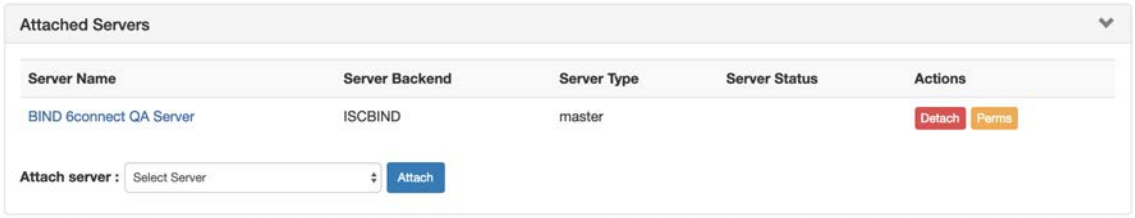
To attach a server, expand the "Attached Server" module, and click on the Attach Server list.



Select the desired server, then click "Attach".

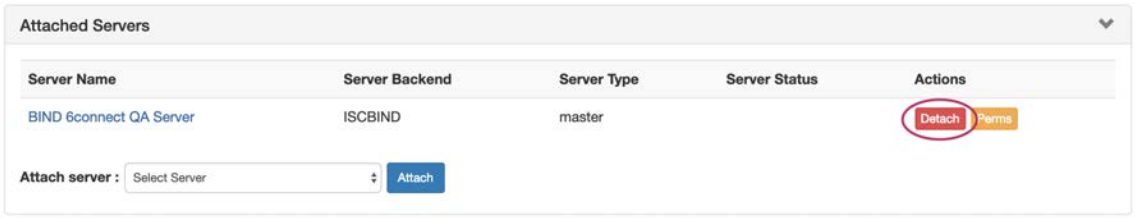


The server is now attached to the group, and future zone and group pushes will be sent to the attached server.



From here, users have the option to detach the server if desired, by clicking the "Detach" button.

Admin users may edit permissions for the server using the "Perms" button, if desired (see: DNS Tab DNSv3 Permissions for additional information).



Edit a Group's Default Parameter Values

Under the desired group, expand the "Group Default Parameters" module by clicking on the expansion arrow.



Save your changes!

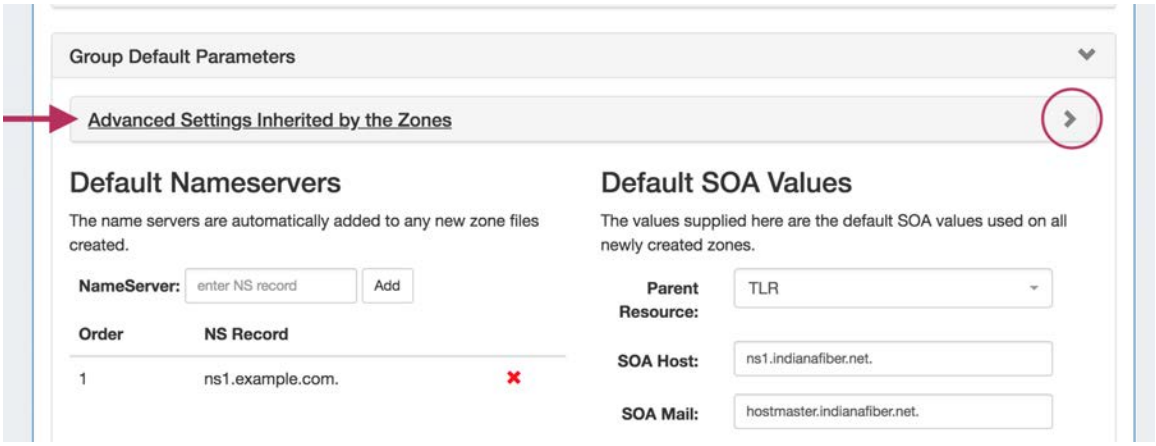
Important - to ensure that your changes are saved while working in Group Default Parameter, click the "Save Group Defaults" button under the Default SOA Values section - this save button will save any changes made to Advanced Settings, Default Nameservers, or Default SOA Settings.

Push Policy changes can be saved by clicking "Save Push Policy".

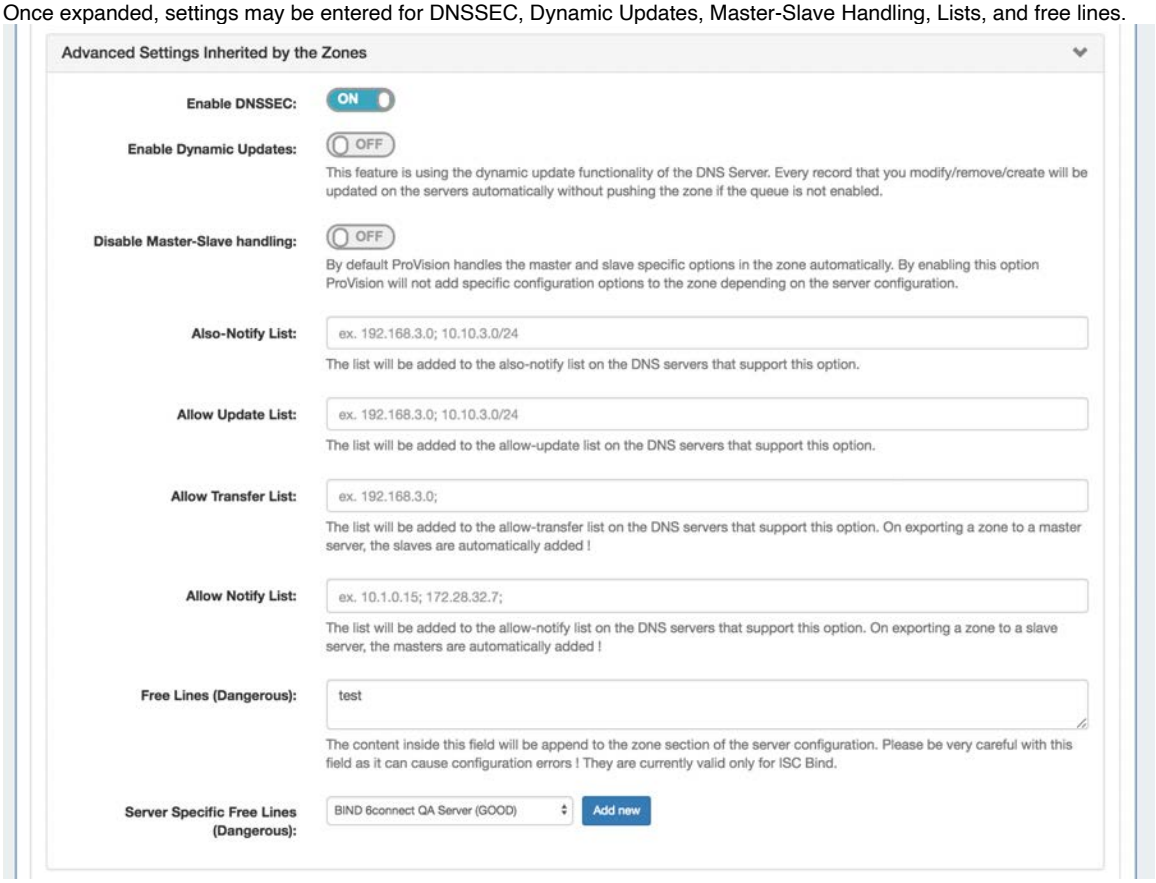
Edit Group Advanced Settings

Open the "Advanced Settings Inherited by the Zones" module by going to any DNS group and opening the "Group Default Parameters".

The Advanced Settings module will be at the top of Default Parameters area. To expand it, click on the expansion arrow on the right side of the header bar.

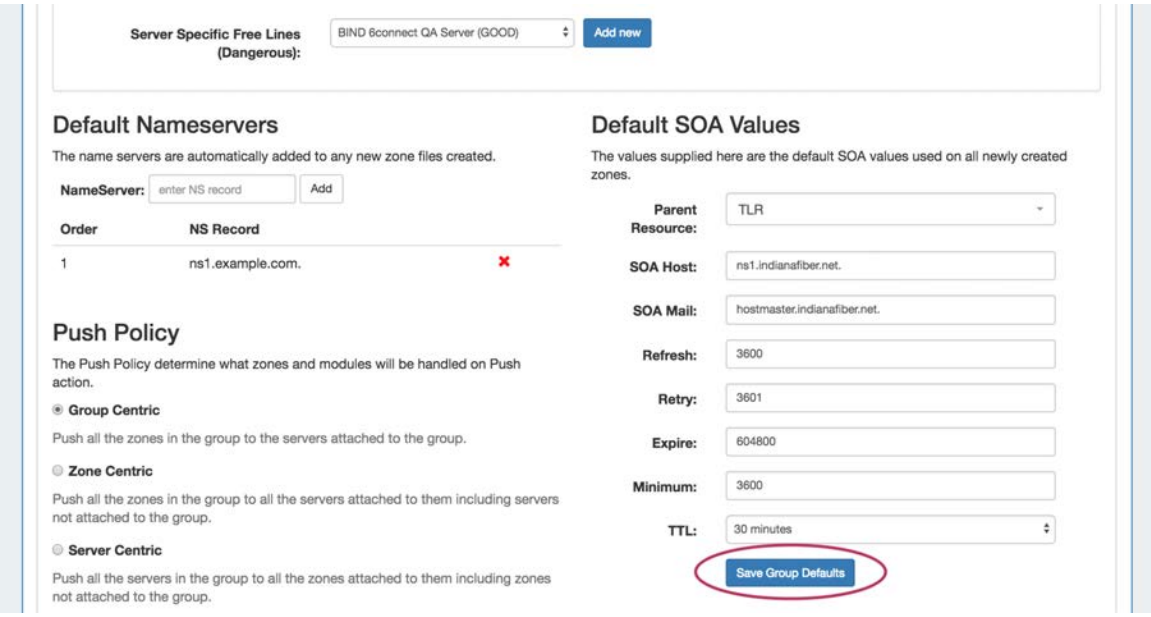


Once expanded, settings may be entered for DNSSEC, Dynamic Updates, Master-Slave Handling, Lists, and free lines.



Save your changes!

Important - to ensure that your changes are saved, click the "Save Group Defaults" button under the Default SOA Values section - this save button will save any changes made to Advanced Settings, Default Nameservers, or Default SOA Settings.

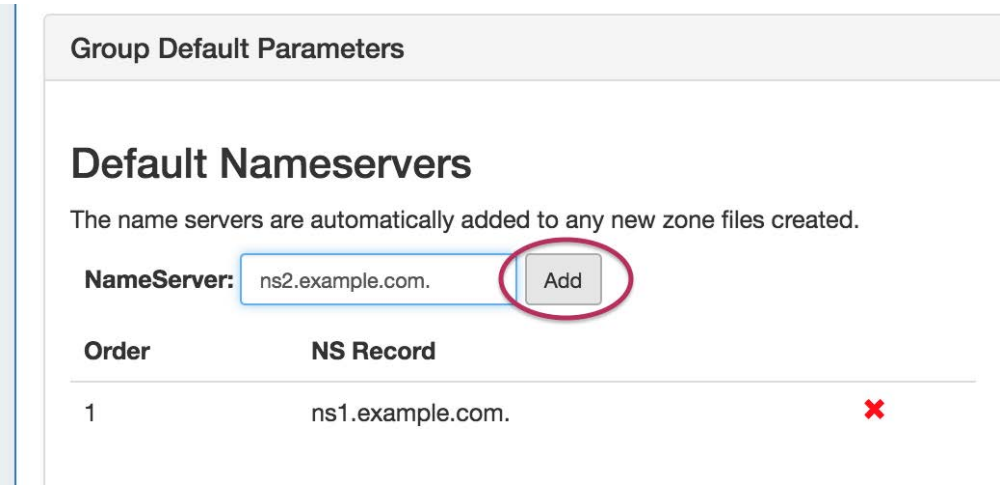


Edit Nameservers

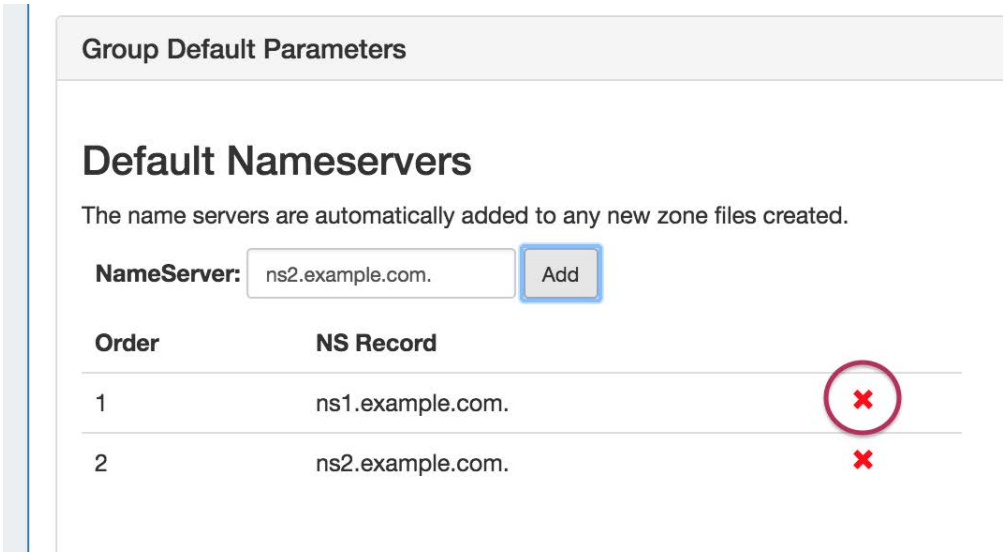
Default Nameservers are automatically added to any newly created zone files.

You may choose not to set a default nameserver, however, an empty Nameservers list can cause invalid zones.

Change a Nameserver by typing the new NS record into the Nameserver box, then click "Add".

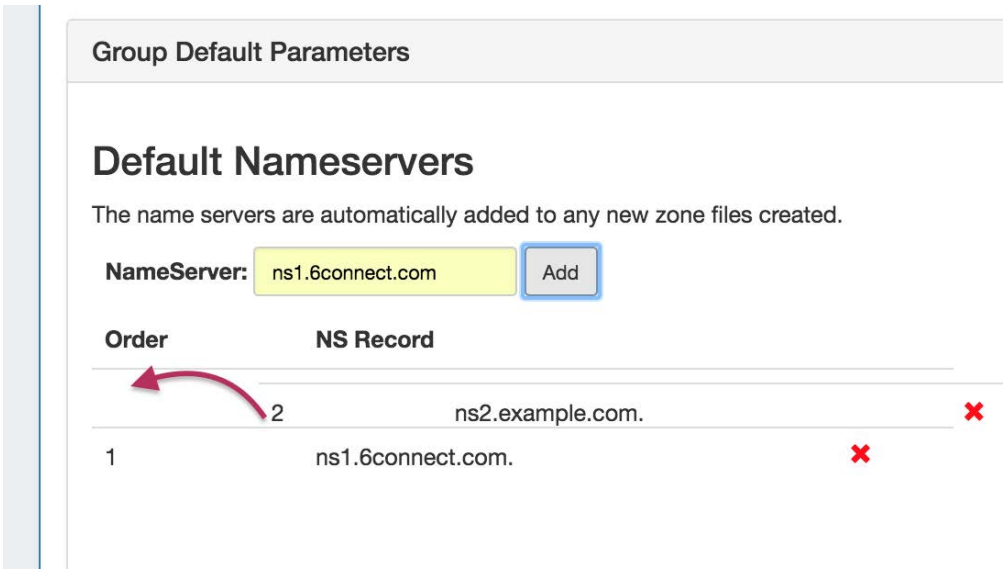


Delete the previous Nameserver by clicking on the red "X" to the right of the NS record.



Change the order of multiple Nameservers by left-clicking (holding the mouse button down) over the NS record to move, dragging to its desired placement, then releasing the mouse button.

The NS record will drop into its new location, with the order updated.

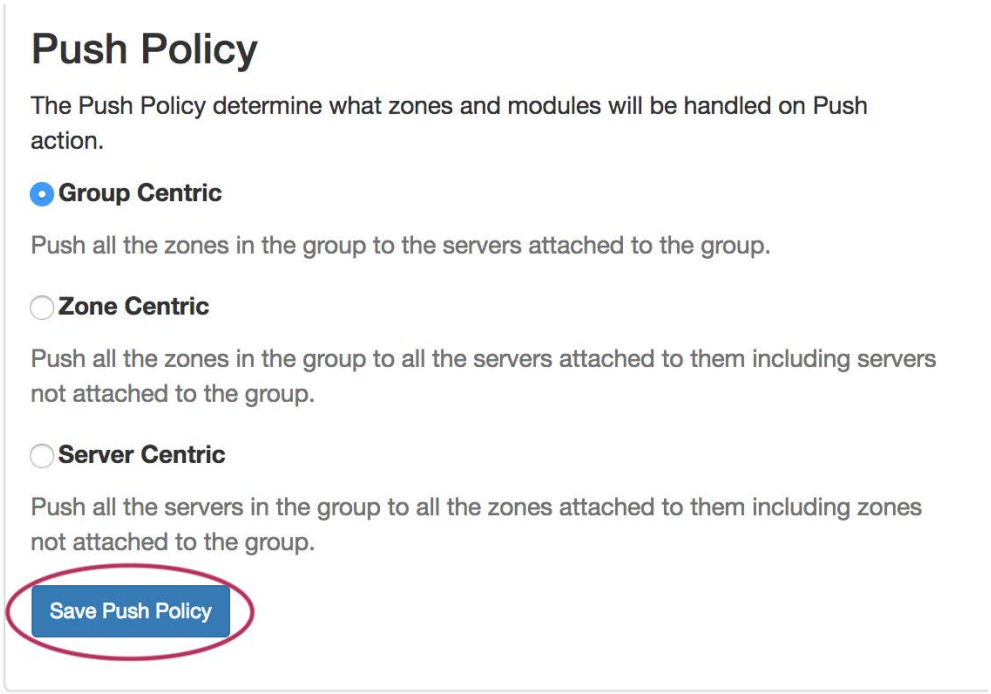


Save your changes!

Important - to ensure that your changes are saved, click the "Save Group Defaults" button under the Default SOA Values section - this save button will save any changes made to Advanced Settings, Default Nameservers, or Default SOA Settings.

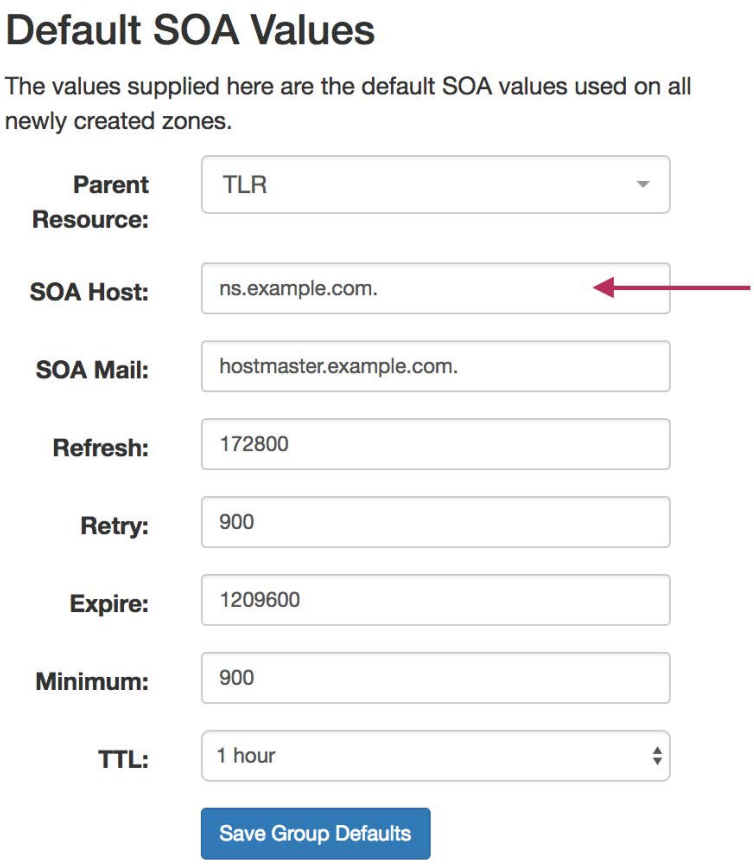
Edit Push Policy

Edit the push policy by selecting the radio next to the desired push behavior ("Group Centric", "Zone Centric", or "Server Centric") and click "Save Push Policy".



Edit SOA Values

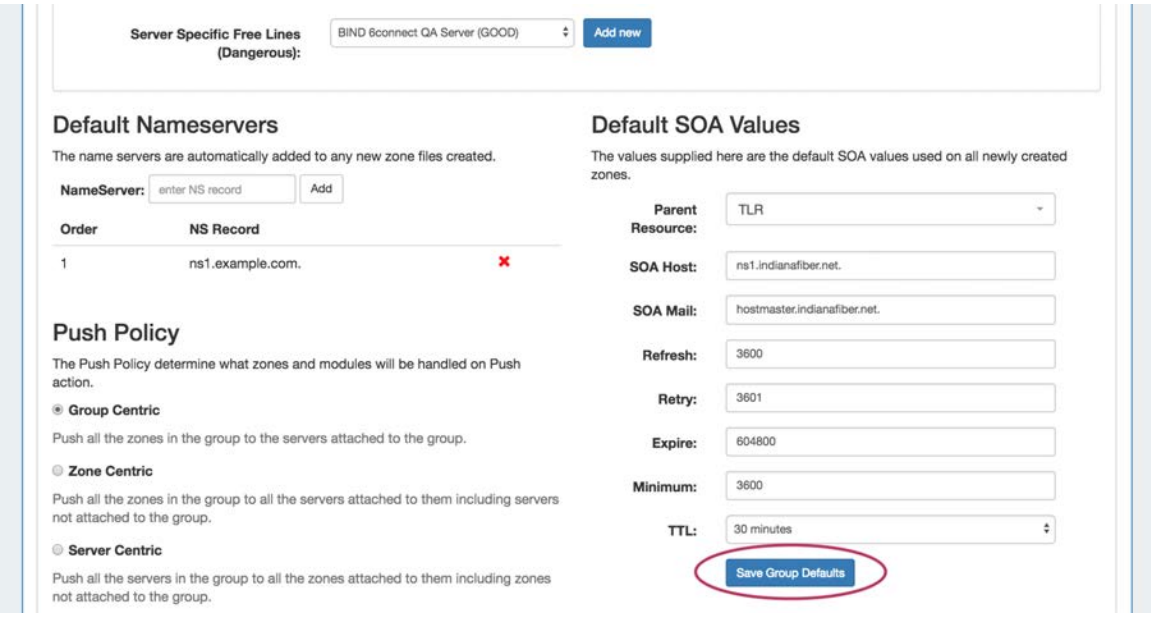
To edit the Default SOA values, simply click inside the value to be changed and type or select your new value. Be sure to also verify the desired parent resource for the group, as the resource selected determines the group's permissions.



Save Changes

Save all Nameserver, Advanced Settings, and SOA value changes by clicking on the "Save Group Defaults" button at the bottom of the section.

Closing without saving will cause all changes to be lost.



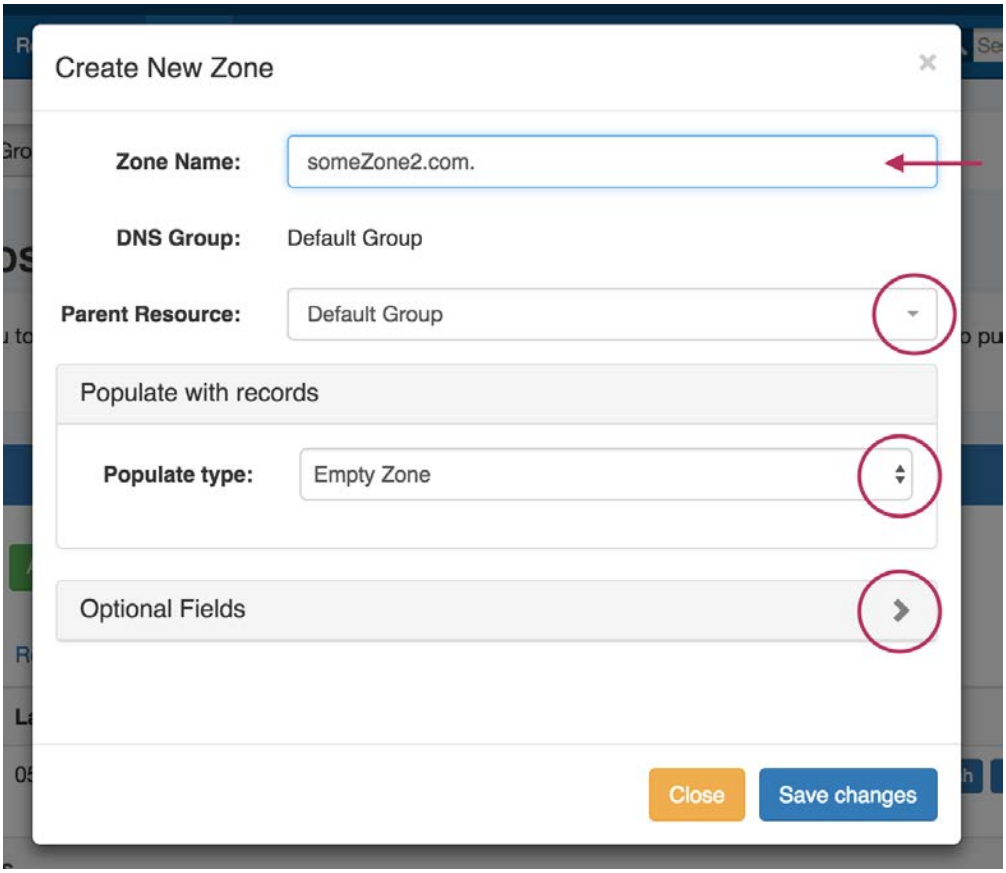
Add Zones to a Group

To add a new zone to a group, click the "Add Zone" button inside the desired group.



Fill in the zone name, select a parent resource (by default, the group is selected), select a populate type, and fill in any optional fields.

For more detail on each of these options, see Working with DNS Zones - Add a Zone.



When complete, hit the "Save Changes" button.

Pushing a Group

Before pushing a group for the first time, verify the settings in the following areas are correct:

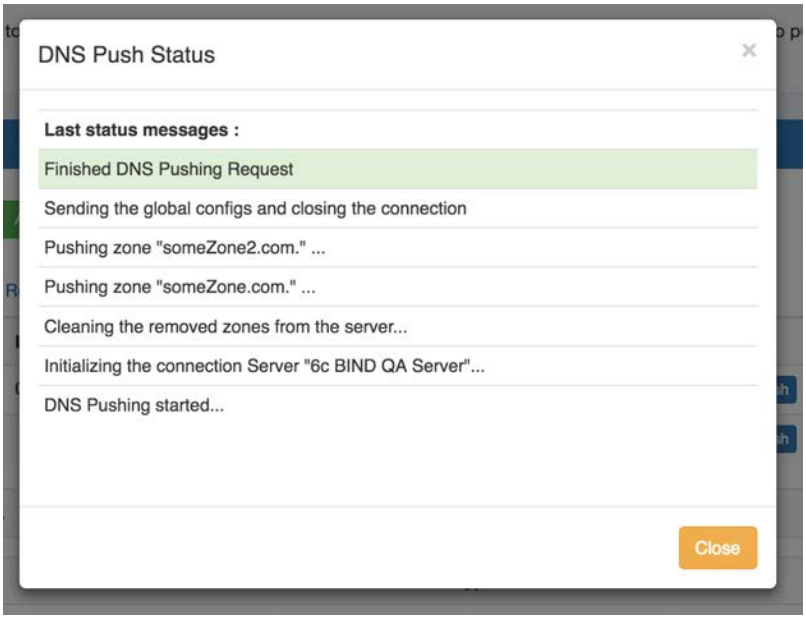
- Under "Attached Servers", verify that the correct server is attached to the DNS group.
- Under "Group Default Parameters" verify SOA Settings, Nameservers, and the Push Policy are set.

Manual Group Push

After verifying the attached server and group settings, manually push the group by clicking the "Push Group" button under the desired group.



A DNS Push Status window appears, showing each zone in the group as it is pushed to the attached server. If successful, a green "Finished DNS Pushing Request" will appear as the final message. If errors occur, an error message will show with details on the issue. When complete, hit the "Close" button.

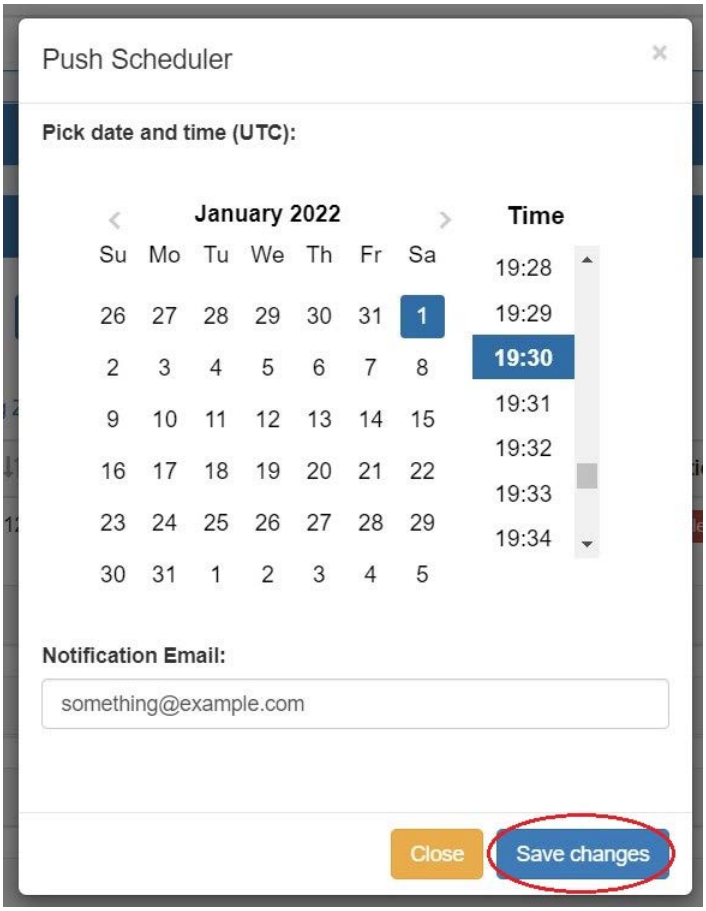


Scheduled Group Push

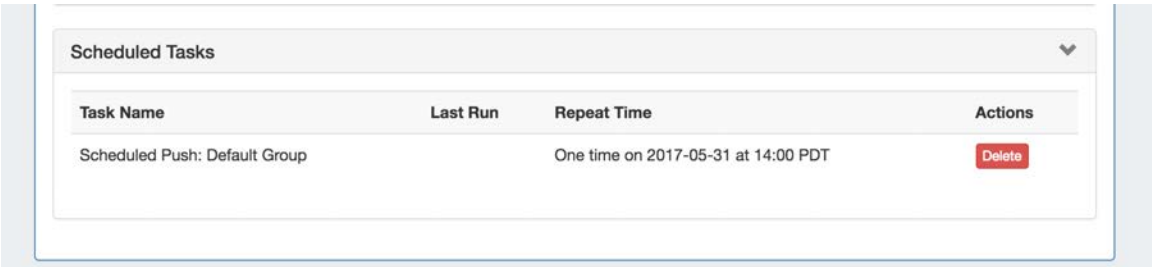
Scheduled pushes may be set up through the "Schedule Push" button for the group.



Click "Schedule Push" for the group, then select a date, time (24 hour), add a notification email address, and click "Save changes".



The scheduled task will be shown in both the group details (under "Scheduled Tasks") and the Admin Scheduler task list.



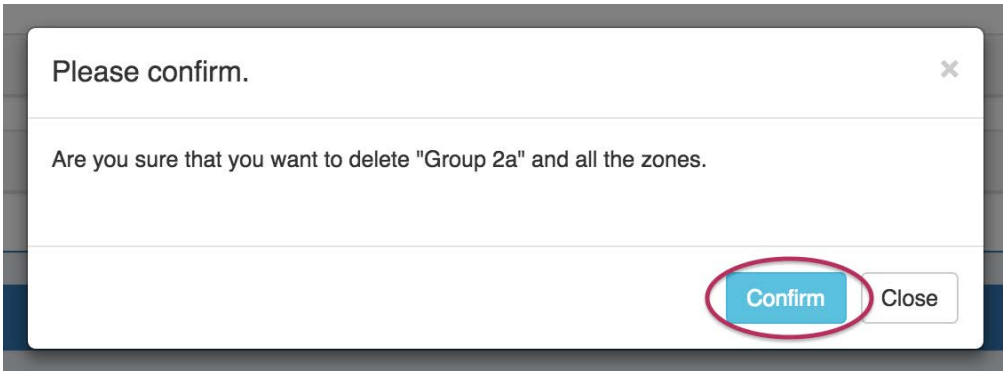
The task may be deleted prior to running by clicking the "delete" button, but will automatically be removed once completed.

Delete a Group

Delete a non-Default Group by clicking on the "X" to the left of the group's name in the DNS Groups List.



A confirmation message will appear, click "Confirm" to save your changes, or "Close" to exit without saving.



The Default Group may not be deleted.

Export a Group

All zones under a DNS group may be exported to a .zip file by clicking the "Export Zones" button at the top of the group module.

The exported .zip file may be used with ProVision's BIND DNS Zone Upload / Import tool.



Move a Group

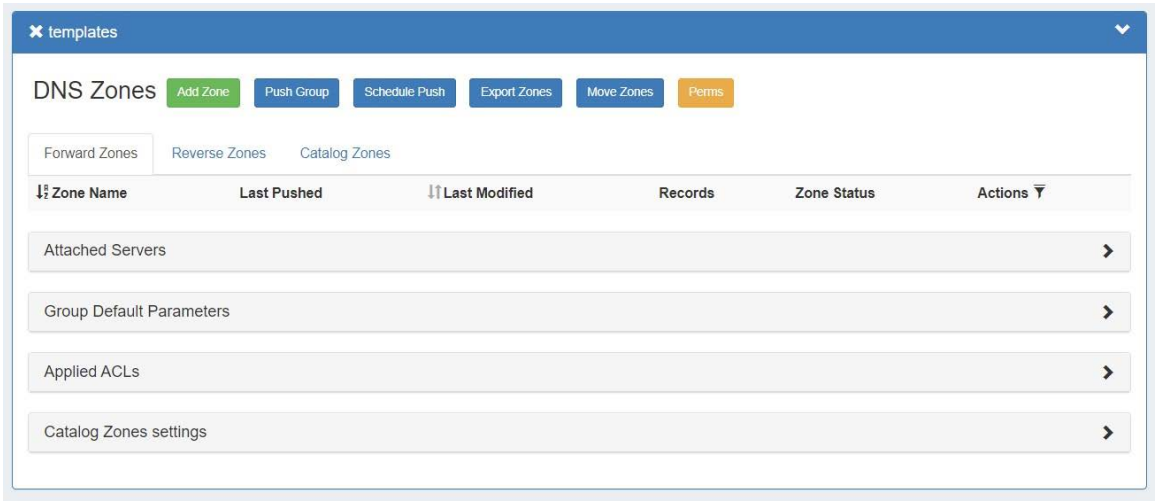
All zones under a DNS group may be moved to another group by clicking the "Move Zones" button at the top of the group module.



Using the Templates Group / Cloning Zones to a Group

By default, a "templates" group is included in DNSv3.

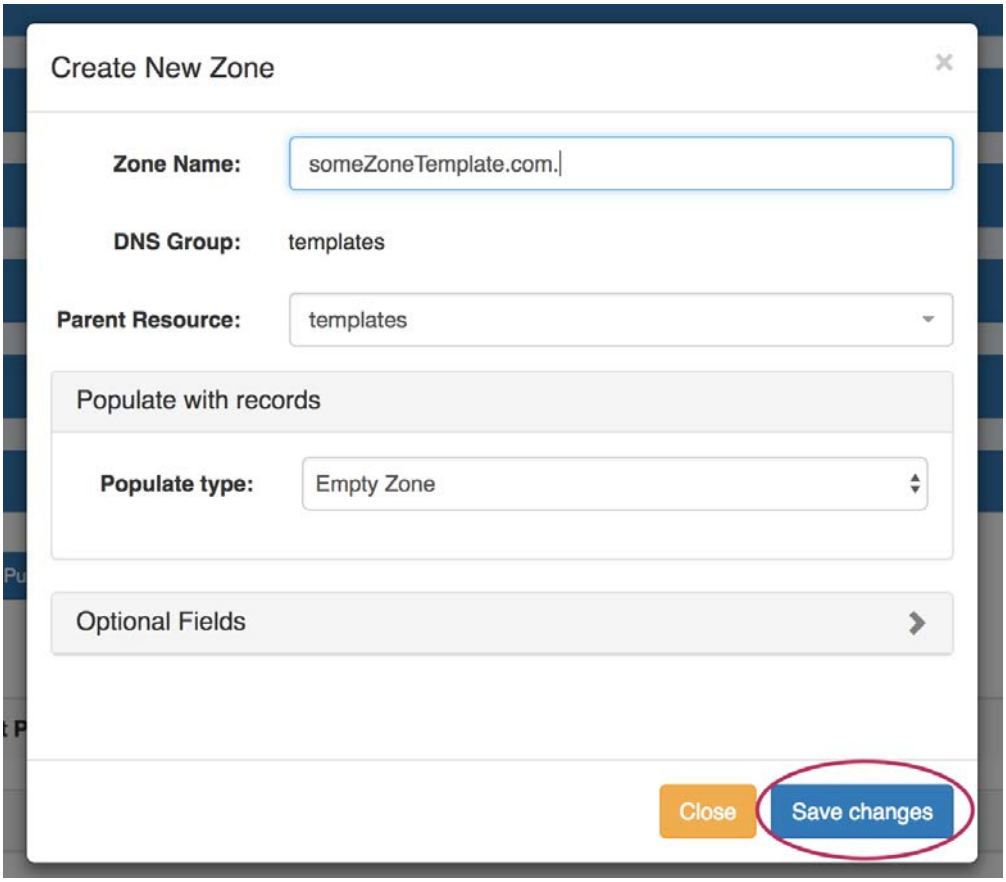
Any pre-DNSv3 DNS Templates will be included in this group, as well as any newly created zones to be used as template zones.



The template group functions the same as any other DNS Group, but gives a holding place for zones designed as templates separate from other zones.

Create your template zone

Add a template zone by clicking the "Add Zone" button, giving the zone a descriptive name to clearly identify as a template, select the populate type, and fill in any optional data. (see Working with DNS Zones - Add a Zone.)

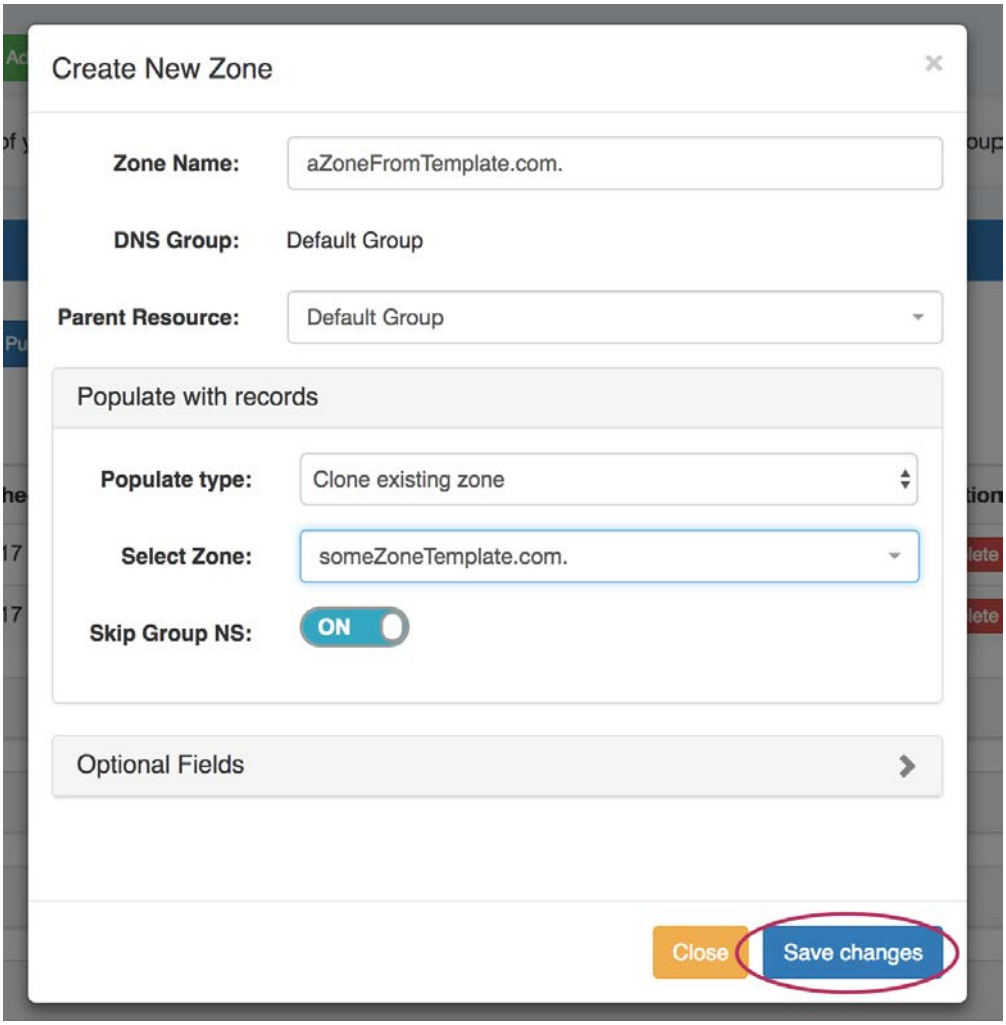


Once the zone has been created, it will show in the templates group zone list, and is now selectable as a base for the "clone existing zone" option when creating a new zone.

Clone Template to a Different Group

Go to a different group, and click "Add Zone". Enter in the new zone name and parent.

Under "Populate Type", select "Clone existing zone" and select /search for the template zone you created.



Edit the optional fields as needed, and click "Save changes".

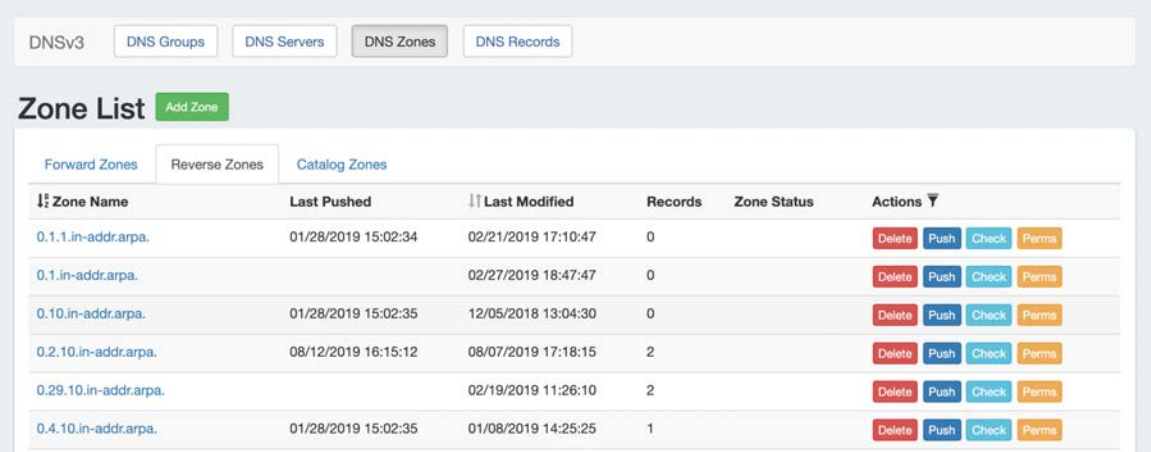
Additional Information

For more information on DNSv3 tasks, see:

- Working with DNS Zones
- DNS Zones Overview
- DNS Administration
- Working with DNS Servers
- Approvals

Editing DNS Zones

DNS Zones



DNS Zones are accessed under the **DNS** tab, **DNS Groups** or **DNS Zones** sub-tabs. The **DNS Zones** sub-tab features the DNS Zone List - a straightforward list of all zones existing in ProVision, including those not attached to DNS Groups. From here, you can create a new zone, view all Forward, Reverse, and Catalog zones, delete, push, check, view pending approvals, or edit permissions (admin only) on a zone.

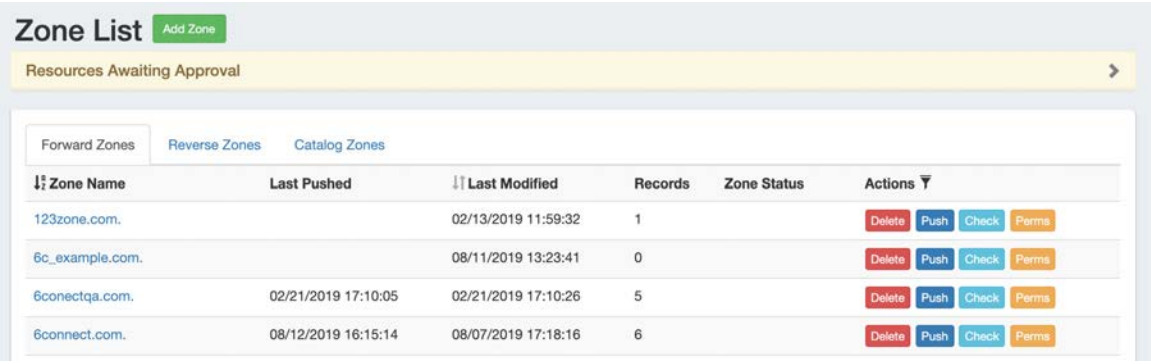
This page focuses on a general UI overview of the DNS Zones and Zone View pages.

For detailed instructions on how to perform specific zone tasks, see Working with DNS Zones.

- DNS Zones
  - DNS Zone List Interface
  - Sort / Filter the Zone List
  - Resources Awaiting Approval
  - View Zone Details (Zone View Page)
  - Additional Information:

DNS Zone List Interface

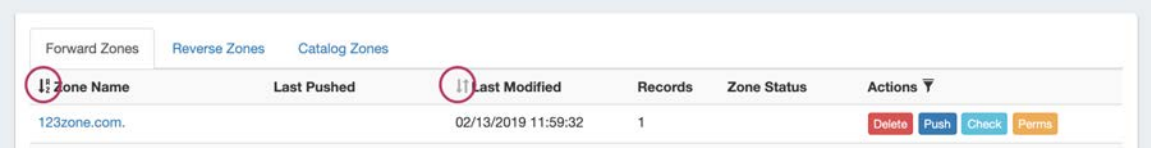
The DNS Zone List shows all zones existing in ProVision, organized into three tabs - Forward, Reverse, and Catalog Zones. By default, the zones load in ascending alphabetical order with 25 zones per page. To switch between the two lists, simply click on the tab for the desired zone type.



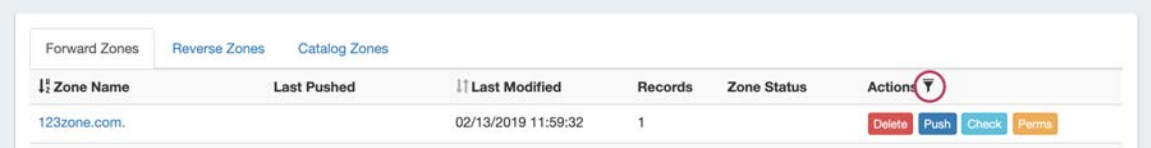
Sort / Filter the Zone List

The Zone list may be sorted by either "Zone Name" or by "Last Modified" time.

To sort the Zone List, click on the up/down arrows next to either column header to toggle between ascending/descending order.



To filter the Zone List, click on the filter icon next to "Actions".



Then, type in all or part of the zone name and select "Partial" or "Exact Match" from the dropdown, or select zone status. Click "Filter."



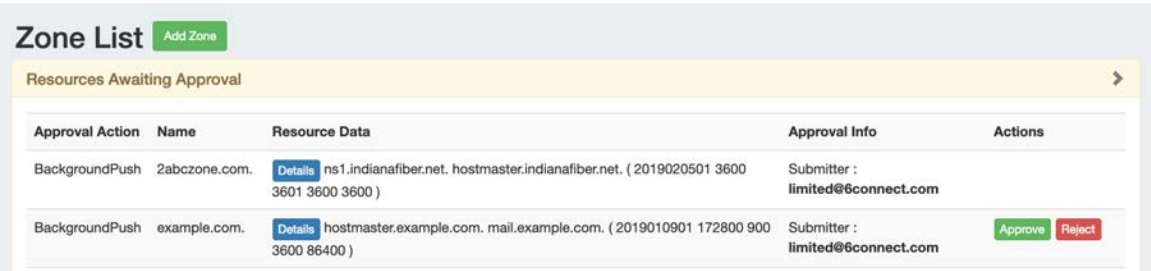
The zone list will filter the zones to only those fitting the selected criteria.

Resources Awaiting Approval

If the Approval system is in use, pending zone approval items will be shown in a "Resources Awaiting Approval" module above the Zone List.

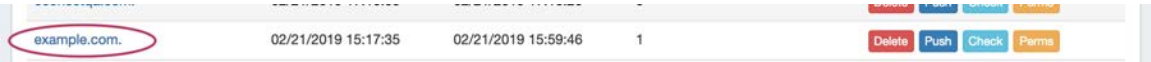
Users who submitted a change for approval will see the details of their change request in this module.

Admin users with permissions to approve or reject the request will have the option to Approve or Deny the change.



View Zone Details (Zone View Page)

To view details or manage a zone, click on the zone name from any Zone List to go to the Zone View page.



Additional information on the Zone View page is available in the next section, Zone View.

Additional Information:

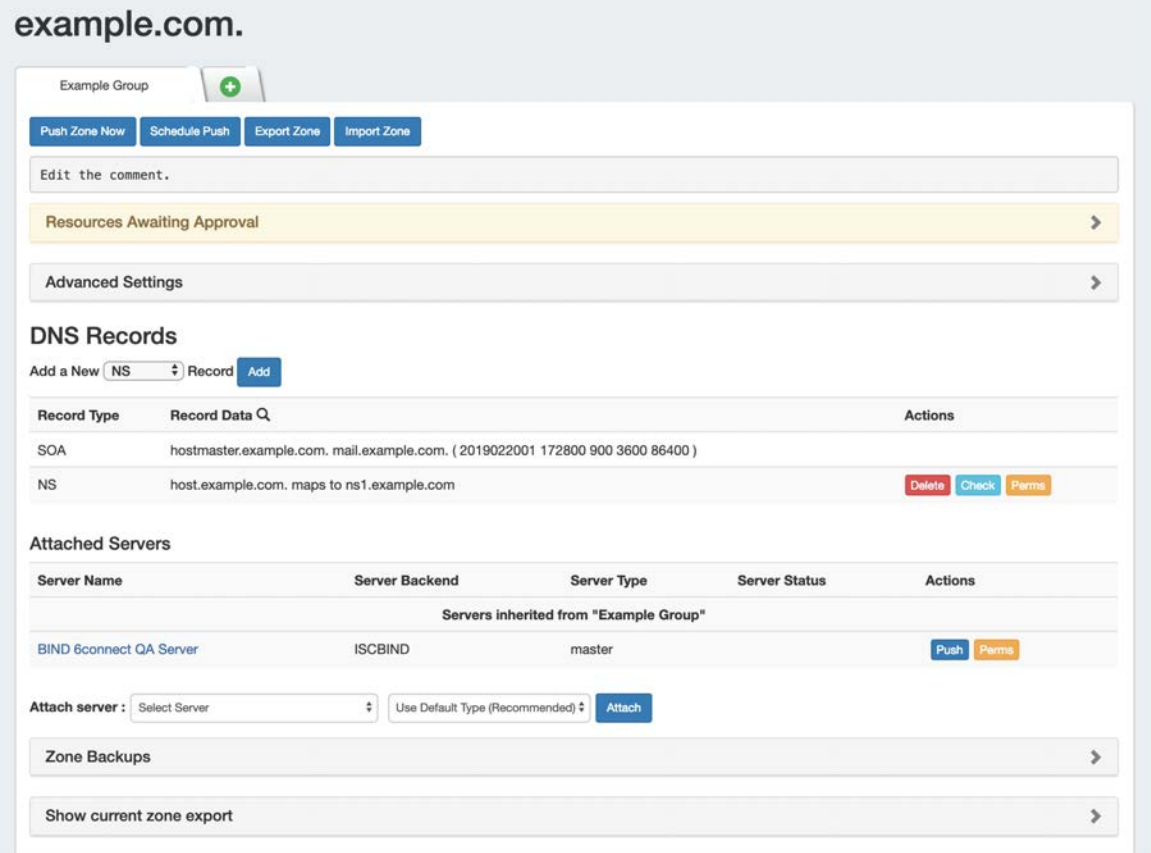
For more information on working with DNS Zones, Groups, and Servers, see the following sections:

- Zone View
- Working with DNS Groups

- Working with DNS Zones
- DNS Administration
- Import DNS Zones
- Approvals

Zone View

The Zone View Page



Zones may be edited by clicking on the Zone name in any zone list in which it appears - from the DNS Zones Zone List, zones listed under DNS Groups, under DNS Server attached zones list, or from the DNS Gadget.

Clicking on the zone name opens up the Zone View page, from where comments may be added, records added or updated, servers attached to the zone, advanced settings edited, backups restored or the zone pushed / exported.

> This section focuses on a general UI overview of the Zone View page.
>
> For detailed instructions on how to perform specific zone tasks on this page, see Working with DNS Zones.

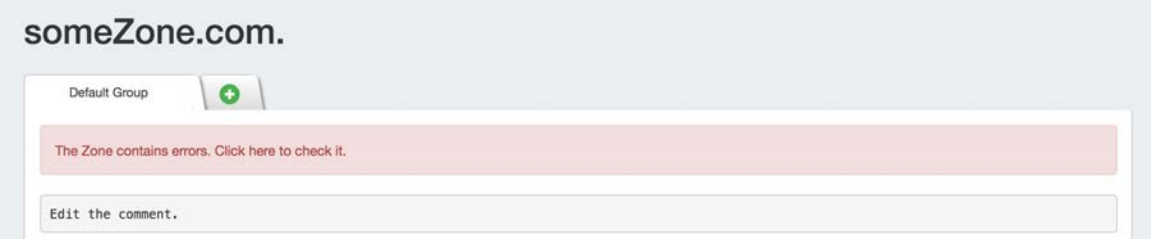
Areas of the Zone View page include:

- The Zone View Page
  - Error Notification
  - Zone Actions
  - Comments
  - Pending Approvals
  - Advanced Settings
  - DNS Records
    - Filter Records
  - Scheduled Tasks
  - Attached Servers
  - Zone Backups
  - Current Zone Export
  - Additional Information:

Error Notification

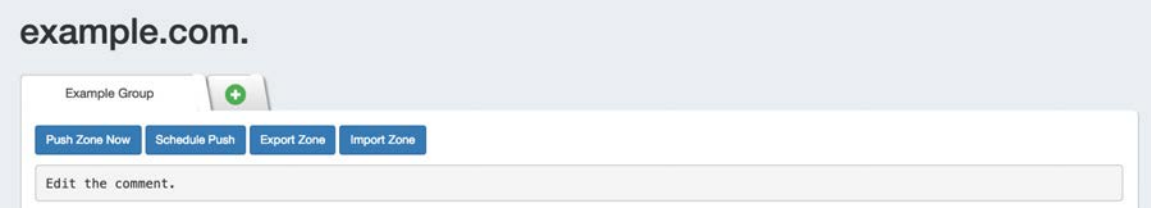
If errors are detected for the zone, an error notice will be given at the top of the group tab for the zone. To review the error, click on the message, and it will list the number of errors present, and details if available.

Records will errors will be highlighted in red in the records list.



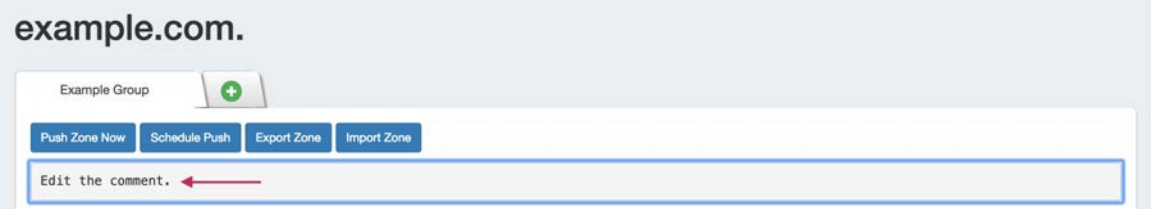
Zone Actions

Zone actions that may be taken include pushing the zone ("Push Zone Now"), scheduling a zone push ("Schedule Push") or exporting the zone to a .zone file ("Export Zone").



Comments

To add a comment to a zone, click anywhere inside the comment area and begin typing. The comment will be saved when an area outside of the comment box is clicked, deselecting the comment area.

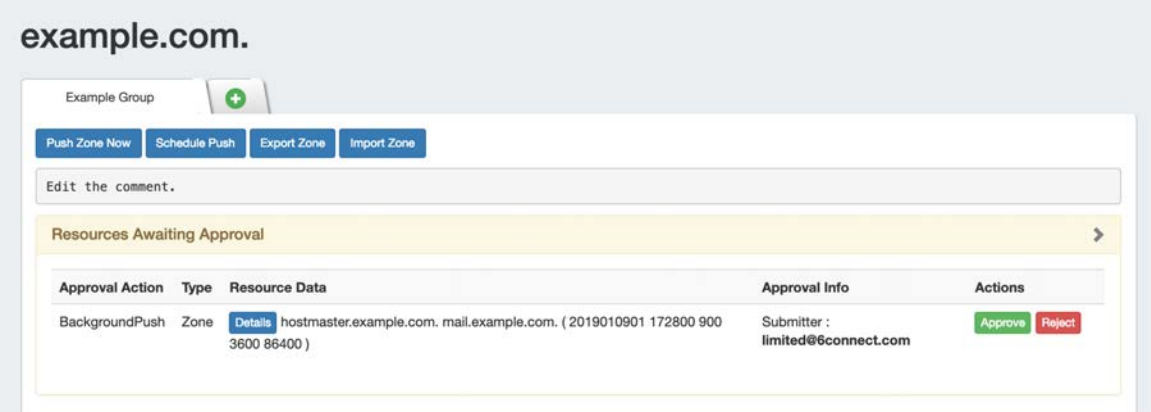


Pending Approvals

If the Approvals system is used, pending approval events for the zone or records will appear in an expandable module under the zone comment.

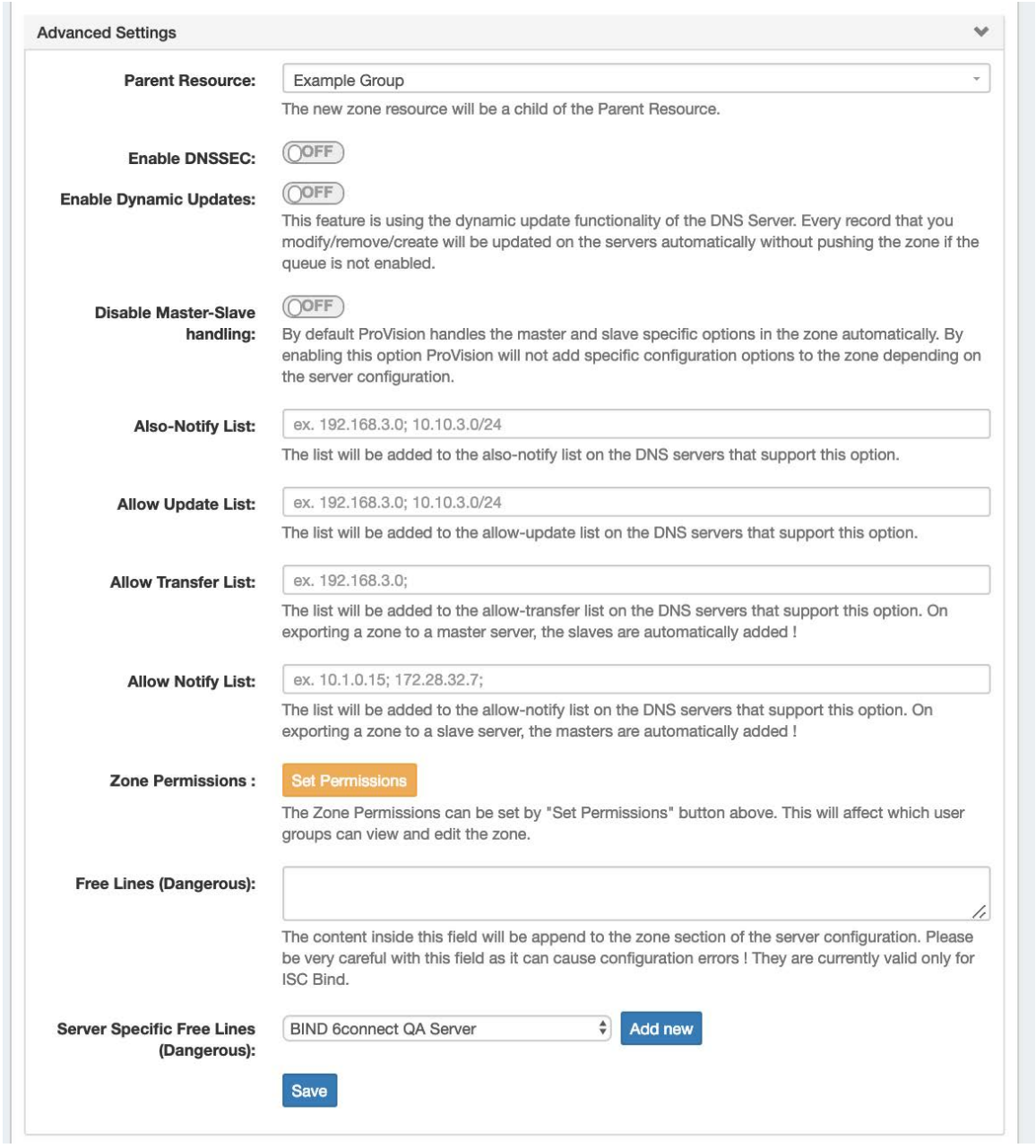
Users who submitted a change request will see the action and data details for their request.

Admin users who can approve/reject the change will see all details plus buttons to Approve or Reject the change. See Approvals for additional information.



Advanced Settings

Open the zone "Advanced Settings" section by clicking on the header or the expansion arrow (>).



Here, you will find options for:

Parent Resource: Sets the zone's Parent Resource, which affects the permissions access for the zone. By default, the parent is set as the DNS Group the zone is in.

Enable DNSSEC: Toggle "On" or "Off" to enable DNSSEC for the zone, if supported by the attached server.

Enable Dynamic Updates: Toggle "On" or "Off" to enable Dynamic Updates for the zone, if supported by the attached server.

Also-notify List: Add IPs to also-notify list of the attached DNS sever, if supported.

Allow Update List: Add IPs to the allow updates list of the attached DNS sever, if supported.

Allow Transfer List: Add IPs to the allow transfer list of the attached DNS sever, if supported. Slaves are automatically added if exporting a zone to a master server.

Allow Notify List: Add IPs to the allow notify list of the attached DNS sever, if supported.

Zone Permissions (Admin): Directly adjust User Group CRUD permissions for this zone.

Free Lines: Enter free lines to append to the zone section of the server configuration for the attached server (ISC BIND only). Use with caution - this can cause configuration errors if mistakenly included.

Server Specific Free Lines: Select a DNS server and click "Add New" to add server-specific Free Lines.

Save Button: Be sure to click "save" when edits are complete, or changes will not be saved.

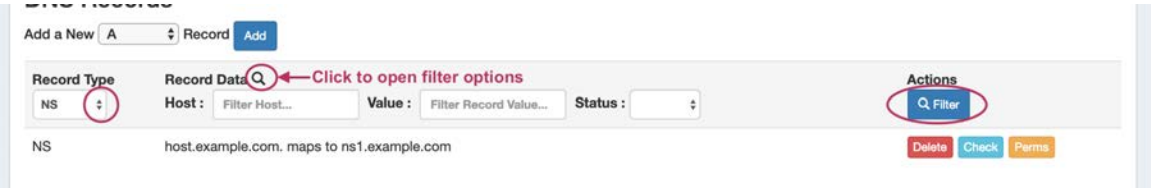
DNS Records

The DNS Records list on the View zone page contains options to add a new record of the selected type, edit record information, delete a record, check record, or edit permissions (admins only).



Filter Records

Filter the records list by clicking the "filter" icon next to "Record Data".



Then, select the desired record type, host / value names, or status. Then, click "Filter".

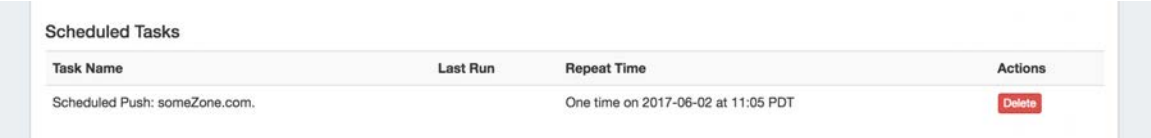
DNS records may also be reviewed and managed from the **DNS Records** sub-tab.

For additional detail on working with DNS Records on this page, see Working with DNS Records.

Scheduled Tasks

If scheduled tasks (zone pushes) have been set up for the zone, they will appear under a "Scheduled Tasks" section.

Tasks here will also show in the Admin Scheduler task list.



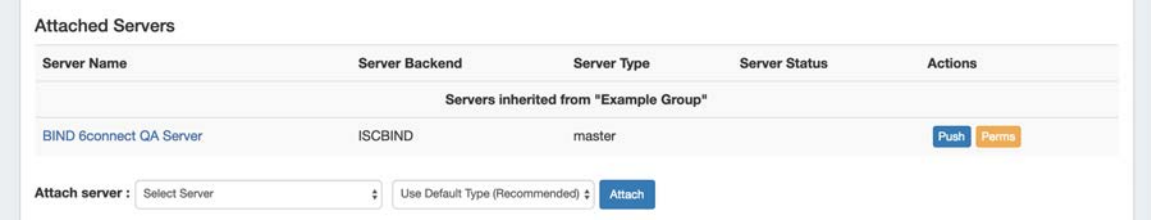
The task may be deleted by clicking the "delete" button.

See Working with DNS Zones for details on Scheduling zone pushes.

Attached Servers

Servers attached directly to the zone, or inherited from the zone's parent DNS Group will be shown here.

Additional servers may be attached by selecting the server name, type (default, master, slave), and clicking the "Attach" button, as long as the user has permissions on both the zone and the server to attach. After attached, users with sufficient permissions may detach, push, or edit permissions on the server.



To detach a server from a zone, look for the server under the "Attached Servers" list, then click "Detach" under actions for that server.

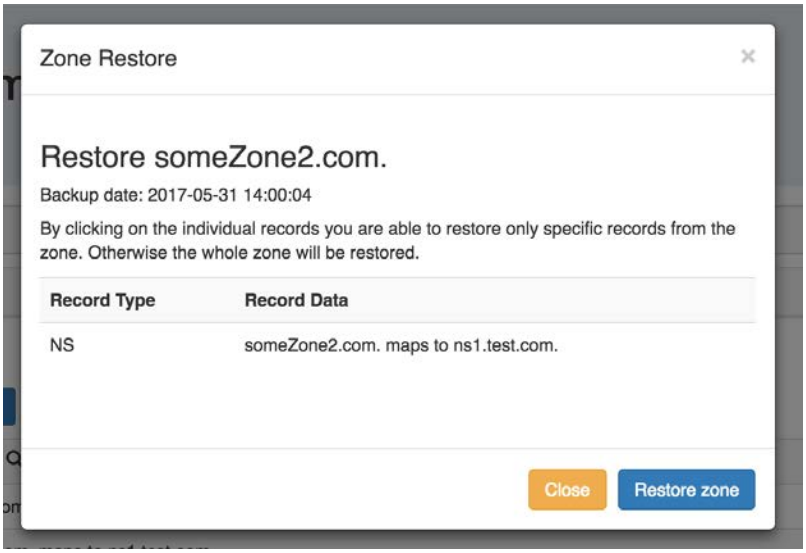
Servers that are attached via inheritance from a DNS Group will not be able to be detached at the zone level.

Zone Backups

If a zone has had changes sucessfully pushed, a "Zone Backups" section appears near the bottom of the page, showing the date and time of the backup.



To view details, or restore the zone to the previous version, click on the row of the desired date/time backup, and the "Zone Restore" module will open.

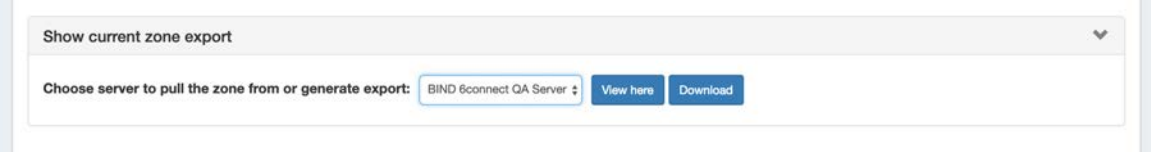


From here, you may restore individual records by clicking on them, or restore the entire zone by clicking the "Restore Zone" button.

To exit without saving, click the "Close" button.

Current Zone Export

To view or download current zone information, expand the "Show Current Zone Export" module. Then, select the DNS server to pull from and select either "View Here" or "Download".



"View Here" will display a read only text data display of the zone information directly in the module.

"Download" will download a .zone file for the zone from the selected server.

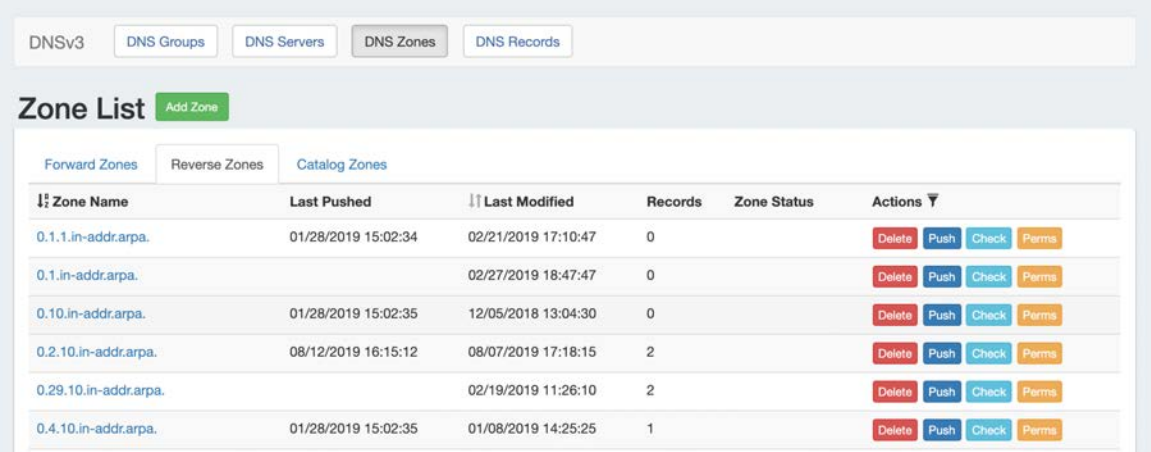
Additional Information:

For more information on working with DNS Zones, Groups, and Servers, see the following sections:

- Working with DNS Groups
- Working with DNS Zones
- Working with DNS Records
- DNS Administration
- Import DNS Zones
- Approvals

Working with DNS Zones - Common Tasks

Working with DNS Zones



This page details some common DNS tasks performed from the **DNS** Tab.

DNS Zones are accessed under the DNS Tab, **DNS Groups** or **DNS Zones** sub-tabs. Separate zone lists exist under each DNS group.

DNS Records are accessed from either the View Zone page (for records under that zone), or globally under the **DNS Records** sub-tab. For Details on working with records in either area, see Working with DNS Records

For a more general overview DNS Groups and Editing Zones, see Working with DNS Groups and DNS Zones Overview. This page focuses on specific DNS zone tasks.

> **DNSv3 Zone Directory**
>
> In DNSv3, zone files in the server directory will have a number appended, similar to 'example.com._123.zone'. This number is the Resource ID associated with the zone, and is used in ProVision to identify the zone and differentiate zones that may have the same name, but under different DNS Groups. This append does not affect any zone functionality otherwise.

- Working with DNS Zones
- Working with DNS Zones
  - Add a Zone
    - Optional Fields
  - Autogenerate Reverse Zone
  - Edit a Zone (View Zone page)
    - Add a comment
    - Edit Advanced Settings
  - Move Zones to a Different Group
    - Single Zone Move
    - Bulk Zone Move
  - Pushing Zones
    - Push Now (from Group List)
    - Push Now (from View Zone page)
    - Schedule Push (from View Zone page)
    - Schedule Push (Admin Scheduler):
    - Group Push:
    - Server Push:
  - Export a Zone
  - Import Zone / Import Records
    - Enable Saving Import Files (Admin Setting - Optional)
    - Import Zone File
      - Importing Zone file with Comments
    - Download Imported Zone File
  - Check a Zone
  - Delete a Zone
  - Additional Information:

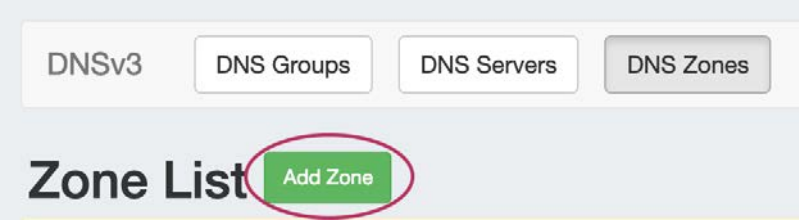
Working with DNS Zones

Add a Zone

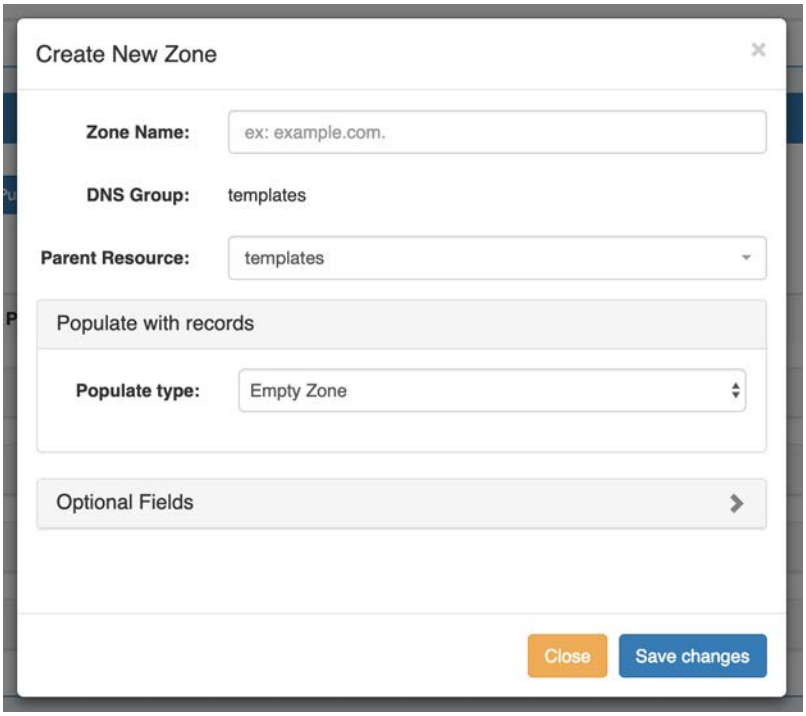
Add a new zone while in the DNS Groups tab by selecting "Add Zone" under the desired group.



You may also add new zones from the DNS Zones tab, by clicking "Add Zone" next to Zone List.



The "Create New Zone" dialog will pop up.



Enter the name of your new zone and select a parent resource, if desired. The DNS group will already be selected.

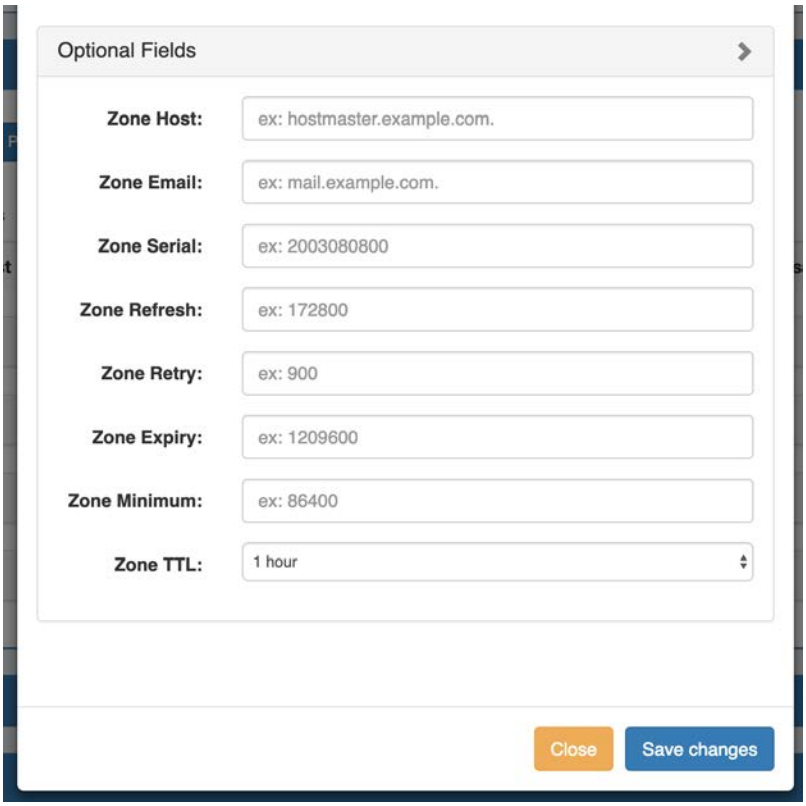
DNSv3 allows you to populate the zone with three options:

- Empty Zone - create the zone as an empty zone, and manually create records
- Populate by AXFR Transfer - transfer zones from an outside server
- Clone an existing zone - use an existing zone as a template, and manually edit as needed

From there, you may either save your changes and complete zone creation, or add in optional field details.

Optional Fields

Expand the "Optional Fields" section by clicking on the chevron (>) or the "Optional Fields" header.



Under this section, add in optional values for Zone Host, Email, Serial , Refresh, Retry, Expiry, or TTL.

When finished, click "Save Changes".

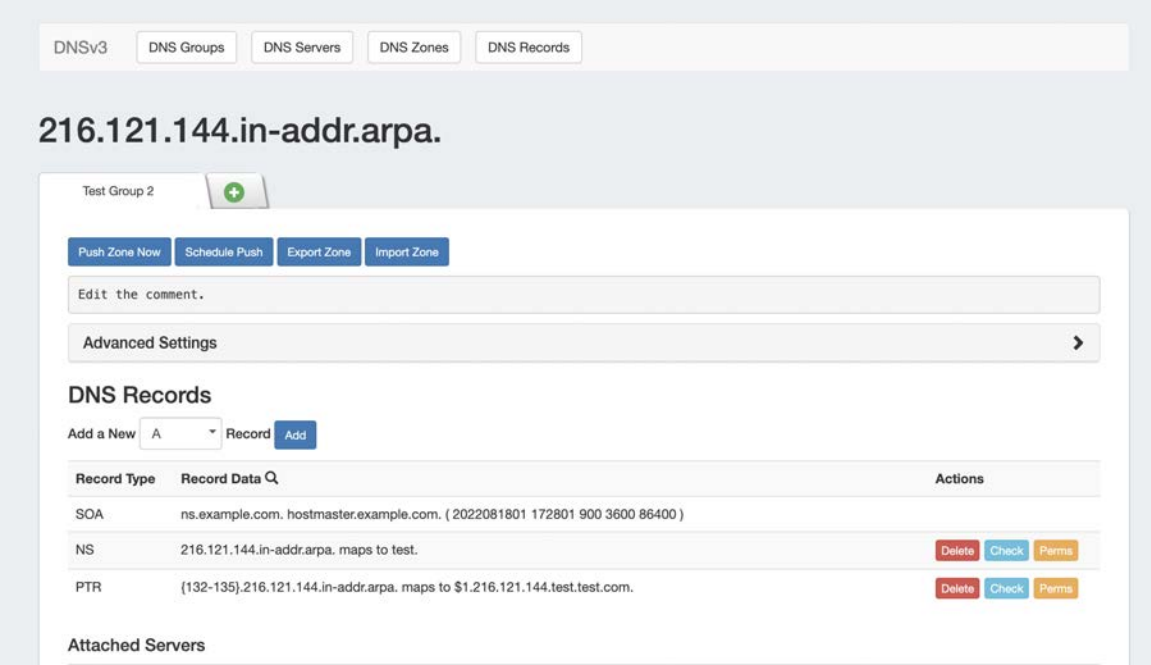
To exit without saving, simply click "Close".

Autogenerate Reverse Zone

Autogenerate a reverse zone from an IP Block by clicking on the CIDR link in the IPAM Gadget block list.



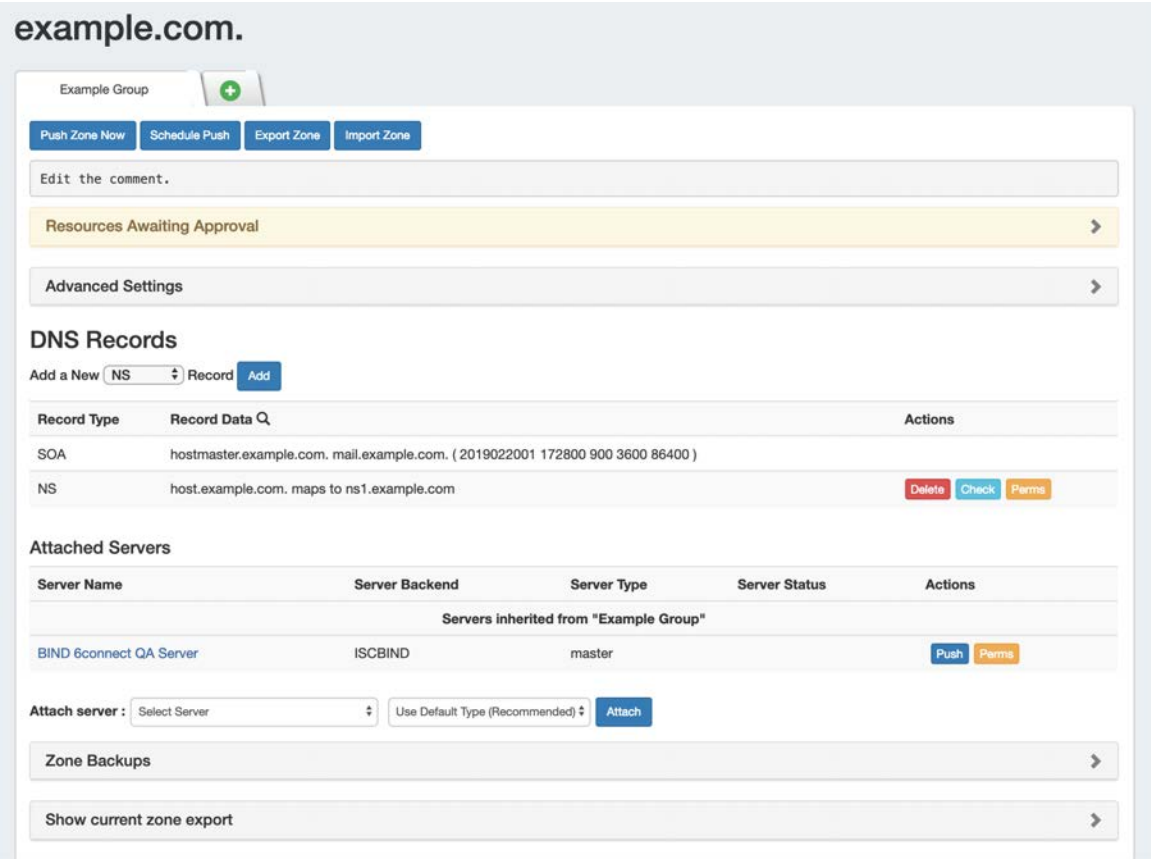
The reverse zone will be created for the block, and the Zone View page will load, displaying further information.



Edit a Zone (View Zone page)

Zones may be editing by clicking on the zone name in any zone list in which it appears - the DNS Zones Zone List, DNS Groups Zone List, or zones listed as attached to a server under DNS Servers.

Clicking on the zone name from any zone list opens up the View Zone page.

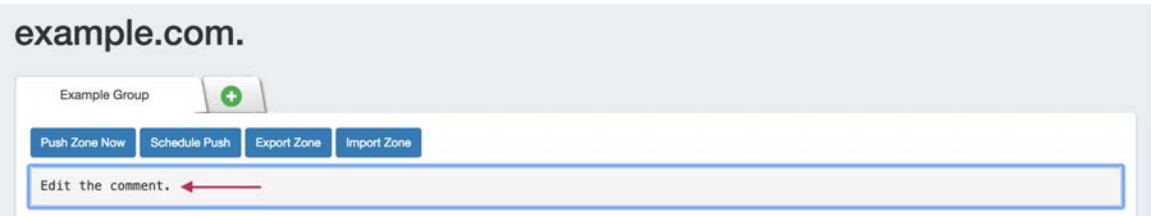


Here, comments may be added, records added or updated, servers attached to the zone, advanced settings edited, backups restored or the zone pushed / exported. For a general interface overview of the View Zone page, see DNS Zones Overview.

For detailed information on working with DNS Records from the View Zone page Record List or the DNS Records sub-tab, see Working with DNS Records.

Add a comment

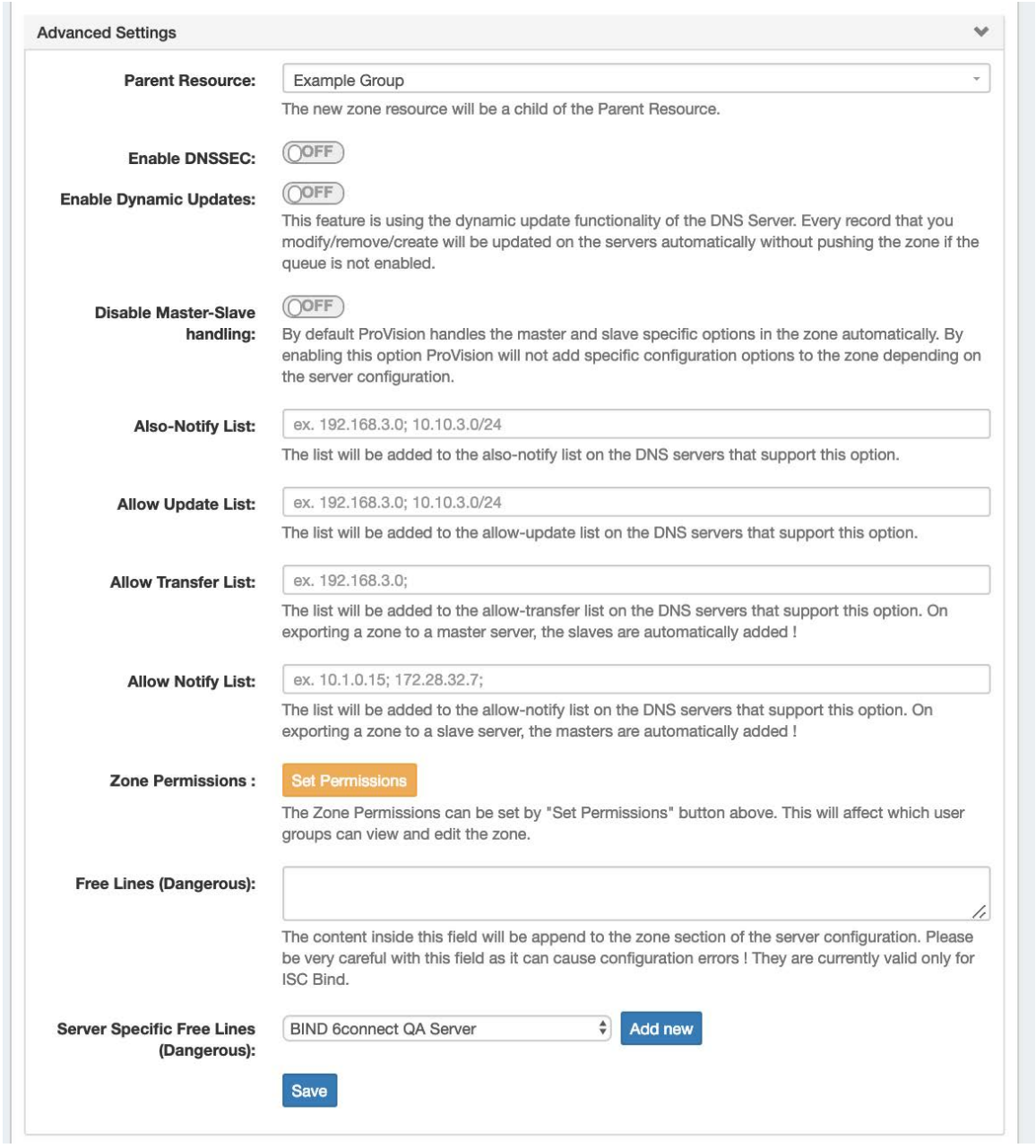
To add a comment to a zone, click anywhere inside the comment area and begin typing. The comment will be saved when an area outside of the comment box is clicked, deselecting the comment area.



Edit Advanced Settings

Open the zone "Advanced Settings" section by clicking on the header or the expansion arrow (>).

Under this area, you can change settings such as Parent Resource, DNSSEC, Lists, Zone permissions, and free lines.



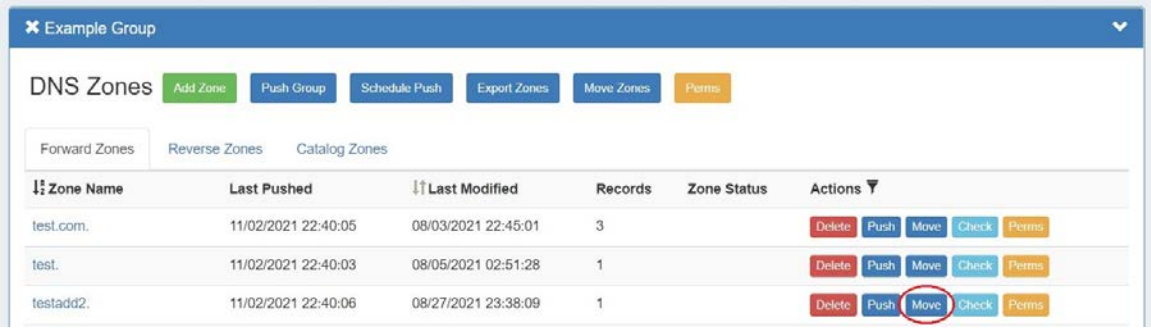
Edit fields as needed, and click "Save" when done.

Move Zones to a Different Group

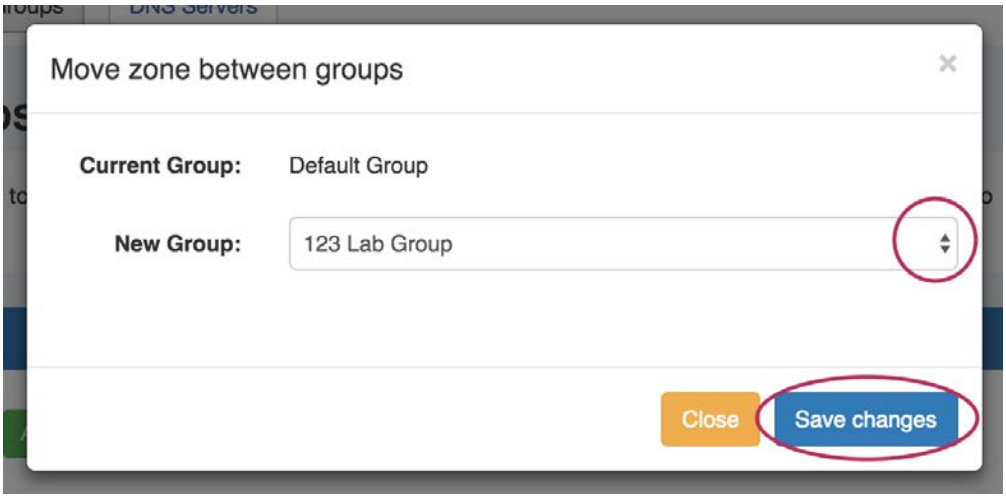
Zones may be moved to a different group than the one created under, either individually or as a group.

Single Zone Move

To move a single zone, navigate to the DNS group the zone is under, then click the "Move" button in the Actions column for the zone.



The "Move Zone" modal will appear - select the new group to move to the zone under, and click "Save Changes" to complete.



Bulk Zone Move

You may move all the zones in a group to another group by selecting "Move Zones" under the desired group.



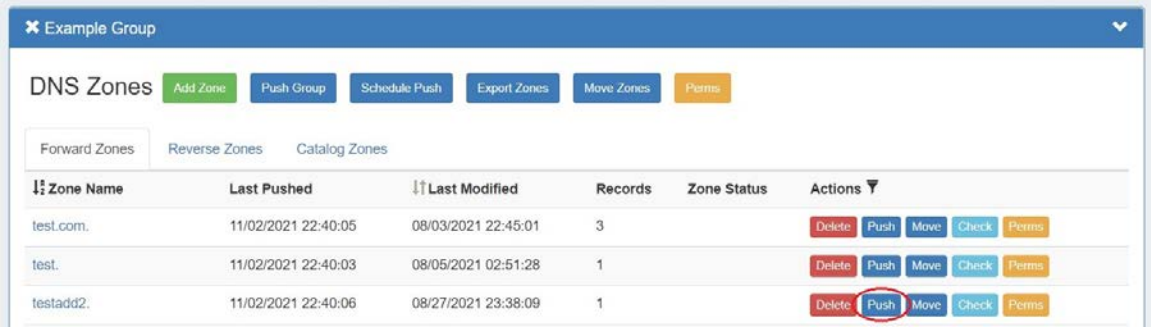
Pushing Zones

Zones may be pushed individually ("Push Zone Now"), as a scheduled future push ("Schedule Push"), or pushed as part of a group or server push.

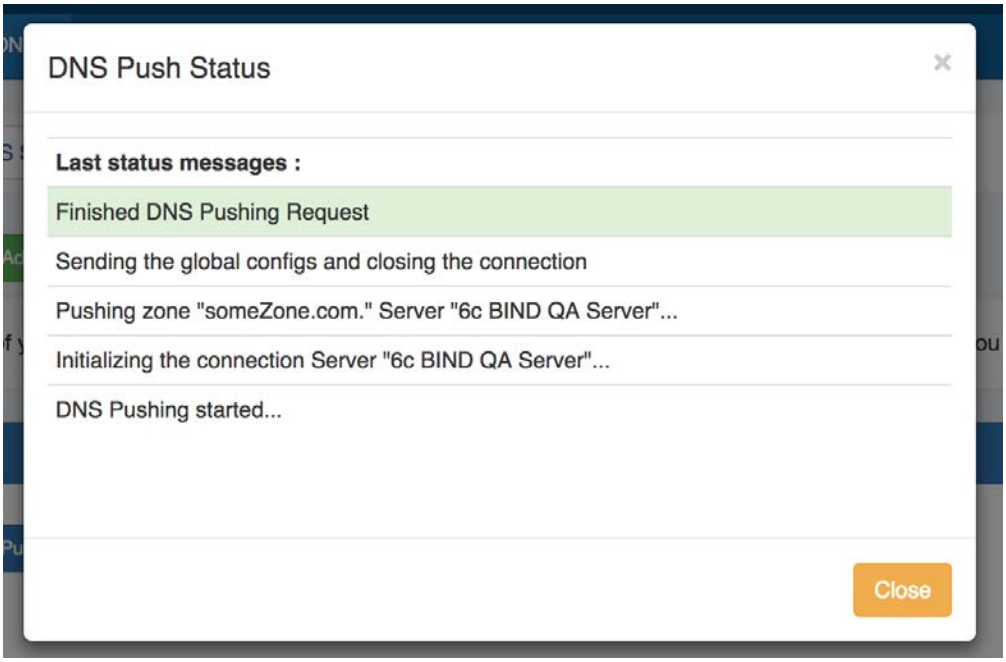
Push Now (from Group List)

To immediately push a single zone, navigate to the DNS group the zone is under, then click the "Push" button in the Actions column for the zone.

You may also look for the zone in the DNS Zones tab Zone List, and then likewise, click the "Push" button in the zone row.

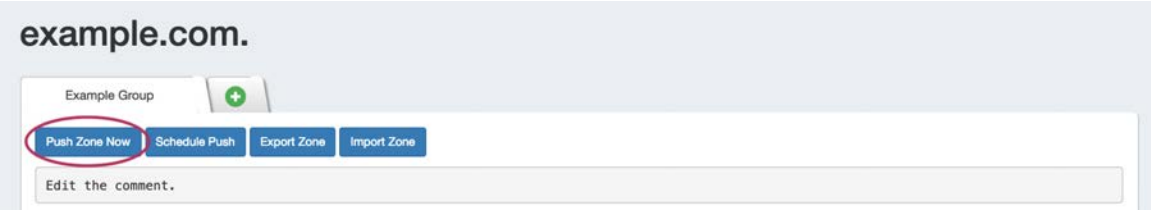


The "Push Status" modal will appear, showing status and any errors that occur. When a successful zone push is complete, a green "Finished DNS Pushing Request" message will appear, and the window may be closed.



Push Now (from View Zone page)

The View Zone page, accessed from clicking on the zone name in the group zone list, includes a "Push Zone Now" button that immediately attempts to push the zone to the attached server(s).

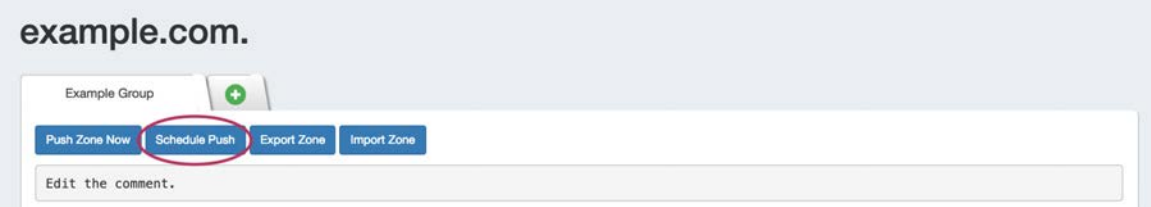


Click on "Push Zone Now", and the "Push Status" modal will appear, showing status and any errors that occur.

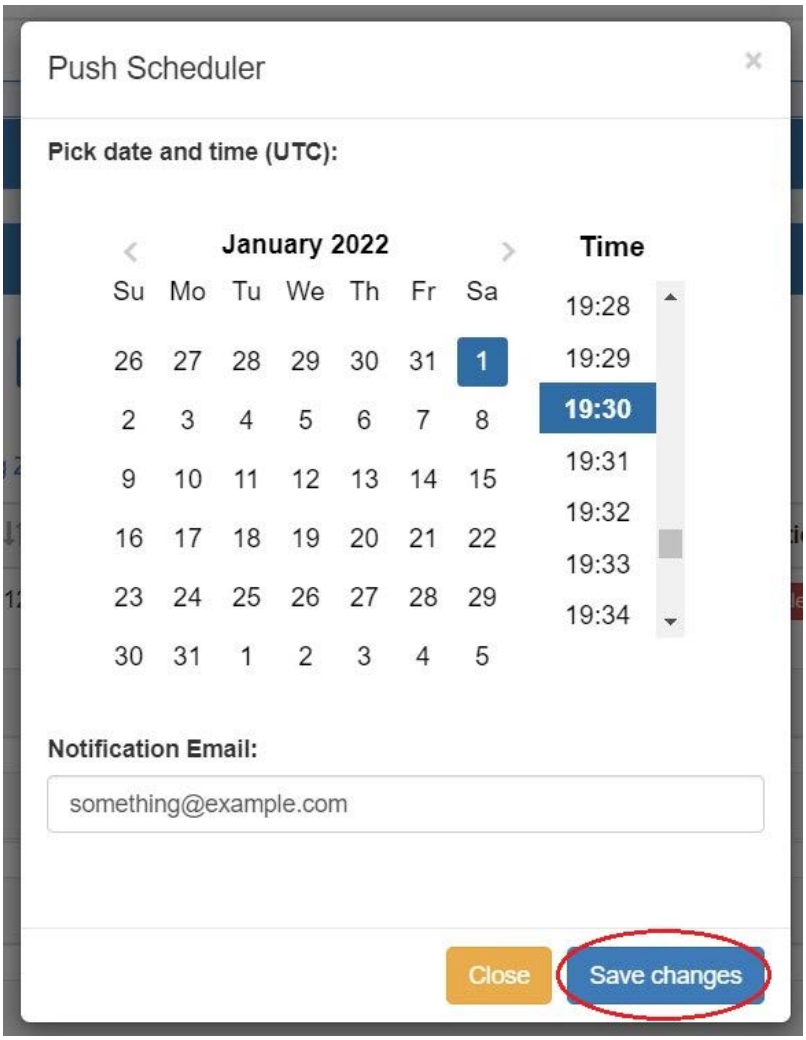
When a successful zone push is complete, a green "Finished DNS Pushing Request" message will appear, and the window may be closed.

Schedule Push (from View Zone page)

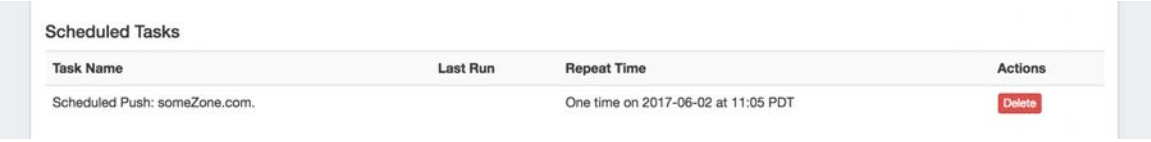
The View Zone page includes an option to schedule a zone push, similar to scheduling a group push.



Click "Schedule Push" for the zone, then select a date, time (24 hour), add a notification email address, and click "Save changes".



The scheduled task will be shown in both the Zone View page (under "Scheduled Tasks") and the Admin Scheduler task list.



The task may be deleted prior to running by clicking the "delete" button, but will automatically be removed once completed.

Schedule Push (Admin Scheduler):

Scheduled zone and server pushes may also be set up by Admin users from the **Scheduler** tab. For more information, see the Scheduler Tab documentation.

Group Push:

All zones contained in a DNS group may be pushed at the same time, by pushing the DNS group.

For information on working with DNS groups, including performing a manual or scheduled group push, see Working with DNS Groups - Pushing a Group.

Server Push:

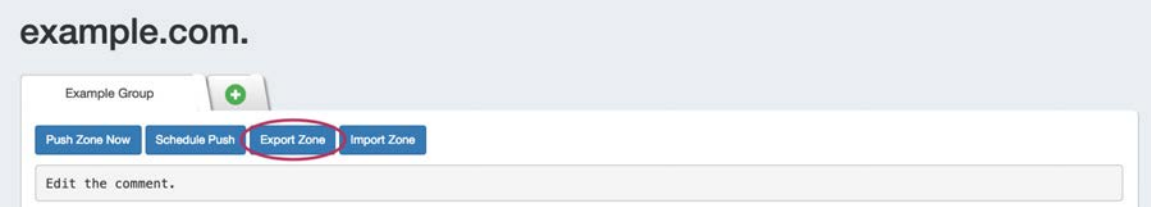
Admin users may push all zones on a server from the DNS Tab -> DNS Servers page.

For information on working with DNS servers, including performing a manual or scheduled server push, see Working with DNS Servers - Pushing a Server.

Export a Zone

Individual zones may be exported to a .zone file by clicking the "Export Zone" button on the View Zone page.

Individual .zone files may later be compressed into a .zip, and used with ProVision's BIND DNS Zone Upload / Import tool.



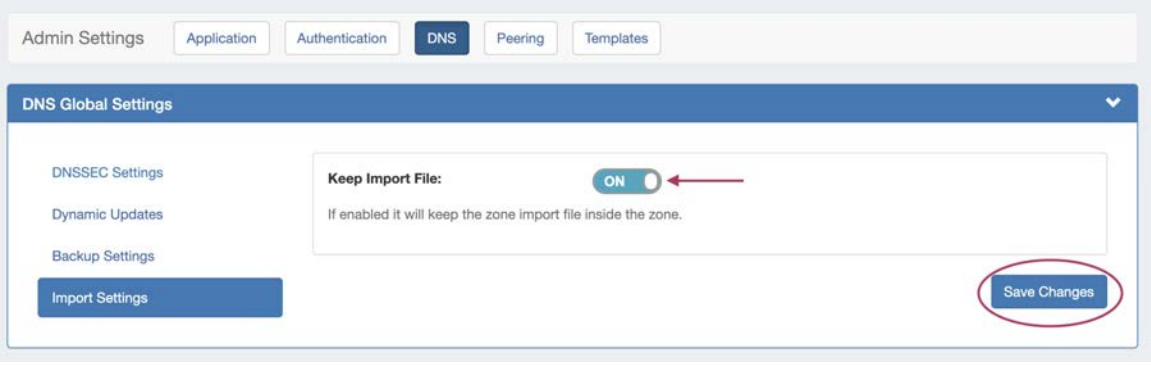
Import Zone / Import Records

A zone file (.zone) may be imported into a ProVision zone to populate record data. Note: To import the record data, the zone must already exist in ProVision - although it may be an empty placeholder zone if necessary.

Enable Saving Import Files (Admin Setting - Optional)

Before you import a zone file, you may (optionally) select to save the import file to the zone. Saving the file allows you to later re-download it directly from ProVision.

To enable saving import files, go to Admin Preferences DNS Settings sub-tab. From there, select "Import Settings" in the DNS Global Settings module.

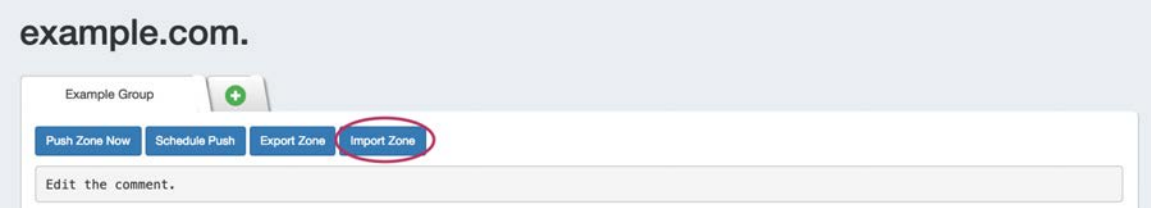


Toggle "Keep Import File" into the ON position, then select "Save Changes".

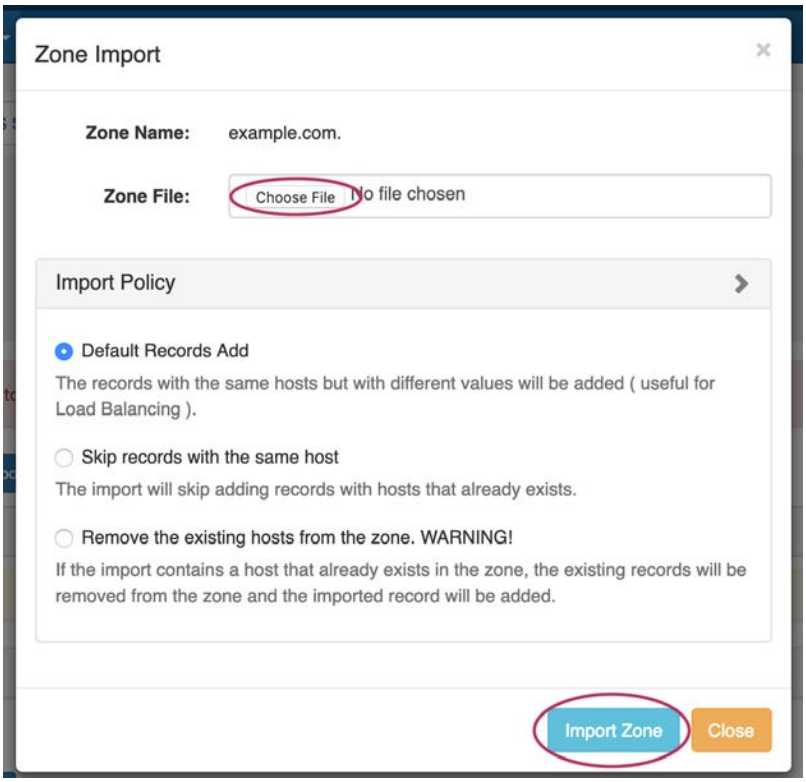
Import Zone File

To import a zone file to populate record data in ProVision, go to the View Zone page for the zone. The zone must already exist in ProVision, although it may be empty

Click "Import Zone" on the View Zone page.



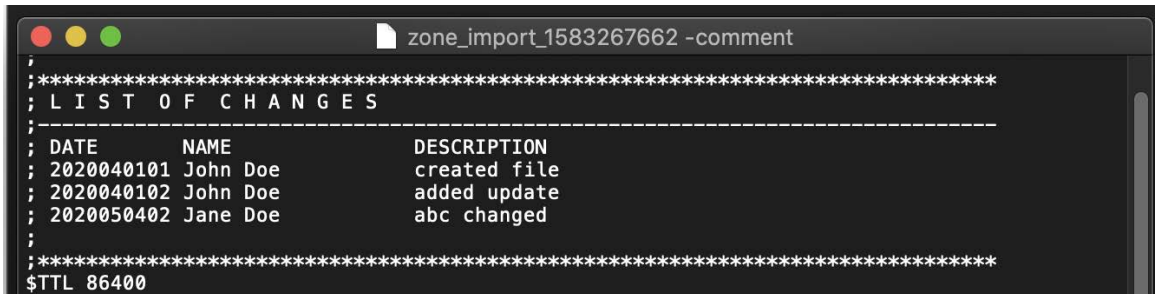
A Zone Import dialog box will open. Next to **Zone File:**, click "Choose File" and select your .zone file to import. Then, select an import policy to follow.



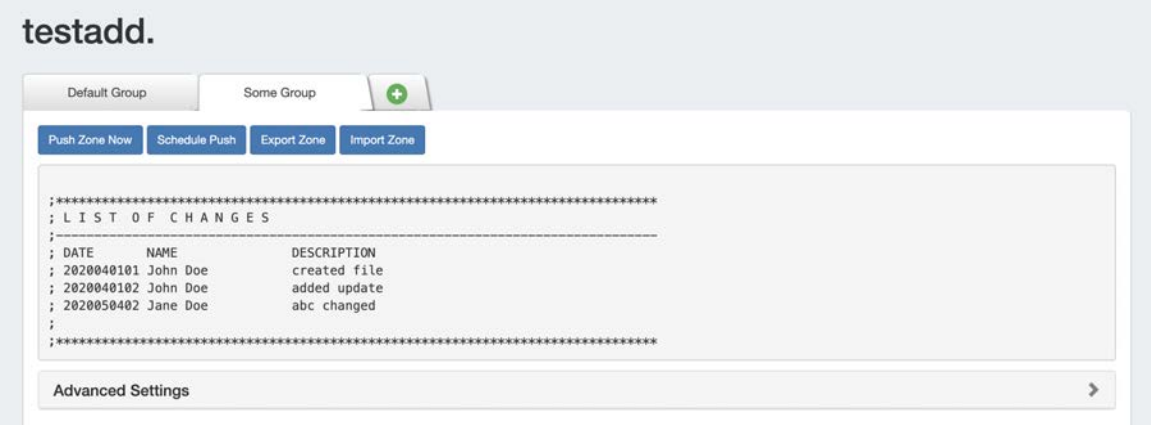
When done, click "Import Zone".

Importing Zone file with Comments

DNS Zone Import will also import comments contained in the .zone file, such as an internal change log (as seen in the image below).



During import, these comments are added to ProVision's zone comments field:



Download Imported Zone File

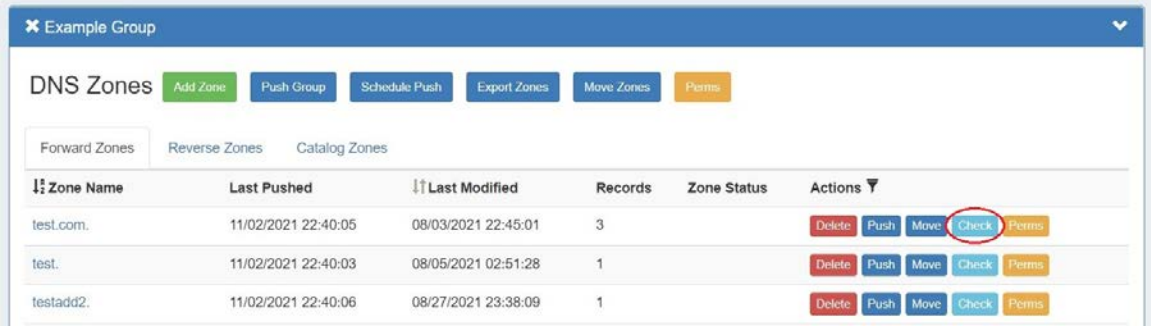
If "Keep Import File" has been enabled, the original zone import file will display in the View Zone page under "Zone Backups and Attached Files".



To download the original file, click "Download" for the import file.

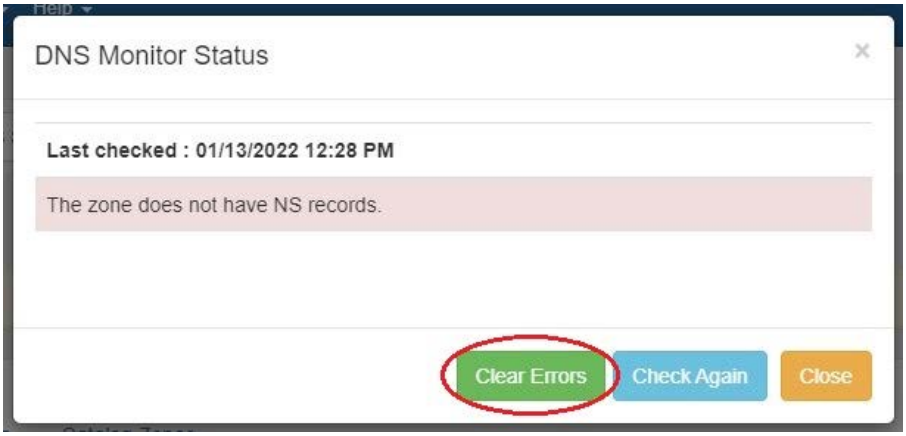
Check a Zone

Check a zone for errors by clicking the "Check" button under "Actions" for the desired zone.

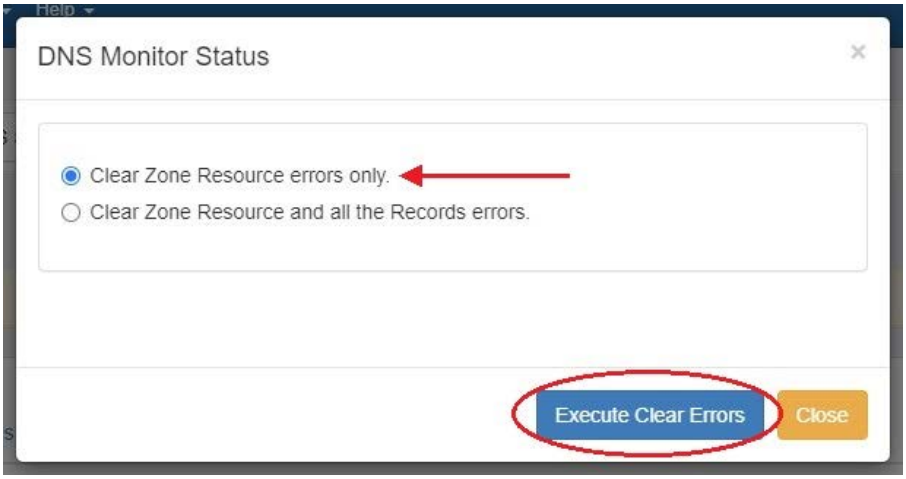


A dialog box will appear, with details on any errors.

You may clear the error if desired, recheck, or close the box. Clicking the "Clear Errors" button allows you to choose whether to clear the zone error only or the zone error and any errors in records in the zone.

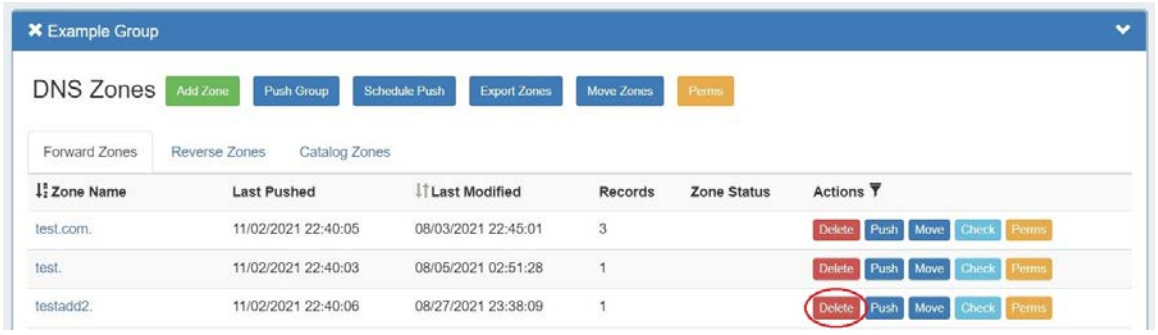


Choose an option and click "Execute Clear Errors".



Delete a Zone

Users with resource delete permissions over the zone may delete a zone record by clicking the "Delete" button under "Actions" for the desired zone entry in any Zone List.



Additional Information:

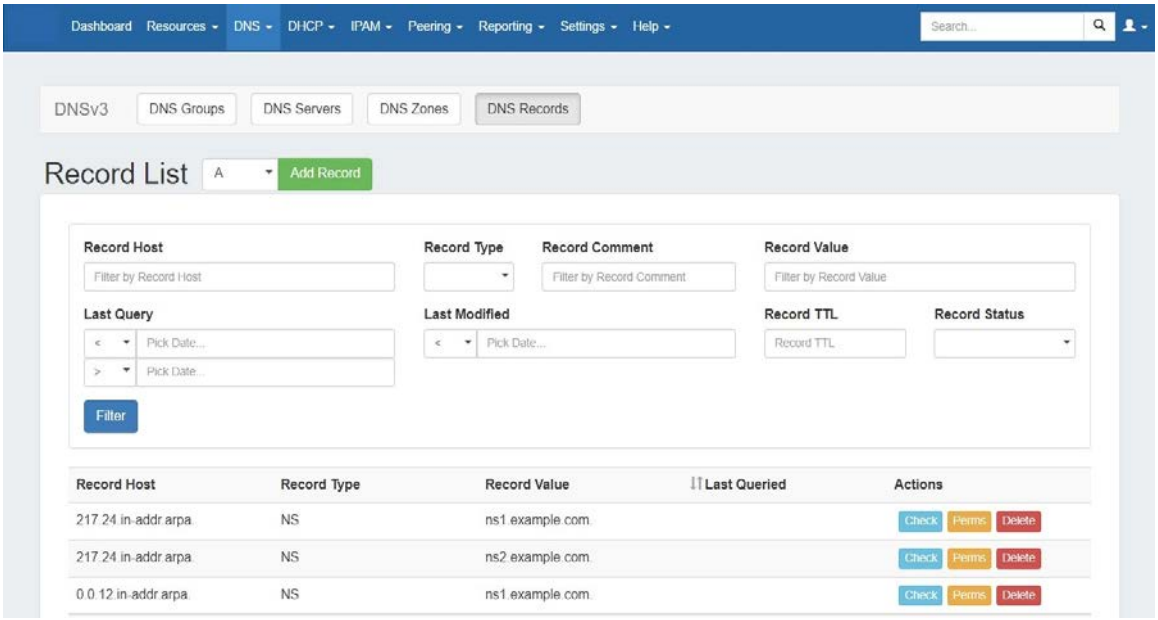
For more information on working with DNS Zones, Groups, and Servers, see the following sections:

- DNS Tab

- Working with DNS Groups
- Working with DNS Records
- Editing DNS Zones (The View Zone Page)
- DNS Administration
- Import DNS Zones
- Approvals

Working with DNS Records

Working with DNS Records



DNS Records may be managed either from the Zone View page (for the records under their respective zone) or globally through the **DNS Records** sub-tab.

- Working with DNS Records
  - Working with Zone Records - Zone View Page
    - Record Types
    - Add Zone Records
    - Autogenerate Forward Zone Records
    - Autogenerate Reverse Zone Records
      - Autogenerate Reverse Zone
    - Import Zone Records
    - Edit Zone Records
    - Delete Zone Records
    - Check a Record
    - Attach / Detach Servers to a Zone
    - Restore a Zone / Record from Backup
  - Working with Records - DNS Records sub-tab
    - Filter Records
    - Work with Records
    - Add a New Record
  - Additional Information

Working with Zone Records - Zone View Page

Record Types

ProVision supports 18 standard record types, as well as the ability to add a custom/arbitrary record type manually.

Available record types include the following:

- A
- A6

- AAAA
- CNAME
- CAA
- DNAME
- DNSKEY
- DS
- MX
- NAPTR
- NS
- PTR
- RP
- SRV
- TLSA
- SPF
- HINFO
- TXT
- Other

OTHER Record Types

When working with DNS Zones and Records, additional record types may be manually added by selecting "Other" when adding a new record.

S64 DNS users can use record type "Other" to add "SYNTH" or "TYPE65464" type records similar to the format below:

```
$ORIGIN 30 IN TYPE65464 ${p4} PTR ${a4}.pool.example.com.
$ORIGIN 600 IN TYPE65464 ${a4} A ${a4}
$ORIGIN TYPE65464 ${p6} PTR user${a6}.my.example.com.
$ORIGIN 5 IN SYNTH user${a6} AAAA ${a6}
$ORIGIN IN SYNTH nptr-${u} NAPTR 10 20 "A" "" "" srv-${u}
$ORIGIN IN SYNTH srv-${u} SRV 10 20 1234 srv-addr-${u}
```

However, arbitrary / other record types are unable to be validated, so use with care!

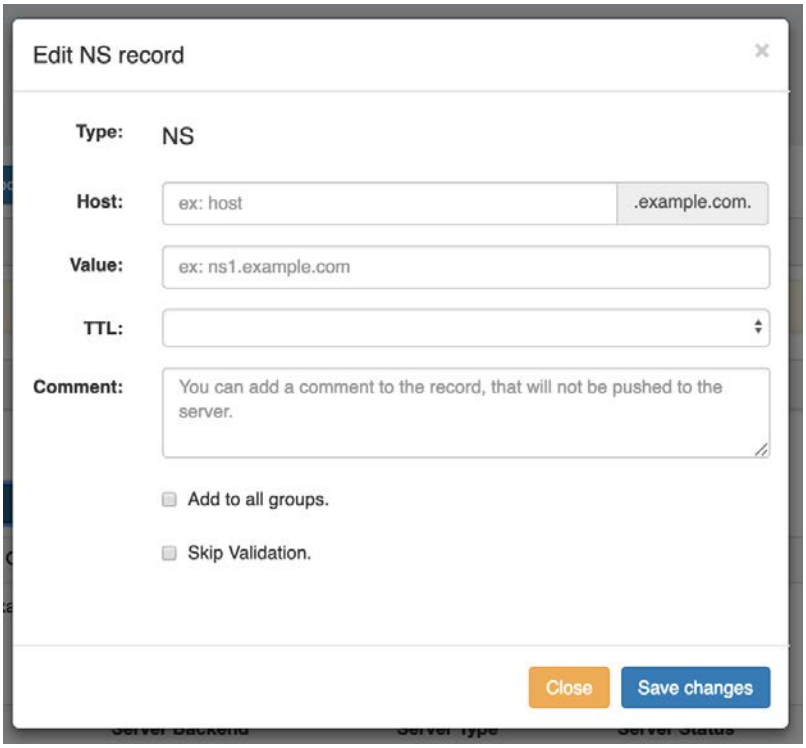
Add Zone Records

From the Zone View page, under DNS Records, look for the line "Add a new ___ Record".

Select the desired record type from the dropdown list, then click "Add".



Fill in the information for the new record, selecting options for adding to groups or skipping validation.



When done, click "Save Changes".

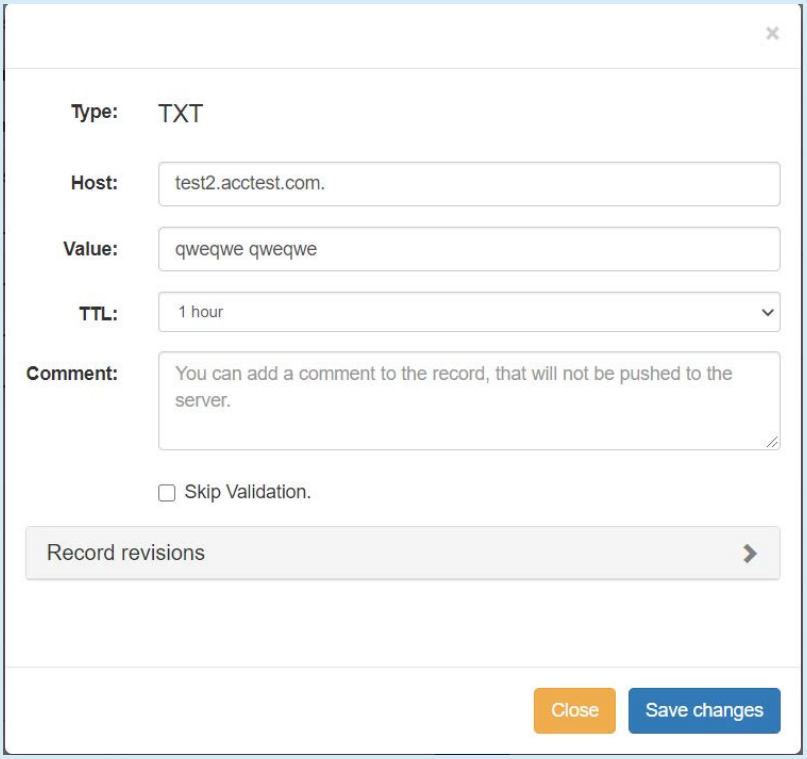
A Note on Quotes

When working with records (like TXT), there is no need to add quotes around the record value - ProVision will automatically add double quotes for the TXT records on Zone Push, and will also automatically use quotes to split TXT values larger than 255 characters.

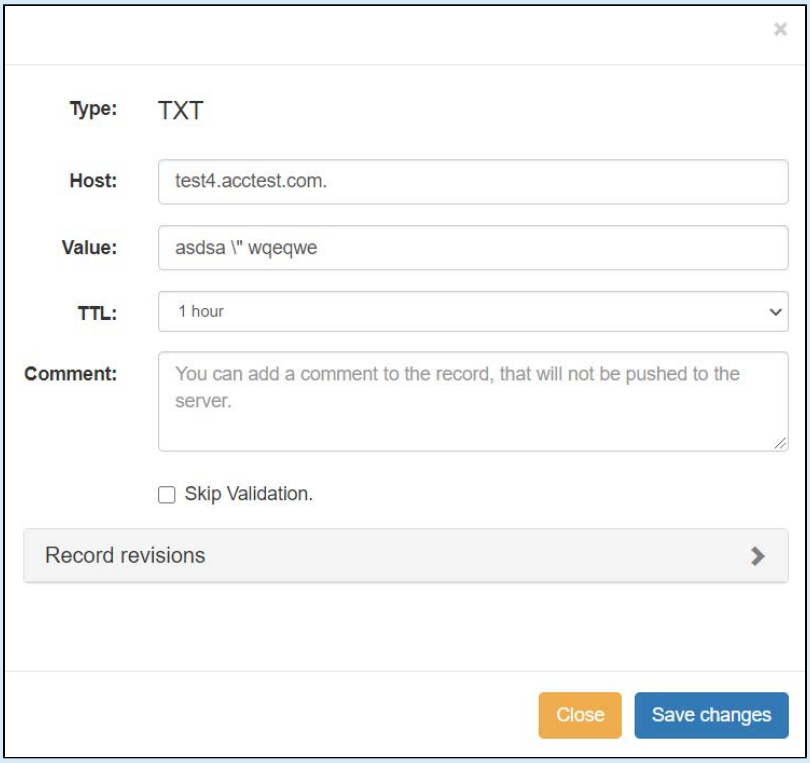
If your record value contains internal quotes that you wish to keep, you may escape it by adding a backslash (\ ) before the quote from the "Edit Record" screen.

Examples:

In the Edit Record screen, there is no need to add quotes to the record value, as seen below:



However, if an internal quote exists that you wish to retain, escape it by using a backslash (\ ) before the quote(s):



When done editing the record, click "Save changes".

Repeating this to create four TXT record examples, we end up with the following for test1 through test4:



These four records become the following in the zone file once pushed (note the automatic addition of quotes around the values, and the escaped quotes in test3 and test 4):

```
test1.acctest.com.    3600    IN    TXT    "qweqwe"

test2.acctest.com.    3600    IN    TXT    "qweqwe qweqwe"

test3.acctest.com.    3600    IN    TXT    "\"qweqw qwewq\""

test4.acctest.com.    3600    IN    TXT    "asdsa \" wqeqwe"
```

If you have additional questions on handling of quote characters in zone records, contact support@6connect.com.

Autogenerate Forward Zone Records

From the Zone View page, under DNS Records, look for the line "Add a new ___ Record".

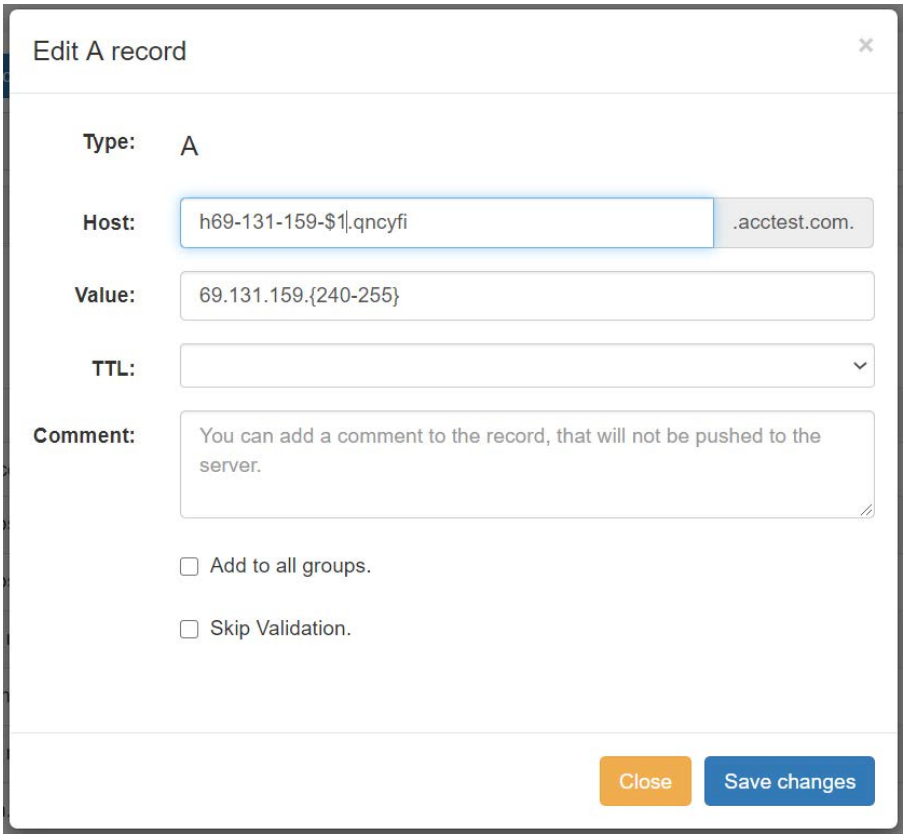
Select the desired record type from the dropdown list, then click "Add".



Enter the Host value for the record.

For the Record Value, enter the IP Address, using brackets for the last octet to denote the range of IPs.

Example:
Host: h69-131-159-$1.qncyfi
Value: 69.131.159.{240-255}



and this is expanded to:

```
h69-131-159-240.qncyfi.acctest.com.    3600    IN      A       69.131.159.240
h69-131-159-241.qncyfi.acctest.com.    3600    IN      A       69.131.159.241
h69-131-159-242.qncyfi.acctest.com.    3600    IN      A       69.131.159.242
h69-131-159-243.qncyfi.acctest.com.    3600    IN      A       69.131.159.243
h69-131-159-244.qncyfi.acctest.com.    3600    IN      A       69.131.159.244
h69-131-159-245.qncyfi.acctest.com.    3600    IN      A       69.131.159.245
h69-131-159-246.qncyfi.acctest.com.    3600    IN      A       69.131.159.246
h69-131-159-247.qncyfi.acctest.com.    3600    IN      A       69.131.159.247
h69-131-159-248.qncyfi.acctest.com.    3600    IN      A       69.131.159.248
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h69-131-159-251.qncyfi.acctest.com.    3600    IN      A       69.131.159.251
h69-131-159-252.qncyfi.acctest.com.    3600    IN      A       69.131.159.252
h69-131-159-253.qncyfi.acctest.com.    3600    IN      A       69.131.159.253
h69-131-159-254.qncyfi.acctest.com.    3600    IN      A       69.131.159.254
h69-131-159-255.qncyfi.acctest.com.    3600    IN      A       69.131.159.255
```

When you are done, click "Save Changes" to complete the edit.

Autogenerate Reverse Zone Records

ProVision can be configured auto-generate IPv4 / IPv6 PTR records in reverse zones based on template.

Example IPv4 :

If the zone is named 33.44.in-addr.arpa.

Host : {100-150}.{22-24}
Value : $1-$2-available.example.com.

The generated records on push will look like :
100.22.33.44.in-addr.arpa. IN PTR 100-22-available.example.com.
101.22.33.44.in-addr.arpa. IN PTR 101-22-available.example.com.
...
149.24.33.44.in-addr.arpa. IN PTR 149-24-available.example.com.
150.24.33.44.in-addr.arpa. IN PTR 150-24-available.example.com.

Example IPv6 :

If the zone is named 0.f.e.d.c.b.a.9.8.7.6.5.4.3.2.1.ip6.arpa.

Host : 0.{0-f}.{2-3}.d.c.b.a.9.8.7.6.5.4.3.2.1
Value : $1-$2-host.example.com.

The generated records on push will look like :
0.0.2.d.c.b.a.9.8.7.6.5.4.3.2.1.0.f.e.d.c.b.a.9.8.7.6.5.4.3.2.1.ip6.arpa. 3600 IN PTR 0-2-host.example.com.
0.1.2.d.c.b.a.9.8.7.6.5.4.3.2.1.0.f.e.d.c.b.a.9.8.7.6.5.4.3.2.1.ip6.arpa. 3600 IN PTR 1-2-host.example.com.
...
0.e.3.d.c.b.a.9.8.7.6.5.4.3.2.1.0.f.e.d.c.b.a.9.8.7.6.5.4.3.2.1.ip6.arpa. 3600 IN PTR e-3-host.example.com.
0.f.3.d.c.b.a.9.8.7.6.5.4.3.2.1.0.f.e.d.c.b.a.9.8.7.6.5.4.3.2.1.ip6.arpa. 3600 IN PTR f-3-host.example.com.

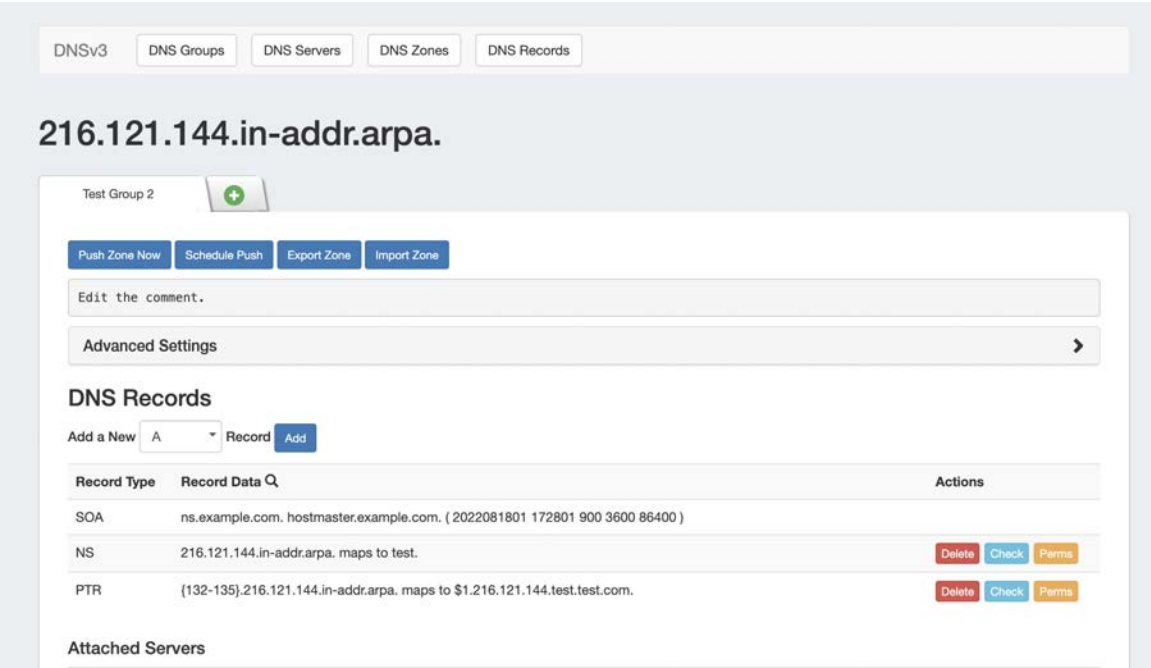
Autogeneration of Reverse Zone Records is also performed when generating a reverse zone from the IPAM Gadget:

Autogenerate Reverse Zone

Autogenerate a reverse zone from an IP Block by clicking on the CIDR link in the block list.



The reverse zone will be created for the block, and the Zone View page will load, displaying further information and autogenerated records.

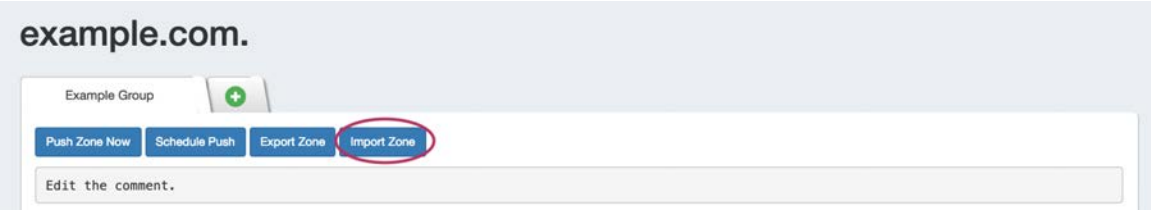


Import Zone Records

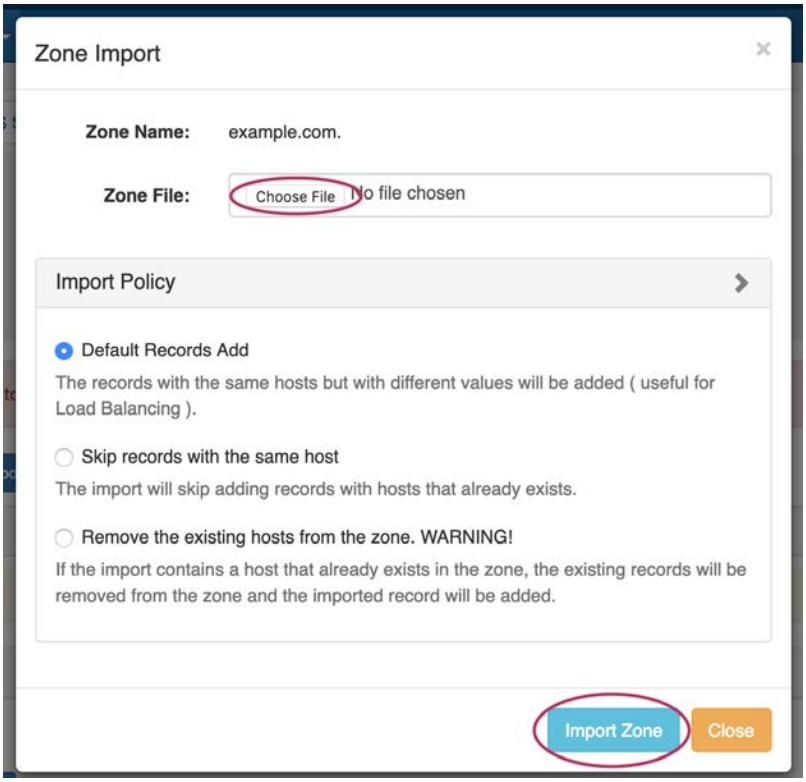
To import a zone file to populate record data in ProVision, go to the Zone View page for the zone. The zone must already exist in ProVision, although it may be empty

> **Tip**
>
> You may wish to enable "Save Import File" in Admin Settings DNS Settings prior to importing zone files, so that the file is available for later download. See Working with DNS Zones or Import DNS Zones.

Click "Import Zone" on the Zone View page.



A Zone Import dialog box will open. Next to **Zone File:**, click "Choose File" and select your .zone file to import. Then, select an import policy to follow.

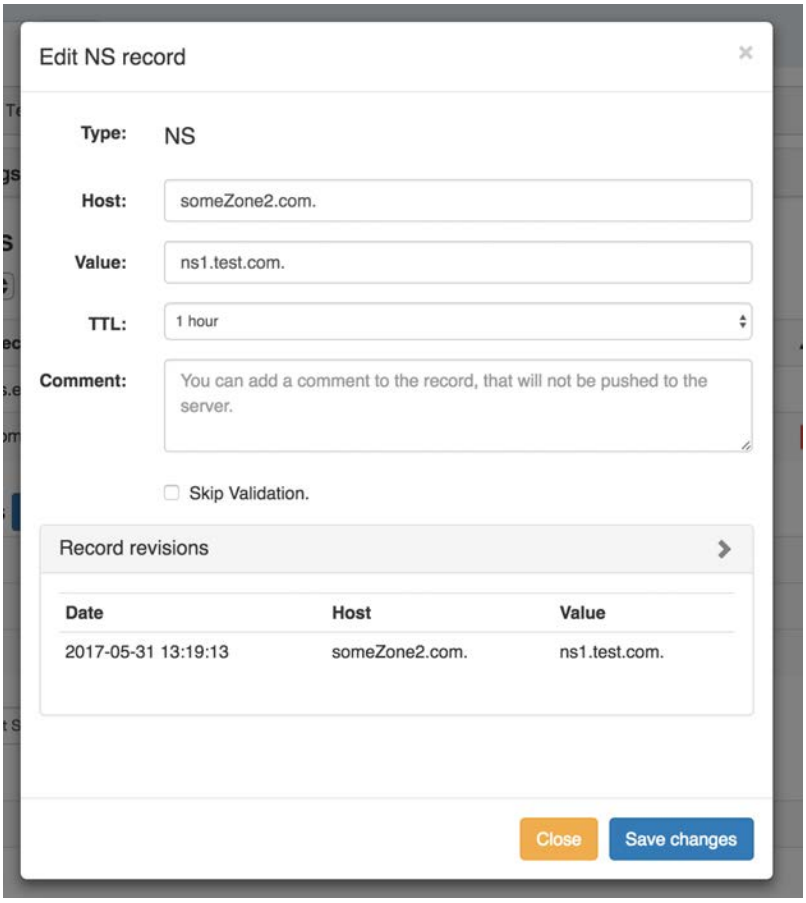


When done, Click "Import Zone".

Edit Zone Records

To edit an existing zone record, click on the record line in the DNS Records list.

The Edit Record dialog will open, allowing you to fill in record details.



Fill in the Host, Value, TTL, and comment if desired.

An option exists to "Skip Validation" - check to select if you wish to bypass validation for the record.

If previous versions of the record exist, the revision log will be visible under "Record revisions".

When edits or reviewing is complete, click "Save changes", or "Close" to exit without saving.

Delete Zone Records

Delete a zone record by clicking the "Delete" button under "Actions" for the desired record entry.



Check a Record

Check a record for errors by clicking the "Check" button under "Actions" for the desired record entry.



A dialog box will appear, with details on any errors.

You may clear the error if desired, recheck, or close the box.

Attach / Detach Servers to a Zone

Under the "Attached Servers" section of the Zone View page, next to "Attach Server:", select the desired server to attach and choose the server type (Default, Master, Slave), then click the "Attach" button.



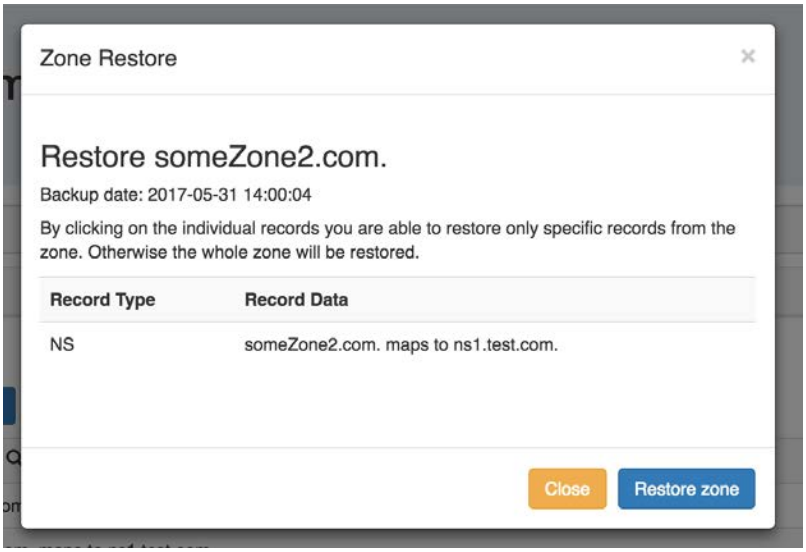
To detach a server from a zone, look for the server under the "Attached Servers" list, then click "Detach" under actions for that server.

Restore a Zone / Record from Backup

If a zone has had changes successfully pushed, a "Zone Backups" section appears near the bottom of the page, showing the date and time of the backup.



To view details, or restore the zone to the previous version, click on the row of the desired date/time backup, and the "Zone Restore" module will open.

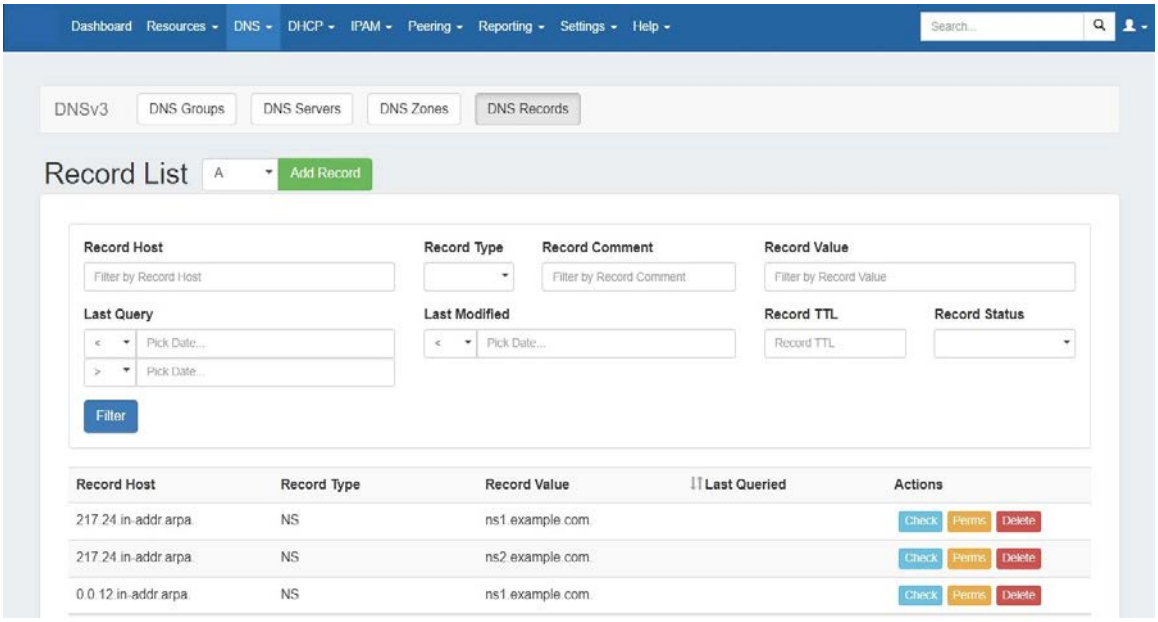


From here, you may restore individual records by clicking on them, or restore the entire zone by clicking the "Restore Zone" button.

To exit without saving, click the "Close" button.

Working with Records - DNS Records sub-tab

The DNS Records sub-tab provides a global list records for expedited searching, filtering, adding, and editing of DNS Records.



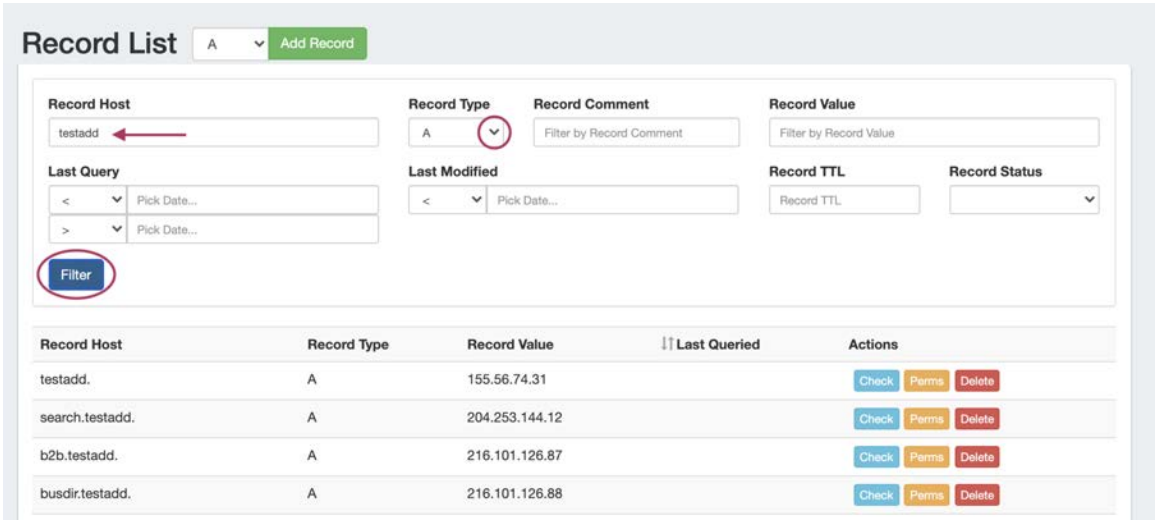
From the DNS Tab, click on the "DNS Records" sub-tab button, or select it from the DNS dropdown menu.

All DNS records available in ProVision displays in a single Record List, along with Host, Type, Value, and Last Queried information.

Filter Records

Search for specific records by filtering by Host, Type, Comment, Value, Last Query, Last Modified, Record TTL, or Status.

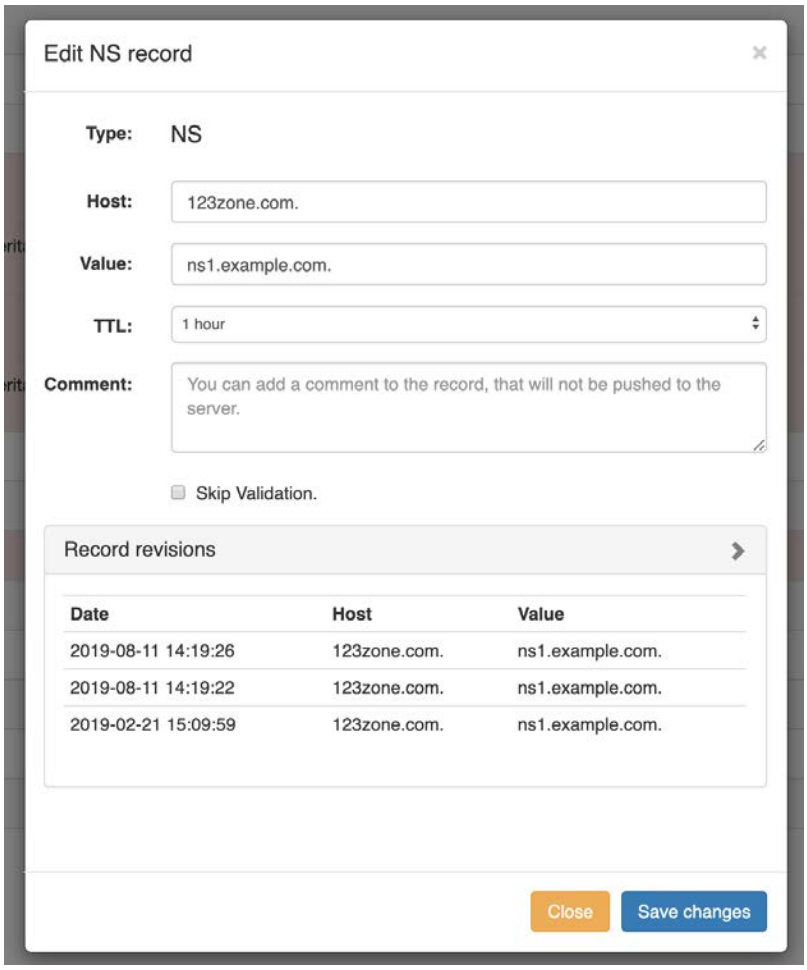
After entering your filter criteria, click "Filter".



Work with Records

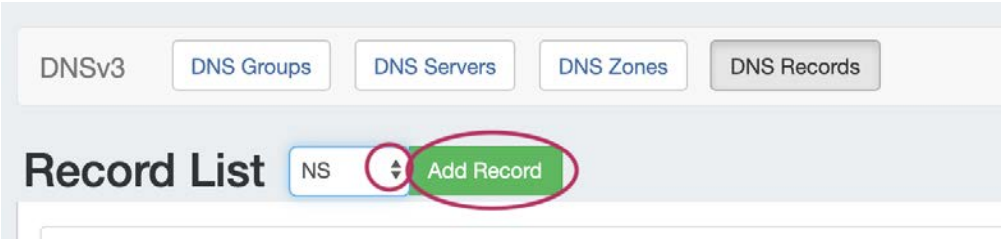
For each record, you may:

- Click the "Check" button to run an DNS Monitor error check on the record
- Review or change record permissions by clicking "Perms" (Admin only)
- Delete the record by clicking "Delete"
- Review or Edit record details by double-clicking on the row for the desired record.
    - Review record revision dates or enter your desired edit, then click "Save changes" to complete.

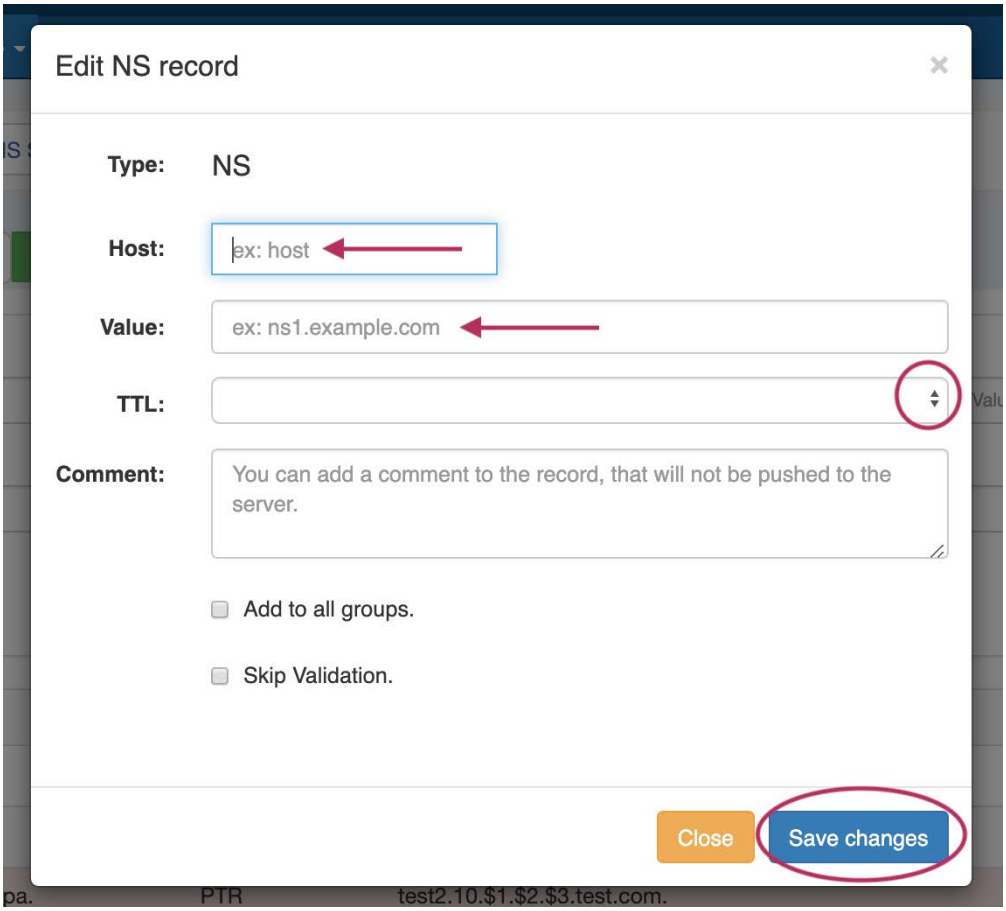


Add a New Record

Next to "Record List", select the desired record type, then click "Add Record".



Enter the record information for the record type. When done, click "Save Changes".



Additional Information

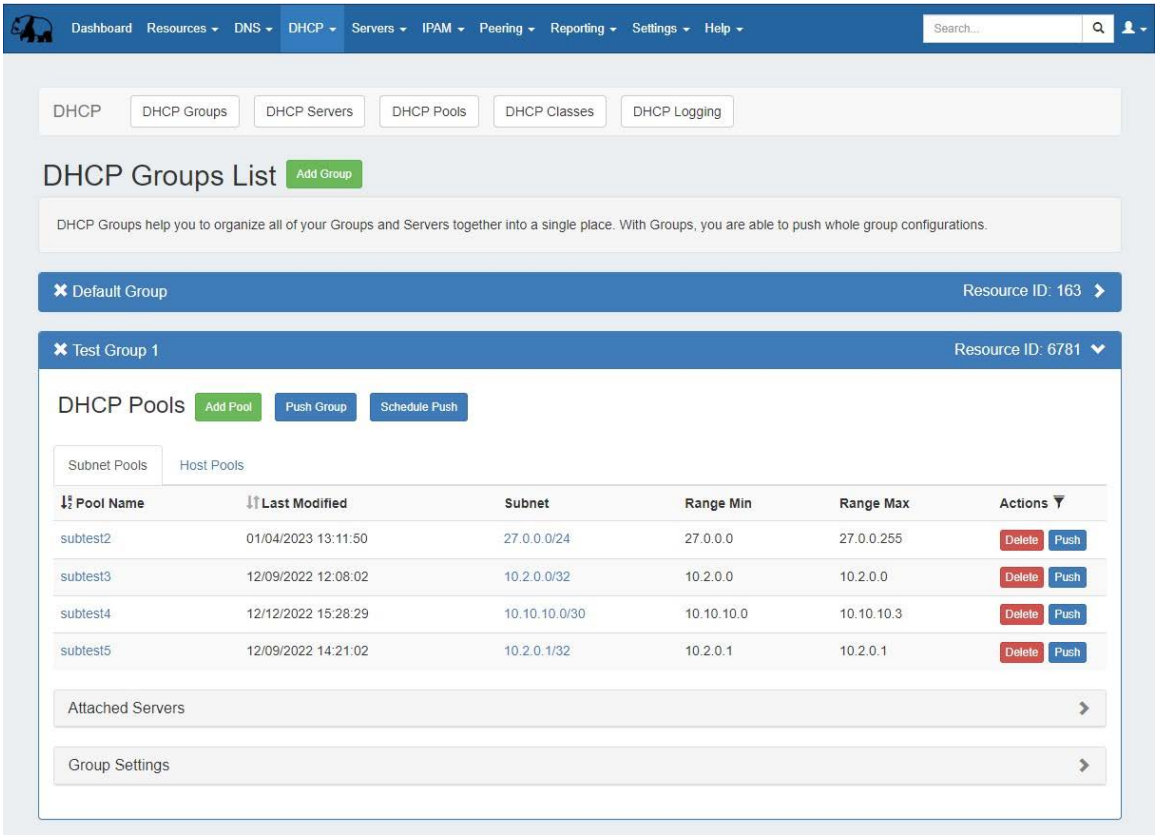
For more information on DNSv3 tasks, see:

- Working with DNS Zones
- DNS Zones Overview
- DNS Administration
- Working with DNS Servers
- Approvals

DHCP Tab

The DHCP Tab

ProVision's **DHCP** Tab combines server management, group organization, and pool management under one tab.



The DHCP tab contains five sub-tabs: **DHCP Groups, DHCP Servers, DHCP Pools, DHCP Classes, and DCHP Logging**.

The **DHCP Groups** tab is where DHCP servers and pools are managed as a part of DHCP groups. The DHCP tab DHCP Groups List allows you to create, view, and manage groups of DHCP servers and pools. Using groups, you can configure and push selected combinations of pools at one time.

The **DHCP Servers** tab is only accessible to Admin users, and contains functions for adding, updating, and managing DHCP servers as well as scheduling server tasks. For Admin-level DHCP tasks, see Working with DHCP Servers.

The **DHCP Pools** tab lists all the pools created in ProVision able to be viewed by the user, in the same format as on the DHCP Groups page, but without the group organization. The Pool List allows you to view, add, delete, and push individual DHCP Host and Subnet Pools. Under a pool, you may specify and update IP assignments, ranges, reservations and optionally set BOOTP Vendor Extensions / DHCP Options to send to the DHCP server.

The **DHCP Classes** tab lists all the classes created in ProVision able to be viewed by the user. The Class List allows you to view, add, and delete DHCP Classes.

The **DHCP Logging** tab provides a link to ProVision's logging system, where you can filter to view DHCP-only logs.

- The DHCP Tab
  - Permissions
    - DHCP Approvals
  - Additional Information

Permissions

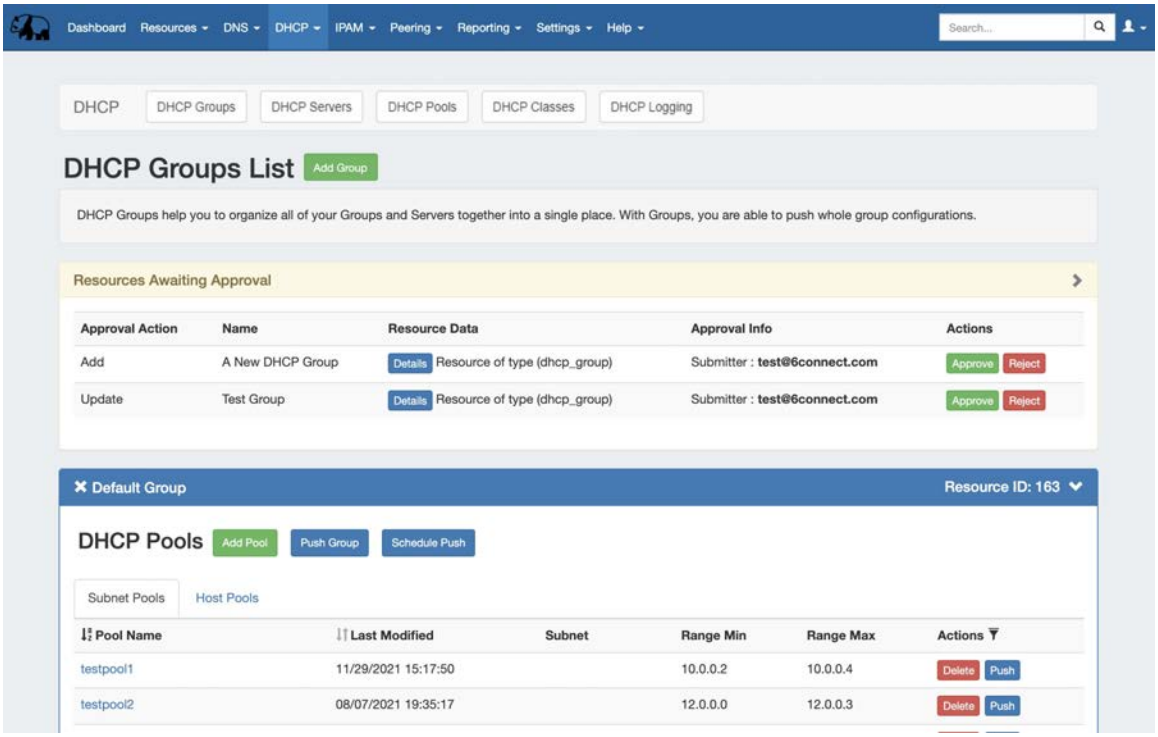
DHCP Management integrates with ProVision's resource and permissions hierarchy, as well as the IP Management system. Individual DHCP servers can be assigned via resource permissions to different internal user groups, to be managed by only the appropriate parties.

DHCP Approvals

The Approvals module stores and queues DHCP actions made by selected User Groups, and sends those actions to a Pending Changes list for administrative review. Later, an administrator (or combination of administrators) can approve or reject these stored actions.

Approvals is primarily set up and managed via the Admin **Approvals** Tab. See the ProVision Admin Guide - Approvals Tab for details on setting up and using Approvals from the Administrative viewpoint.

In the **DHCP** Tab, a "Resources Awaiting Approval" module will display near the top of DHCP Groups, DHCP Servers, DHCP Pools Lists, and DHCP Pool pages, if a change has been submitted on that page that is pending approval.



Users who submitted a change for approval will see the details of their change request in this module.

Admin users with permissions to approve or reject the request will have the option to Approve or Deny the change.

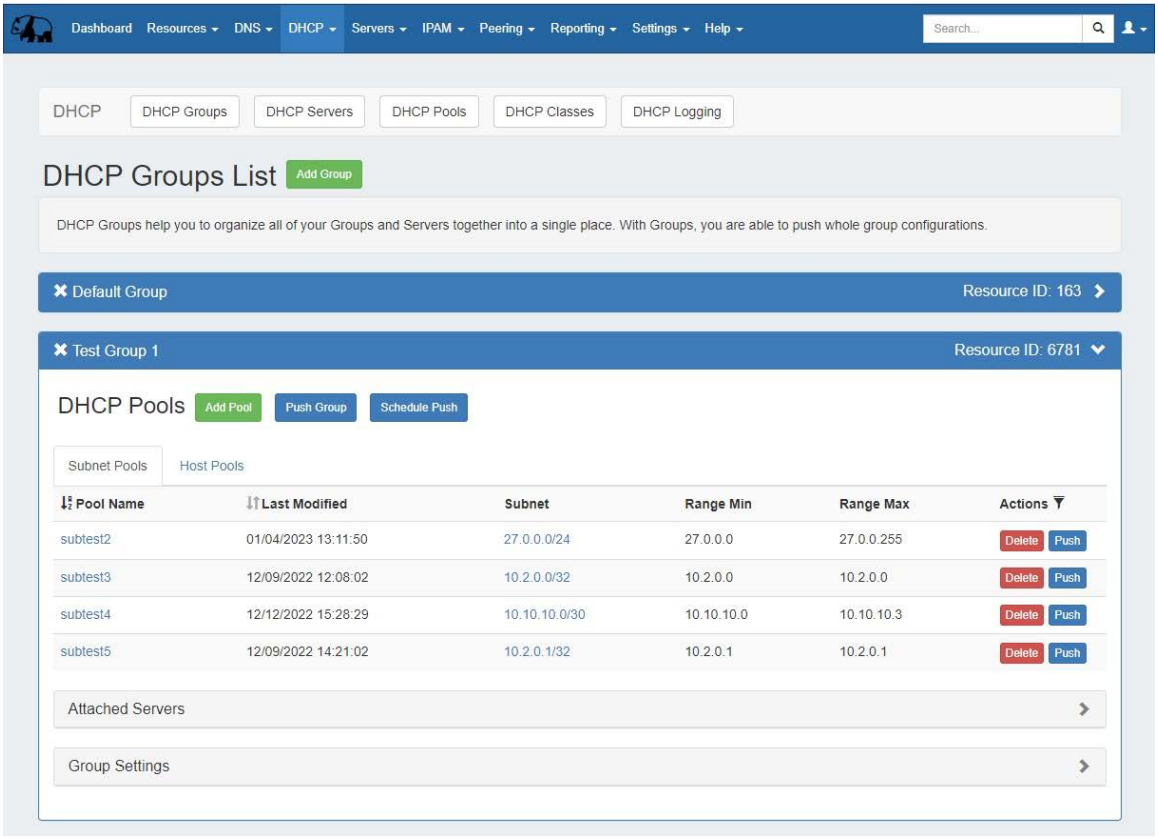
Additional Information

See the following sections for detail on working within the DHCP Tab:

- Working with DHCP Groups
- Working with DHCP Pools
- Working with DHCP Classes
- Working with DHCP Gadgets

Working with DHCP Groups

DHCP Groups



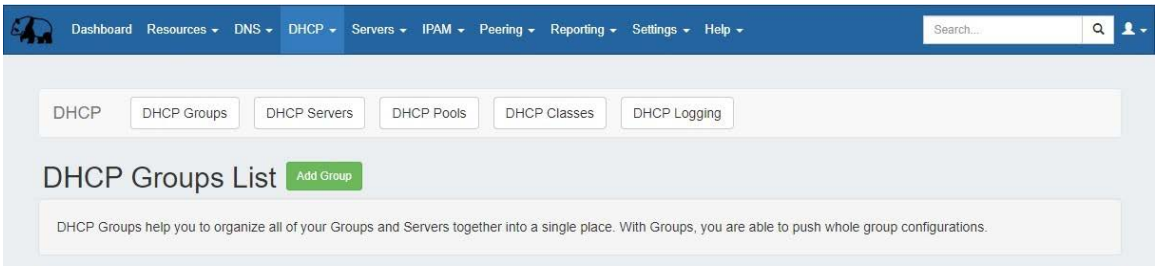
The **DHCP** tab **DHCP Groups List** allows you to create, view, and manage groups of DHCP servers and pools. Using groups, you can configure and push selected combinations of zones at one time.

- DHCP Groups List Interface

Working with DHCP Groups
- Add a Group
- Edit a Group
  - Edit a Group Name:
  - Edit a Group's Settings:
    - Edit Parent Resource
    - Edit Failover Name
- Add Pools to a Group
  - Add a Subnet Pool
    - Smart Assign
    - Direct Assign
  - Add a Host Pool
    - Smart Assign
    - Direct Assign
- Pushing a DHCP Group
  - Manual Group Push
  - Scheduled Group Push
- Delete a Group
- Additional Information

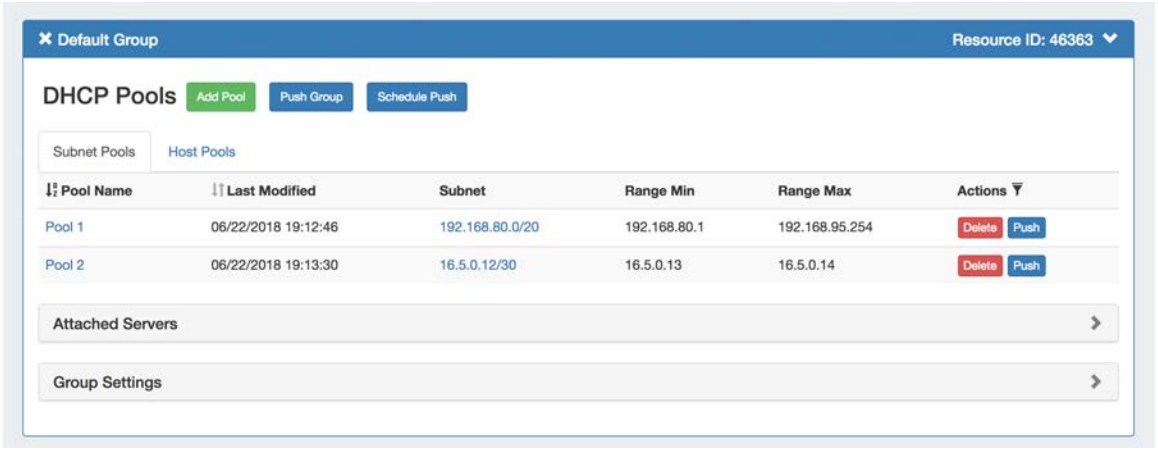
DHCP Groups List Interface

Navigation: Move between the DHCP Groups, DHCP Servers, DHCP Pools, DHCP Classes, and DHCP Logging pages via the subtab buttons below the main navigation bar.



1) Add Group Button: Opens a dialog for creating a DHCP group

2) Group Container: The group container header shows the group name. Expand or close the group container by clicking on the expansion arrow (>) on the far right of the header. Clicking on the X will delete the group and all zones included in the group. Rename the group by clicking on the name, then typing the desired changes and clicking outside of the name.



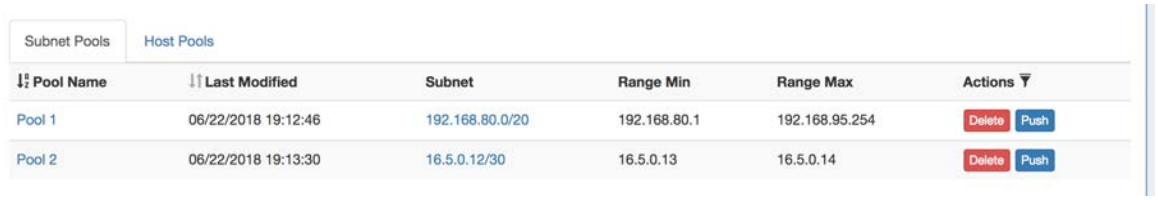
Group Pool Actions:

3) Add Pool Button: Opens a dialog for creating a DHCP pool under that group.

4) Push Group Button: Pushes all pools in the group to the associated DHCP server.

5) Schedule Push Button: Schedules a push of all pools in the group to the selected day and time. Requires the scheduler tab / cron tasks to be enabled.

6) Pool List: Subnet and host pools included in the group.



7) Subnet / Host Pools Tabs: Shows zone list containing only forward or reverse zones, respectively.

8) Pool Name (Sortable): The name of the pool. Clicking on the pool name will open the pool details page. Clicking on the "Pool Name" header will sort the zone list by ascending or descending by name.

9) Last Modified (Sortable): The date and time the pool was last modified. Clicking on the "Last Modified" header will sort the list by most / least recent modification date.

10) Subnet (or IP): The subnet or IP of the subnet/host pool, respectively.

11) Range Min (or MAC): The starting range address for subnet pools, or the MAC for host pools.

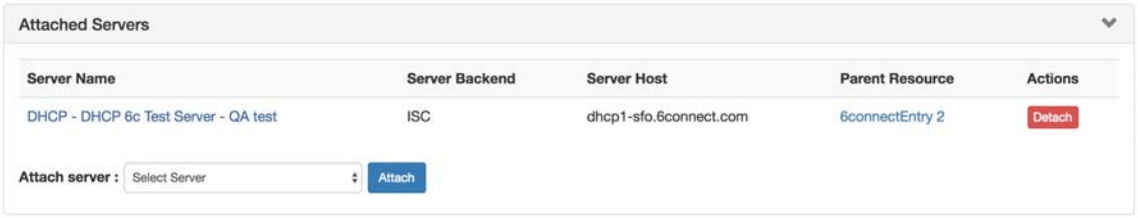
12) Range Max: For the subnet list, the ending range address for the pool.

13) Actions: Clicking on the "Actions" header will reveal sortable filters for selected fields. Buttons under the Actions column indicate actions that may be performed on each pool:

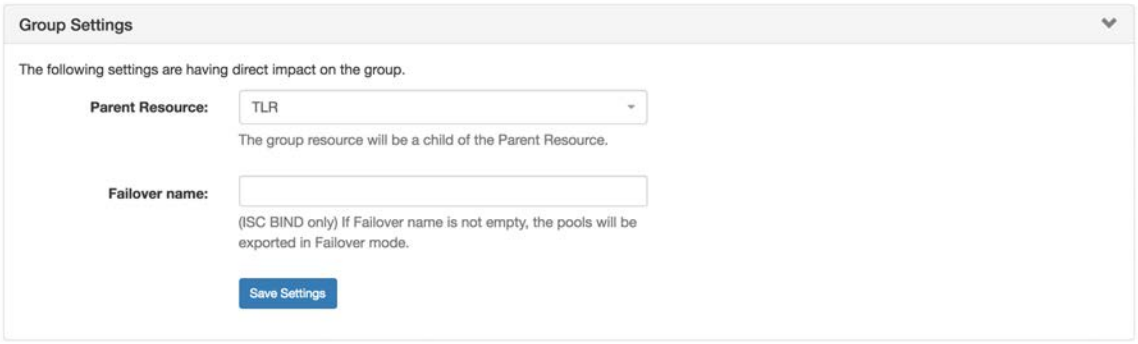
14) Delete: Deletes the pool from ProVision.

15) Push: Pushes the pool to the associated server.

16) Attached Servers: Click on the header title or > to expand or collapse. View, attach, or detach a DHCP server from the group.

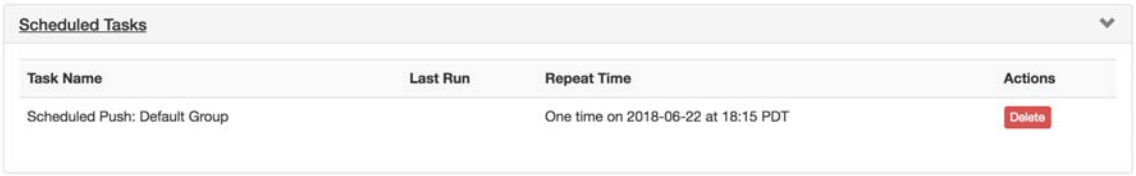


17) Group Settings: Click on the header title or > to expand or collapse. Edit default group settings including the Parent Resource and Failover name.



18) Save Settings Button: Saves any changes made to the DHCP Group Settings options.

22) Scheduled Tasks: If a scheduled push has been set up for the group, the task information will show in a "Scheduled Tasks" module. Click on the header title or > to expand or collapse.



From here, you may review or delete scheduled group pushes.

Working with DHCP Groups

DHCP groups allow for organizing multiple pools together and linking those pools with one or more servers. Pools may be pushed individually, as a group, or at the server level.

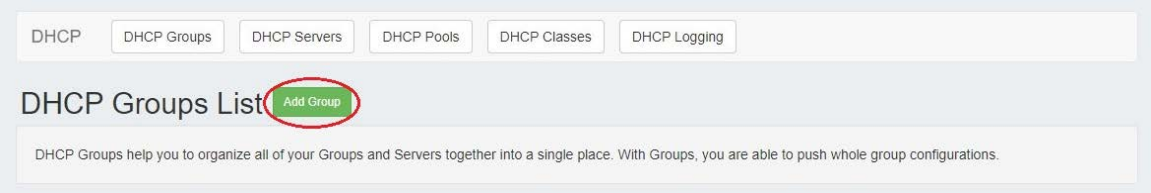
ProVision automatically designates a Default Group for pools to be imported or added into. Creating additional groups is completely optional.

Add a Group

Create DHCP groups by clicking the "Add Group" Button, then add subnet or host pools under the group by clicking "Add Pool" for the desired group.

Pools may be pushed individually, as a part of a DHCP group, or through pushing an entire DHCP server.

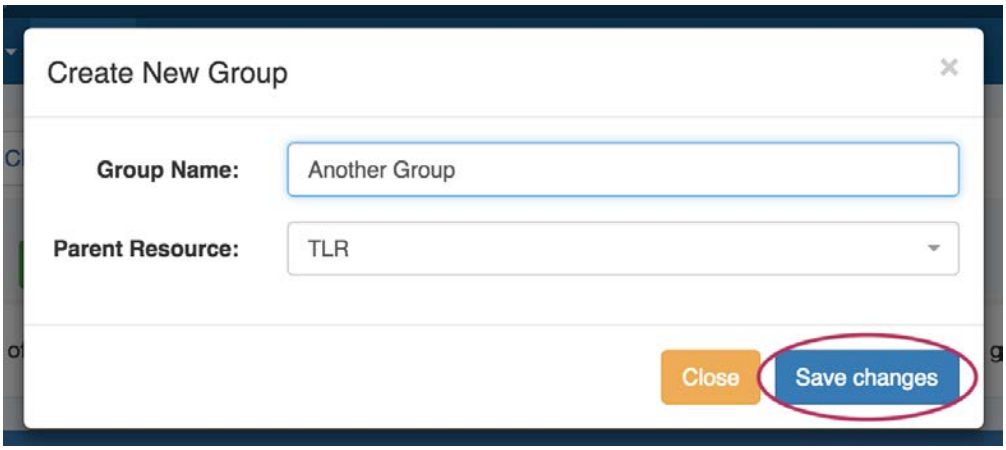
To create a new group, from the DHCP Tab, select the DHCP Groups sub menu. Then, click the "Add Group" button next to "DNS Groups List".



This will open the "Create New Group" dialog.

Enter the desired group name and select a parent resource.

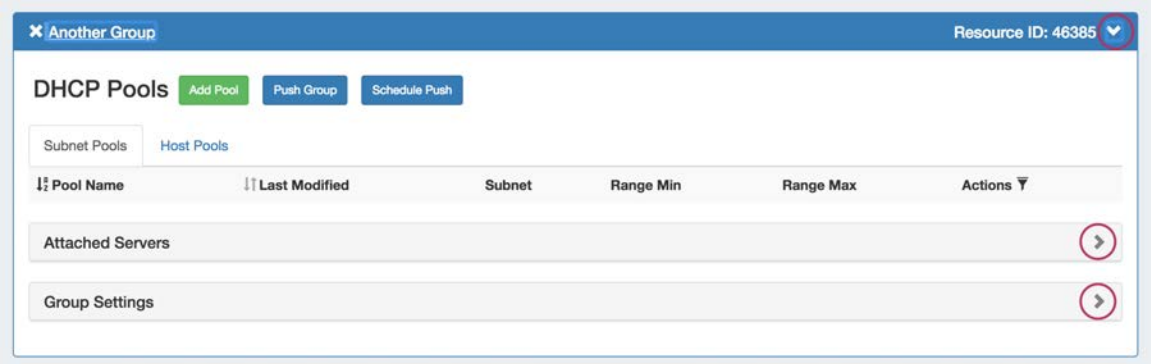
Click the "Save Changes" button when complete.



The new group will be added to the DHCP Groups List.

Open the group container for the new group by clicking on the expansion arrow at the top right corner of the header.

Information for Attached Servers and Group Settings may also be viewed and edited by clicking on the expansion arrows for each section.



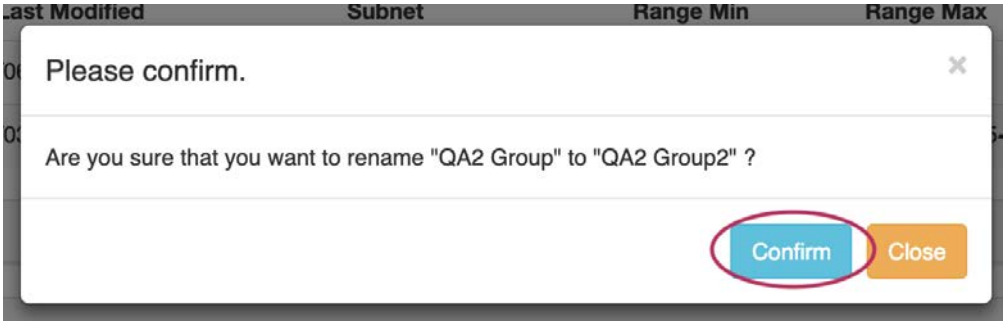
Edit a Group

Edit a Group Name:

Edit the name for a group by clicking inside the group's name. A highlight box will appear around the name, and a cursor inside the box.



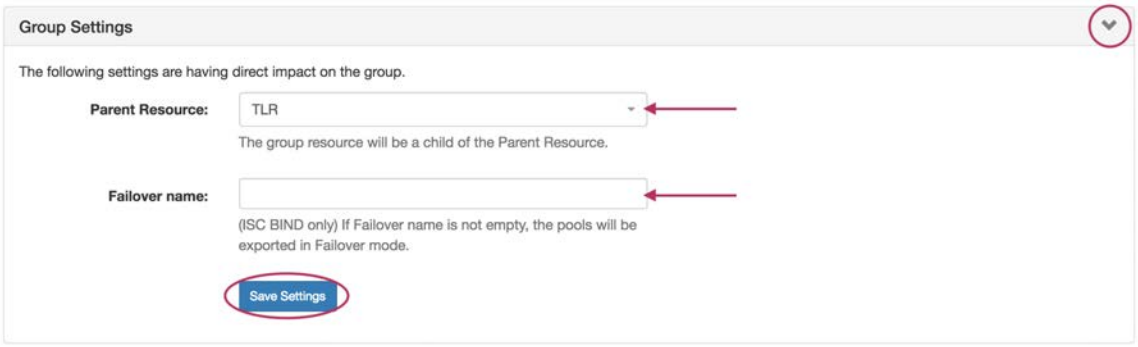
Edit the text as desired using your mouse or arrow keys to navigate through the text. When complete, click anywhere outside of the name box, and a confirmation dialog will appear.



Click "Confirm" to save your changes, or "Close" to exit without saving.

Edit a Group's Settings:

Under the desired group, expand the "Group Settings" module by clicking on the expansion arrow in the upper right corner of the header.



Edit Parent Resource

Change the parent resource for the DHCP group by searching and selecting the desired resource from the dropdown box.

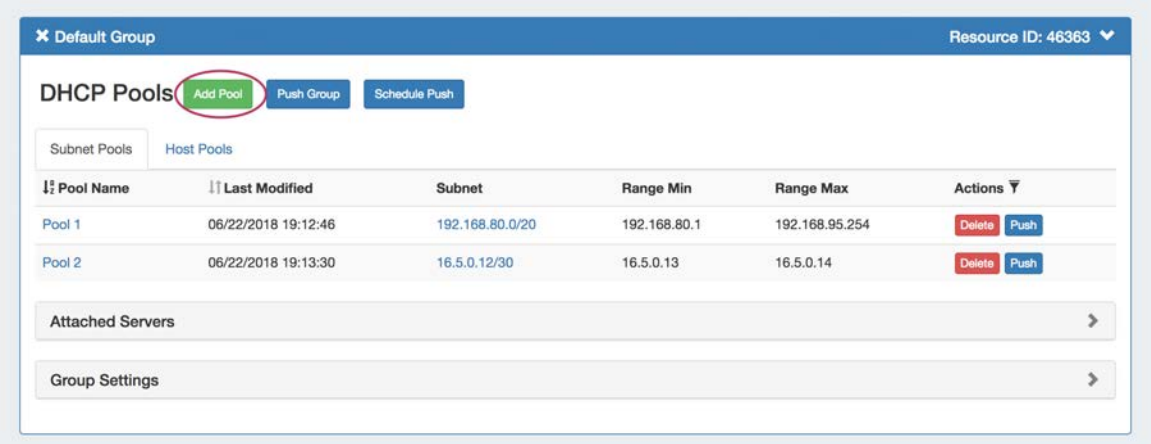
Edit Failover Name

Edit the Failover name by typing the name directly in the Failover Name input. If the Failover name is not empty, the pools will be exported in Failover mode. NOTE: This is for ISC BIND only.

When done with your edits, be sure to click the "Save Settings" button.

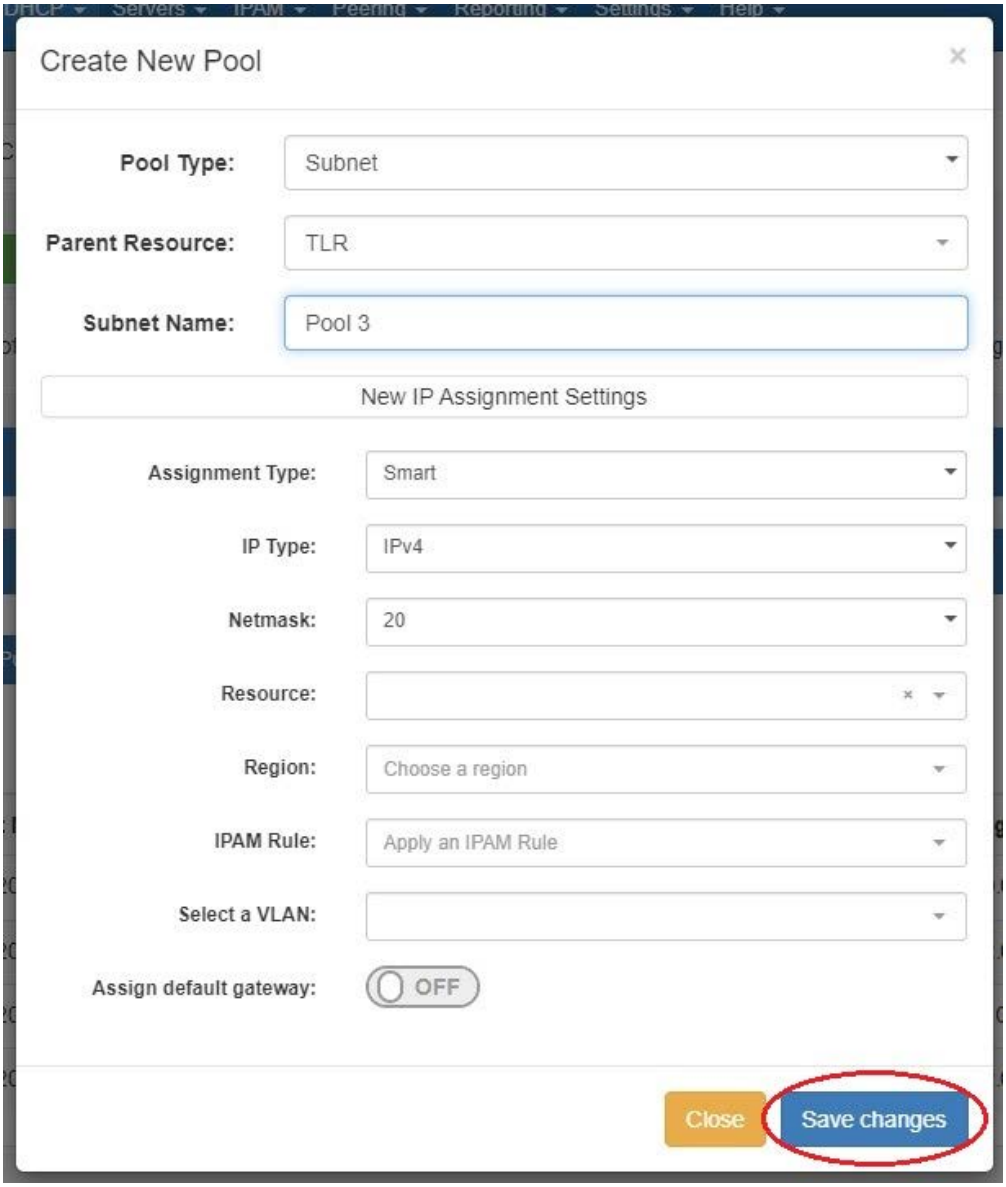
Add Pools to a Group

To add a new pool to a DHCP group, click the "Add Pool" button inside the desired group.



Add a Subnet Pool

To add a new subnet pool to a DHCP group, select "Subnet" as the Pool Type. Select the parent resource and type in a subnet name.



Next, choose an assignment type - you may either have ProVision smart assign a block for the pool that matches your provided criteria, or directly assign a specific block.

Smart Assign

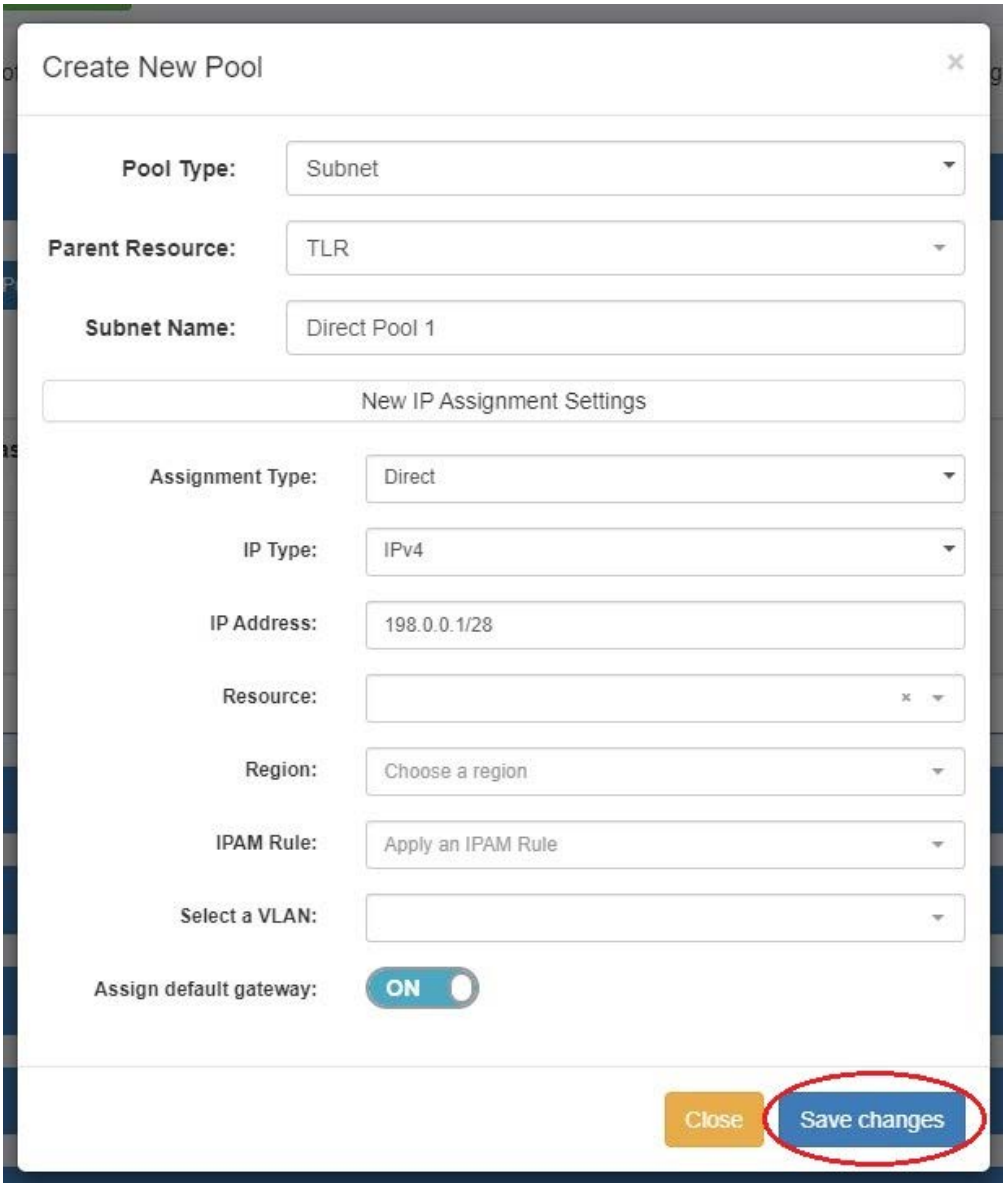
To Smart Assign a DHCP pool, select "Smart" for the Assignment type, choose IPv4 or IPv6 for the IP type, then select a netmask.

All other fields are optional - Resource, Region, IPAM Rules, and VLAN may be selected to further narrow the block criteria. If desired, toggle "Assign Default Gateway" on.

When done, click "Save Changes". ProVision will choose the first block matching all criteria to assign to the pool.

If no block matches the given criteria, a message will state so. Try either removing some criteria, or ensure that blocks exist in IPAM (with subassignments enabled!) with the given attributes.

Direct Assign



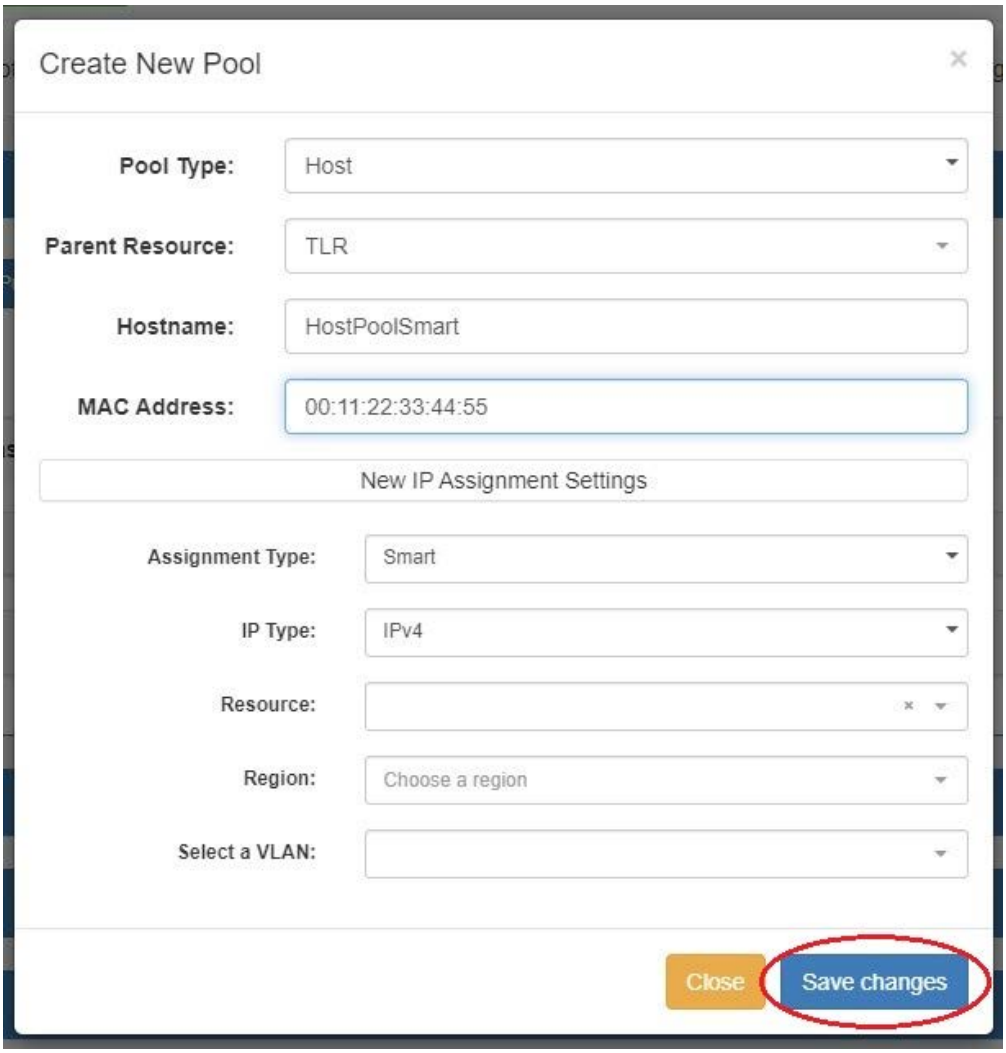
To Direct Assign a DHCP pool, select "Direct" for the assignment type, choose IPv4 or IPv6 for the IP type, then type in the desired IP address.

All other fields are optional - Resource, Region, IPAM Rules, and VLAN may be selected to further narrow the block criteria, if duplicate blocks exist. If desired, toggle "Assign Default Gateway" on.

When done, click "Save Changes". If the typed block exists in ProVision with subassignments enabled, and meets any additional criteria, that block will be assigned to the pool.

Add a Host Pool

To add a new host pool to a DHCP group, select "Host" as the pool type. Select the parent resource, and add a hostname and MAC address.



Next, choose an assignment type - you may either have ProVision smart assign a block for the pool that matches your provided criteria, or directly assign a specific block.

Smart Assign

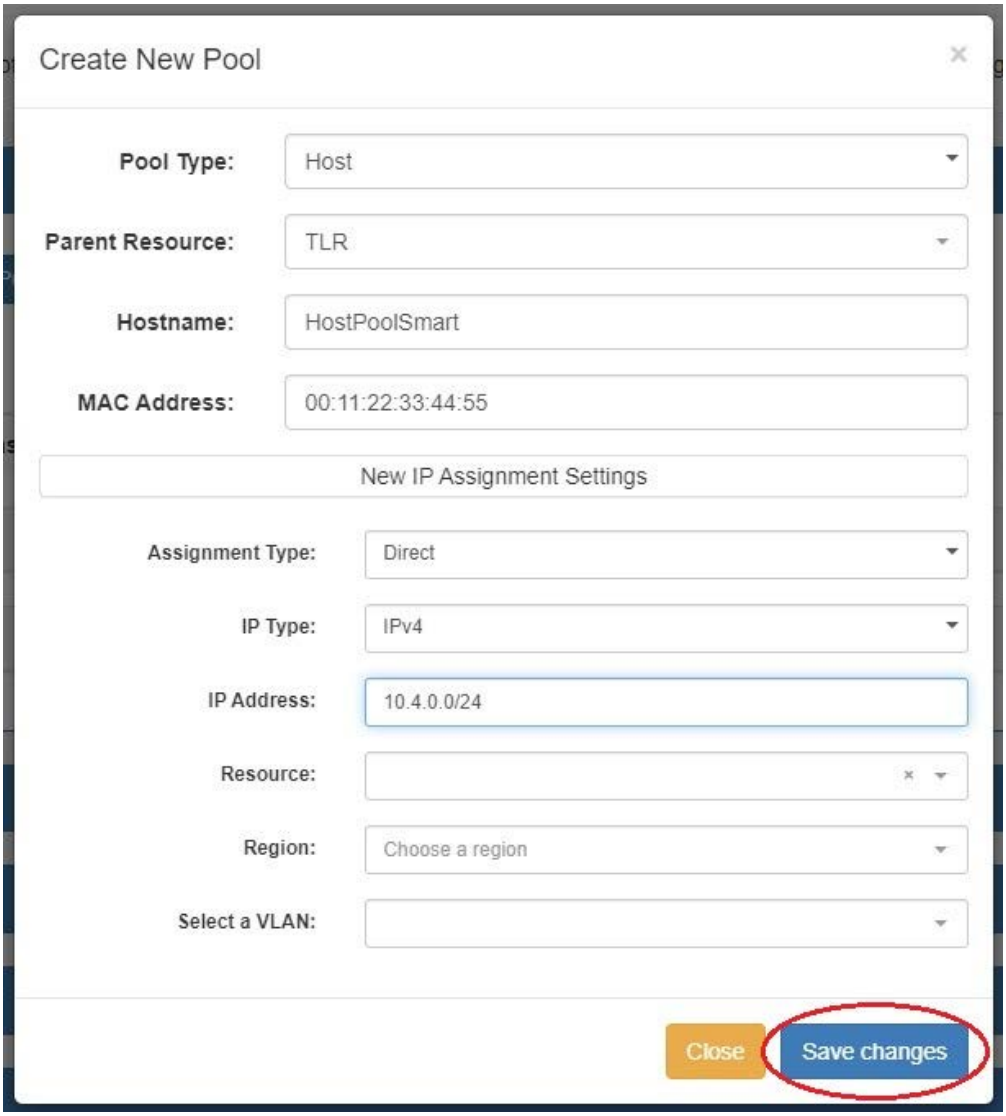
To Smart Assign a DHCP pool, select "Smart" for the assignment type and choose IPv4 or IPv6 for the IP type.

All other fields are optional - Resource, Region, IPAM Rules, and VLAN may be selected to further narrow the block criteria.

When done, click "Save Changes". ProVision will choose the first block matching all criteria to assign to the pool.

If no block matches the given criteria, a message will state so. Try either removing some criteria, or ensure that blocks exist in IPAM (with subassignments enabled!) with the given attributes.

Direct Assign



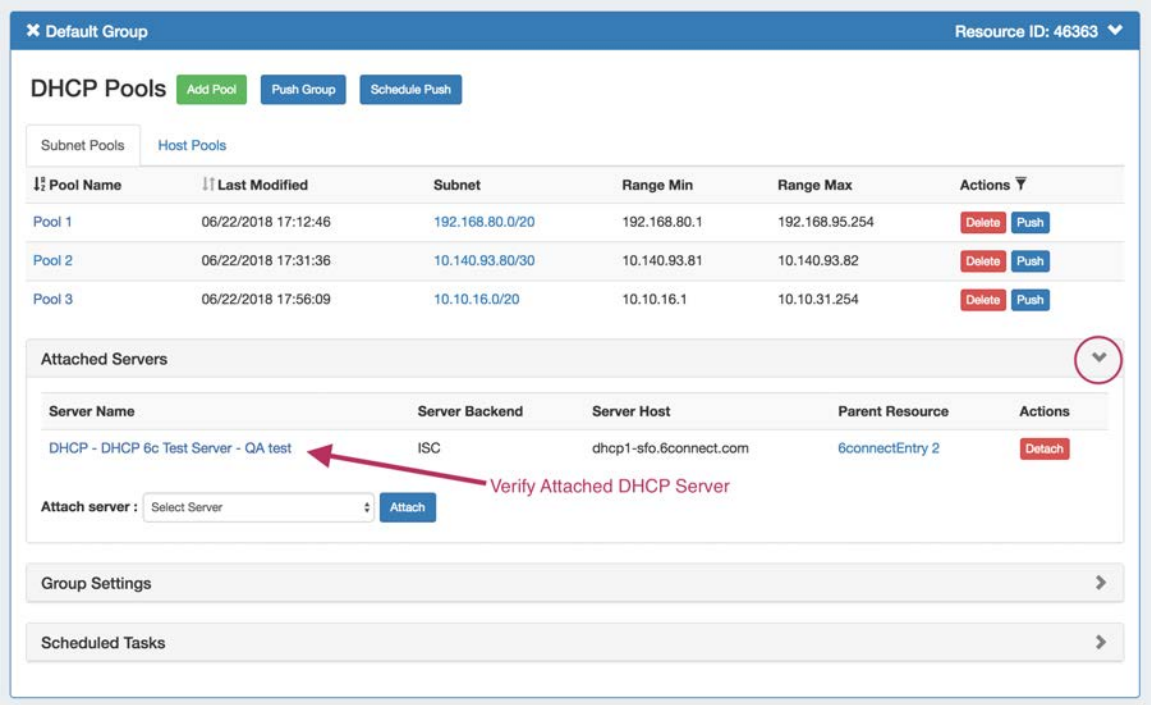
To Direct Assign a DHCP pool, select "Direct" for the assignment type, choose IPv4 or IPv6 for the IP type, then type in the desired IP address.

All other fields are optional - Resource, Region, IPAM Rules, and VLAN may be selected to further narrow the block criteria, if duplicate blocks exist.

When done, click "Save Changes". If the typed block exists in ProVision with subassignments enabled, and meets any additional criteria, that block will be assigned to the pool.

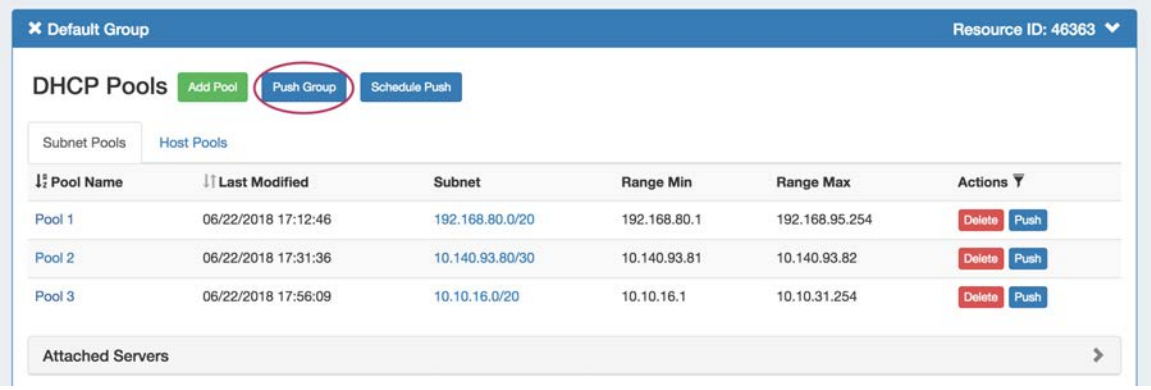
Pushing a DHCP Group

Before pushing a group, expand the "Attached Servers" section and verify that the correct server is attached to the DHCP group.



Manual Group Push

After verifying the attached server, manually push the group by clicking the "Push Group" button under the desired DHCP group.



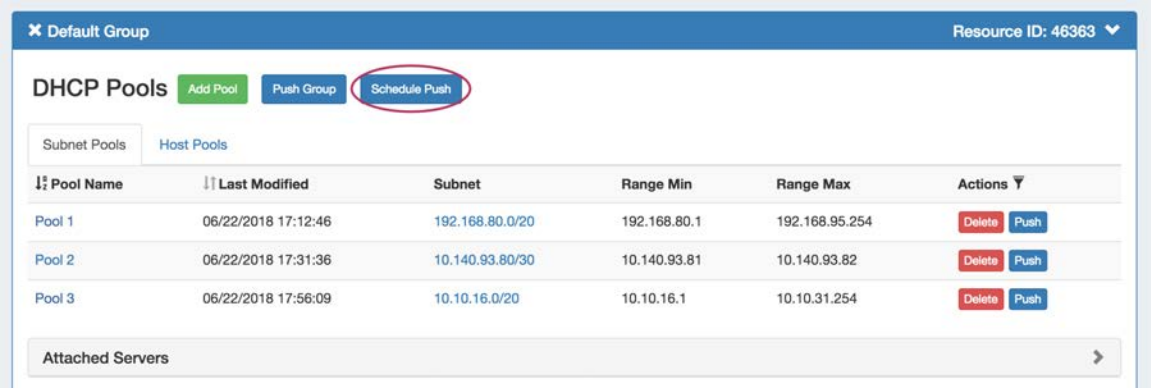
A DHCP Push Status window appears. If successful, a green "Finished DHCP Pushing Request" will appear as the final message.

If errors occur, an error message will show with details on the issue. When complete, hit the "Close" button.

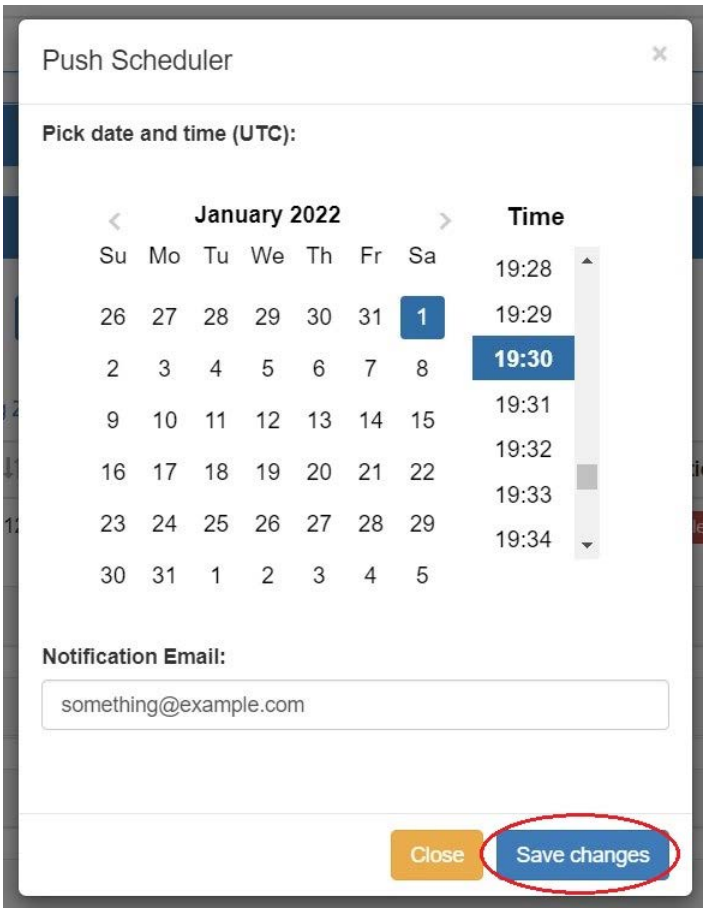


Scheduled Group Push

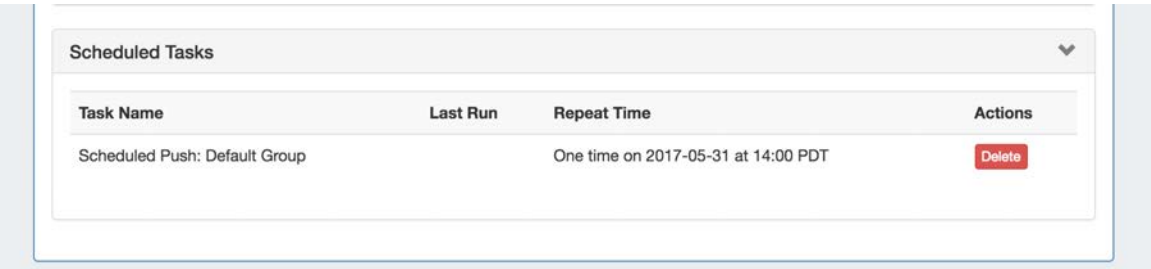
Scheduled pushes may be set up through the "Schedule Push" button for the group.



Click "Schedule Push" for the group, then select a date, time (24 hour), add a notification email address, and click "Save changes".



The scheduled task will be shown in both the group details (under "Scheduled Tasks") and the Admin Scheduler task list.



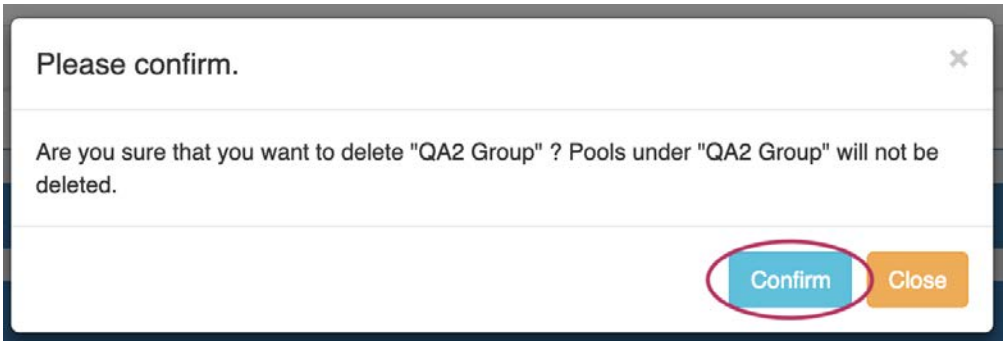
The task may be deleted prior to running by clicking the "delete" button, but will automatically be removed once completed.

Delete a Group

Delete a non-Default Group by clicking on the "X" to the left of the group's name in the DHCP Groups List. When you delete a DHCP group, pools under the group will not be deleted. They will no longer be associated with a DHCP group, and can be managed from the DHCP Pools List.



A confirmation message will appear, click "Confirm" to save your changes, or "Close" to exit without saving.



The Default Group may not be deleted.

Additional Information

For more information on DHCP tasks, see:

- DHCP Tab
- Working with DHCP Pools
- Working with DHCP Gadgets

Administrative Tasks:

- DHCP Administration
- Working with DHCP Servers

Working with DHCP Pools

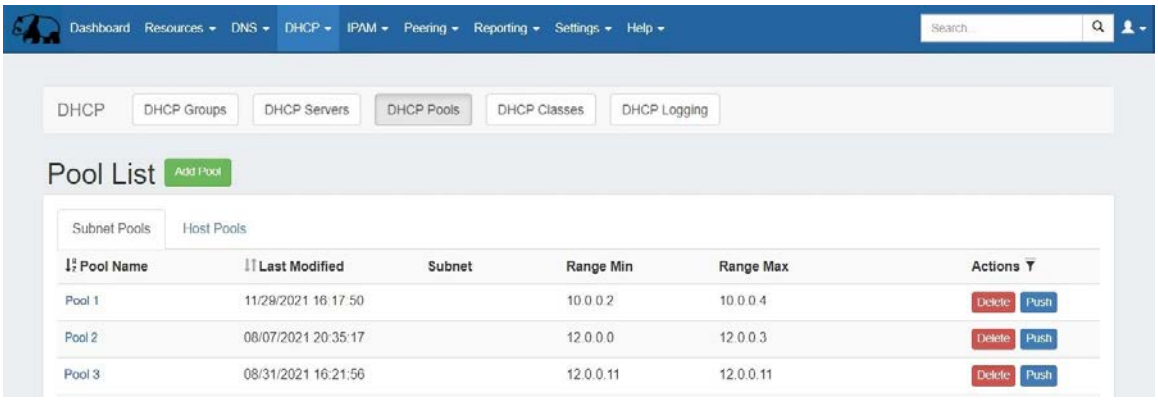
DHCP Pool Management

DHCP Pool specific tasks are managed from two main areas in ProVision - the **DHCP Pools** list, and the **Pool Details** page.

The DHCP Pools List is accessed from the **DHCP** tab, then clicking on the **DHCP Pools** subtab button.

Clicking on the Pool name from any DHCP Pool List will open the **Pool Details** page for the specific pool.

DHCP Pools List



The **DHCP Pools** list provides the same pool-level functionality as the DHCP Groups pool lists, but includes all pools regardless of Group attachment.

From this page, you may create, view, edit, and push subnet or host pools.

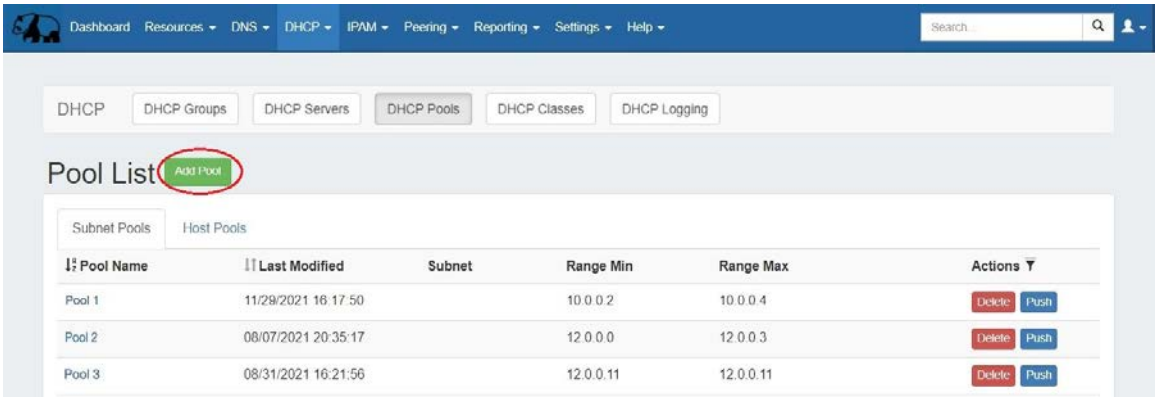
Clicking on the pool name will open the **Pool Details** page, and clicking on the Subnet will open IPAM Mange for the assigned pool block.

The Pool Details page allows you to view, add, delete, and push individual DHCP Host and Subnet Pools. Under a pool, you may specify and update IP assignments, ranges, reservations and optionally set BOOTP Vendor Extensions / DHCP Options to send to the DHCP server.

- DHCP Pools List
  - Add a DHCP Pool
    - Create Subnet Pool
      - Smart Assign
      - Direct Assign
    - Create a Host Pool
      - Smart Assign
      - Direct Assign
  - The Pool Details Page
    - View / Edit / Manage a Pool
    - Edit IP Assignment
    - Add / Edit a comment:
    - Edit / Add a Pool Range
    - Edit Advanced Settings:
    - Add / Remove a DHCP Subnet Option
    - Add / Remove a Pool Reservation or Pool Reservation Option
    - Detach Server from a Pool
    - Delete a Pool
  - Pushing DHCP Pools
    - Manual Pool Push (DHCP Pools List)
    - Manual Pool Push (Pool Details page):
    - Schedule Push (from Pool Details page):
    - Schedule Push (Admin Scheduler):
    - DHCP Group Push:
    - DHCP Server Push:
  - Additional Information:

Add a DHCP Pool

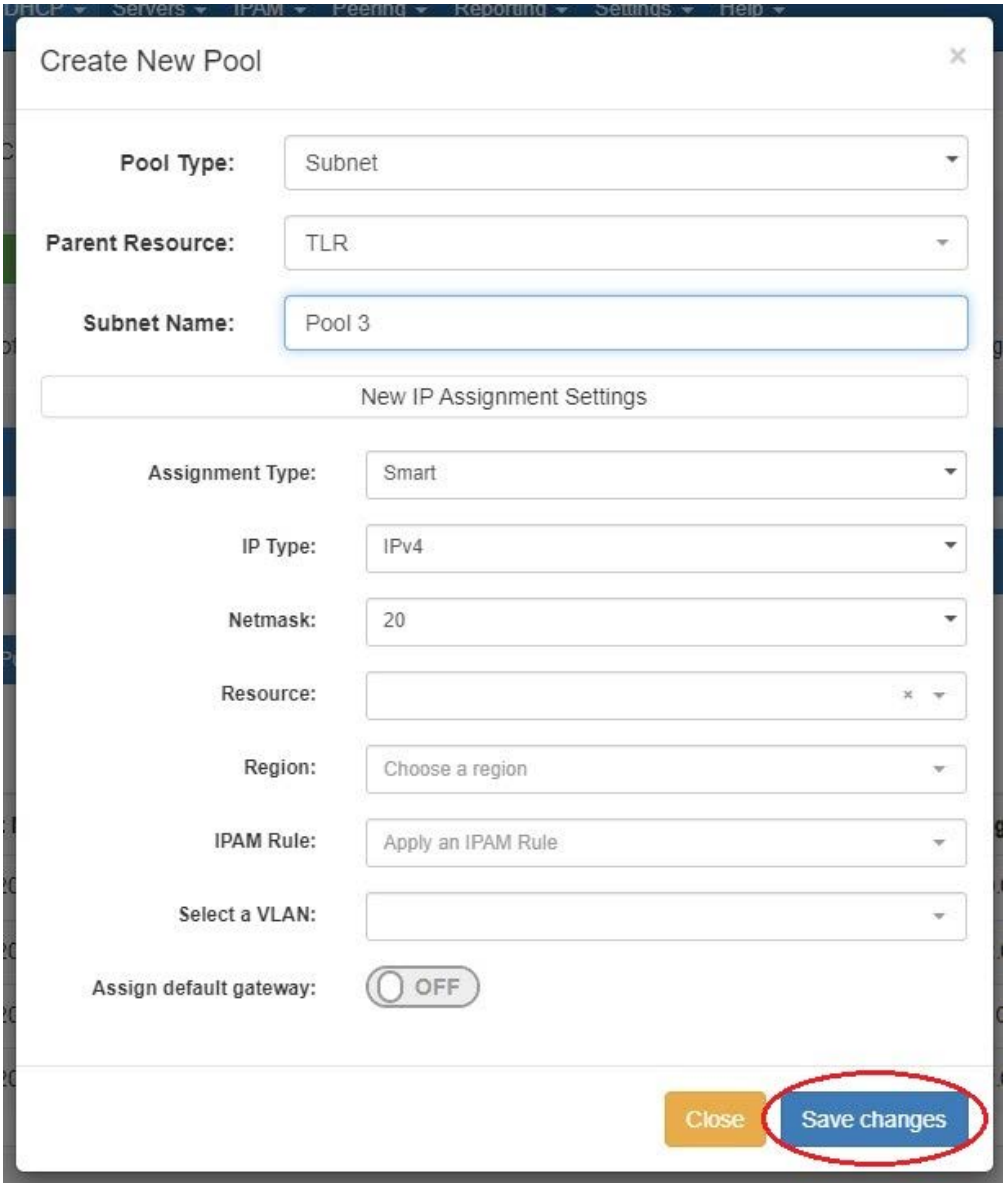
Add a new DHCP Pool from the Pool List by clicking the "Add Pool" button at the top of the page.



When the "Create New Pool" dialog appears, you may choose to create either a Subnet or Host Pool. Either pool type may have a block smart assigned or manually direct assigned.

Create Subnet Pool

To add a new subnet pool to a DHCP Group, select "Subnet" as the Pool Type. Select the parent resource and type in a Subnet Name.



Next, choose an assignment type - you may either have ProVision smart assign a block for the pool that matches your provided criteria, or directly assign a specific block.

Smart Assign

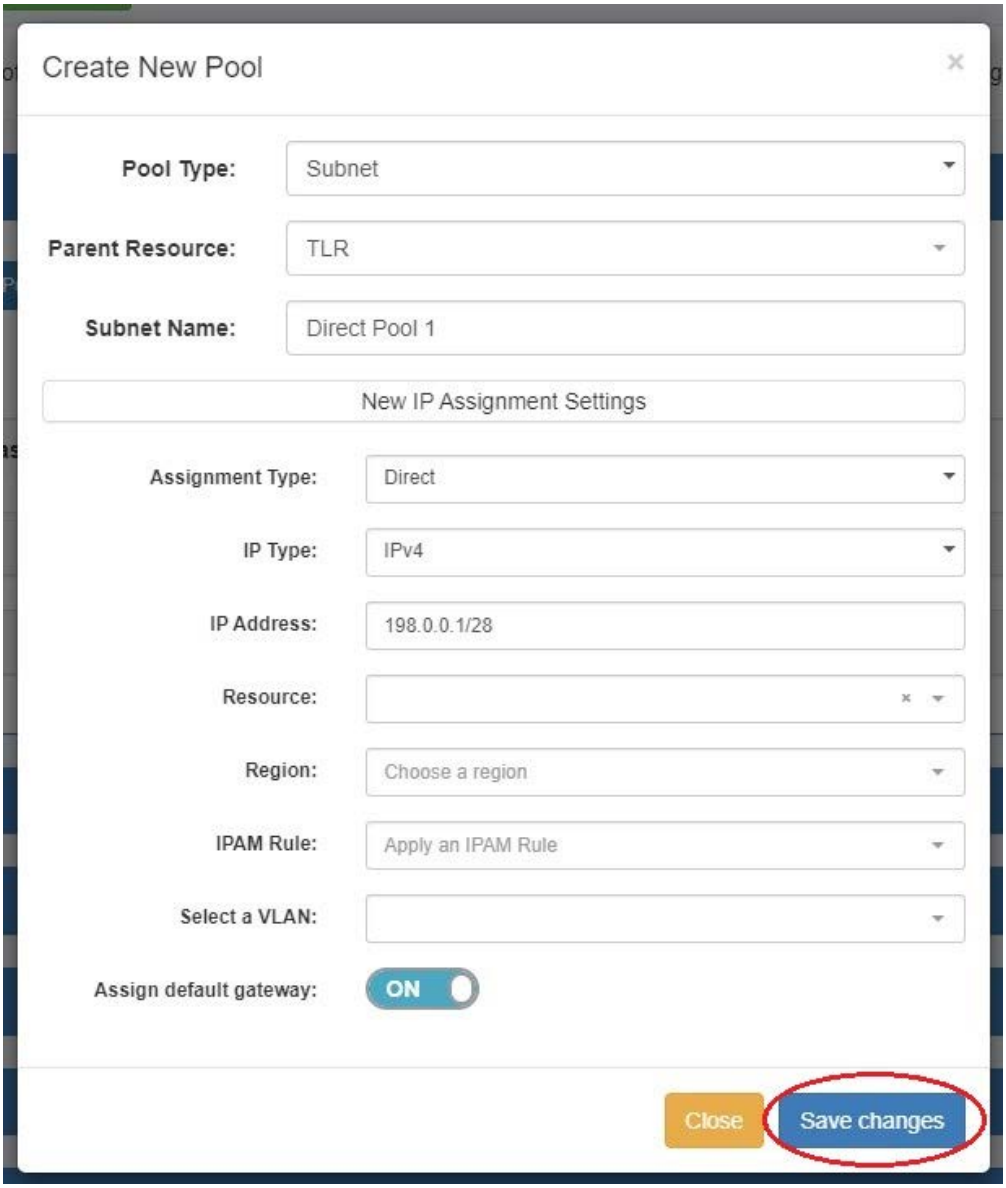
To Smart Assign a DHCP pool, select "Smart" for the Assignment type, choose IPv4 or IPv6 for the IP type, then select a netmask.

All other fields are optional - Resource, Region, IPAM Rules, and VLAN may be selected to further narrow the block criteria. If desired, toggle "Assign Default Gateway" on.

When done, click "Save Changes". ProVision will choose the first block matching all criteria to assign to the pool.

If no block matches the given criteria, a message will state so. Try either removing some criteria, or ensure that blocks exist in IPAM (with subassignments enabled!) with the given attributes.

Direct Assign



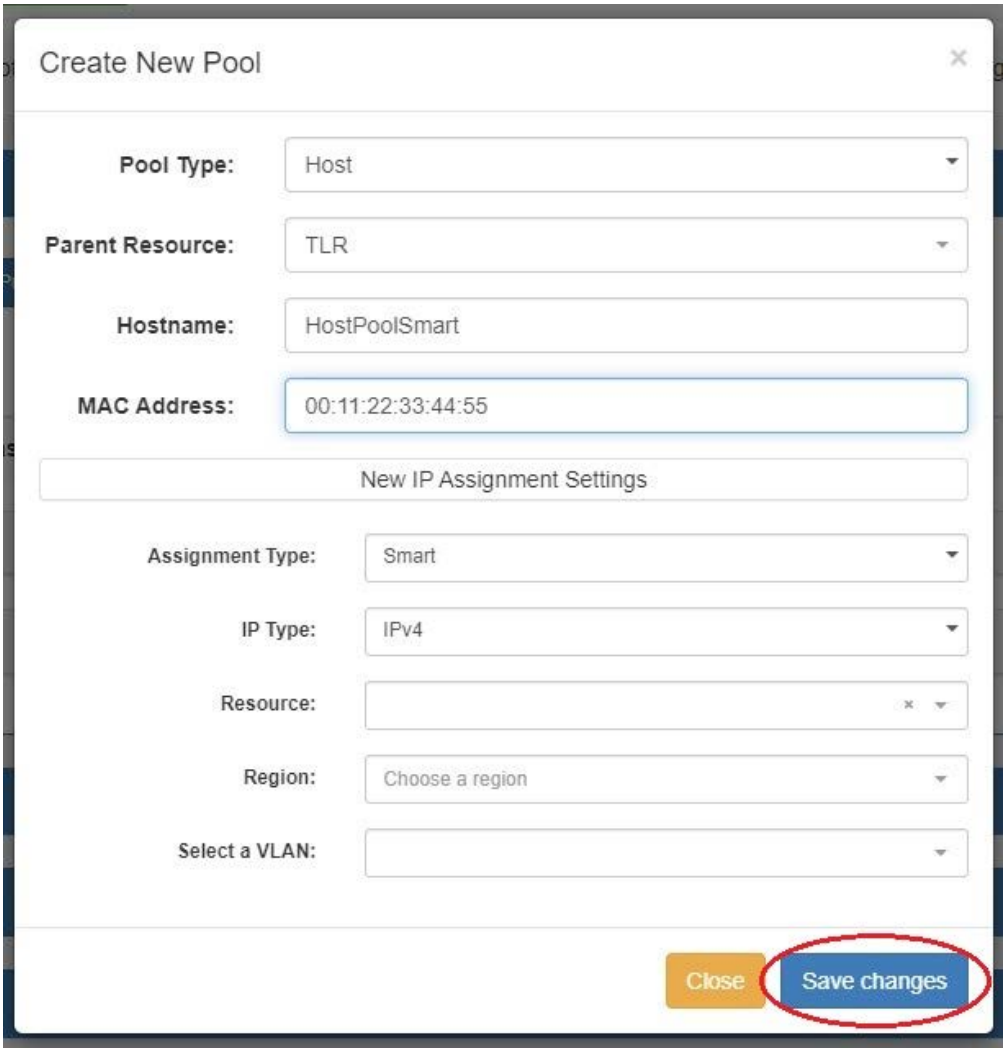
To Direct Assign a DHCP pool, select "Direct" for the Assignment type, choose IPv4 or IPv6 for the IP type, then type in the desired IP Address.

All other fields are optional - Resource, Region, IPAM Rules, and VLAN may be selected to further narrow the block criteria, if duplicate blocks exist. If desired, toggle "Assign Default Gateway" on.

When done, click "Save Changes". If the typed block exists in ProVision with subassignments enabled, and meets any additional criteria, that block will be assigned to the pool.

Create a Host Pool

To add a new host pool to a DHCP Group, select "Host" as the Pool Type. Select the parent resource, and add a Hostname and MAC Address.



Next, choose an assignment type - you may either have ProVision smart assign a block for the pool that matches your provided criteria, or directly assign a specific block.

Smart Assign

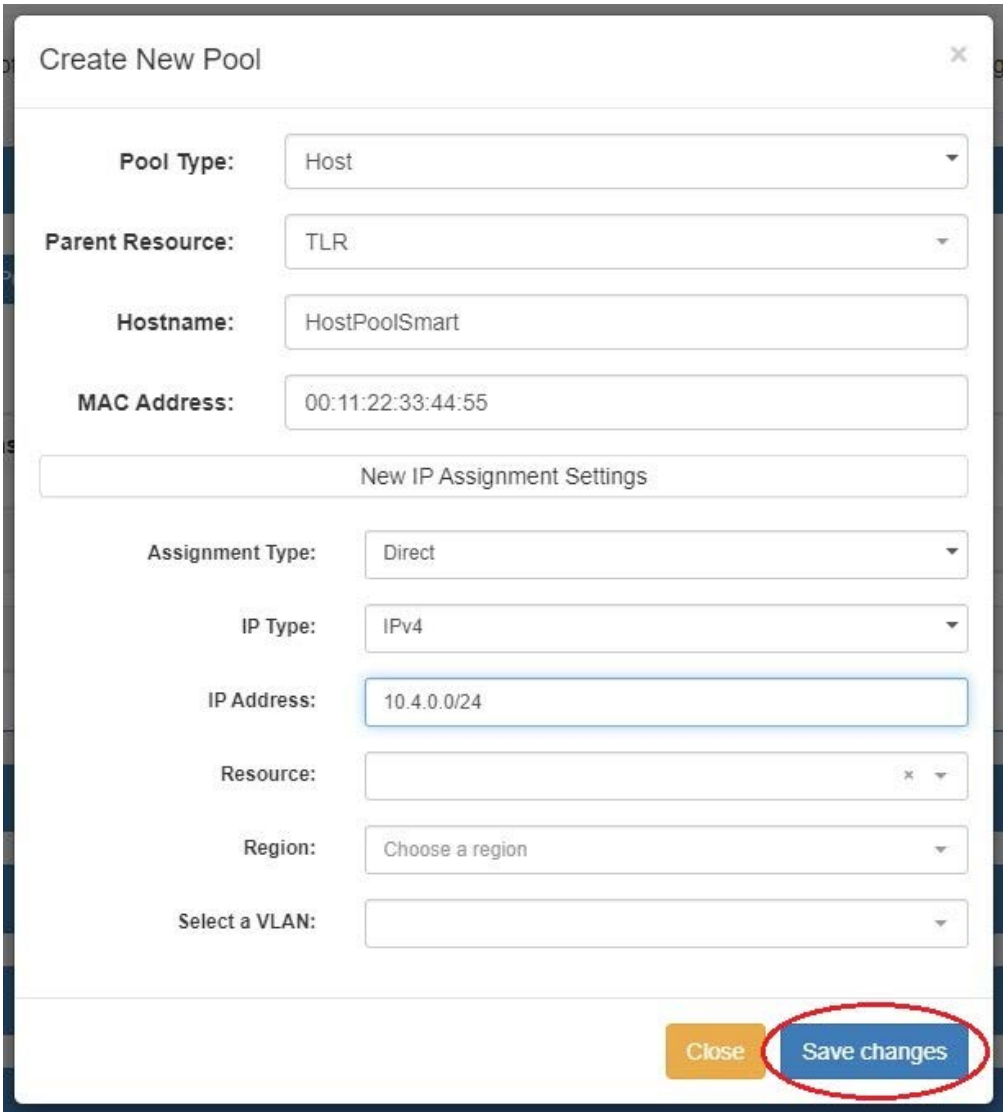
To Smart Assign a DHCP pool, select "Smart" for the Assignment type and choose IPv4 or IPv6 for the IP type.

All other fields are optional - Resource, Region, IPAM Rules, and VLAN may be selected to further narrow the block criteria.

When done, click "Save Changes". ProVision will choose the first block matching all criteria to assign to the pool.

If no block matches the given criteria, a message will state so. Try either removing some criteria, or ensure that blocks exist in IPAM (with subassignments enabled!) with the given attributes.

Direct Assign



To Direct Assign a DHCP pool, select "Direct" for the Assignment type, choose IPv4 or IPv6 for the IP type, then type in the desired IP Address.

All other fields are optional - Resource, Region, IPAM Rules, and VLAN may be selected to further narrow the block criteria, if duplicate blocks exist.

When done, click "Save Changes". If the typed block exists in ProVision with subassignments enabled, and meets any additional criteria, that block will be assigned to the pool.

The Pool Details Page

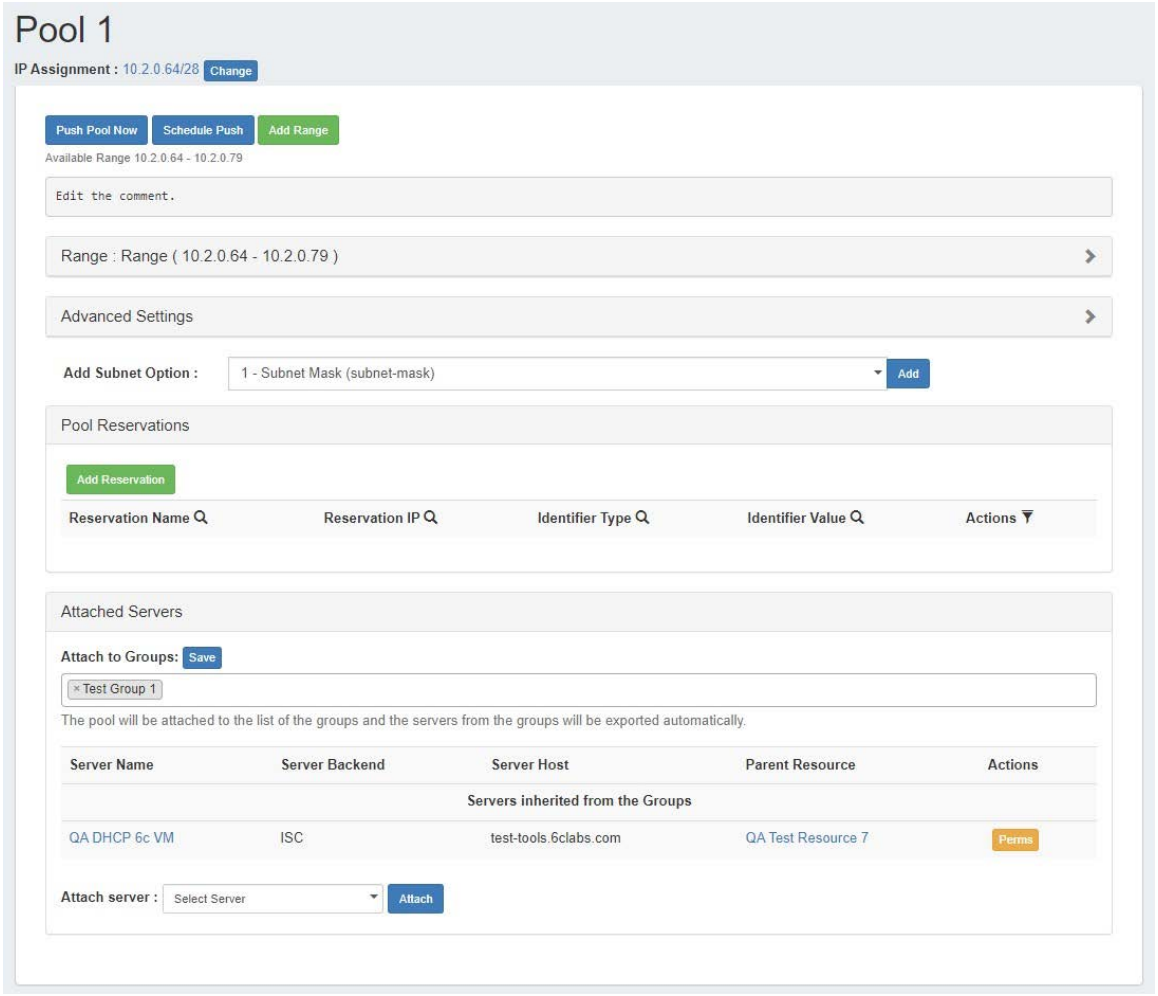
Additional Pool Management options are available from the **Pool Details** page. Pools may be edited by clicking on the Pool name in any **DHCP Pools** list in which it appears.

View / Edit / Manage a Pool

To view, edit, or manage the details for a pool, open the Pool Details page by clicking on the pool name from any DHCP Pools list.

From this page, users may edit assignment, range, settings, reservations, options, or servers for the pool.

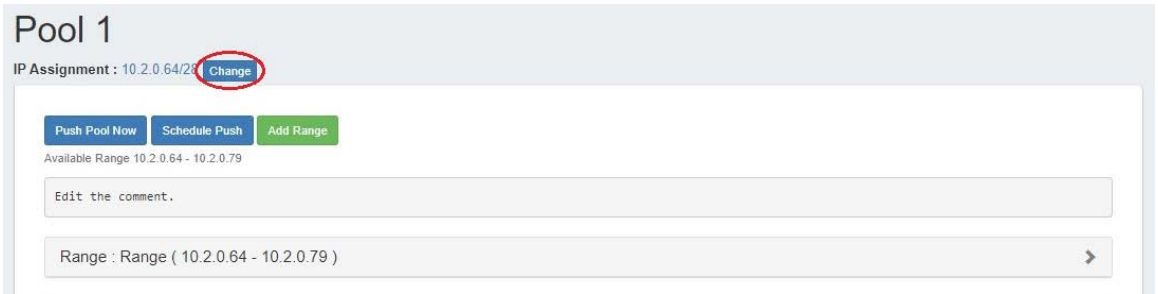
To push the pool, click the "Push Pool Now" or "Schedule Push" buttons at the top of the pool details.



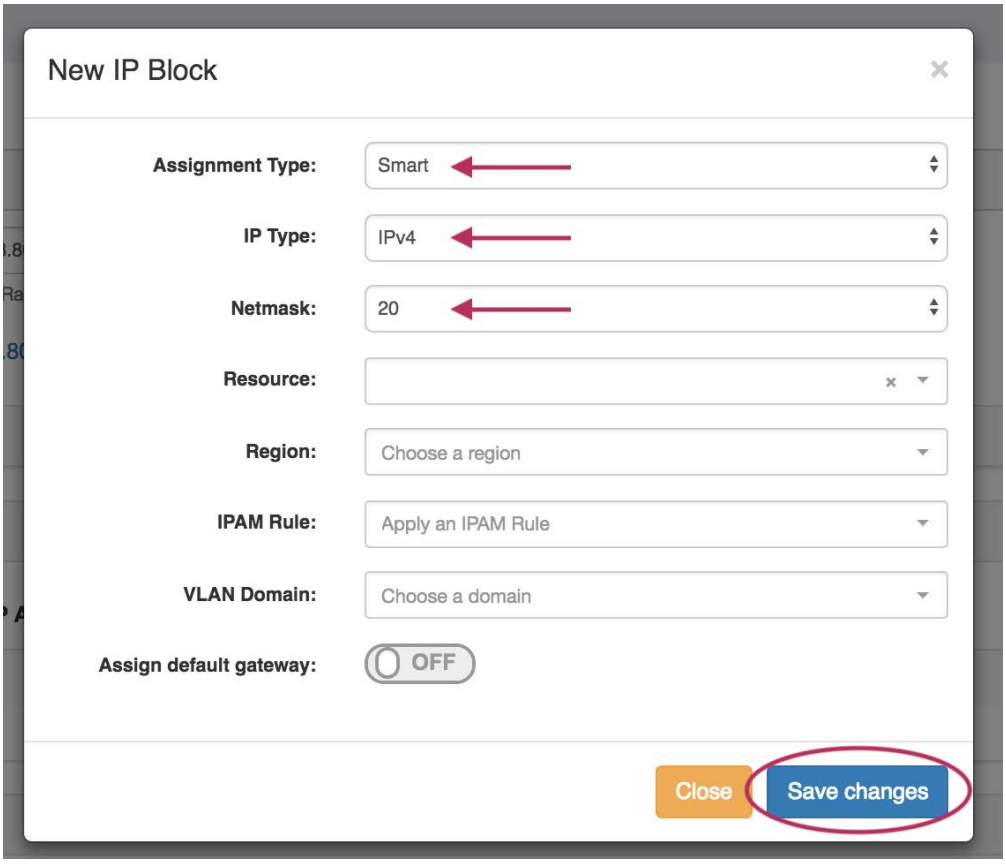
Edit IP Assignment

The current IP assignment displays at the top of the Pool Details page. Clicking the CIDR will take you to IPAM manage for the assigned block / aggregate.

To change the current IP assignment for the pool, click the "Change" button next to "IP Assignment".



In the "New IP Block" dialog, select the Assignment Type, IP Type, and Netmask. Optional fields include Resource, Region, IPAM Rule, and VLAN as filtering criteria if desired.



When complete, click "Save changes".

If no block meets the selected criteria, an error message will appear - try removing filter criteria, or verify that subassignable blocks meeting the criteria have been created in IPAM.

If successful, the IP assignment will change to a block meeting the provided attributes.

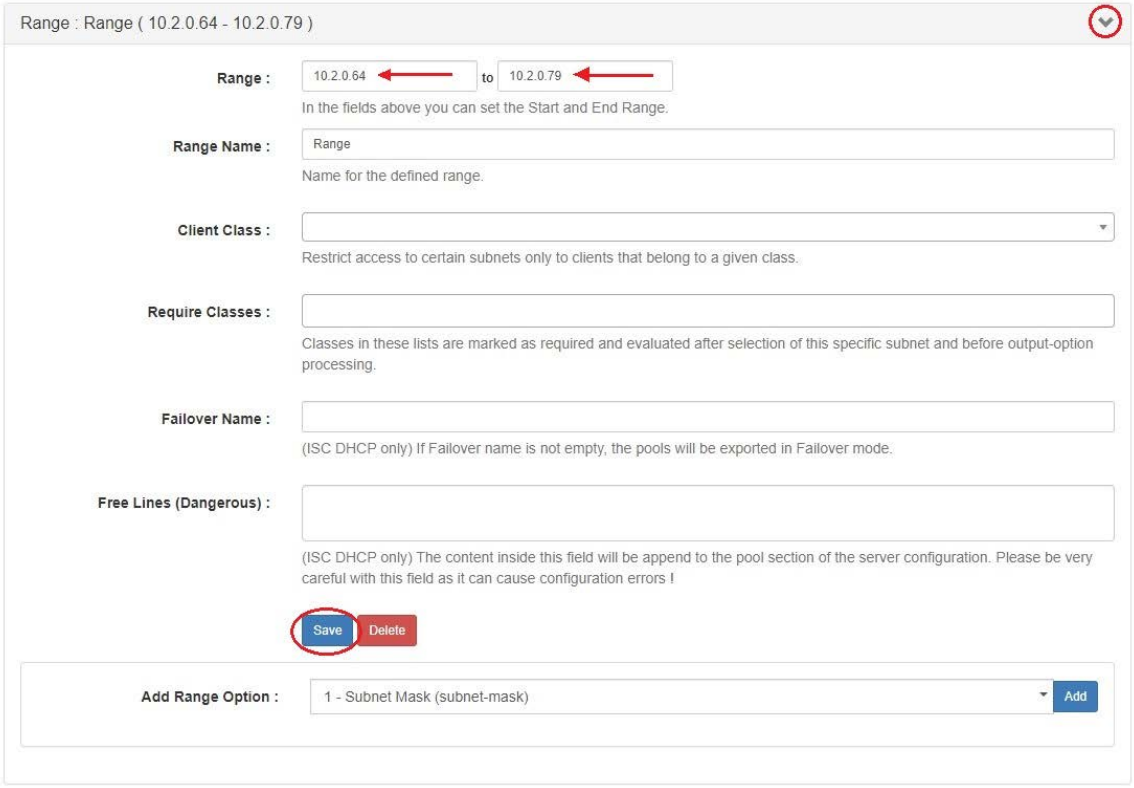
Add / Edit a comment:

To add a comment to a pool, click anywhere inside the comment area and begin typing. The comment will be saved when an area outside of the comment box is clicked, deselecting the comment area.

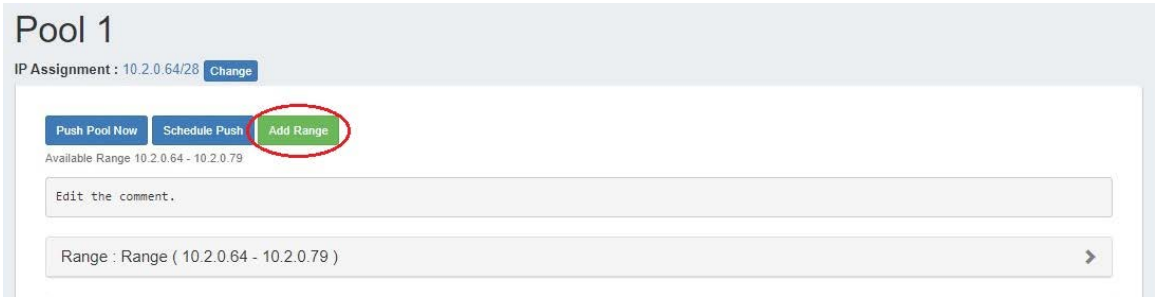


Edit / Add a Pool Range

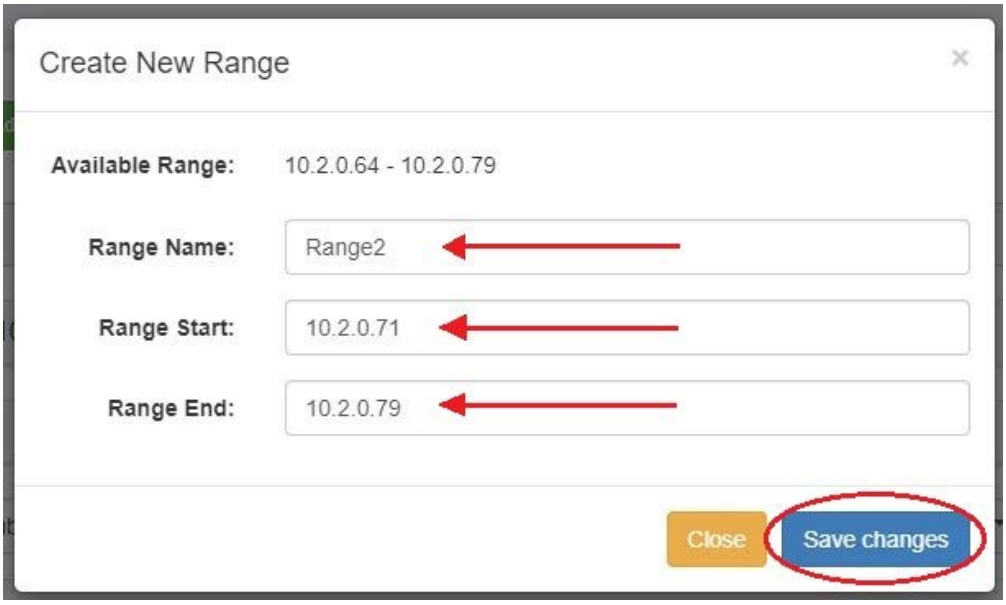
The pool range may be manually edited by expanding the "Range" module and typing the desired range start and end values into the "Range" fields, then clicking the "Save" button. From here, you may also edit the Range Name, Class and other settings, or add an option to a range.



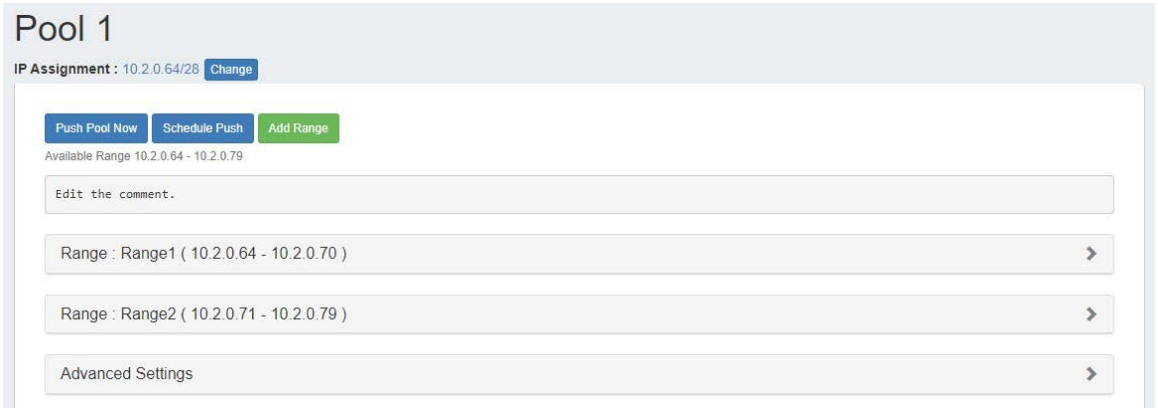
To add a range, click the "Add Range" button at top.



Enter a Range Name, Range Start, and Range End and click "Save changes".

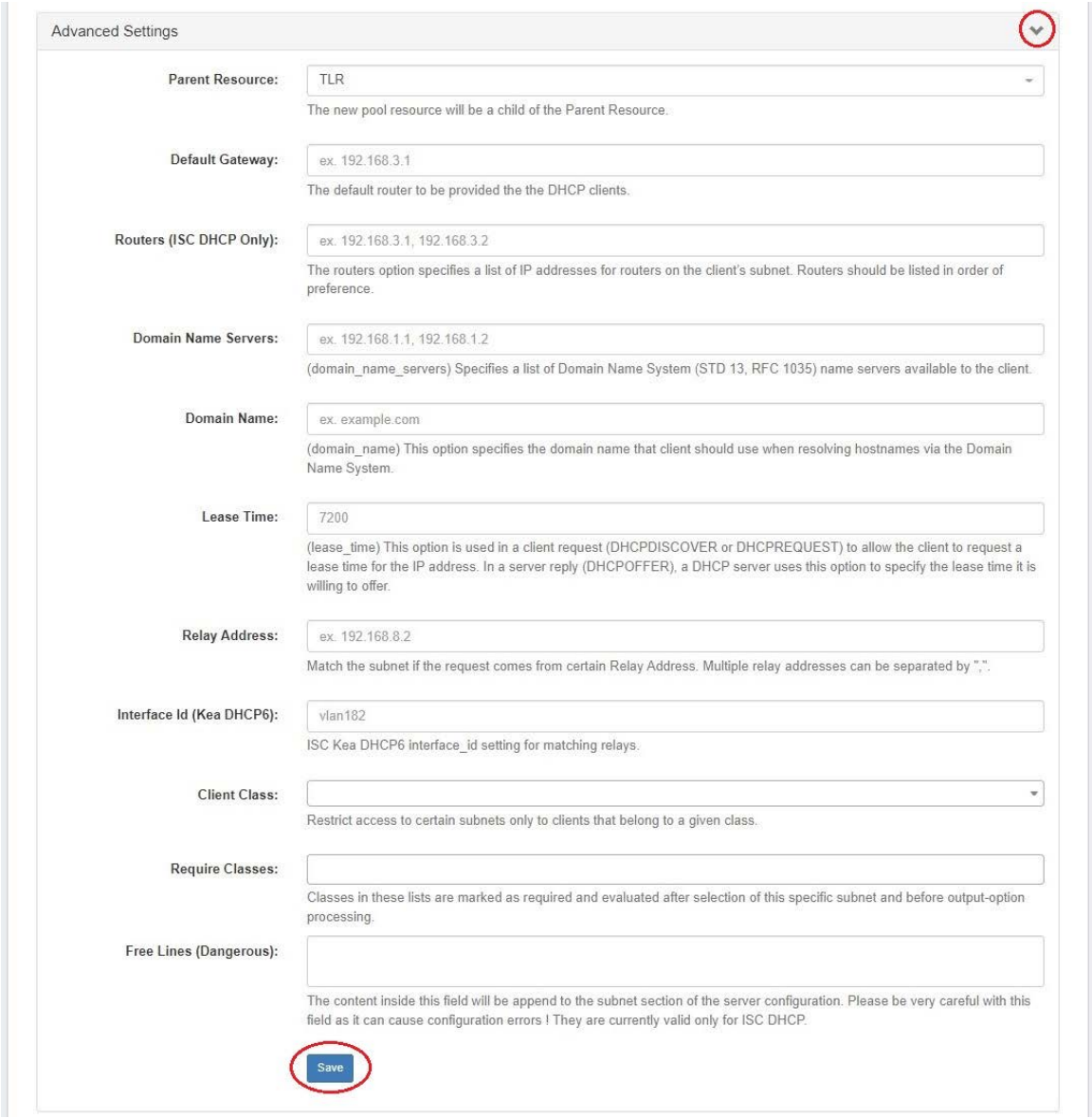


The range will then be added to the pool and available for editing.



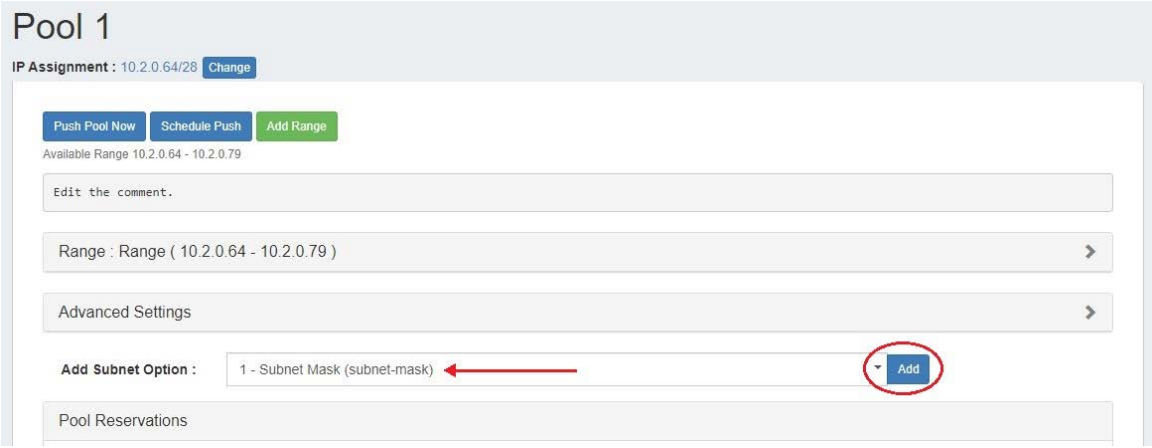
Edit Advanced Settings:

Open the zone "Advanced Settings" section by clicking on the header or the expansion arrow (>). Edit fields as needed, and click "Save" when complete.

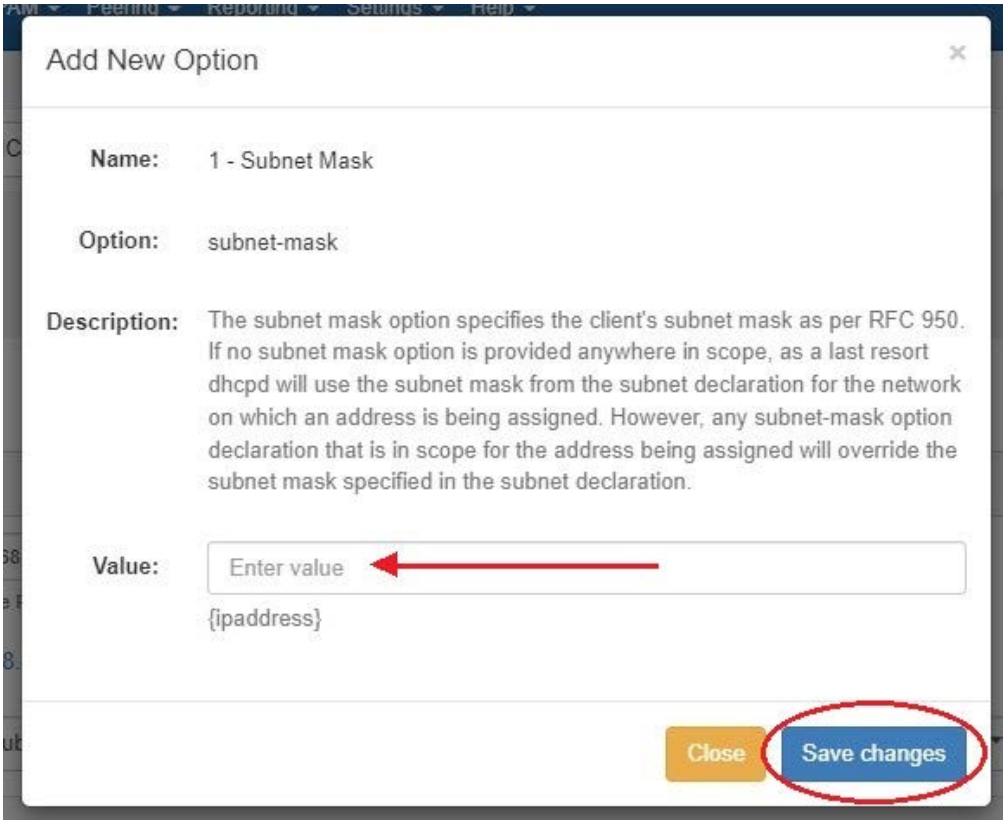


Add / Remove a DHCP Subnet Option

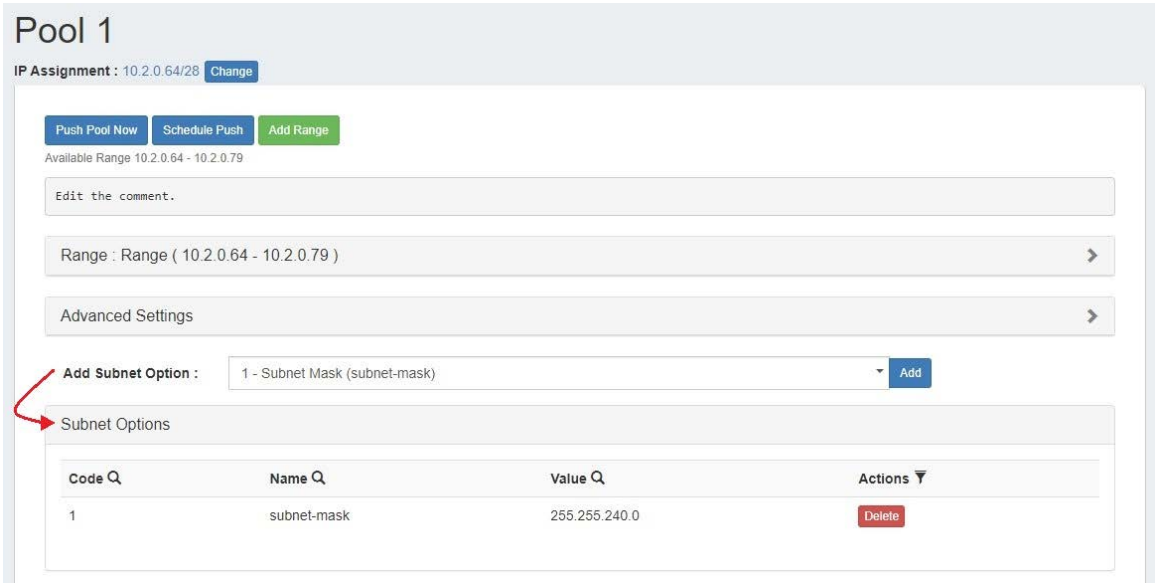
To add a DHCP Subnet Option to a subnet pool, select an option from the dropdown and click "Add".



Enter a value for the option and hit "Save changes".



When an option is added a new "Subnet Options" module will be added to the pool view.



To delete an option click the "Delete" button next to it.

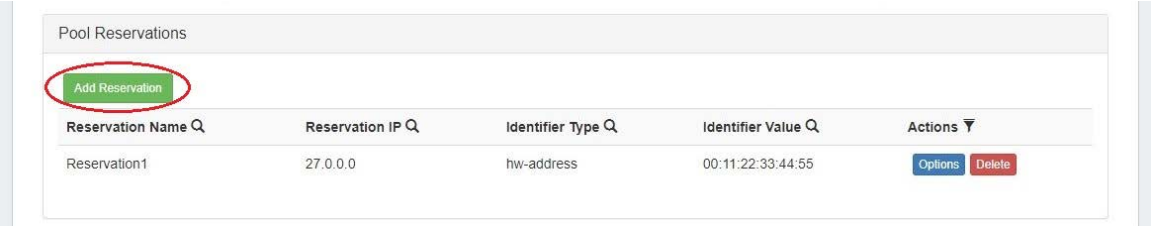


User Defined DHCP Subnet Options may be configured by Admin level users. See DHCP Settings for more details.

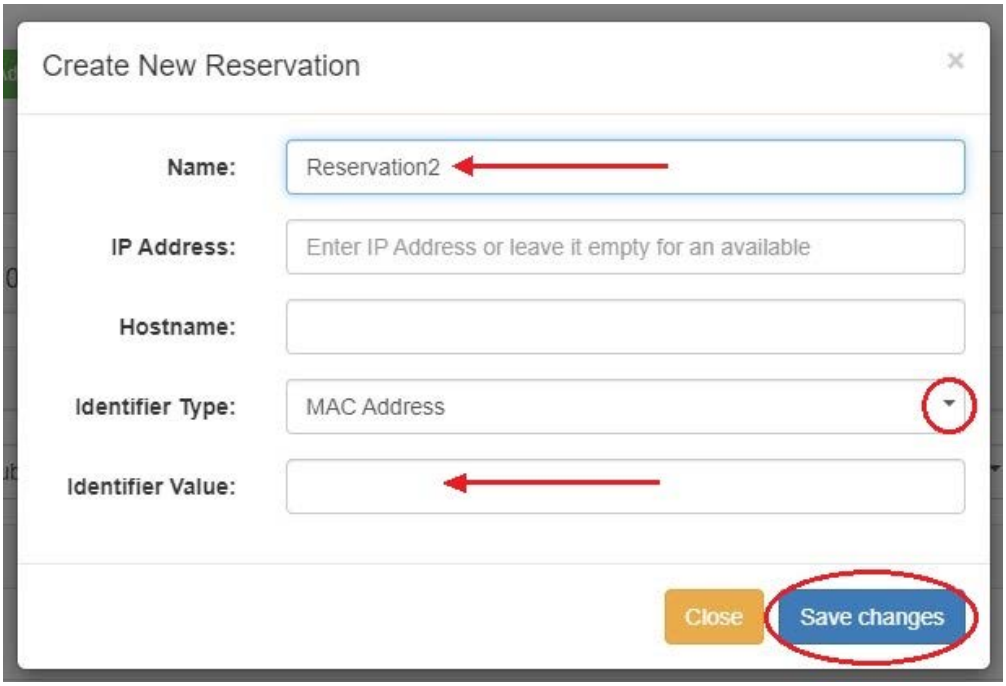
Add / Remove a Pool Reservation or Pool Reservation Option

DHCP Pool Reservations allow for a permanent address to be reserved for the pool assignment.

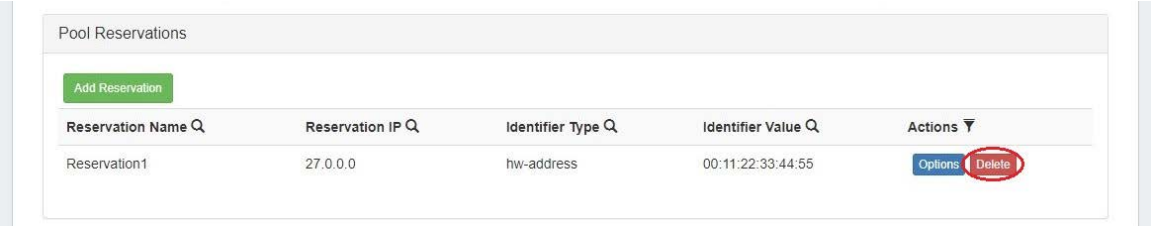
Add a new pool reservation by clicking the "Add Reservation" button under "Pool Reservations".



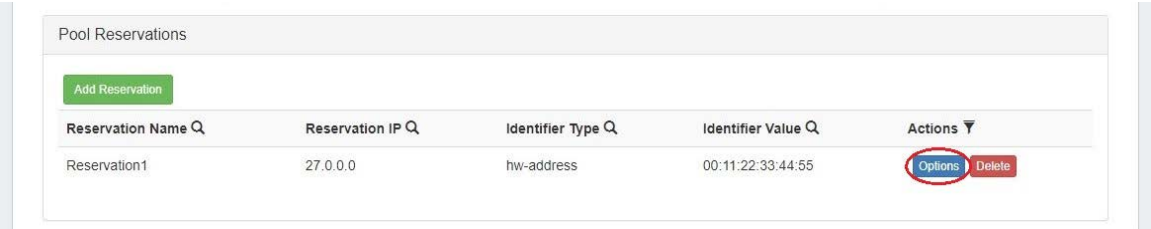
Enter the Name and IP (or leave empty for any available). Choose an Identifier Type from the dropdown, enter a value, and hit "Save Changes".



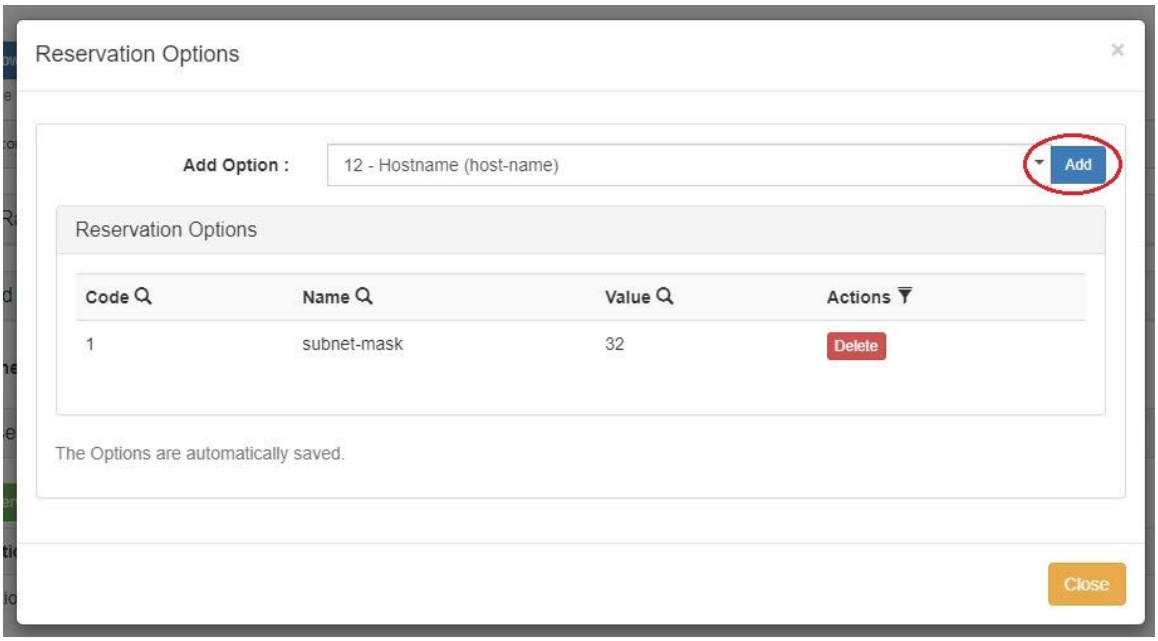
Once created, a reservation may be removed by clicking the "Delete" button next to it.



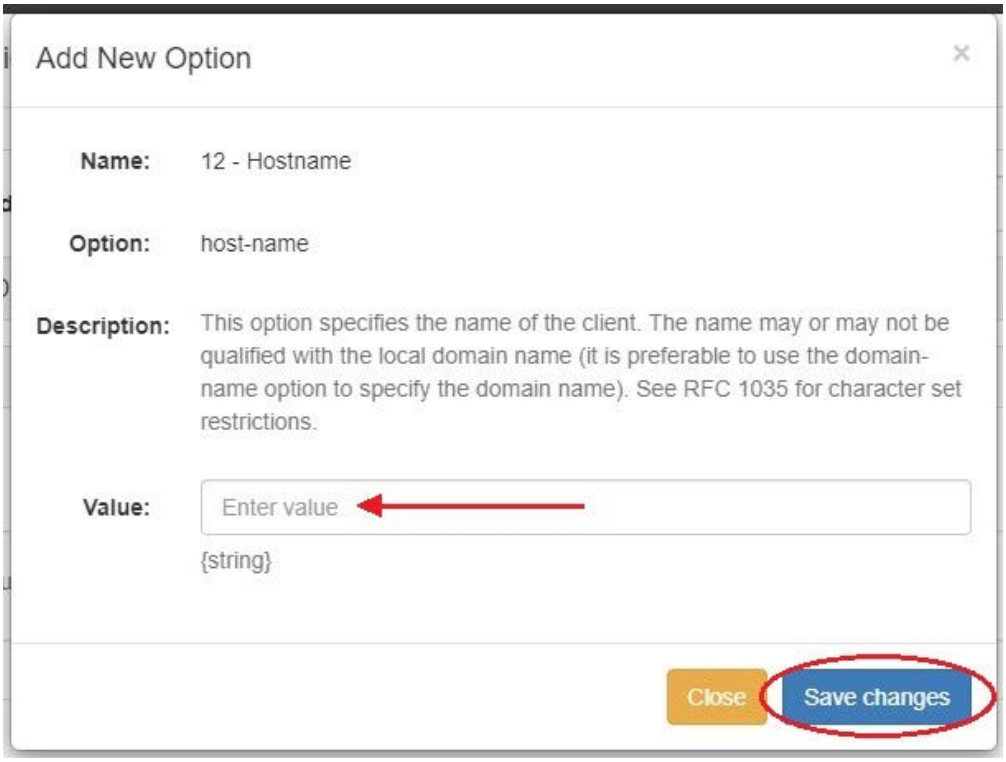
DHCP Options may be added to a reservation, if desired, by clicking the "Options" button next to it.



Choose a DHCP option from the dropdown menu and click "Add".



Enter a value for the chosen option and click "Save changes".

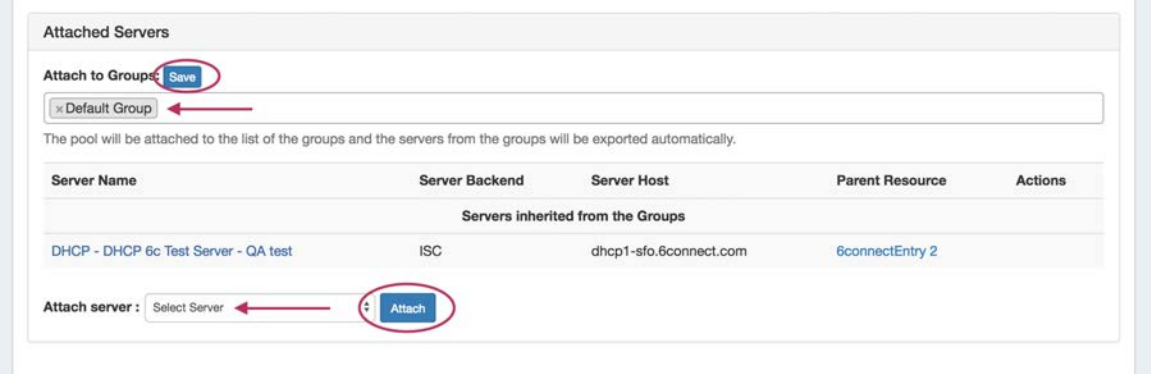


Attach Group / Server to a Pool

Servers may be attached to a pool either from a DHCP Group association, or directly from the Pool Details Page.

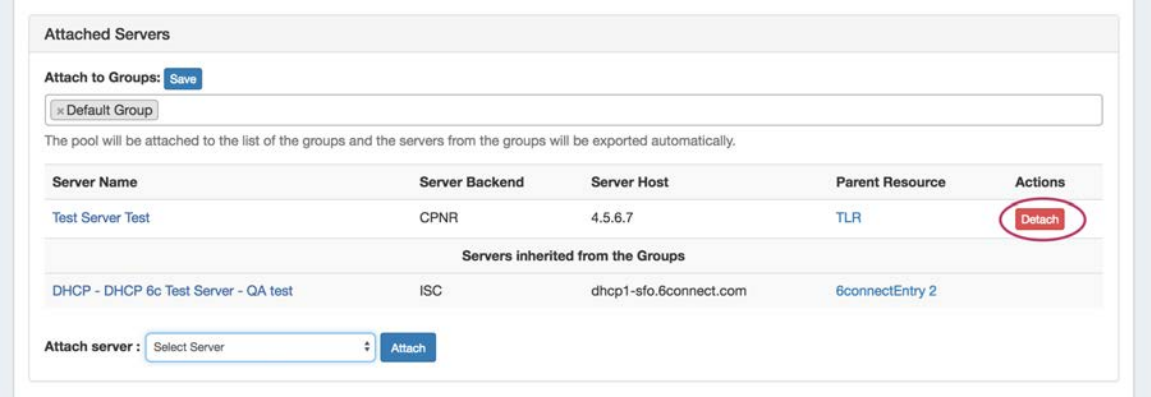
Attach the pool to a DHCP Group by clicking in the DHCP Group search box, selecting a Group, then clicking "Save" next to "Attach to Groups". The pool will inherit the DHCP server associated with that group.

To directly attach a DHCP server to a pool, select the server from the "Attach server" dropdown, then click the "Attach" button.



Detach Server from a Pool

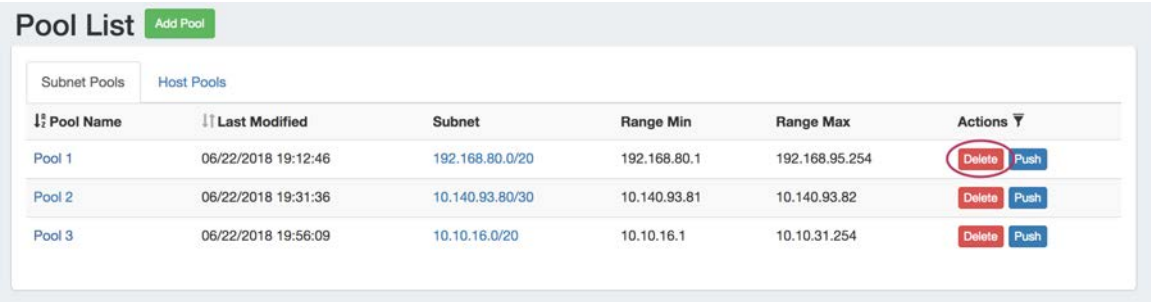
To detach a server from a pool, look for the server under the "Attached Servers" list, then click "Detach" under actions for that server.



To detach a server inherited from a Group, the pool must be removed from the group. To do that, click the "x" next to the group name in the "Attach to Groups" box, then click "Save".

Delete a Pool

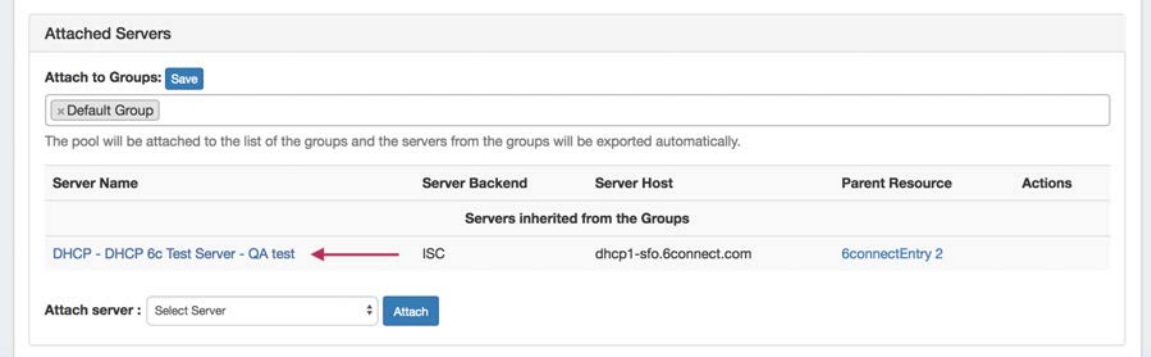
Users with delete permissions over the pool may delete it by clicking the "Delete" button under "Actions" from any DHCP Pool List.



Pushing DHCP Pools

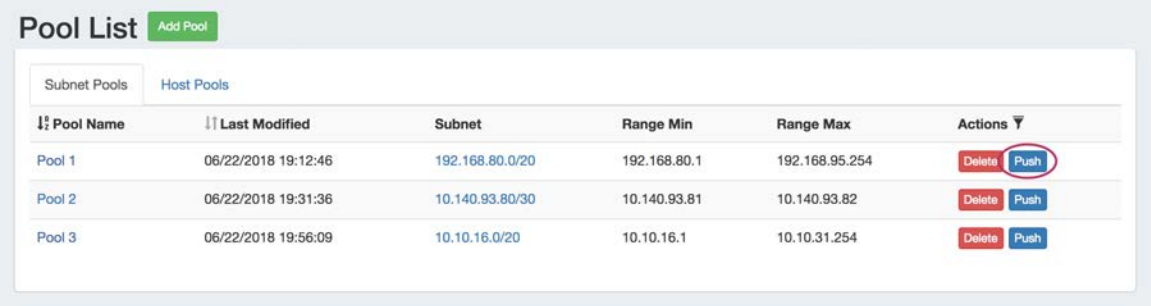
Pools may be pushed manually ("Push", "Push Pool Now"), as a scheduled future push ("Schedule Push"), or pushed as part of a DHCP Group or DHCP Server Push.

Before pushing a pool for the first time, view the "Attached Servers" section in the **Pool Details** page and verify that the correct server is attached to the DHCP Pool, either directly or via a DHCP Group.



Manual Pool Push (DHCP Pools List)

Pools may be manually pushed by clicking the "Push" button for the pool from any **DHCP Pools** list.



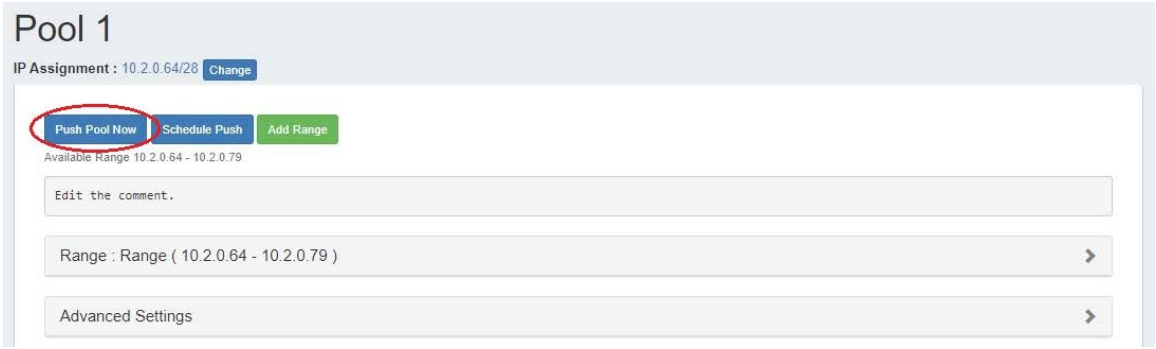
The "DHCP Push Status" modal will appear, showing status and any errors that occur.



When a successful push is complete, a green "Finished DHCP Pushing Request" message will appear, and the window may be closed.

Manual Pool Push (Pool Details page):

The Pool Details page, accessed from clicking on the zone name in the Group zone list, includes a "Push Pool Now" button that immediately attempts to push the pool to the attached server(s).

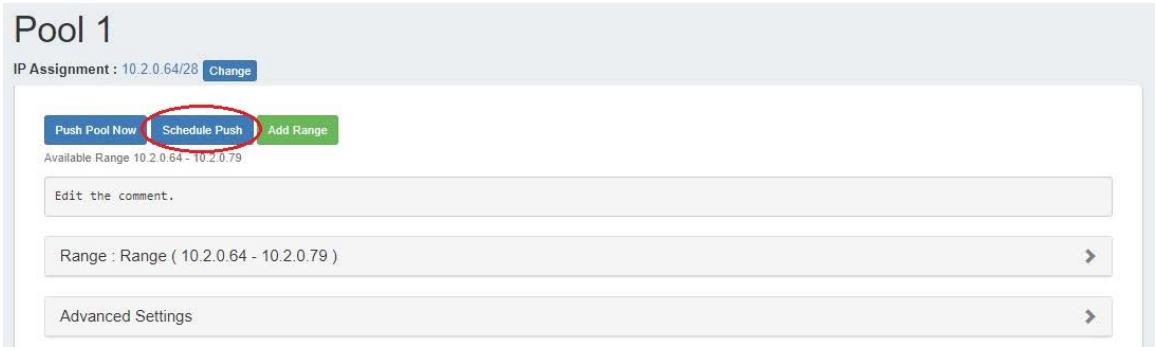


Click on "Push Pool Now", and the "DHCP Push Status" modal will appear, showing status and any errors that occur.

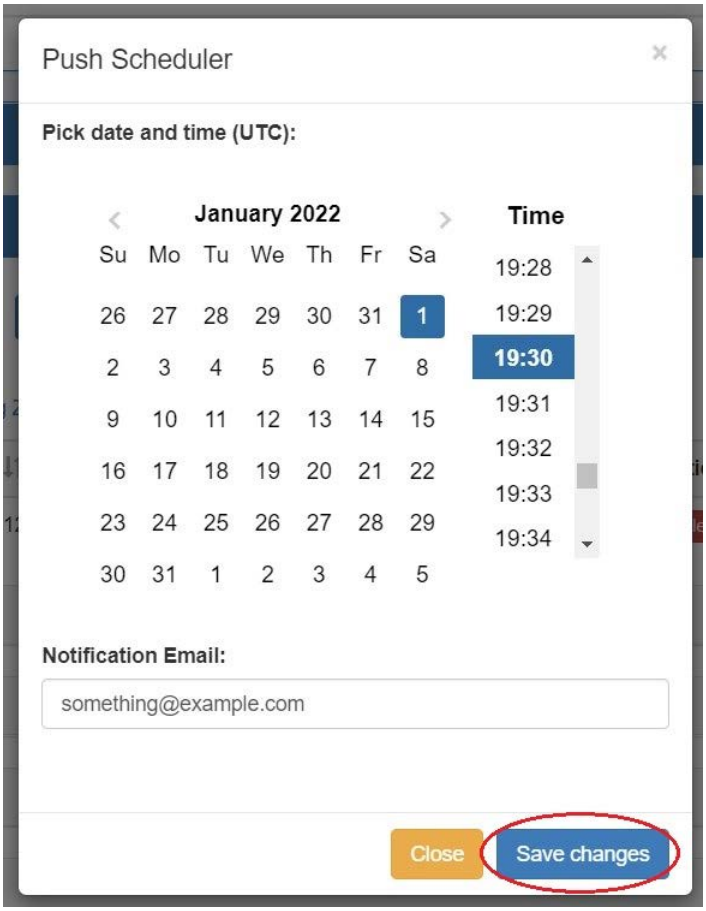
When a successful push is complete, a green "Finished DHCP Pushing Request" message will appear, and the window may be closed.

Schedule Push (from Pool Details page):

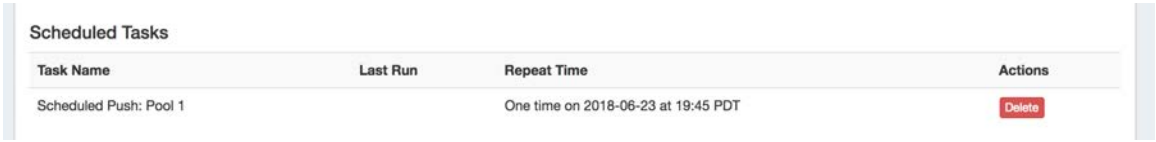
The Pool Details page includes an option to schedule a push, similar to scheduling a Group push.



Click "Schedule Push" for the pool, then select a date, time (24 hour), add a notification email address, and click "Save changes".



The Scheduled task will be shown in both the Pool Details page (under "Scheduled Tasks") and the Admin Scheduler task list.



The task may be deleted prior to running by clicking the "delete" button, but will automatically be removed once completed.

Schedule Push (Admin Scheduler):

Pools may also be pushed via scheduled DHCP Group or DHCP Server pushes. Server pushes may be set up by Admin users from either the **DHCP Servers** section, or the **Scheduler** tab.

For more information, see the Working with DHCP Servers or Scheduler Tab documentation.

DHCP Group Push:

All pools contained in a DHCP Group may be pushed at the same time, by pushing the DHCP Group.

For information on working with DHCP Groups, including performing a manual or scheduled Group push, see Working with DHCP Groups - Pushing a Group.

DHCP Server Push:

Admin users may push all pools on a DHCP server from the **DHCP** Tab -> **DHCP Servers** page.

For information on working with DHCP Servers, including performing a manual or scheduled server push, see Working with DHCP Servers - Pushing a Server.

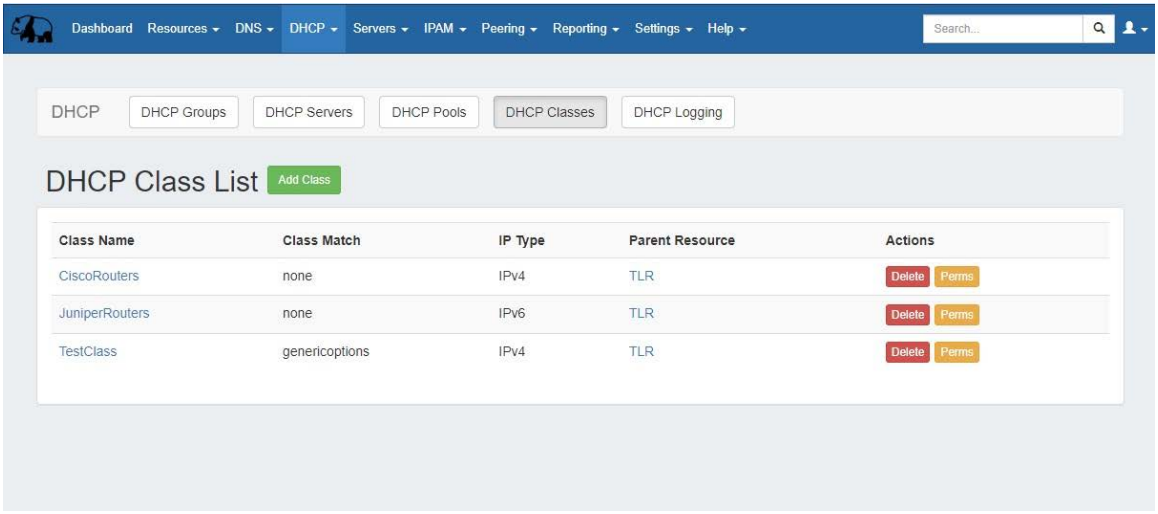
Additional Information:

For more information on working with DHCP Pools, Groups, and Servers, see the following sections:

- DHCP Tab
- Working with DHCP Groups
- Working with DHCP Gadgets
- DHCP Administration
- DHCP Settings

Working with DHCP Classes

DHCP Class List



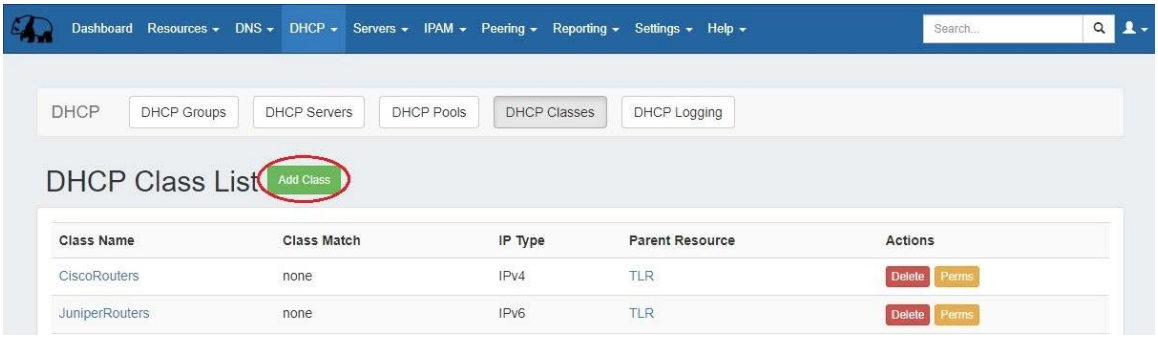
The DHCP Class List is accessed from the **DHCP** tab, then clicking on the **DHCP Classes** subtab button. From this page, you may create, view, and edit DHCP Classes.

Clicking on the Class name from will open the Class Details page for the specific class.

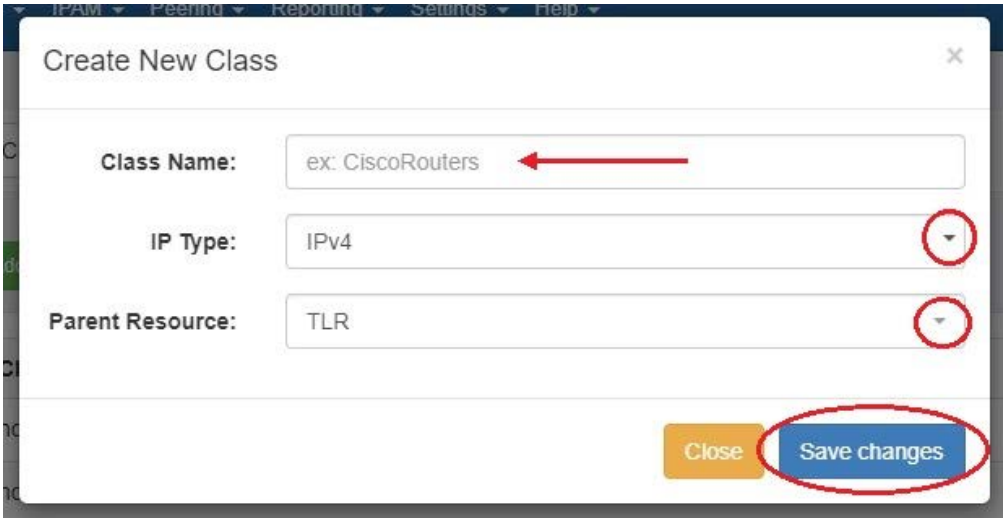
- DHCP Class List
  - Add a DHCP Class
  - Edit a DHCP Class
    - Add / Edit a comment
    - Add / Remove Matching Type
    - Add / Remove a DHCP Subnet Option
  - Delete a DHCP Class
  - DHCP Subnet Pools and Classes
  - Additional Information

Add a DHCP Class

Add a new DHCP Class to the Class List by clicking the "Add Class" button at the top of the page.

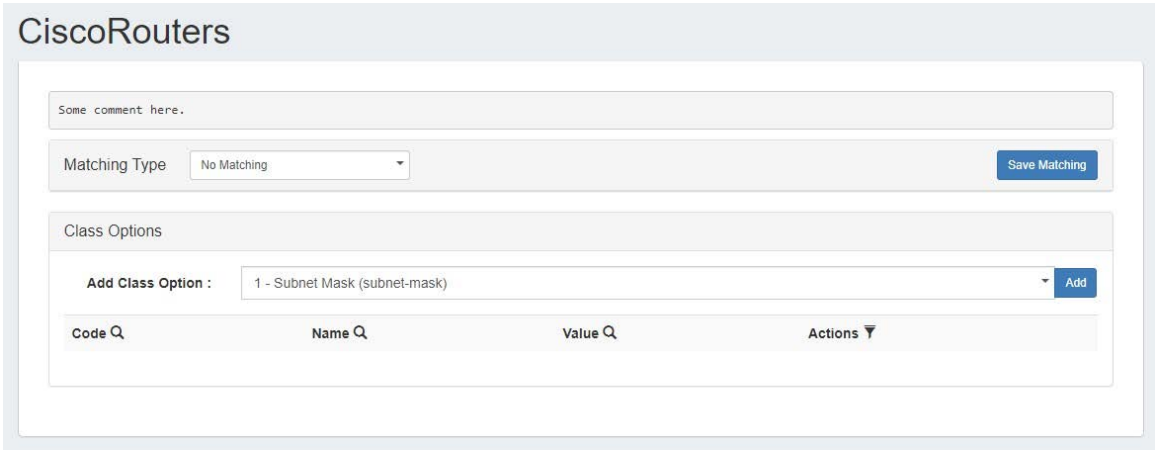


In the "Create New Class" dialog, enter a name for the class and choose IPv4 or IPv6 and a parent resource.



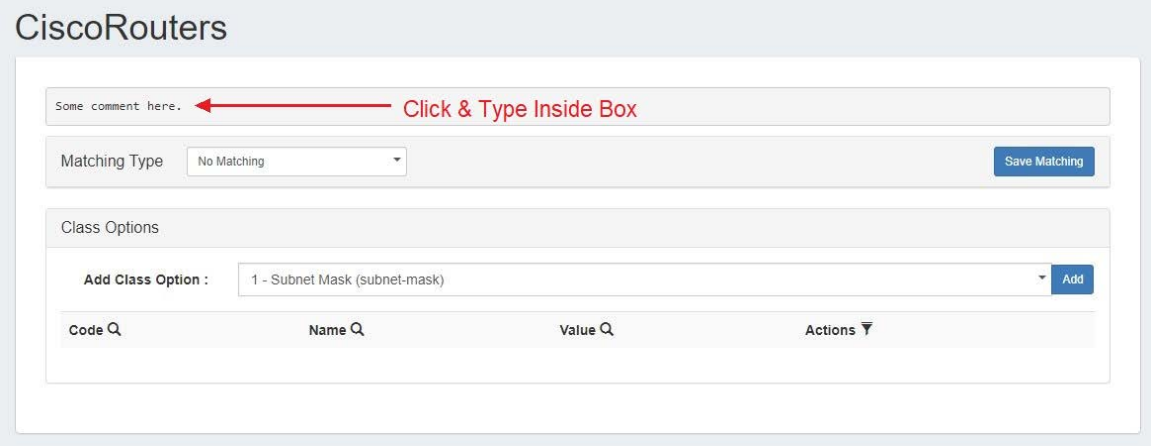
Edit a DHCP Class

Classes may be edited by clicking on the Class name. From this page, users may edit class options and matching.



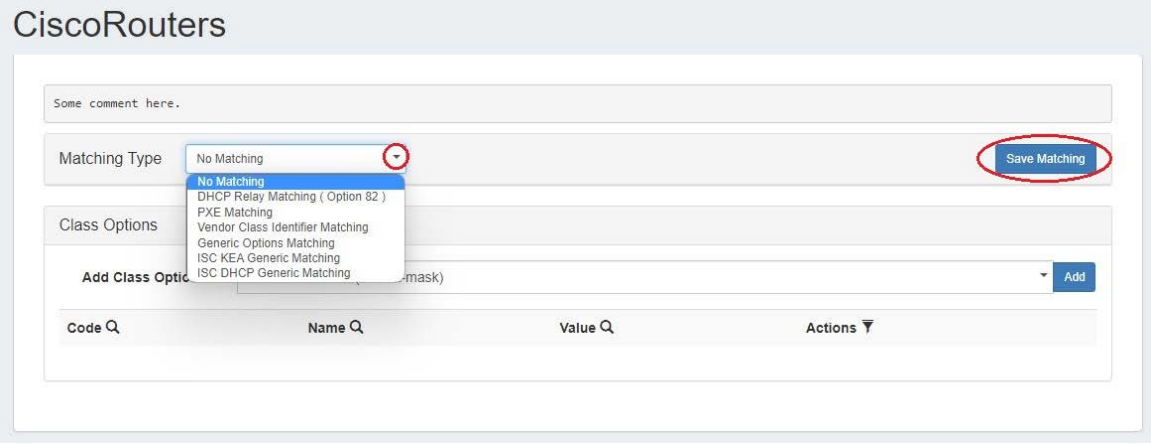
Add / Edit a comment

To add a comment to a pool, click anywhere inside the comment area and begin typing. The comment will be saved when an area outside of the comment box is clicked, deselecting the comment area.



Add / Remove Matching Type

Select a Matching Type for a class by selecting a type from the dropdown menu, entering in the type criteria, and clicking "Save Matching" when done. To remove matching, select "No Matching" from the dropdown and click "Save Matching".

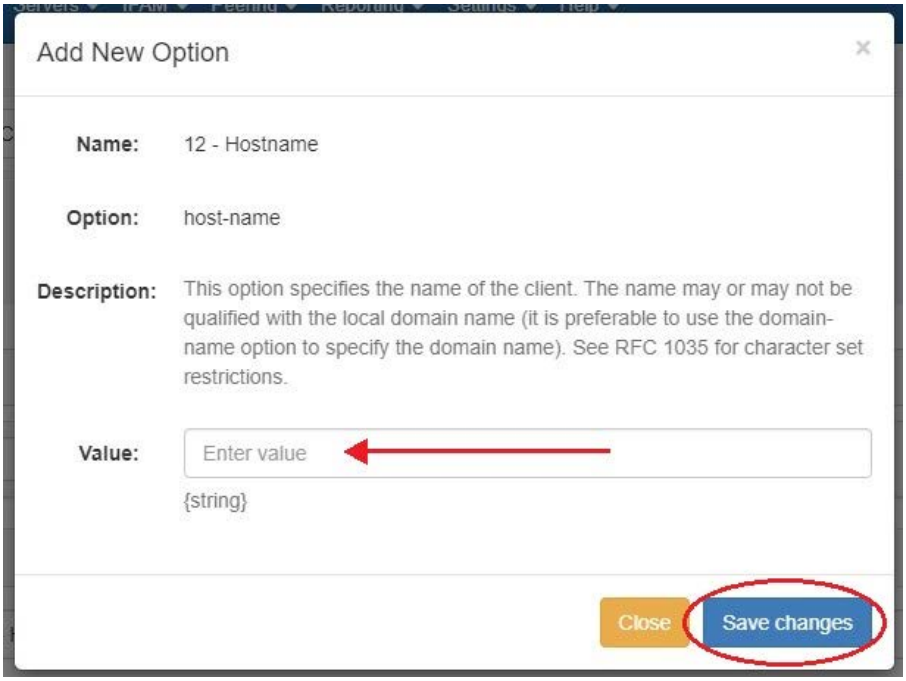


Add / Remove a DHCP Subnet Option

To add a DHCP Option, select one from the dropdown menu in the Class Options module and click "Add".



Enter a value for the Option and click "Save changes".

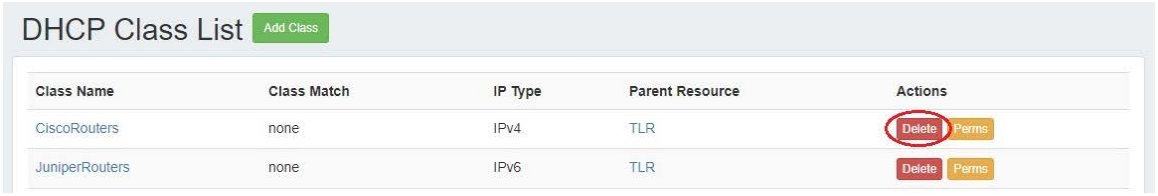


To remove an Option, click the "delete" button in the Actions column. You can filter the Options list by code, name, or value by clicking the search icon (magnifying glass) over a column.



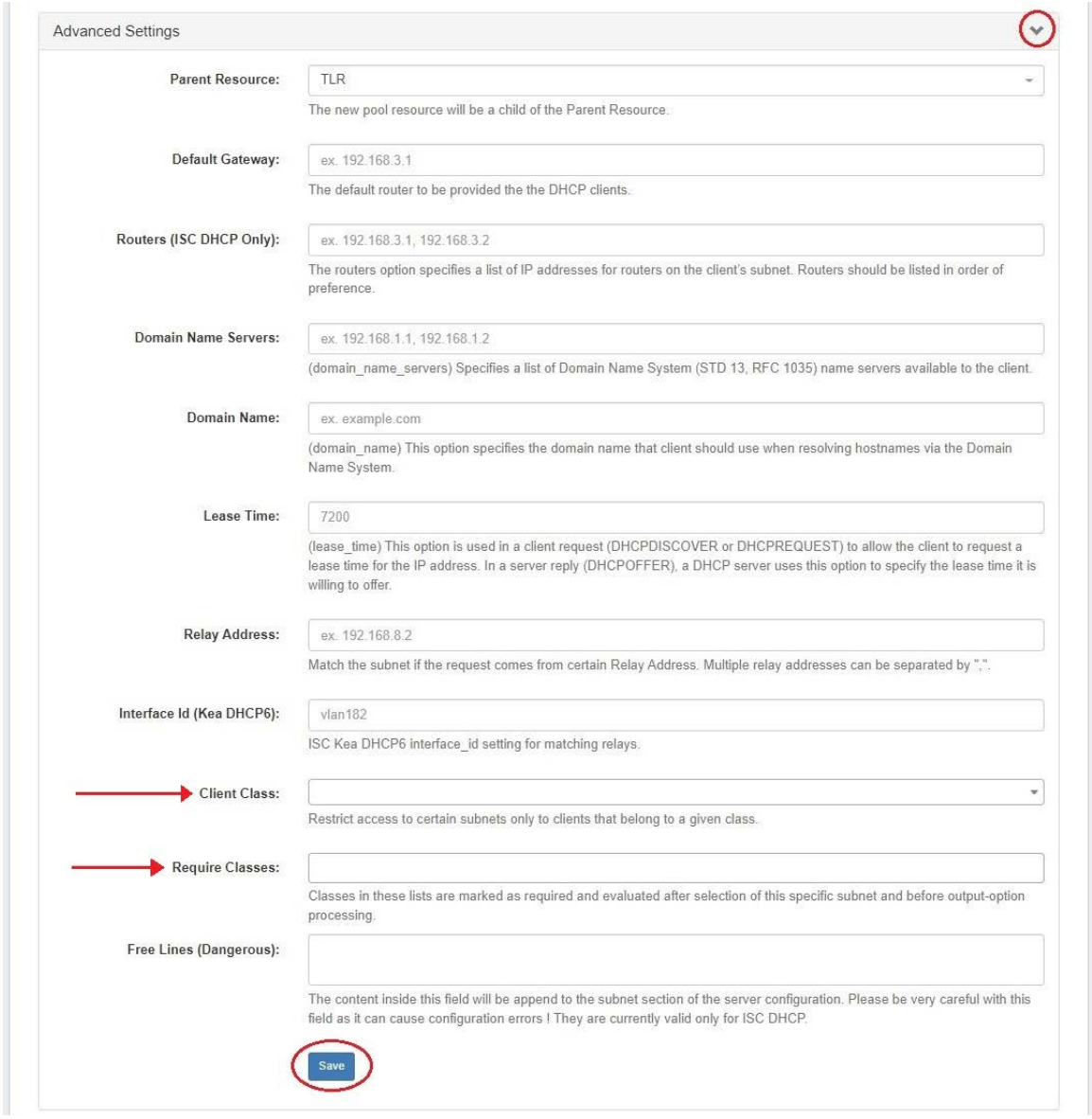
Delete a DHCP Class

Users with delete permissions over the class may delete it by clicking the "Delete" button under "Actions".



DHCP Subnet Pools and Classes

Class options for DHCP pools are available in the "Advanced Settings" section of the pool details page.



Additional Information

For more information on working with DHCP Pools, Groups, and Servers, see the following sections:

- DHCP Tab
- Working with DHCP Groups
- Working with DHCP Gadgets
- DHCP Administration
- DHCP Settings

Working with DHCP Gadgets

Working with DHCP Gadgets

There are two DHCP Gadgets available to integrate onto a resource entry page - the DHCP Management Gadget, and the DHCP Customer Configuration Gadget.

For an overview of gadgets and how to attach them to resource pages, see Gadgets and Adding a Gadget to a Section .

- DHCP Management Gadget (Legacy)
  - Before You Begin:
    - Attach / Enable the DHCP Gadget
    - Managing DHCP Server Configurations
    - Group Management
      - Working with DHCP Groups
    - Connection Configuration
    - Server Details
    - Scan Server
    - DHCP Pools
      - DHCP Pool Search:
    - Create a New DHCP Pool - Subnets
    - Create a New DHCP Pool - Host
    - Current Pushed Configuration
    - Saving/Pushing DHCP Server Configurations
- Working with the DHCP Customer Configuration Gadget
    - Setting up the DHCP Customer Configuration Gadget
    - Using the DHCP Customer Configuration Gadget
  - Additional Information

DHCP Management Gadget (Legacy)

> Note: As of ProVision 7.0.0, the DHCP Management Gadget is a legacy feature.
>
> While it is still available to be used, we recommend checking out the updated **DHCP** Tab and using the DHCP Groups, DHCP Servers, and DHCP Pools pages as the primary DHCP management system.

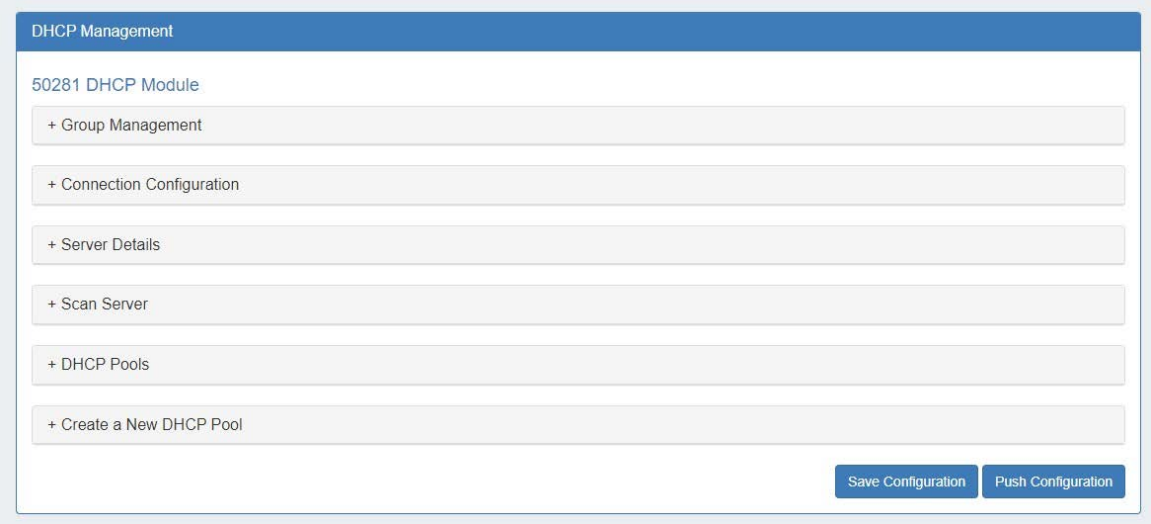
Before You Begin:

Attach / Enable the DHCP Gadget

Verify that the DHCP Gadget is attached to the resource section. Then, you can enable the gadget by selecting the radio button next to "On", and click "Update".



Once enabled, the DHCP Management Gadget will show sections for "Group Management", "Connection Configuration", "Server Details", "Scan Server", "DHCP Pools", and "Create a New DHCP Pool". Once pushes or unpushed configuration changes occur, a "Current Pushed Configuration" or "Unpushed Configuration" section will be available for review.



These sections will be reviewed in detail further on in this section.

A Note on DHCP Aggregates

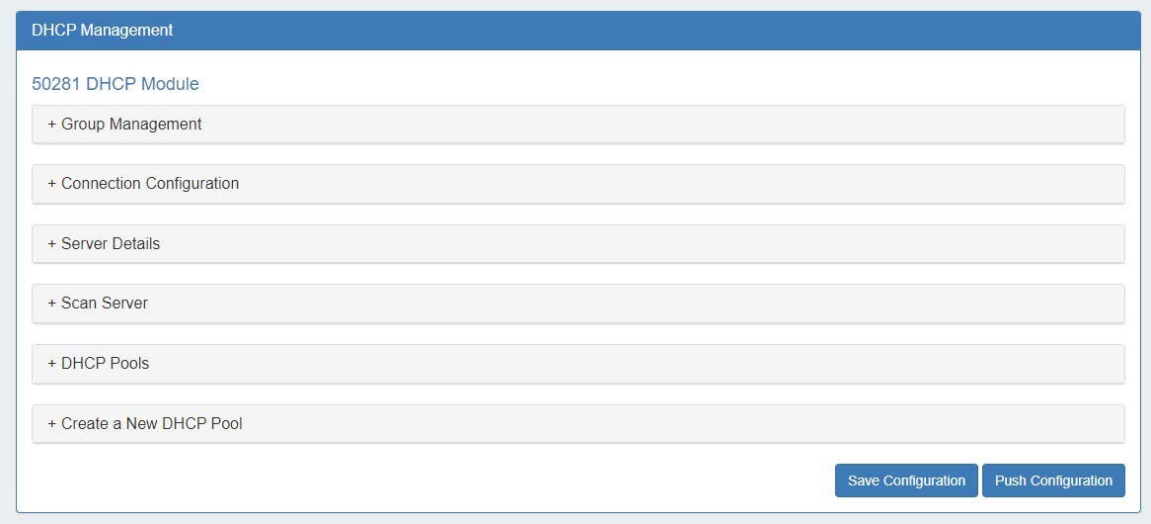
ProVision versions prior to 7.0.0 required creating or identifying specific IPAM blocks as "DHCP Aggregates" using the "DHCP Available" status to assign DHCP pools from.

As of 7.0.0, these statuses have been removed, and any IPAM block may be used to assign DHCP pools from, as long as they are subassignable and meet the assignment criteria provided by the user.

This applies to all DHCP Management functions - the DHCP Management Gadget, DHCP Customer Configuration Gadget, and all DHCP Tab areas.

Managing DHCP Server Configurations

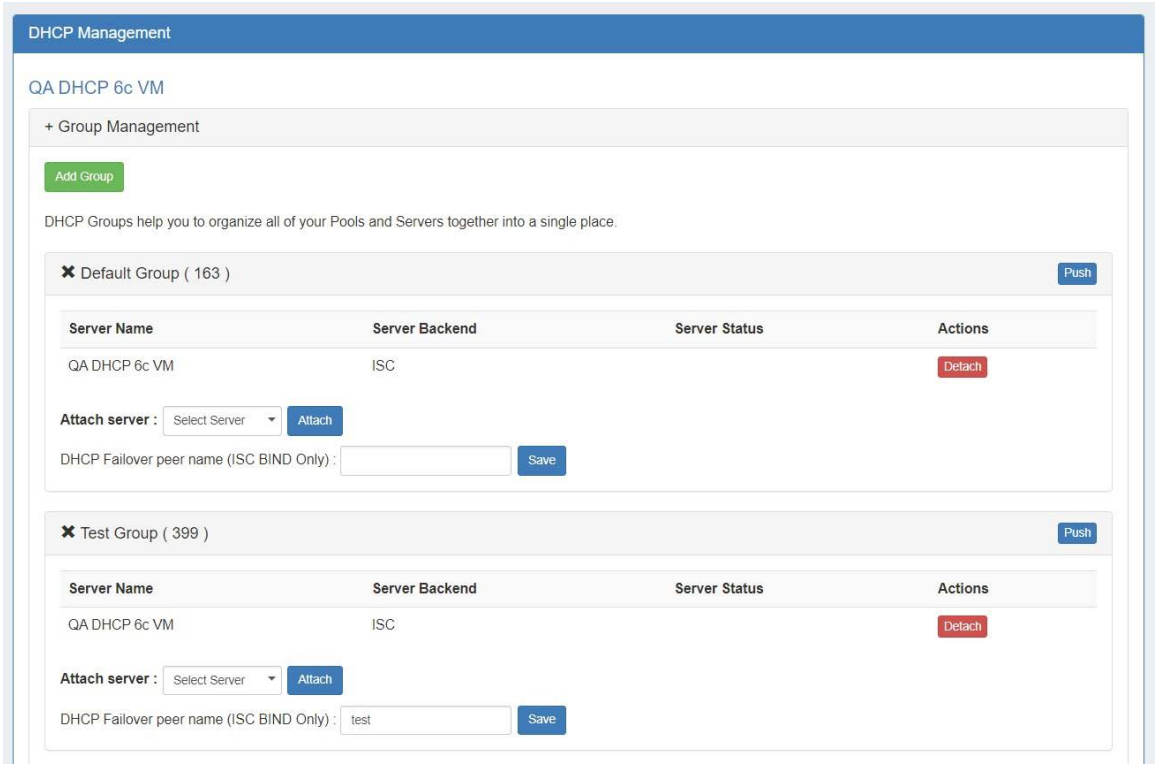
Once DHCP functions are enabled for a resource section, you will be able to manage configurations per resource by expanding the relevant areas on the resource's entry page.



Group Management

This section of the DHCP Management Gadget allows you to create and manage DHCP groups.

DHCP groups help you to organize all of your Pools and Servers together into a single place, and push pools linked to a DHCP Group to all of the servers attached to that group. It also allows for the designation of a DHCP Failover Peer for ISC BIND servers.



Working with DHCP Groups

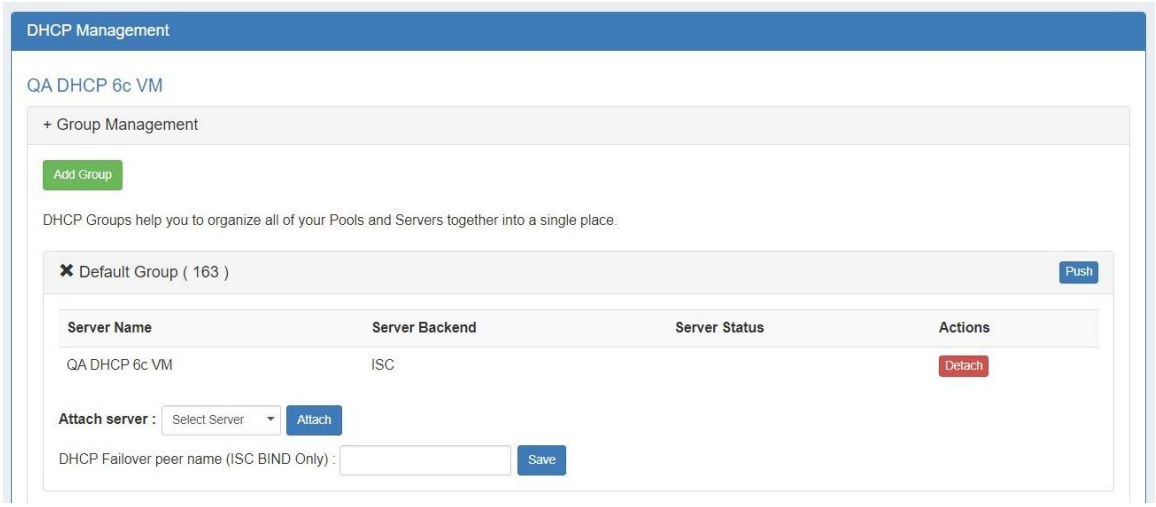
Step 1: Create DHCP Servers

Ensure that all necessary DHCP servers are created via the DHCP Tab DHCP Servers page. See Working with DHCP Servers for additional information.

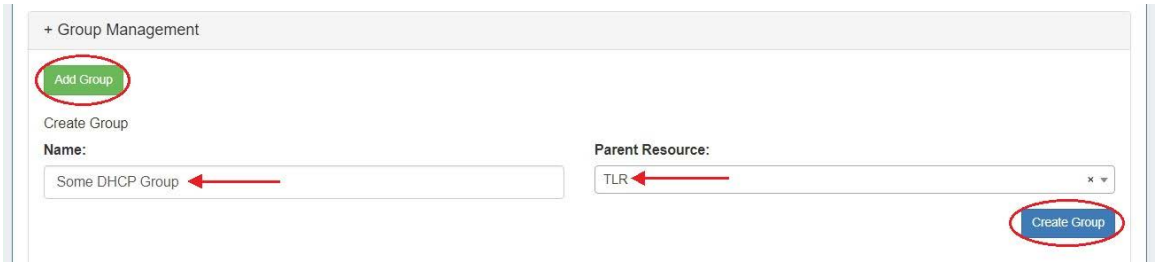
All DHCP servers listed under the DHCP tab will be available to select to attach to DHCP groups.

Step 2: Create DHCP Groups

Select a DHCP server page with the DHCP Management Gadget from, and expand the Group Management section. Note: Any DHCP server page with the Management Gadget is fine to use, as the Group Management section will globally update to be the same in any DHCP Management Gadget. As of ProVision 7.0.0, DHCP groups may also be created and managed from the DHCP Groups page under the DHCP Tab .



A "Default Group" should be available immediately, or you can click the "Add Group" button to create a new DHCP group. Type in the desired group name and select a parent resource for the group, then click "Create Group".

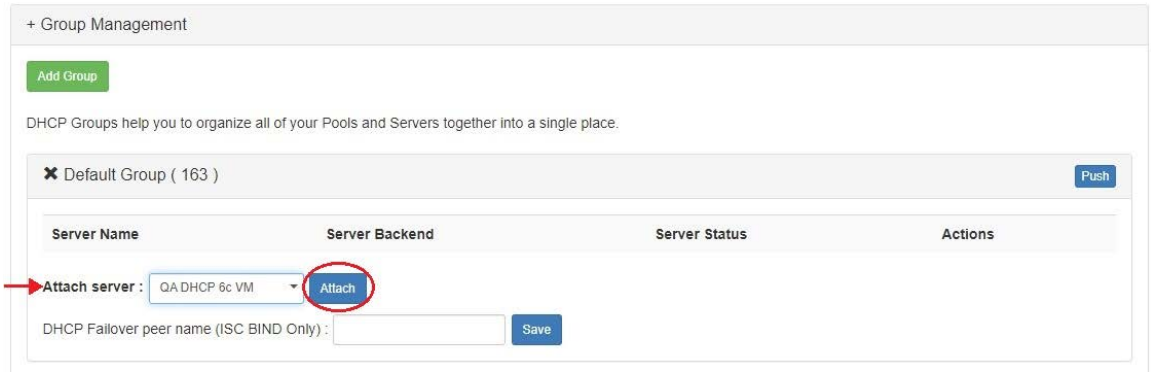


Your new group will be available in the DHCP Management Gadget. To delete the DHCP group, click the "X" next to the group name.

Step 3: Attach DHCP Servers to Groups

All DHCP servers listed under the ProVision DHCP Tab will be available to select and attach to the group.

Select the desired server from the "Attach Server" selector, then click "Attach". The server is now attached to the group and available for pushes.



If needed, a server may be removed from a DHCP group by clicking the "Detach" button.

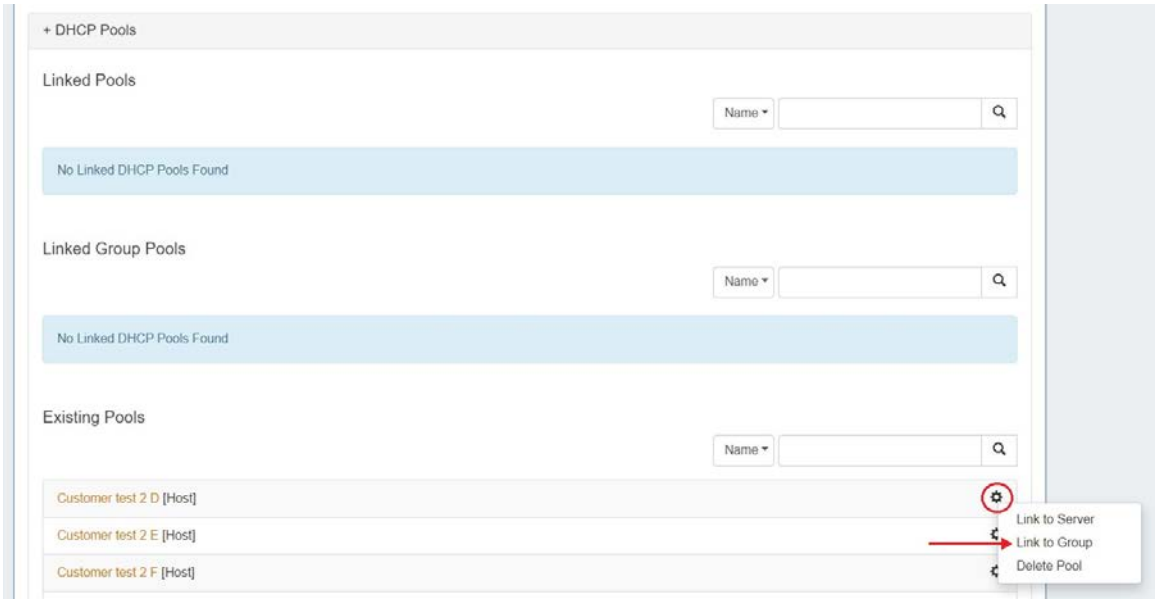
Step 4: Identify Failover Peer (Optional - ISC Bind Only)

If a DHCP failover peer is configured for the server, enter the server name and click the "Save" button. In the event that the primary server fails to push, the push will be sent to the failover peer instead.

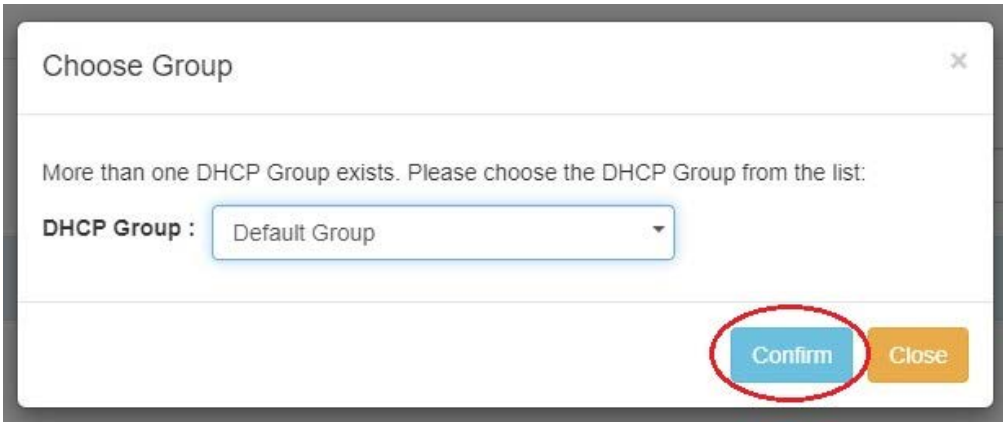


Step 5: Link Pools to DHCP Groups

From the Existing Pools list under the DHCP Pools section, click the Action Menu (gear icon) for the pool you wish to link to a DHCP group. From there, click "Link to Group".



If multiple DHCP groups exist, a dialog box will pop up for you to select the desired group to link the pool to. Select the DHCP group, then click "Confirm" to add the pool to the group.



Once linked, the DHCP pool will show under the "Linked Group Pools" area of the DHCP Pool section. From here, if desired, you may remove the pool from the group by clicking the Action Menu and "Remove Link".



Step 6: Push the DHCP Group

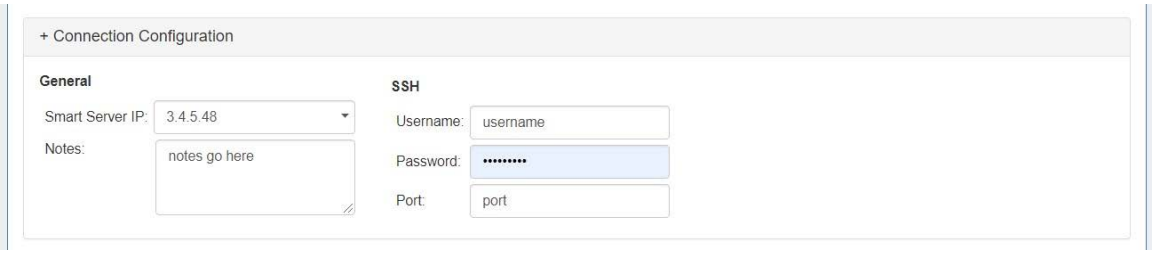
Lastly, click the "Push" button for the DHCP group to push the linked pool(s) for the group to the linked DHCP module, and then push all DHCP servers linked to the group.



While pushing, a status box will appear to show status and any errors, if applicable.

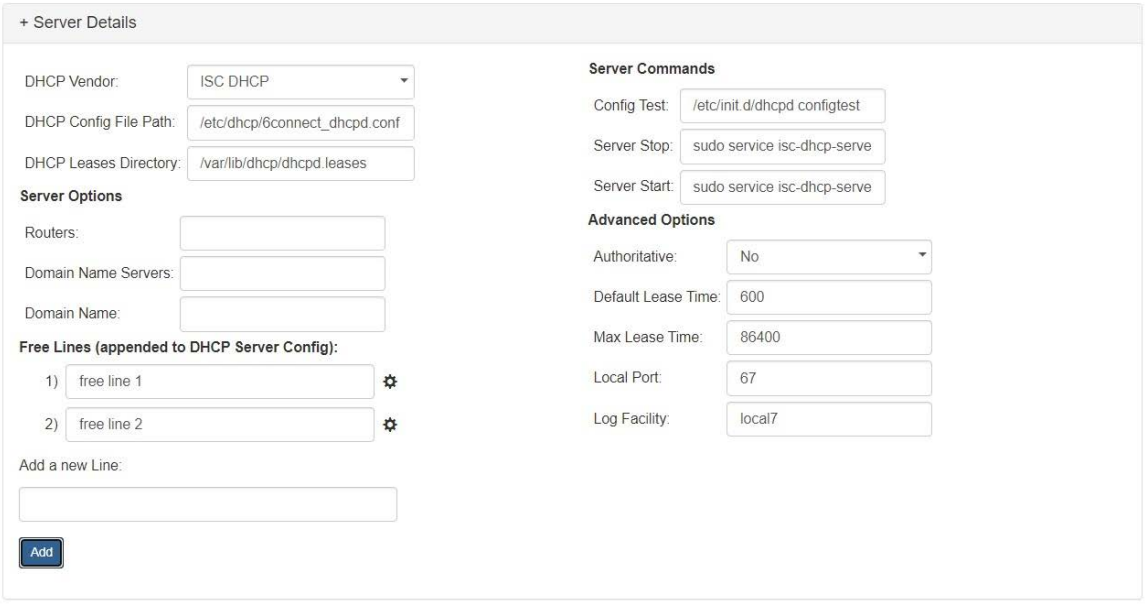
Connection Configuration

In this gadget area, you may enter in the information that will be used for ProVision to communicate to the DHCP server.



Server Details

Server details and advanced options may be entered under this portion of the gadget.



Server Command: Config Test

A note on the Server Command: Config Test option:

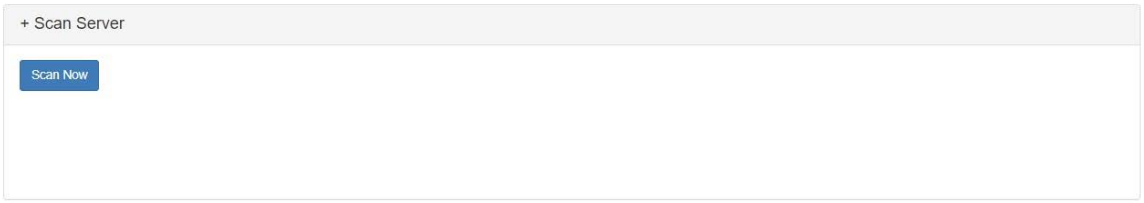
This command is run after the newly-written DHCP Config file has been transferred to the server but before the server is restarted. Due to the wide variety of DHCP install configurations that can arise on different systems, it is best if the Config Test option is as explicit as possible. For example:

sudo /usr/sbin/dhcpd -t -cf /etc/dhcp/dhcpd.conf

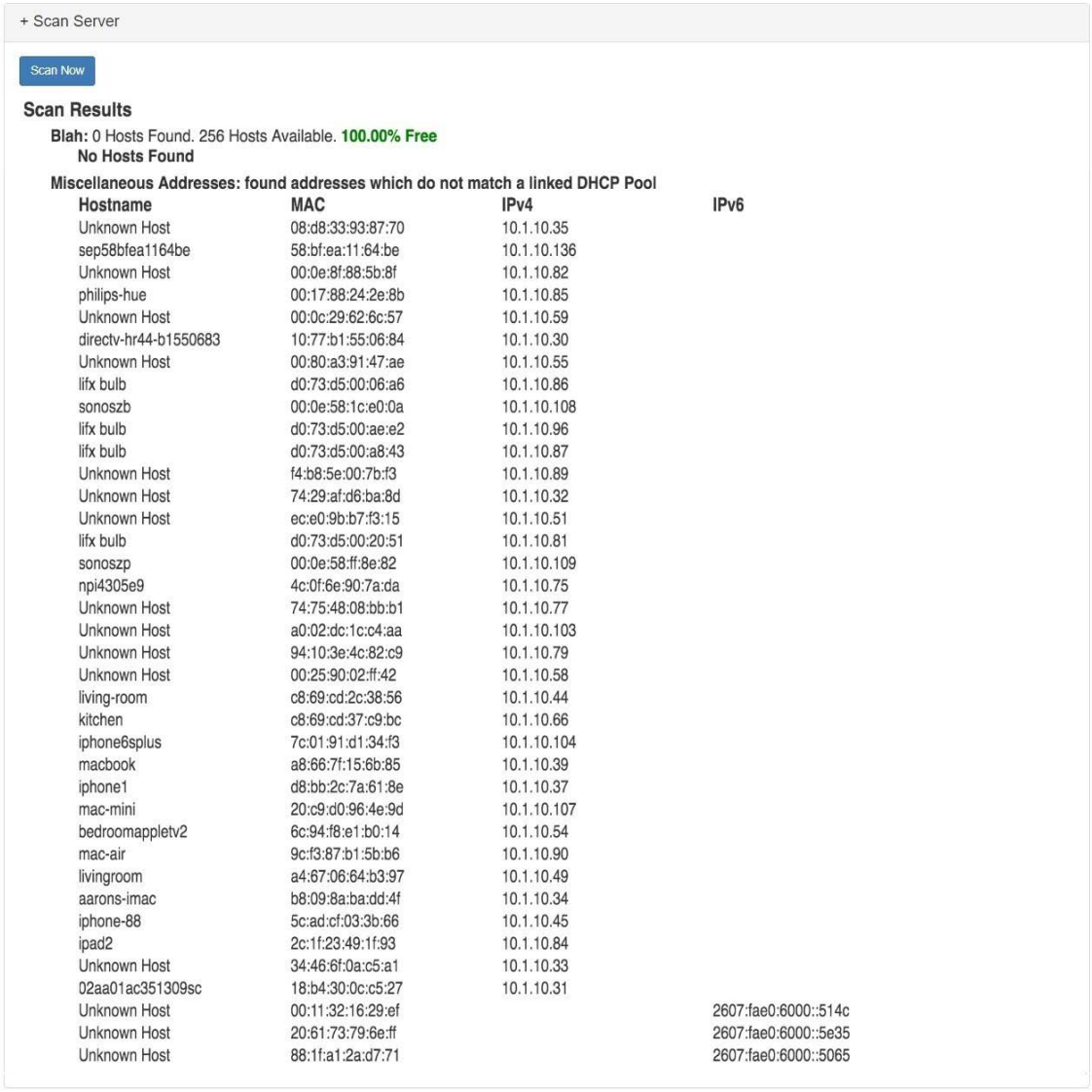
This command explicitly requests the DHCP daemon start in test-only mode (-t) with a specific config file (-cf). This config file should be the location supplied in the "DHCP Config File Path" section.

Scan Server

Scan Server provides a "Scan Now" button, which scans the DHCP server and returns found IPs under DHCP pools.



The returned IPs are divided by pools and IPv4/IPv6. Returned fields include MAC address, IP address, and name. The percentage utilization of IP space out of the available DHCP pool space is also included at the top of the list.



If the scan is unable to be completed, an error message will appear in the DHCP Management section.

DHCP Pools

In this area, the admin can specify what DHCP pools are linked to the DHCP server or DHCP groups.This includes any host reservations, as well as DHCP pools as defined in the next section.

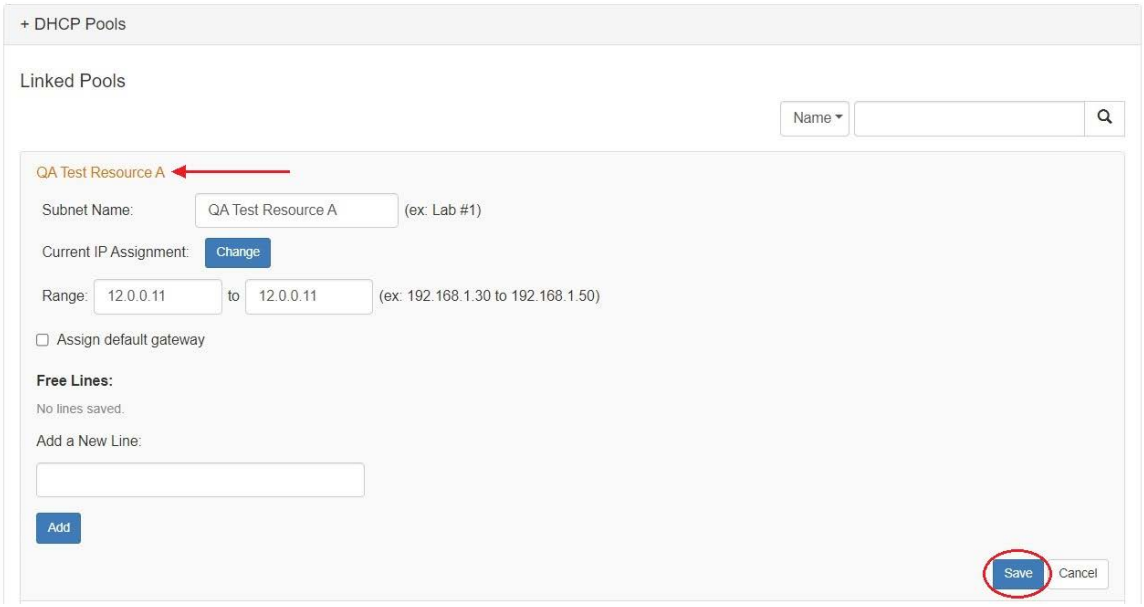
Use the Action Menu on an existing pool to Link to Server, Link to Group, or Delete Pool. The Action Menu for Linked Pools will show the option to Remove Link from Pools.





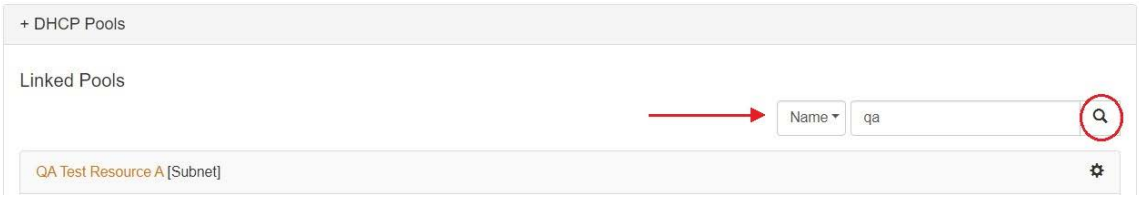


Additional edits may be made to pools by clicking on the pool name. This allows the pool name, assignment, and lines to be changed. Be sure to hit "Save" after making changes.



DHCP Pool Search:

Both Linked and Existing DHCP pools have field-specific search options to filter the DHCP pool list(s). Select the search term type from the dropdown list, type the search term in the search box, then hit the "Search" icon.



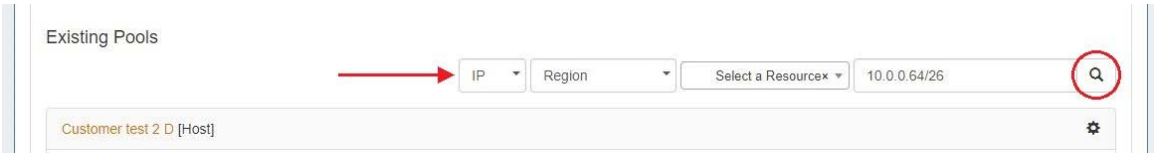
For both Linked and Existing pools, search terms include:

Name: The full or partial name of the pool (ex: "Lab")

MAC: The full (ex: 00:11:22:33:44:55:66:77) or partial (:22) MAC address, for pools that were created as "Host" type. MAC address searches must include a colon.

IP: Search by IP Block by providing the CIDR assigned to the pool. *(ex: 10.0.0.0/24)*

For Existing Pools, additional filter terms may be included to further filter the IP search by Region or assigned Resource.



After entering your search terms, click the "Search" icon, and the pool list will filter to the results.

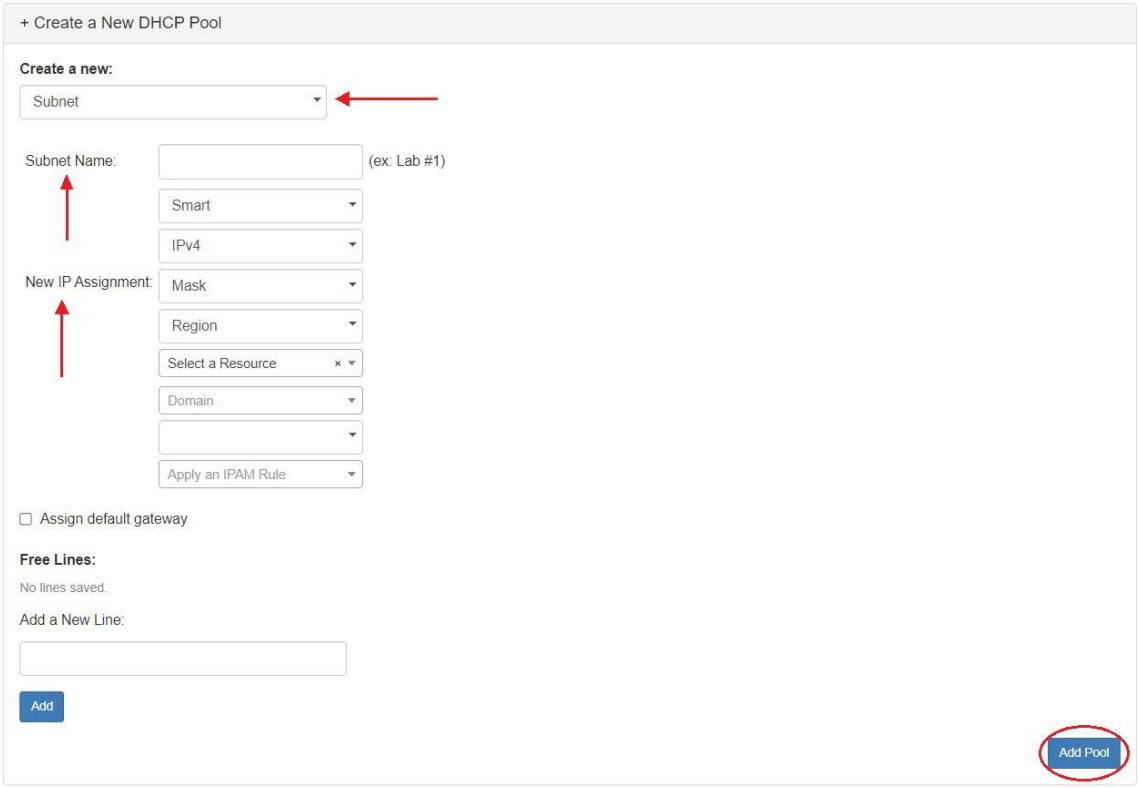
Create a New DHCP Pool - Subnets

When assigning a subnet (via dropdown) the IP assignment selection will pull the data from any IPAM block meeting your defined criteria. You can use either a Smart or Direct assignment depending on your preference. For Smart Assign pool creation, existing IP Rules may be applied to reserve additional addresses out of the pool range. To create an IP Rule, see IPAM Rules.

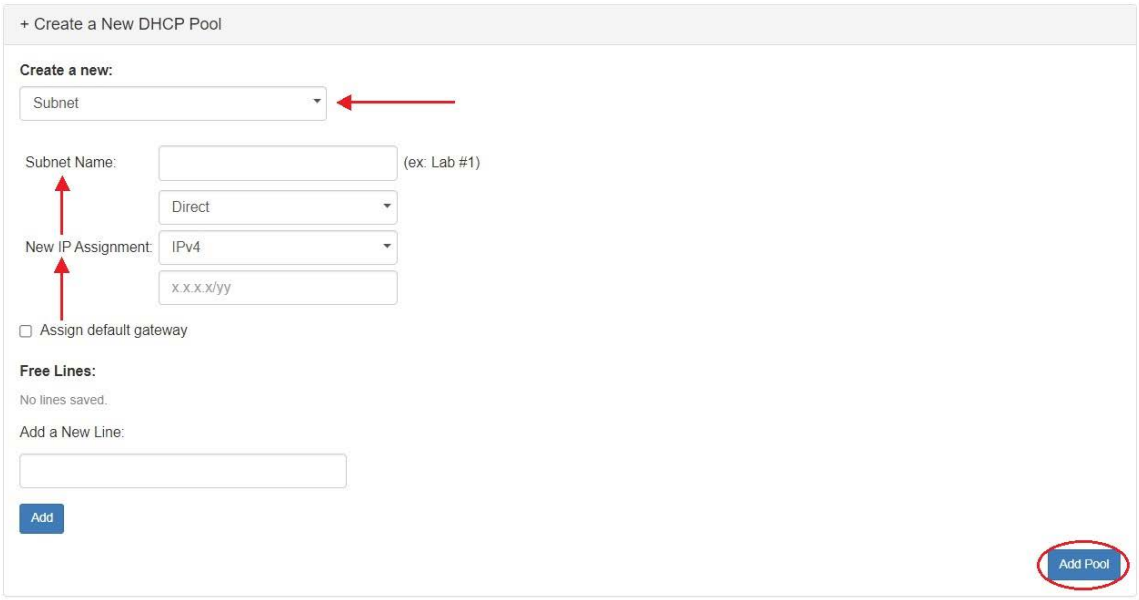
> **DHCP Pools and IP Rules**
>
> For DHCP pools, ProVision automatically reserves the first and last address of the pool for Gateway and Broadcast addresses, respectively.
>
> If an additional IP Rule is applied, the rule will begin with the second address in the block.
>
> For example: if a DHCP pool is created using 10.0.0.64/29 with an IP Rule of "Reserve First Three", the resulting pool range would be 10.0.0.68 through 10.0.0.70, as the first four as well as the final address would be reserved.

Enter the name of the pool / subnet, and select the assignment criteria:

For **Smart Assign**: select IPv4 / IPv6, Mask, then optional Region, Resource assignment, Domain - VLAN, and IP Rules criteria, add free lines if desired, then click "Add Pool".



For **Direct Assign**: select IPv4 / IPv6 and enter the block in CIDR format, add free lines if desired, then click "Add Pool".

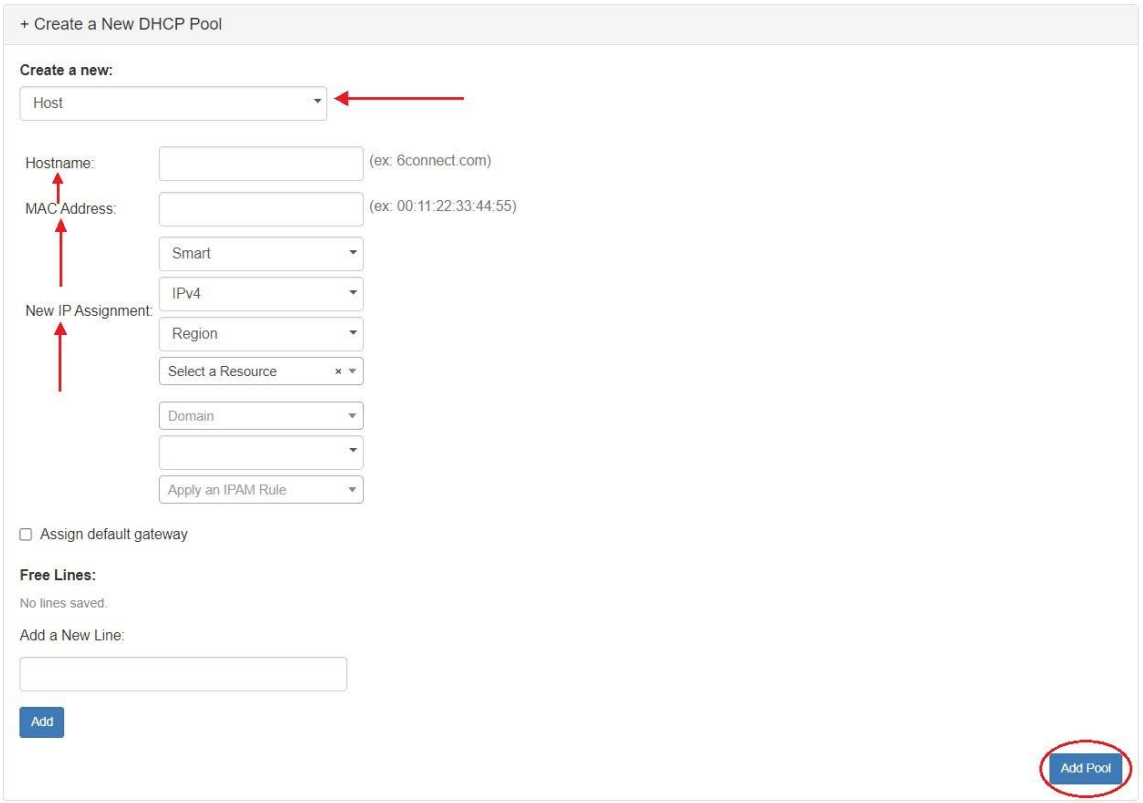


Create a New DHCP Pool - Host

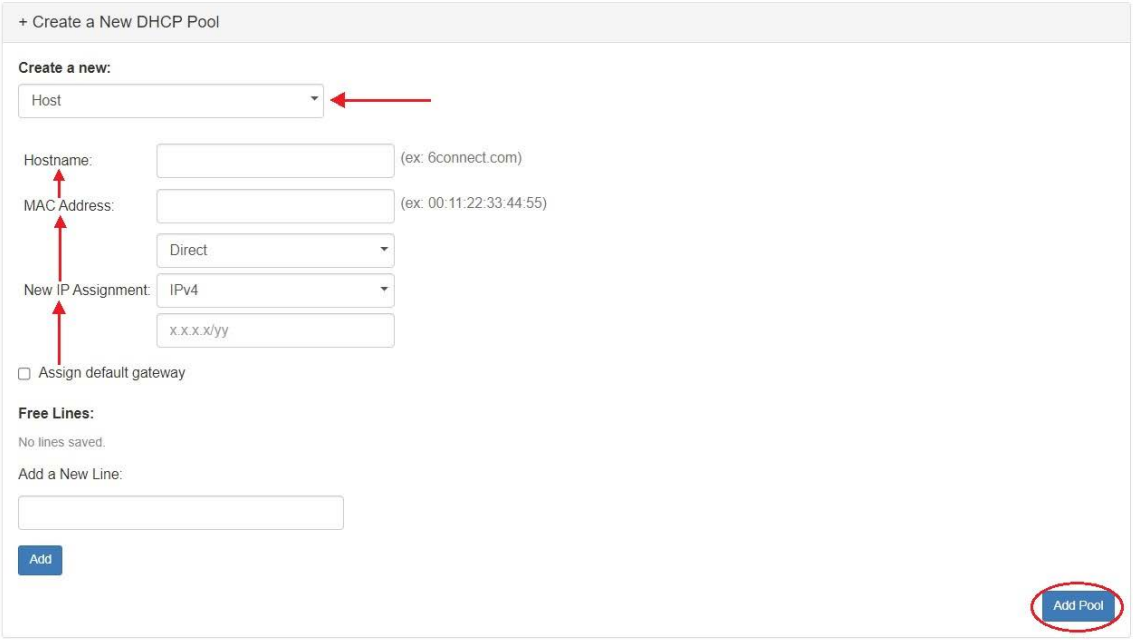
When reserving Hostname/MAC data, change the dropdown to "Host". This will also give you an option to assign from an existing DHCP block (Smart Assign) or a specific IP address (Direct Assign).

Enter the name of the hostname and MAC address, then select the assignment criteria:

For **Smart Assign**: select IPv4 / IPv6, then optional Region, Resource assignment, Domain - VLAN, and IP Rule criteria, add free lines if desired, then click "Add Pool".



For **Direct Assign**: select IPv4 / IPv6 and enter the block in CIDR format, add free lines if desired, then click "Add Pool".



Current Pushed Configuration

Expanding "Current Pushed Configuration" allows you to view the detailed text (read-only) of the last successfully pushed configuration.

Current Pushed Configuration does not reflect any un-pushed changes or failed pushes.



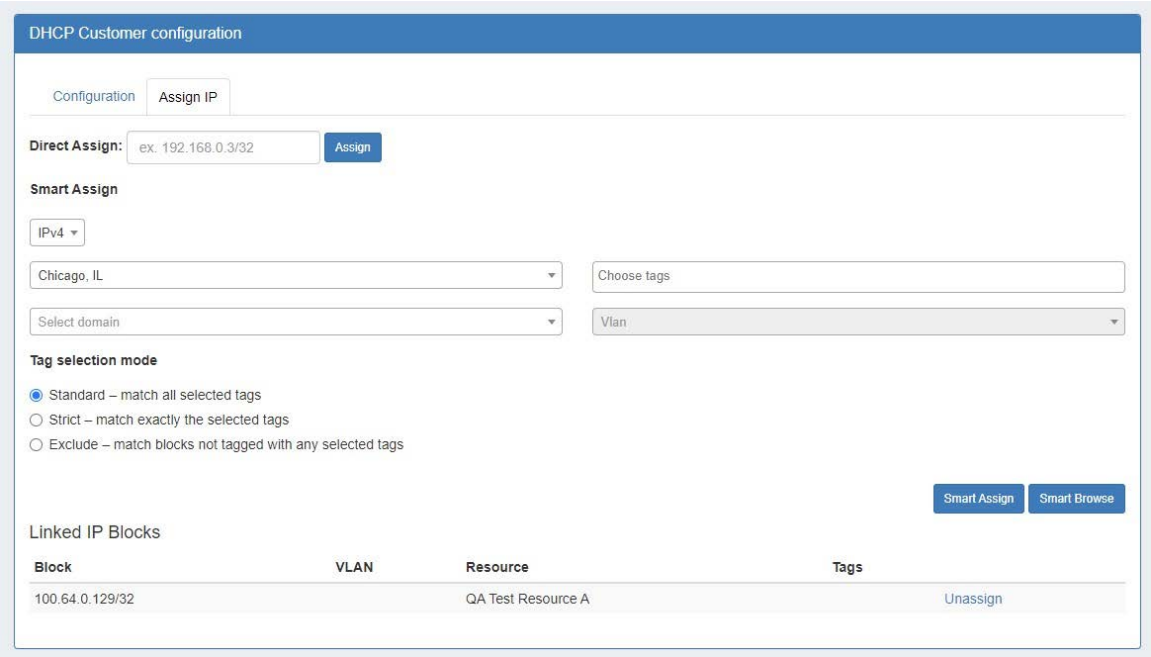
Saving/Pushing DHCP Server Configurations

It is recommended that you save your configuration after changes. Save your changes by clicking the "Save Configuration" button at the bottom of the DHCP Management Gadget.

When you push a configuration (by clicking "Push Configuration") the configuration is automatically saved.



Working with the DHCP Customer Configuration Gadget



The DHCP Customer Configuration Gadget allows users to assign APNIC IP aggregates to the DHCP server pools and generate DHCP Server Configuration changes.

These configurations are then sent to the associated DHCP server Management Gadget as "Unpushed Configurations", where they may be held until a manual or schedule push occurs.

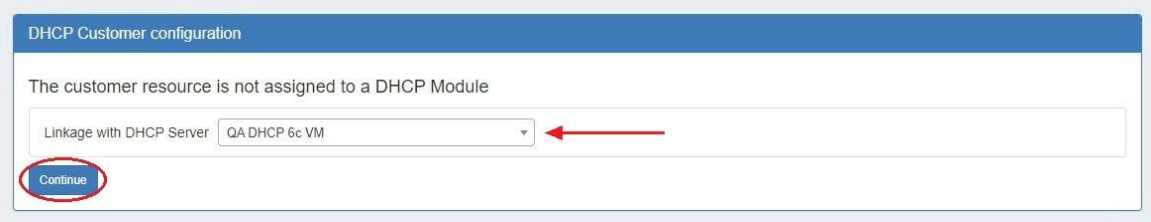
Setting up the DHCP Customer Configuration Gadget

Before using the DHCP Customer Configuration Gadget, the following should be set up in ProVision:

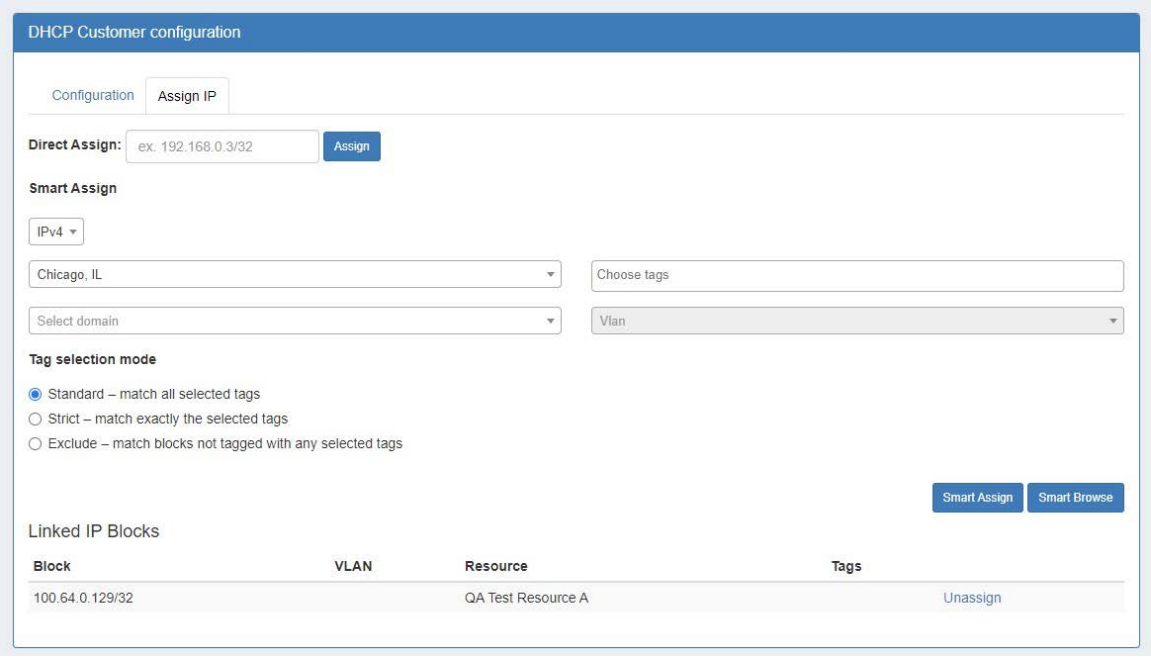
- The associated DHCP server should be created in ProVision and set up in the DHCP Management Gadget or DHCP Tab - DHCP Servers list (See: DHCP Tab).
- Add the DHCP Customer Configuration Gadget to the desired section. You may want to create a specific "DHCP Customer" section for DHCP customer entries (See: Customizing Sections).
- Have, or set up APNIC Aggregates for DHCP use from the IPAM Tab with the desired IP space type, Region(s), Tags, and any desired VLAN criteria. Regions are a required field when assigning IPs from the DHCP Customer Configuration Gadget. Any APNIC aggregate may be used for DHCP, so you may want to create a "DHCP" IPAM Tag to help denote the desired aggregate(s).
- If you are planning on Direct Assigning the DHCP blocks in the Customer Configuration Gadget, ensure that the desired blocks in the DHCP are split to individual /32 or /128 size. Smart Assign and Smart Browse will automatically split the block to assign the correct size.

Using the DHCP Customer Configuration Gadget

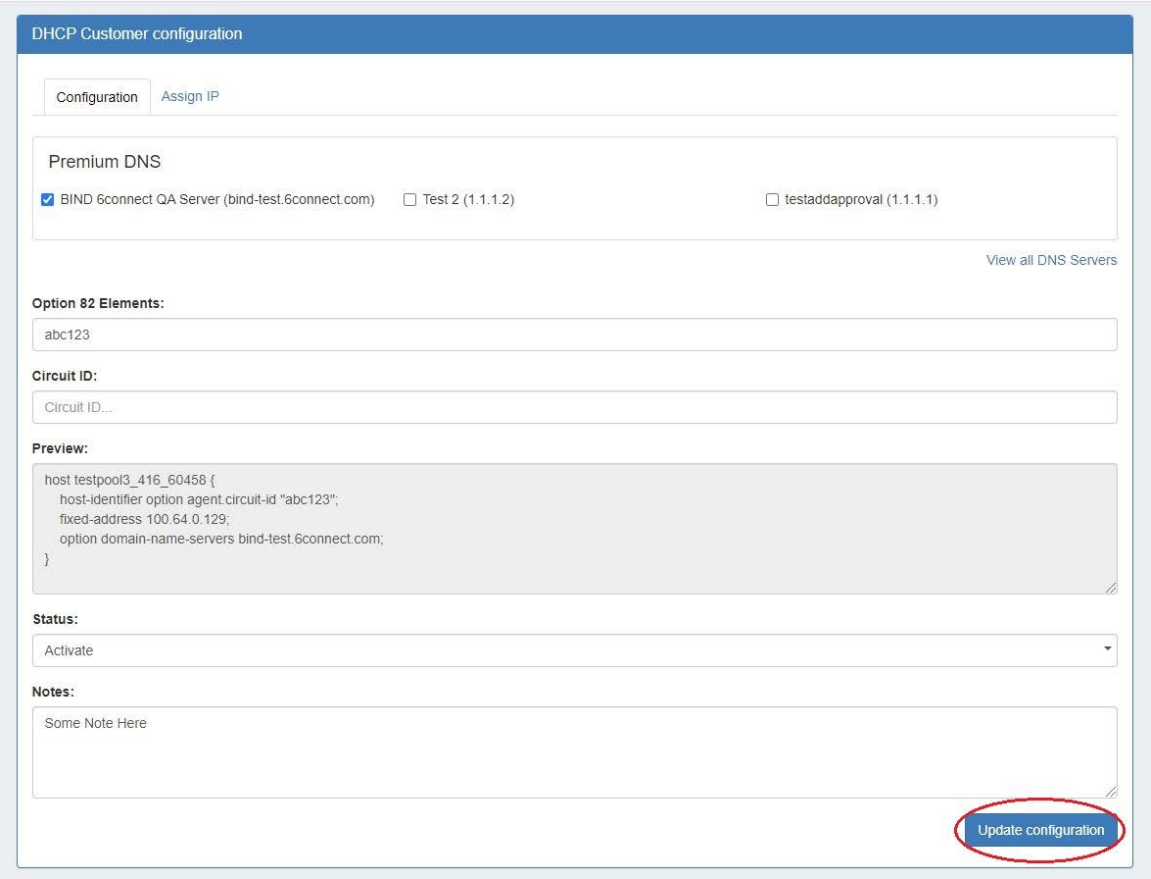
Step 1) Link the Gadget with the desired DHCP server



Step 2) Assign IP's for pools from DHCP aggregates



Step 3) Set up configuration information - add Option 82 Elements, Circuit ID, and notes. Use the "Preview" field to confirm the accuracy of the data, and select the status as "Activate" or "Terminate".
Once saved, the updated configuration will be sent to the DHCP Management Gadget.



Step 4) An admin user may manually push the updated configuration from the DHCP Management Gadget, or use a scheduled DHCP push task to automate the pushes.

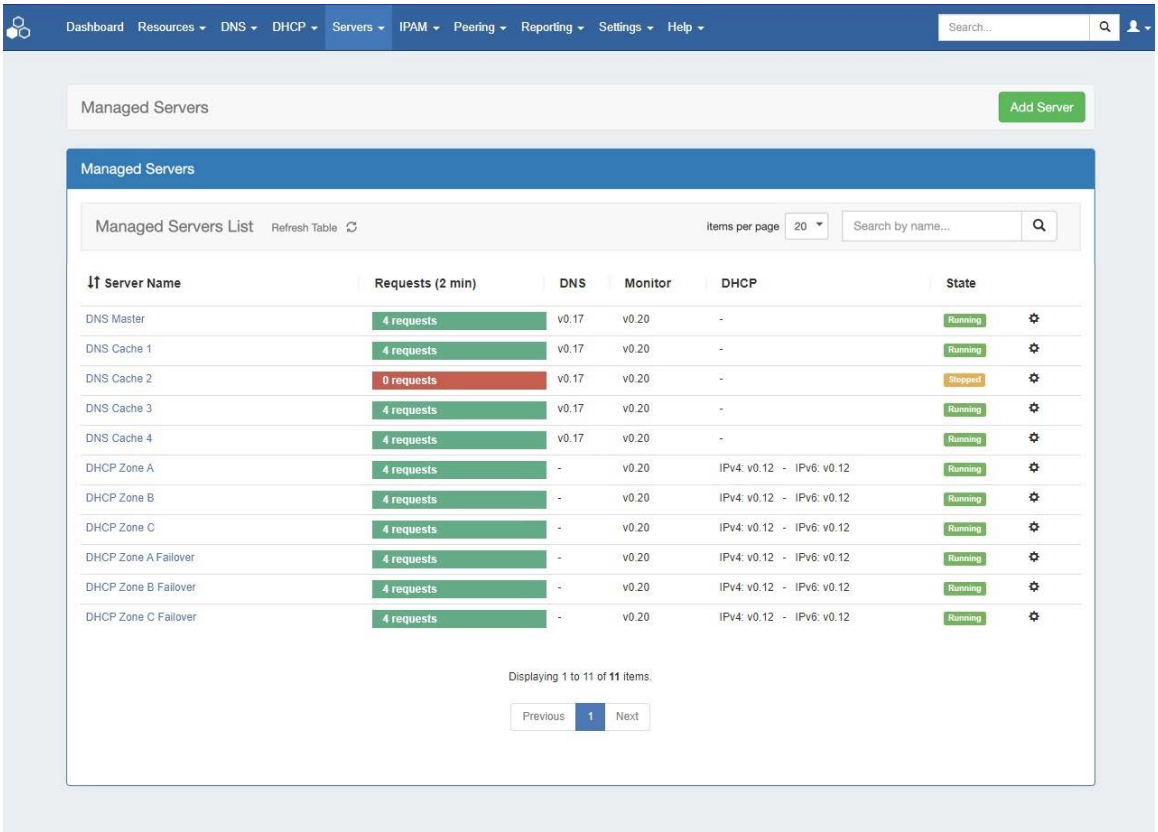
See Gadgets - DHCP Customer Configuration for more details.

Additional Information

For more detail on advanced DHCP topics and the DHCP API, see API Module - DHCP.

Managed Servers

Managed Servers



The Managed Servers tab allows for DNS and DHCP VM servers to be created, installed, managed, and monitored from within ProVision.

Managed Servers is handled via two main areas of the GUI: the **Managed Servers** Tab and in Admin **Admin Settings - Managed Servers** sub-tab. Managed servers actions are also available via APIv2 and the command line.

Requirements

Note: Python3, Docker, and Rabbit MQ services are used to support and run Managed Servers. Local customers planning on utilizing managed servers will need to either install these services, or contact support@6connect.com for assistance to accommodate specific network needs.

Required installations are already included for hosted customers.

- Managed Servers
  - Overview
    - Features
    - Permissions
    - Administration
    - Managed Servers API
  - Managed Servers Flow Chart
  - Managed Servers - Initial Setup and Installation
    - Install RabbitMQ
    - Enter Managed Servers Settings
      - 1) RabbitMQ Settings
      - 2) Enter Monitoring Settings
      - 2) Enter Update Settings
        - Update Settings - Docker Update Mode (Internet)
        - Update Settings - Image Download (Local)
    - Install Python 3 / Additional Services

        - Create Managed Servers
    - Working with Managed Servers
    - Additional Information

Overview

ProVision's Managed Servers tab allows for DNS (Knot-based) and DHCP(Kea-based) VMs to be created, managed and monitored from within ProVision, either from the GUI or command line.

Features

Managed Server Features include:

- VM creation, management, and monitoring from within ProVision
- Minimal requirements - Managed Servers only requires Python3 and Docker as dependencies
- OS options include CentOS and Ubuntu
- Supports both remote and manual setups
- Supports both root and non-root installations (for the latter, some root steps may be required)
- Installation and upgrade may be performed either via internet connection or locally:
    - Remote internet install/upgrade connects to 6connect's servers to get new versions
    - Local installs/upgrades will require users to upload the new version locally into their ProVision instance
    - No kernel updates or other system updates are required for local updates - only the Docker container will be updated.

Monitoring Features include:

- DNS Monitoring includes hit count for given period for each host/resource, total hit count, and last access time
- System monitoring Includes CPU load, Disk usage, connection information, swap memory, and virtual memory monitoring.
- Monitoring is available via GUI or API.
- Both "Push" and "Pull" options for statistics data are available
- Heartbeat service independent of Docker to provide monitoring data

Permissions

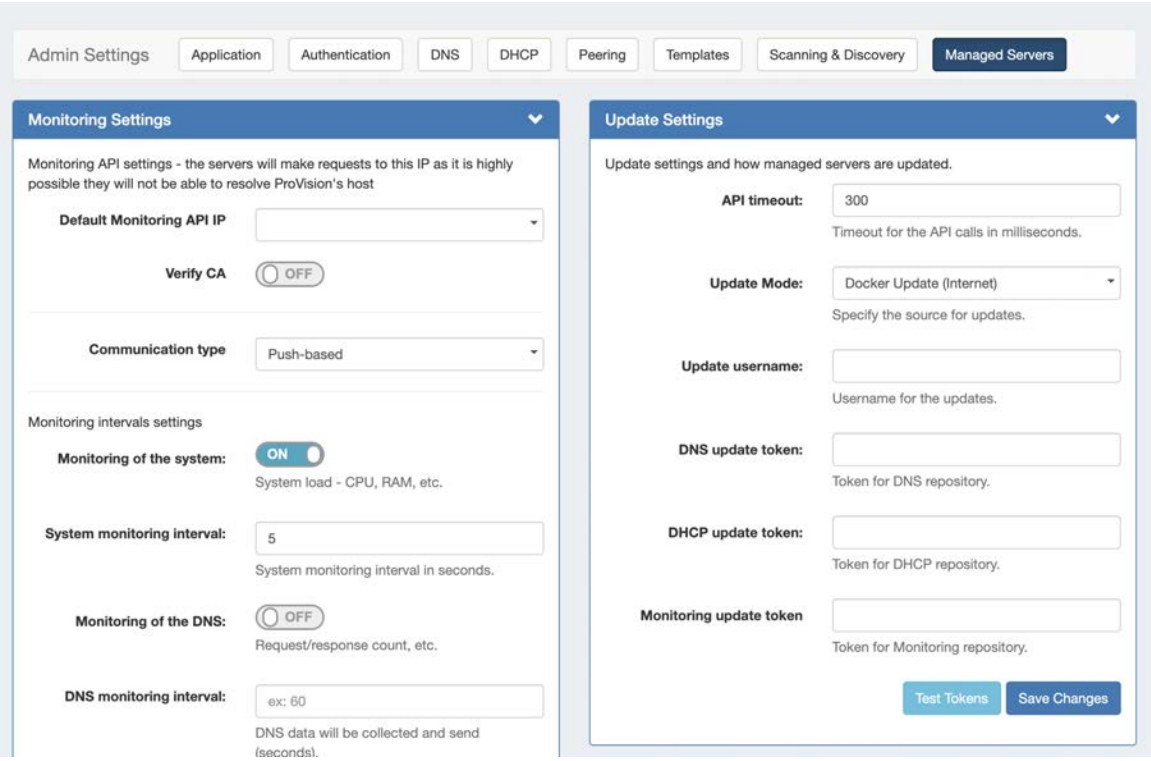
Managed Servers uses a "6c servers" user group, under which automatic or manual "server users" are created. The "6c servers" user group gives permissions to all 6c server resources.

The "server users" are necessary to allow access and permissions for the managed server(s). When new server is created with an empty user (instead of a user-provided existing user) a random new user is automatically created under that group. Only that server user has permission to update the associated managed server.

Administration

The "Managed Servers" sub-tab under Admin Settings includes modules for global setup of Monitoring Settings, Update Settings, Monitoring Services, and RabbitMQ settings.

These settings provide the "default" values for servers created from the Managed Servers Tab.



After making any settings updates, be sure to click "Save Changes" under the updated module.

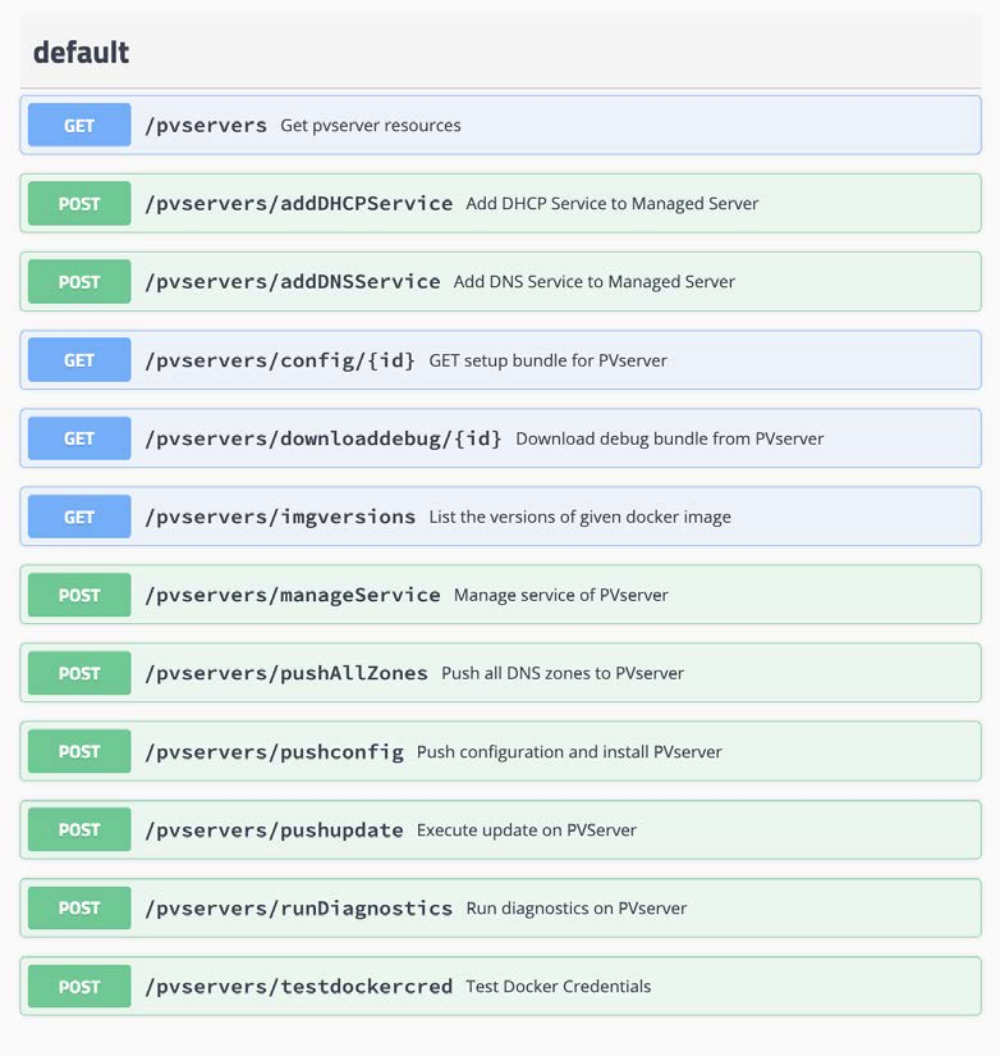
For additional details, see Managed Servers Settings.

Managed Servers API

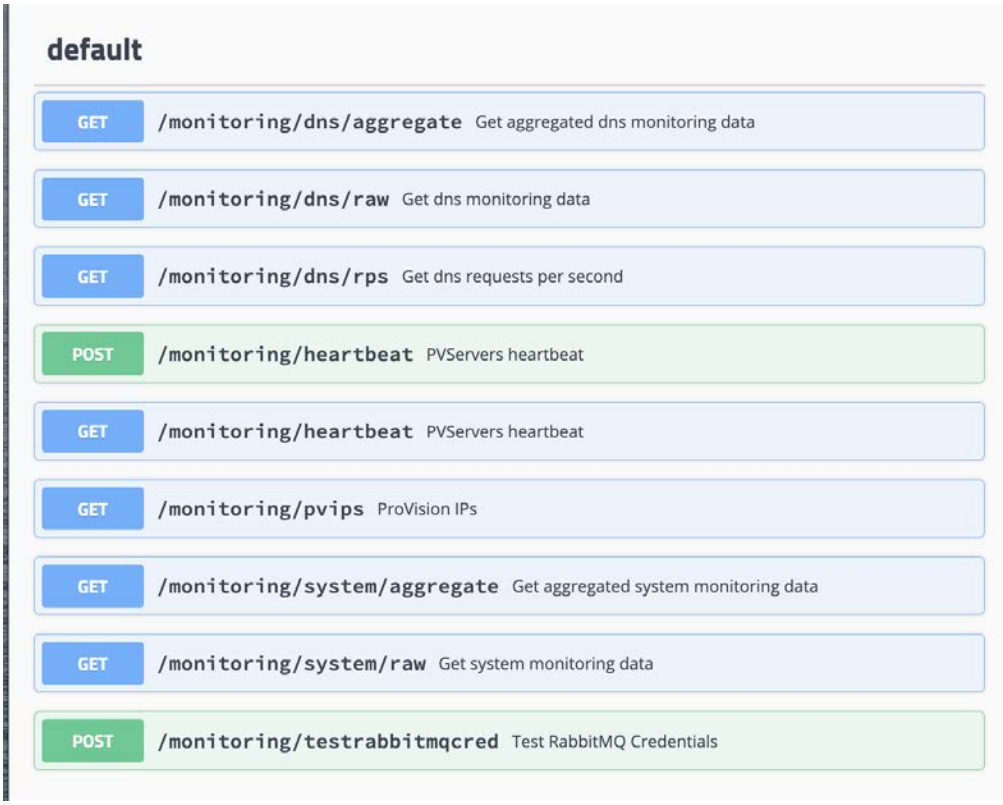
APIv2 endpoints are available for Managed Servers and Managed Server Monitoring.

To view these endpoints from your instance, go to the API Tab APIv2 Swagger Documentation, then click the Swagger links for the family categories "PVServers" and "Monitoring". For information on using the API, see APIv2.

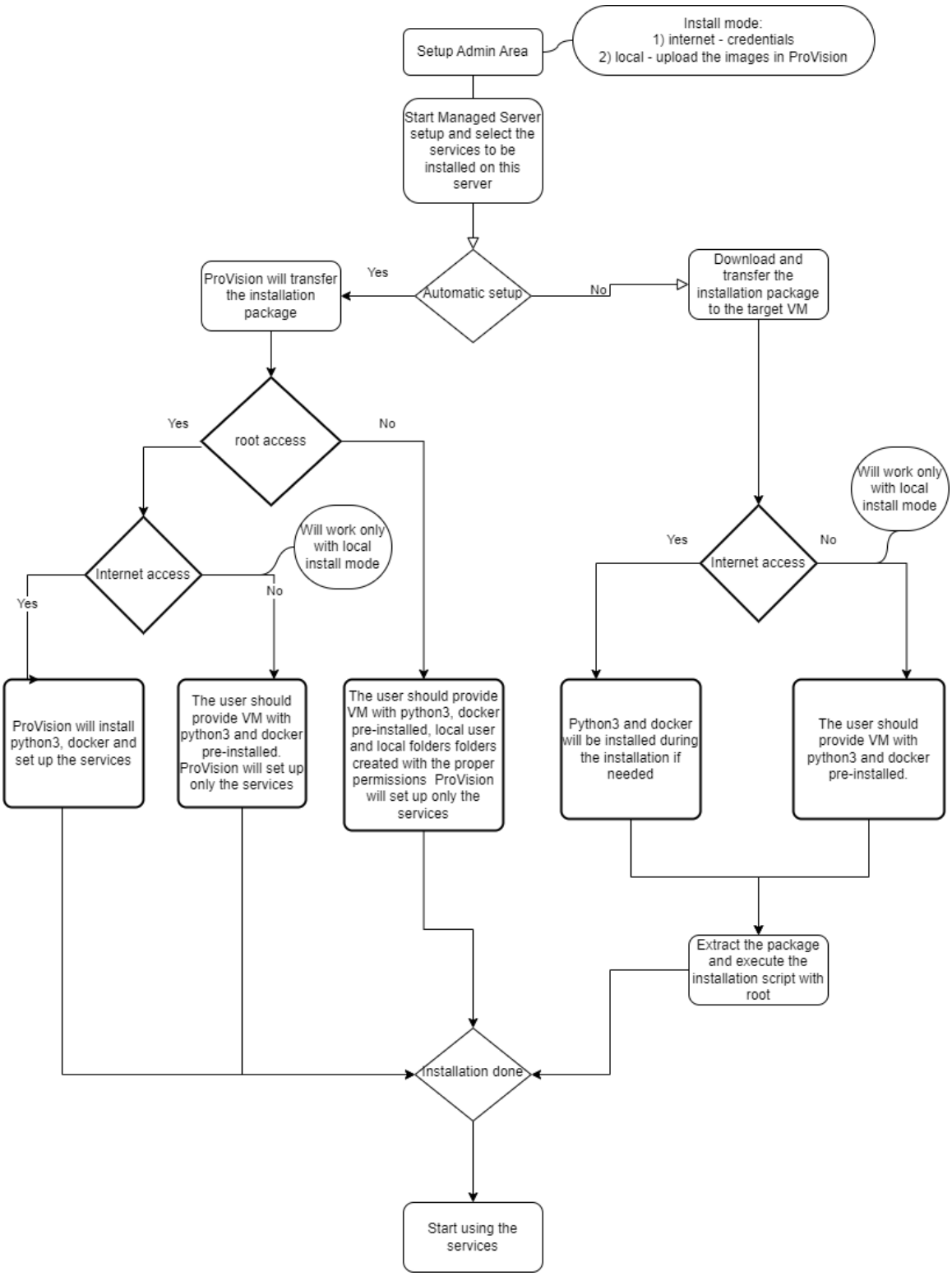
Managed Servers Endpoints:



Monitoring Endpoints:



Managed Servers Flow Chart



Managed Servers - Initial Setup and Installation

Install necessary packages (RabbitMQ, Python 3.6+, Docker), if not already installed with your ProVision instance.

Python 3.6+ and Docker should be installed on the target VM for the managed server in advance, prior to starting the managed server installation.

If an internet connection is established, Docker will be automatically installed by ProVision scripts.

Install RabbitMQ

If RabbitMQ has not already been installed on your ProVision instance / VM, you will need to install it by running the included shell script (Note: Installing RabbitMQ requires internet access.):

1) Run install_rabbitmq.sh.

```
/usr/bin/sh /path_to_provision/tools/install_rabbitmq_{OS}.sh
```

Ubuntu RabbitMQ installation script:

install_rabbitmq_ubuntu.sh

```
#!/usr/bin/sh

# https://www.rabbitmq.com/install-debian.html#apt-quick-start-cloudsmith

sudo apt-get install curl gnupg apt-transport-https -y

## Team RabbitMQ's main signing key
curl -1sLf "https://keys.openpgp.org/vks/v1/by-fingerprint/0A9AF2115F4687BD29803A206B73A36E6026DFCA" | sudo
gpg --dearmor | sudo tee /usr/share/keyrings/com.rabbitmq.team.gpg > /dev/null
## Launchpad PPA that provides modern Erlang releases
curl -1sLf "https://keyserver.ubuntu.com/pks/lookup?op=get&search=0xf77f1eda57ebb1cc" | sudo gpg --dearmor |
sudo tee /usr/share/keyrings/net.launchpad.ppa.rabbitmq.erlang.gpg > /dev/null
## PackageCloud RabbitMQ repository
curl -1sLf "https://packagecloud.io/rabbitmq/rabbitmq-server/gpgkey" | sudo gpg --dearmor | sudo tee /usr
/share/keyrings/io.packagecloud.rabbitmq.gpg > /dev/null

## Add apt repositories maintained by Team RabbitMQ
sudo tee /etc/apt/sources.list.d/rabbitmq.list <<EOF
## Provides modern Erlang/OTP releases
##
## "bionic" as distribution name should work for any reasonably recent Ubuntu or Debian release.
## See the release to distribution mapping table in RabbitMQ doc guides to learn more.
deb [signed-by=/usr/share/keyrings/net.launchpad.ppa.rabbitmq.erlang.gpg] http://ppa.launchpad.net/rabbitmq
/rabbitmq-erlang/ubuntu focal main
deb-src [signed-by=/usr/share/keyrings/net.launchpad.ppa.rabbitmq.erlang.gpg] http://ppa.launchpad.net
/rabbitmq/rabbitmq-erlang/ubuntu focal main

## Provides RabbitMQ
##
## "bionic" as distribution name should work for any reasonably recent Ubuntu or Debian release.
## See the release to distribution mapping table in RabbitMQ doc guides to learn more.
deb [signed-by=/usr/share/keyrings/io.packagecloud.rabbitmq.gpg] https://packagecloud.io/rabbitmq/rabbitmq-
server/ubuntu/ focal main
deb-src [signed-by=/usr/share/keyrings/io.packagecloud.rabbitmq.gpg] https://packagecloud.io/rabbitmq
/rabbitmq-server/ubuntu/ focal main
EOF

## Update package indices
sudo apt-get update -y

## Install Erlang packages
sudo apt-get install -y erlang-base \
                               erlang-asn1 erlang-crypto erlang-eldap erlang-ftp erlang-inets \
                                                          erlang-mnesia erlang-os-mon erlang-parsetools erlang-
public-key \
                                                                                    erlang-runtime-tools erlang-
snmp erlang-ssl \

erlang-syntax-tools erlang-tftp erlang-tools erlang-xmerl

## Install rabbitmq-server and its dependencies
sudo apt-get install rabbitmq-server -y --fix-missing

sudo rabbitmq-plugins enable rabbitmq_management

sudo rabbitmq-server start -detached

sleep 5

sudo rabbitmqctl add_user pv_rabbitmq S3curePassW0rd!
sudo rabbitmqctl set_user_tags pv_rabbitmq administrator
sudo rabbitmqctl set_permissions -p / pv_rabbitmq ".*" ".*" ".*"

sudo systemctl enable rabbitmq-server

echo "RabbitMQ user is:  pv_rabbitmq"
echo "RabbitMQ password is:  S3curePassW0rd!"
echo "RabbitMQ port is:  5672"
echo "RabbitMQ management port is:  15672"
```

CentOS RabbitMQ installation script:

install_rabbitmq_centos.sh

```
#!/usr/bin/sh

# https://www.rabbitmq.com/install-debian.html#apt-quick-start-cloudsmith

sudo yum install curl gnupg apt-transport-https -y

## Team RabbitMQ's main signing key
curl -1sLf "https://keys.openpgp.org/vks/v1/by-fingerprint/0A9AF2115F4687BD29803A206B73A36E6026DFCA" | sudo
gpg --dearmor | sudo tee /usr/share/keyrings/com.rabbitmq.team.gpg > /dev/null
## Launchpad PPA that provides modern Erlang releases
curl -1sLf "https://keyserver.ubuntu.com/pks/lookup?op=get&search=0xf77f1eda57ebb1cc" | sudo gpg --dearmor |
sudo tee /usr/share/keyrings/net.launchpad.ppa.rabbitmq.erlang.gpg > /dev/null
## PackageCloud RabbitMQ repository
curl -1sLf "https://packagecloud.io/rabbitmq/rabbitmq-server/gpgkey" | sudo gpg --dearmor | sudo tee /usr
/share/keyrings/io.packagecloud.rabbitmq.gpg > /dev/null

## Add apt repositories maintained by Team RabbitMQ
#sudo tee /etc/apt/sources.list.d/rabbitmq.list <<EOF
## Provides modern Erlang/OTP releases
##
## "bionic" as distribution name should work for any reasonably recent Ubuntu or Debian release.
## See the release to distribution mapping table in RabbitMQ doc guides to learn more.
#deb [signed-by=/usr/share/keyrings/net.launchpad.ppa.rabbitmq.erlang.gpg] http://ppa.launchpad.net/rabbitmq
/rabbitmq-erlang/ubuntu focal main
#deb-src [signed-by=/usr/share/keyrings/net.launchpad.ppa.rabbitmq.erlang.gpg] http://ppa.launchpad.net
/rabbitmq/rabbitmq-erlang/ubuntu focal main

## Provides RabbitMQ
##
## "bionic" as distribution name should work for any reasonably recent Ubuntu or Debian release.
## See the release to distribution mapping table in RabbitMQ doc guides to learn more.
#deb [signed-by=/usr/share/keyrings/io.packagecloud.rabbitmq.gpg] https://packagecloud.io/rabbitmq/rabbitmq-
server/ubuntu/ focal main
#deb-src [signed-by=/usr/share/keyrings/io.packagecloud.rabbitmq.gpg] https://packagecloud.io/rabbitmq
/rabbitmq-server/ubuntu/ focal main
#EOF

## Update package indices
sudo yum update -y

## Install Erlang packages
sudo yum install -y erlang-base erlang-asn1 erlang-crypto erlang-eldap erlang-ftp erlang-inets erlang-mnesia
erlang-os-mon erlang-parsetools erlang-public-key erlang-runtime-tools erlang-snmp erlang-ssl erlang-syntax-
tools erlang-tftp erlang-tools erlang-xmerl

## Install rabbitmq-server and its dependencies
sudo yum install rabbitmq-server -y

sudo rabbitmq-plugins enable rabbitmq_management

sudo rabbitmq-server start -detached

sleep 5

sudo rabbitmqctl add_user pv_rabbitmq S3curePassW0rd!
sudo rabbitmqctl set_user_tags pv_rabbitmq administrator
sudo rabbitmqctl set_permissions -p / pv_rabbitmq ".*" ".*" ".*"

sudo systemctl enable rabbitmq-server

echo "RabbitMQ user is:  pv_rabbitmq"
echo "RabbitMQ password is:  S3curePassW0rd!"
echo "RabbitMQ port is:  5672"
echo "RabbitMQ management port is:  15672"
```

This script is taken from Installing on Debian and Ubuntu — RabbitMQ and may need an update in future.

2) You may verify the installation is working by opening http://your.host:15672

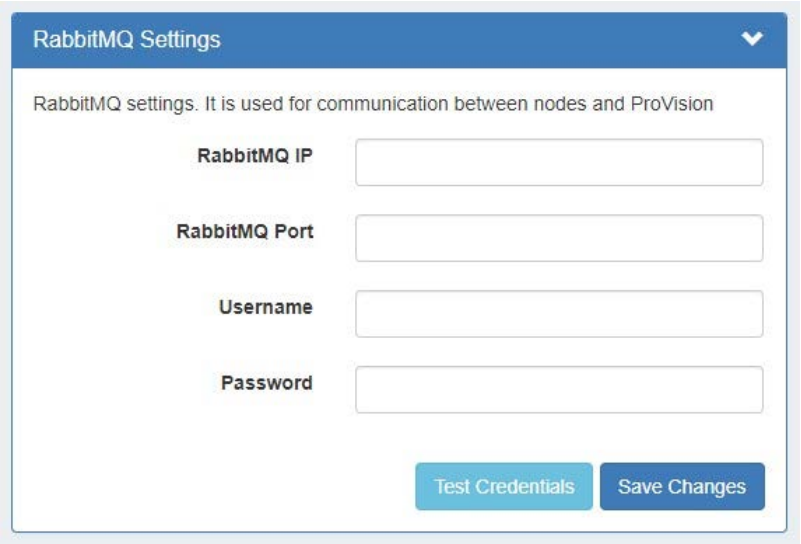
3) Once confirmed working, go to ProVision Admin Settings Managed Server Settings. Then, enter the RabbitMQ IP, port, username, and password into the RabbitMQ Settings section. When done, click "Save Changes".

Enter Managed Servers Settings

In ProVision, navigate to Admin Settings Managed Servers and enter or verify settings in the following areas:

1) RabbitMQ Settings

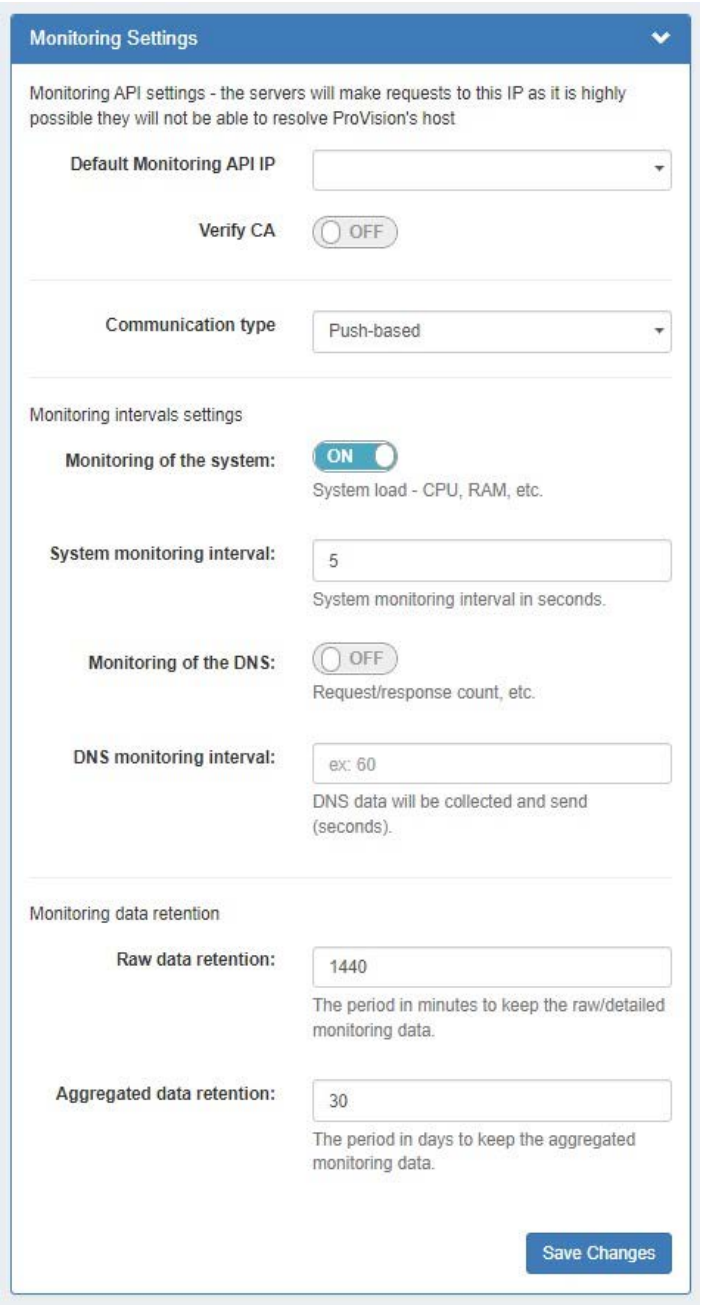
Enter the RabbitMQ IP, port, username, and password into the RabbitMQ Settings section. To verify the settings, click "Test Credentials".



When done, click "Save Changes".

2) Enter Monitoring Settings

Under Monitoring Settings, select the "Default Monitoring API IP", and enter any additional setting options as follows:



- **Default Monitoring API IP:** The default IP to be used for API calls (heartbeat, activation, etc.) for managed server monitoring and to send API requests, as multiple IPs may be available depending on the Provision set up.
    - Note: The Default Monitoring API IP can be set to a default value in this area, but it may also be set individually per managed server as an override.
- **Verify CA:** Toggle to "on" if you wish to enable the CA check.
- **Communication type:** Push (when the server pushes data to ProVision) and pull (when ProVision connects to the server and pulls the data). Push is preferred, but Pull-based may be desirable in cases where a firewall would not allow inbound connections to ProVision.
- **Monitoring of the system:** Toggle to "on" to enable monitoring of system statistics.
- **System monitoring interval:** How often (in seconds) the system will be checked. The smaller the interval, the more data there will be to store.
- **Monitoring of the DNS:** Toggle to "on" to enable gathering statistics from the DNS server.
- **DNS monitoring interval:** How often (in seconds) the DNS server will be monitored. Data will be aggregated for the set period of time and the aggregated results will be sent.
- **Raw data retention:** The number of minutes to retain raw data. By default, this is set to 1440 minutes (1 day). Raw data requires sizable storage needs.
- **Aggregated data retention:** The number of days to retain aggregated data.

2) Enter Update Settings

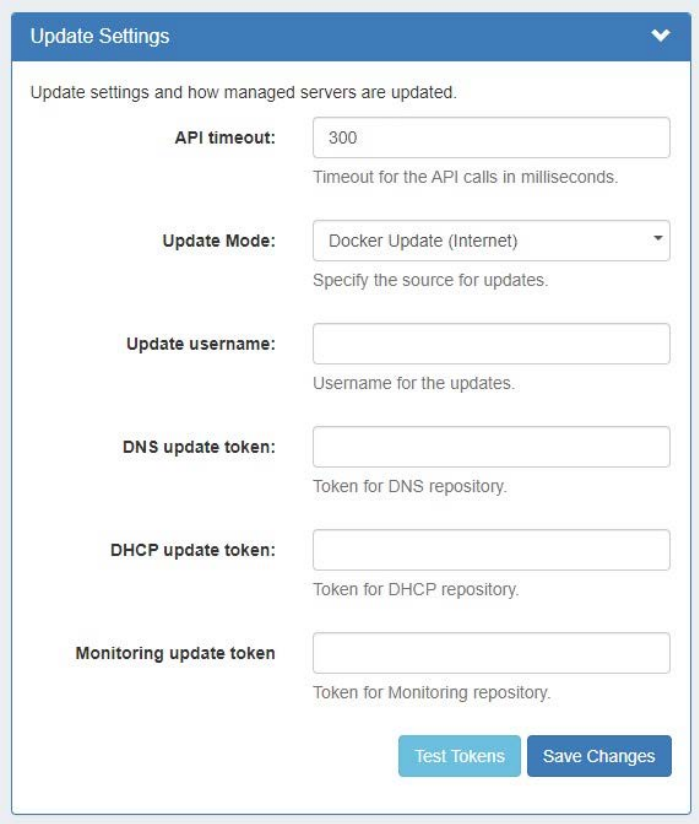
Enter Update settings to use for Managed Servers, starting with API timeout (in milliseconds) and Update Mode.

Fill in the remaining update settings as applicable to the selected update mode:

- **Internet Docker Update (Recommended)** - This uses a Docker update directly from our docker registry. Internet connection is required for the managed server in order this mode to work.
    - When this is chosen, fields to enter tokens for the DNS / DHCP repository will displayed.

> For assistance obtaining repository tokens, please contact support@6connect.com.

Update Settings - Docker Update Mode (Internet)



API timeout: Timeout for API calls in milliseconds.

Update Mode: Enter the source for updates, depending on internet accessibility. Two options are available:

- Image Download (Local) - This option is to update from ProVision, locally. No internet connection is required from the managed server, but an image file must be manually downloaded from a separate secure site and then uploaded into ProVision.

> If "Image Download (Local)" is selected, you must download the image file from a secure 6connect site to then upload for this setting. Please contact support@6connect.com for credentials to access the image download area.

- Internet Docker Update - This uses a Docker update directly from our docker registry. Internet connection is required for the managed server in order this mode to work. When this is chosen fields for tokens for our gitlab/registry appear to be filled in:
    - **Update username:** Enter the username for updates.
    - **DNS update token:** Enter the token for the DNS repository.
    - **DHCP update token:** Enter the token for the DHCP repository.
    - **Monitoring update token:** Enter the token for the Monitoring repository.
- **Test Tokens:** Click to test the applied tokens for DNS, DHCP, and Monitor.

For assistance obtaining repository tokens, please contact support@6connect.com.

- **ProVision Image Download** - If Update Mode is set to "Image Download (Local)", then no internet connection is required from the managed server, but an image file must be manually downloaded from a separate secure site to then upload into ProVision.

Update Settings - Image Download (Local)

If Update Mode is set to "Image Download (Local)", the following settings will display to enter:

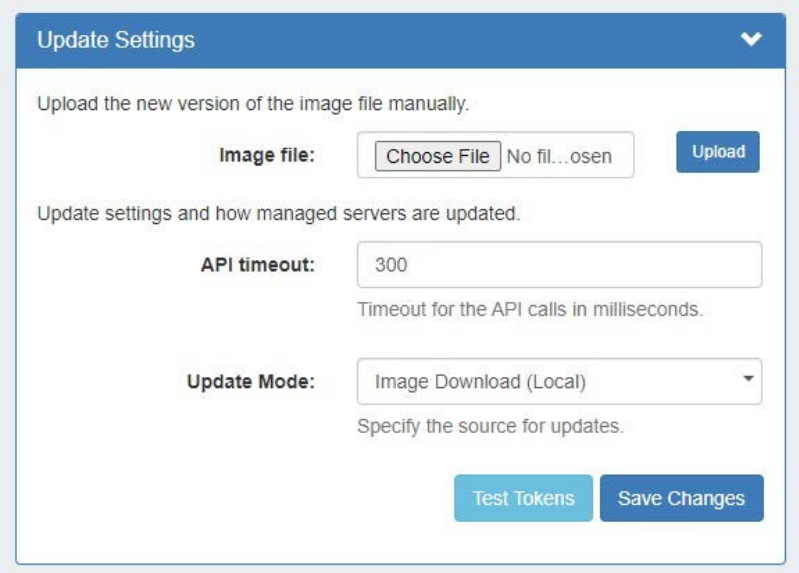


Image file: Attach the Image file for upload to ProVision.

If "Image Download (Local)" is selected, you must download the image file from a secure 6connect site to then upload for this setting. Please contact support@6connect.com for credentials to access the image download area.

API timeout: Timeout for API calls in milliseconds.

Update Mode: Enter the source for updates - Image Download (Local), or opt to change to Docker Update (Requires Internet).

Images history: Available only after saving changes.

Test Tokens: Click to test the applied tokens for DNS, DHCP, and Monitor.

Install Python 3 / Additional Services

Setup the necessary services:

Run MQ workers
`python3 /path_to_provision/pvservers/setup/pv_install/setup_services.py`

Create Managed Servers

At this point, initial setup is complete and you may begin to create new managed servers in ProVision.

For instructions on creating a new managed server, see Working with Managed Servers.

Working with Managed Servers

For information on creating a new managed server, working with the managed server list, and viewing monitoring, see the following sections:

- Working with Managed Servers

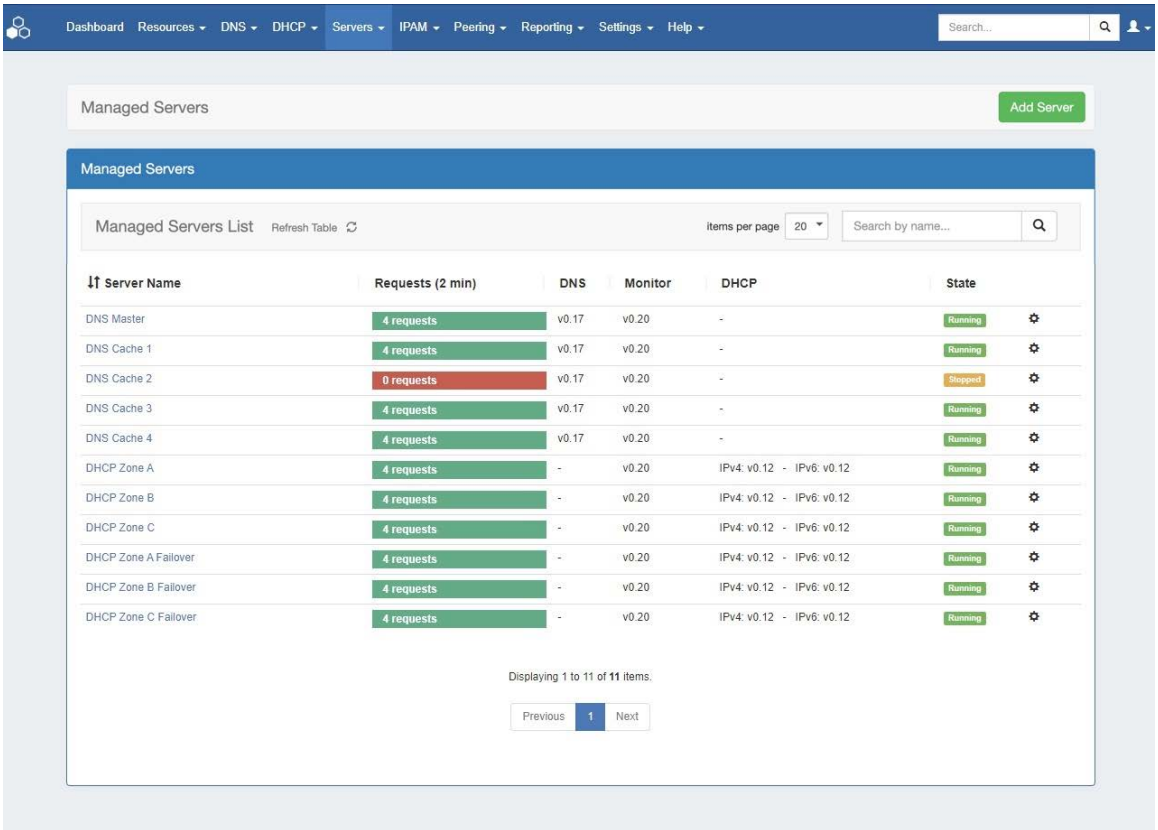
Additional Information

For Admin-level managed server setting information, see:

- Managed Servers Settings

Working with Managed Servers

Working with Managed Servers



The Managed Server page is where you can add a new server, view the list of existing servers, and view monitoring data on each server. From here, you may also access server settings and details for each server.

Requirements

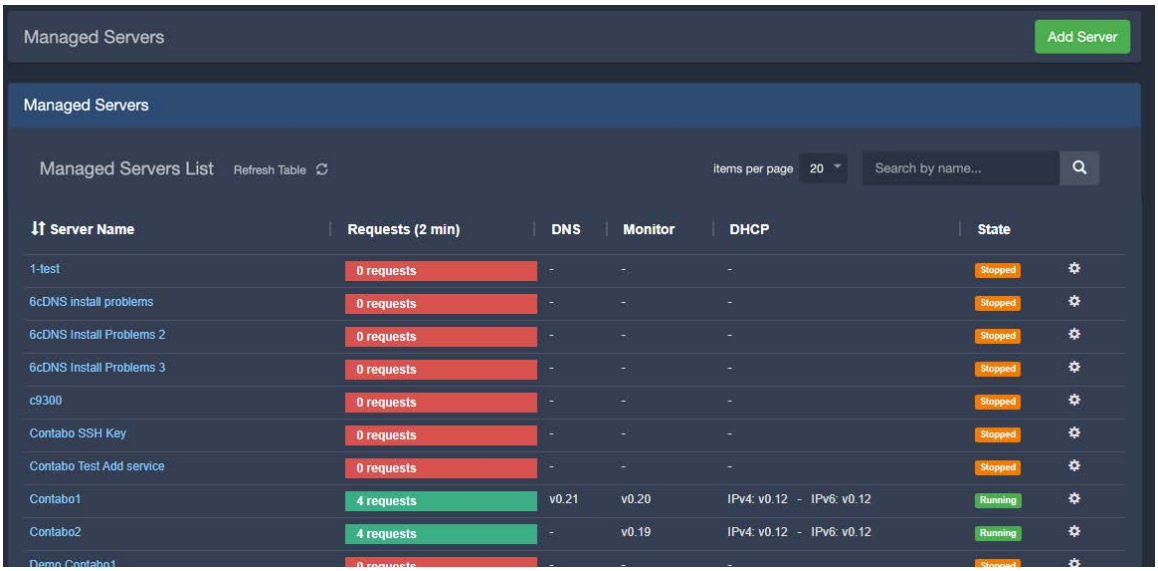
Note: Managed Servers requires Python3 and Docker to be installed to support this feature.

- Working with Managed Servers
  - The Managed Server List Interface
    - Working with the Managed Server List
  - Add New Managed Server (Setup Wizard)
    - Step 1: Common Settings
    - Step 2: Communication Settings
    - Step 3: Monitoring Settings
    - Step 4: Service Settings
    - Step 5: Confirmation
  - View or Edit Managed Server Details
    - Settings
    - Services
      - Add Service
    - Monitoring
    - RPS (requests per second)
  - Update / Install Managed Server (Existing Component)
    - Requirements
    - Automatic (Recommended)
    - Manual (from the command line)
    - Without root
  - Update Managed Server
  - Managed Server Diagnostics / Debug

    - Automatic - GUI
    - Manual - Command Line Scripts
    - Local
  - Delete Managed Server
  - Additional Information

The Managed Server List Interface

The Managed Server Section List provides server and monitoring data for each managed DNS / DHCP server.



The list provides the following information:

Server Name: The server display name, set by the user during server creation. You may click on the server name link to view server details

Requests: Requests are the heartbeat notifications received in the last 2 minutes. Requests are sent every 30 seconds, so a display of 4 or 5 requests represents a satisfactory request connection, and the request bar will show in green. For any lower value, the color of the bar will show in red.

DNS / Monitor / DHCP: The version of the component running. If the server is not running, no version will display.

State: State shows the overall state of the server - the server may be running, but without any components started. "Running" will show in green, whereas "Stopped" will display as an orange bar.

Action Menu (gear icon): Right click on the action menu (or anywhere on the row) to display available server actions

Working with the Managed Server List

The following actions may be performed when interacting with the server list:

Sort the list by clicking on the "Server Name" column, to view by Ascending / Descending order

Search / Filter the list for specific servers by entering a full or partial server name into the search box at the upper right of the list

Display more/fewer servers per page by clicking on the "Items per page" selector at the top right of the list, next to the search box

Refresh the list to check for updated information by clicking the "Refresh Table" button (rotating arrows)

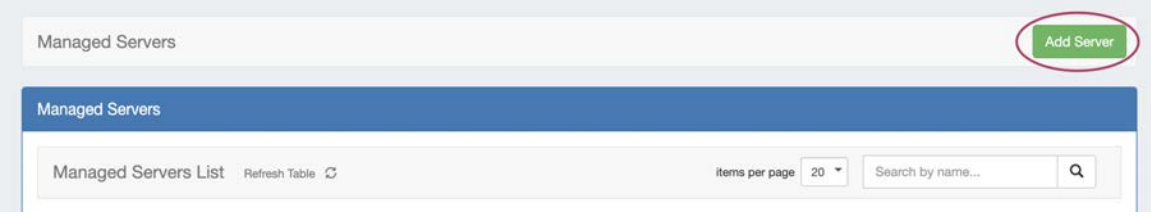
Click on a server name to view / edit server details

Add New Managed Server (Setup Wizard)

Before you begin, you will need to know following connection information for the new managed server:

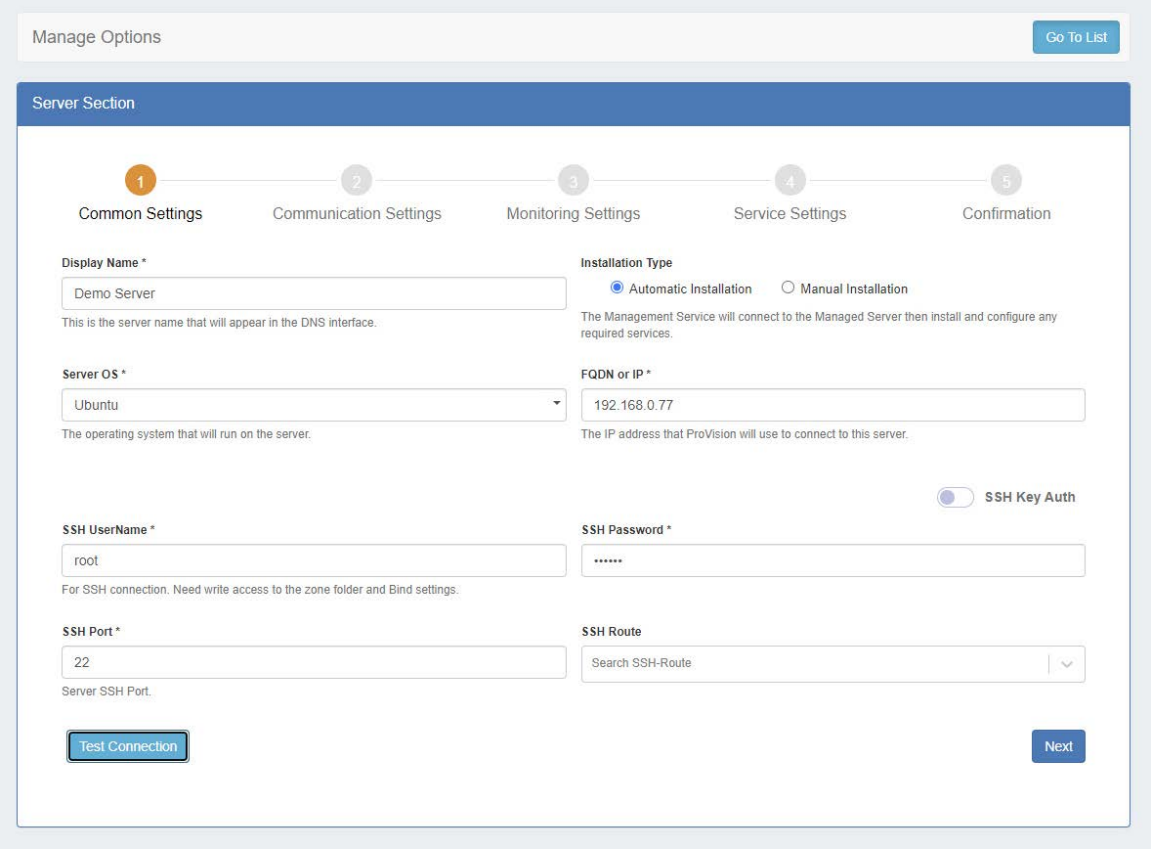
- Server FQDN or IP (only required for automatic installation)
- Desired server OS
- SSH credentials and port

To set up a new managed server, click "Add Server" at the top right of the Managed Server Tab.



From there, proceed through each of the five steps of the Add New Server wizard, below:

Step 1: Common Settings



Enter the common settings for the new server:

Display Name: The display name for the server

Installation Type: You may choose either an automatic installation, where ProVision handles the installation, or perform a manual installation.

After selecting the installation type, enter the required fields for the server, depending on the selected install type:

Display Name (always required)

Server OS (always required)

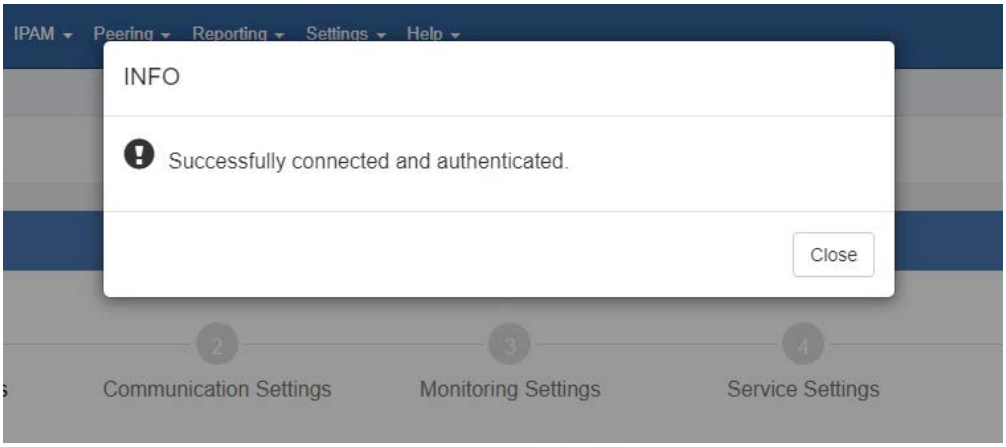
FQDN or IP (required for automatic installations)

SSH Username / Password (required for automatic installations)

SSH Port (required for automatic installations)

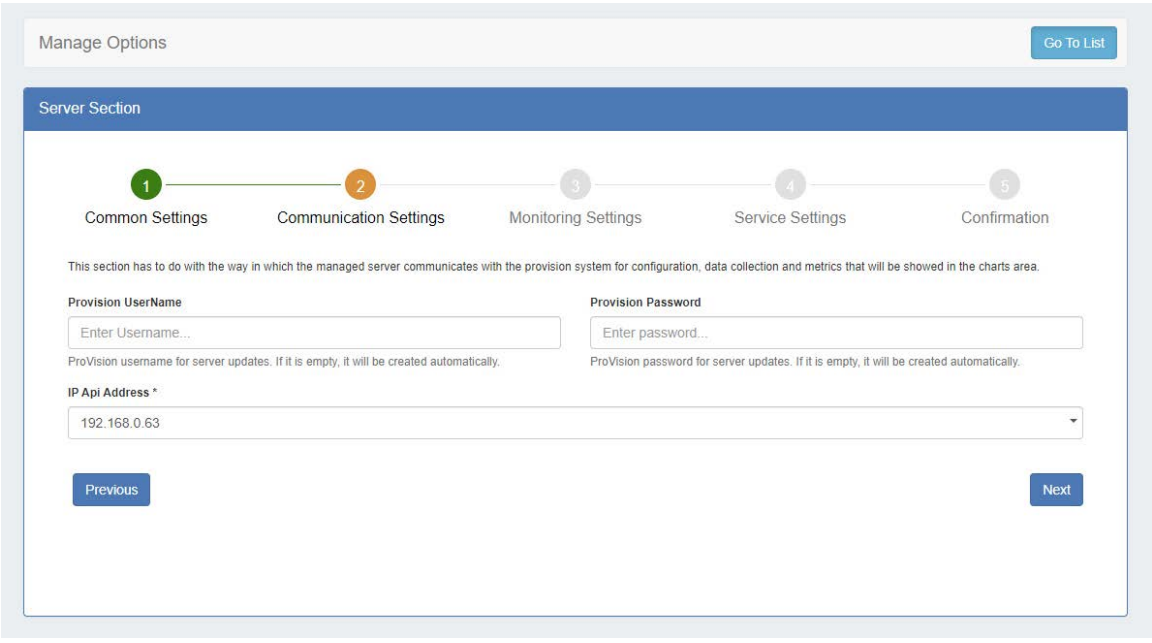
SSH Route (optional)

After entering in the common settings, click "Test Connection" to verify the connection and authentication.



Once a connection has been confirmed, click "Next".

Step 2: Communication Settings



Managed servers require a ProVision user account and API IP in order to communicate configuration, data, and monitoring information.

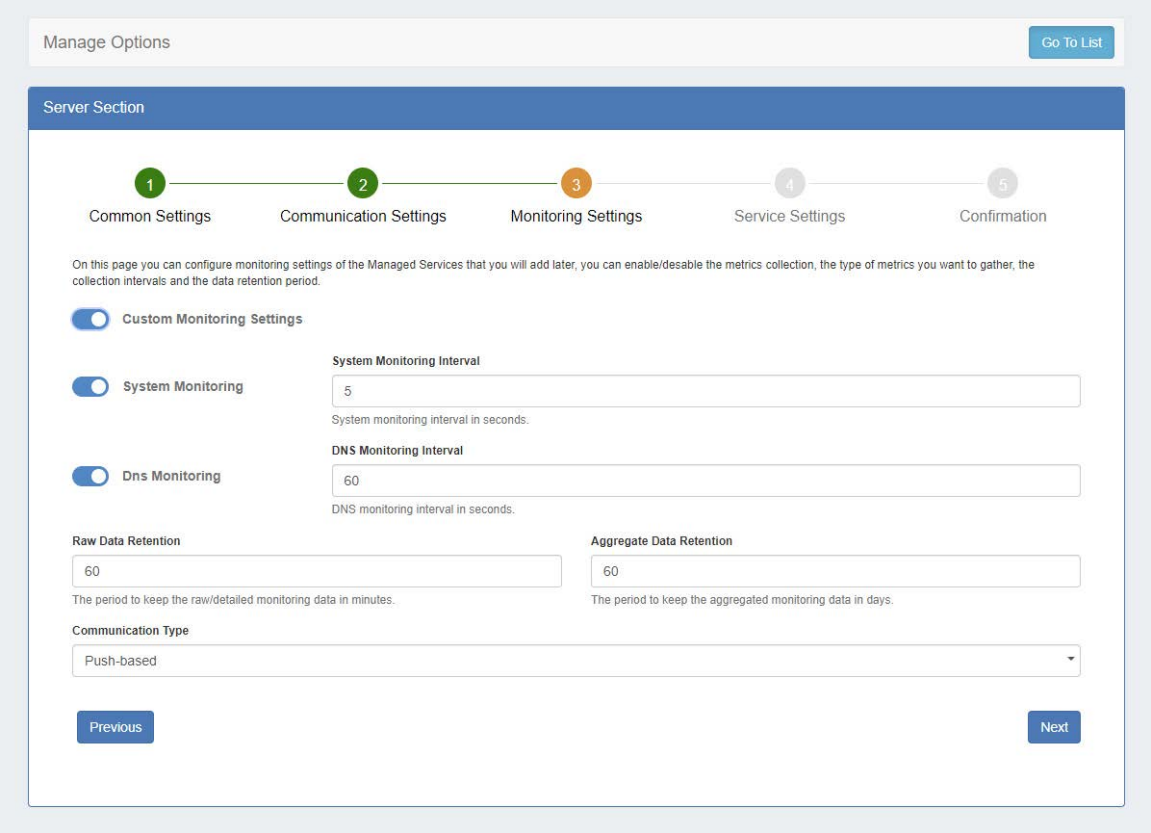
ProVision Username / Password: You may enter a specific ProVision username and password, or allow one to be automatically generated. If you enter an existing ProVision user, please ensure that the user is included under the 6cservers group and/or has full C/R/U/D resource permissions on the "6c server" resource.

IP API Address: The API address the managed server should use. There are cases when the DNS servers are in different networks and should communicate with ProVision on different IPs.

Click "Next" to proceed.

Step 3: Monitoring Settings

Select the desired monitoring settings for the server. You may either accept the default settings, or click on the toggle for **Custom Monitoring Settings** to override default settings.



Options include:

System Monitoring: Enable / Disable monitoring for system statistics. If enabled, enter the desired **System Monitoring Interval** (in seconds). More frequent intervals require larger storage, but generates more data in cases where investigation is needed.

DNS Monitoring: Enable / Disable monitoring for DNS statistics. If enabled, enter the desired **DNS Monitoring Interval** (in seconds). DNS requests are collected for the set time interval, and then sent as an aggregated result.

Raw Data Retention: How long to keep the raw data, in minutes. This affects how far back you could investigate an incident using the detailed data. Raw data requires sizable storage needs; so the default setting is 1440 min (1 day).

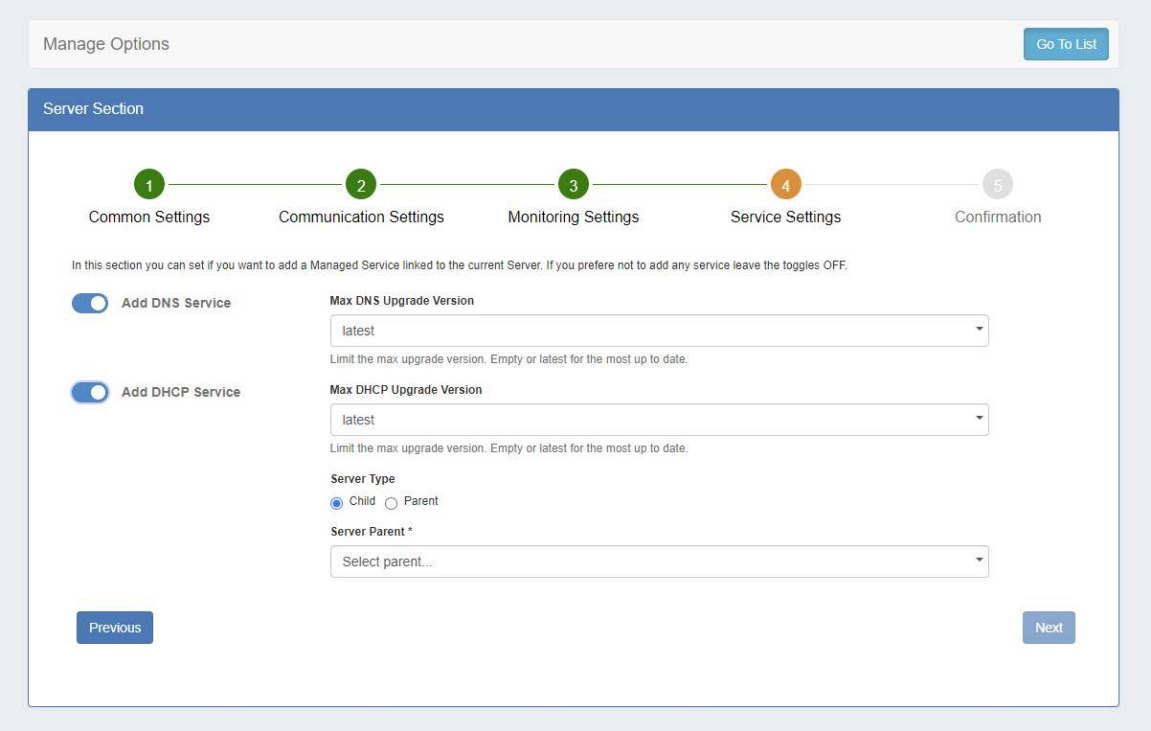
Aggregated Data Retention: How long to keep the aggregated data, in days.

Communication type: Select either Push-based (when the server pushes data to ProVision) or Pull-based (when ProVision connects to the server and pulls the data). Push-based is the preferred method, but Pull-based may be desirable in cases where a firewall would not allow inbound connections to ProVision.

Click "Next" to continue.

Step 4: Service Settings

Here you can select which components to install linked to the current server. If you prefer not to add a service, both toggles may be disabled.



Add DNS Service: Enable / Disable to add a DNS Managed Service link. Options include:

> **Max DNS Upgrade Version:** Select either "latest", or select a specific version to install and not upgrade beyond, in case of known issues or incompatibility.

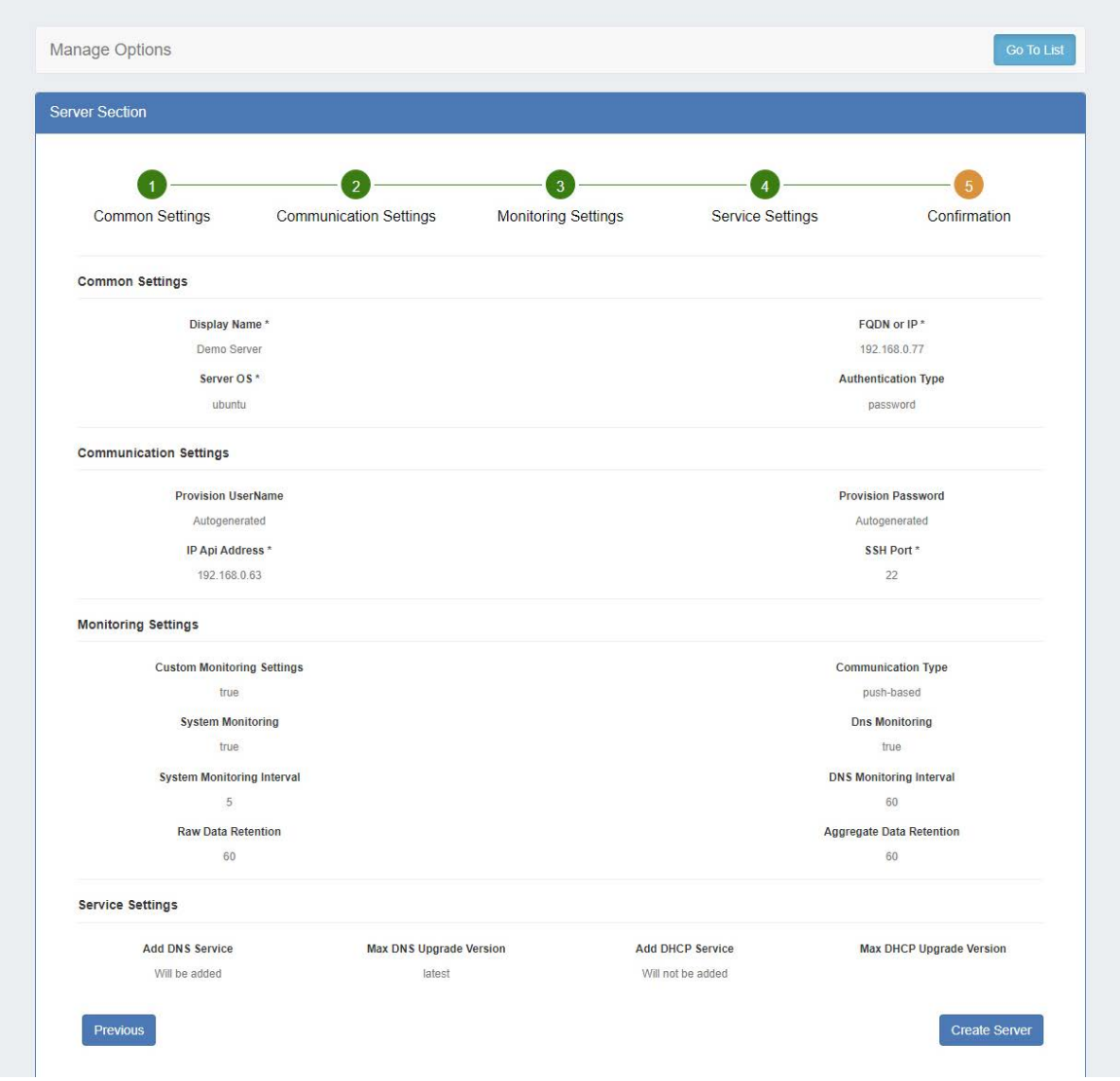
Add DHCP Service: Enable / Disable to add a DNS Managed Service link (Kea / MySQL DB). Multiple DHCP instances can connect to one database, organized as one parent with multiple children.

> In ProVision, "1 database" = "1 dhcpmodule resource" , and only a "parent" DHCP can have address and credentials for the database. The children don't store any information about the database and the necessary data is taken from the parent; no "dhcpmodule resource" are created for the children.
>
> Options include:
>
> **Max DHCP Upgrade Version:** Select either "latest", or select a specific version to install and not upgrade beyond, in case of known issues or incompatibility.
>
> **Server Type:** Select "Child" or "Parent".
>
> - Child: If "Child" is selected, then the parent server must be selected. On the managed server there will be an attribute to note that it will have DHCP component, but it would be a child one and which one is the parent. In this case the pv_mysql component is not installed as it is not needed - the DHCP will connect to another database
> - Parent (Default Configuration): By default, if "Parent" is selected then ProVision will set up pv_dhcp and pv_mysql components on the server and pv_dhcp will be configured to use this pv_mysql as database. The server will offer both IPv4 and IPv6 addresses.
> - Parent (Advanced Configuration): The main use case is when you don't want to put further load to the server by hosting the database or a database in a container might not perform good enough, you have this option to provide another MySQL instance. Using this the user can also modify the database name, user, password and if the server should serve IPv4, IPv6 or both. The user can also select the location of the database - local with pv_mysql component with the provided credentials or remote, which is completely remote database and no pv_mysql component will be set up.

When you are done setting up service and database settings, click "Next".

Step 5: Confirmation

The last step to setting up a new managed server is review and confirmation.



Options selected in previous steps will display on the page - review and confirm all settings, utilizing the "Previous" button if changes are needed.

Once settings are verified, click "Create Server" to complete the setup wizard.

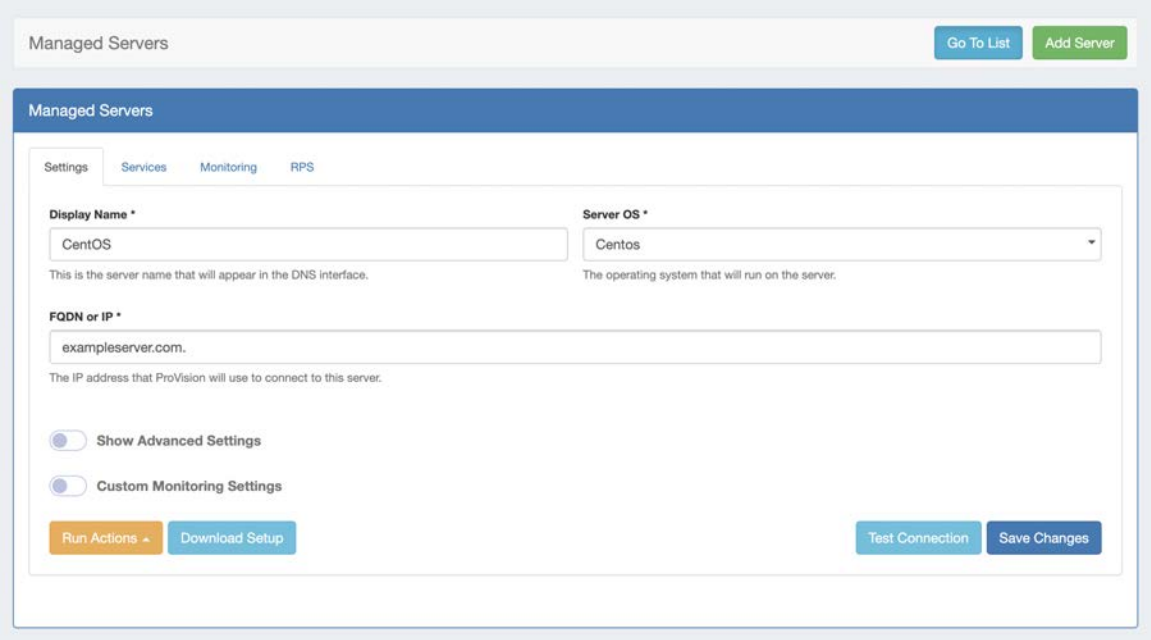
The new Managed Server will display in the Managed Server list.

After a new server has been created, you may edit it by clicking on the server name, or view monitoring data from the Managed Server list.

View or Edit Managed Server Details

Click on a server name, or open the server action menu to view details for a managed server.

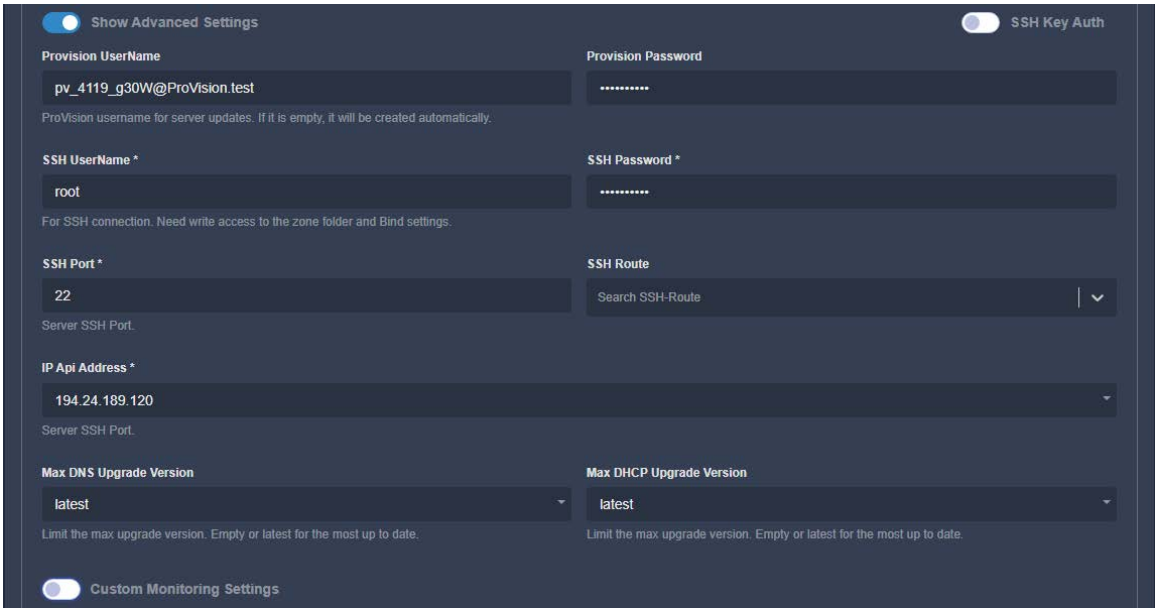
The details of a server are organized into tabs: Settings, Services, Monitoring, and RPS.



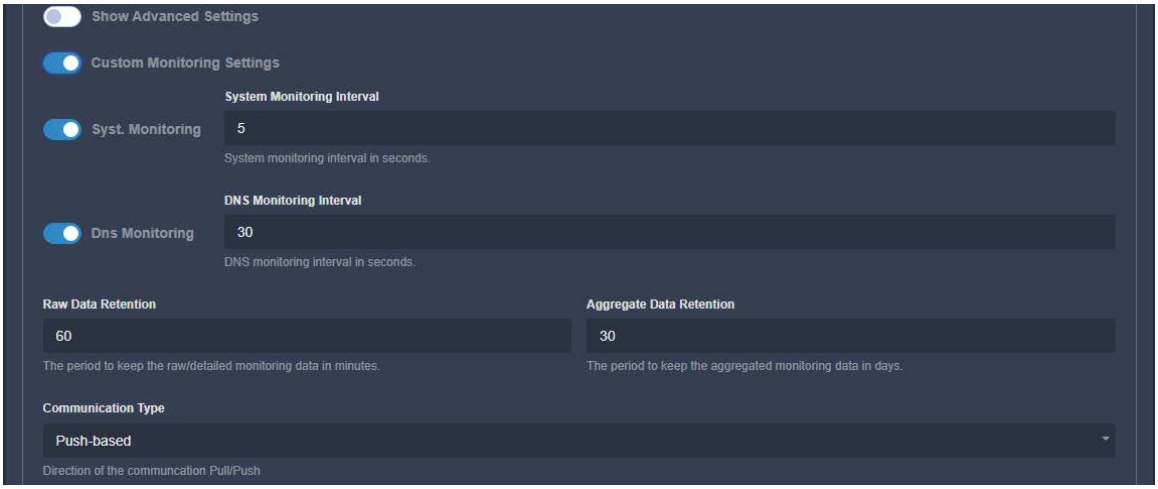
Settings

By default, only "Display Name", "Server OS" and "FQDN or IP" fields are shown.

Toggle on "Show Advanced Settings" to see the ssh credentials, "IP Api Address" and the max versions for each component:



Toggle on "Custom Monitoring Settings" to view/edit the monitoring settings:



This will be toggled if the user has set custom settings earlier or during the setup. The fields are the same as in the Monitoring Settings step during setup and are described there.

At the bottom left of the settings module, two buttons are available: "Run Actions" (including Push Install, Push Update, and Run Diagnostic options) and "Download Setup".

On the bottom right, you may click "Test Connection" to test the SSH connection to the server.



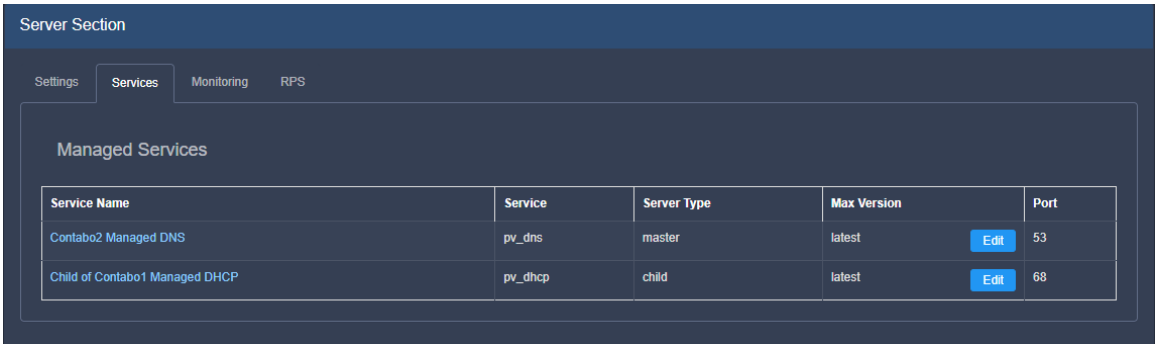
When any edits are complete, click "Save Changes".

Services

Under Services, you can view the enabled components for this server.

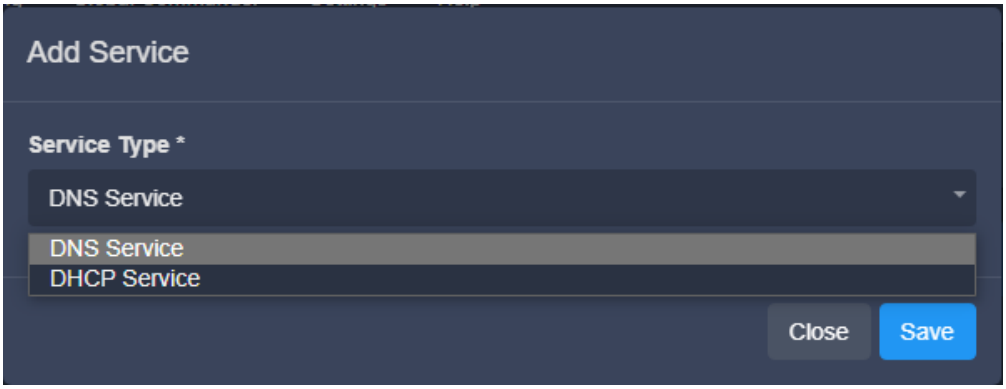


Click on a component to open a new tab with component details. In case of a "child" DHCP service, the link will lead to its parent.

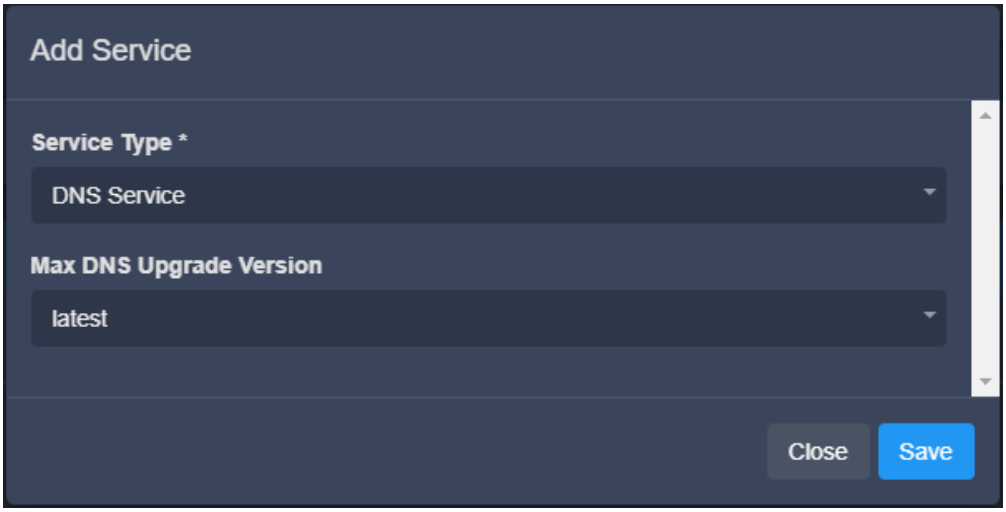


Add Service

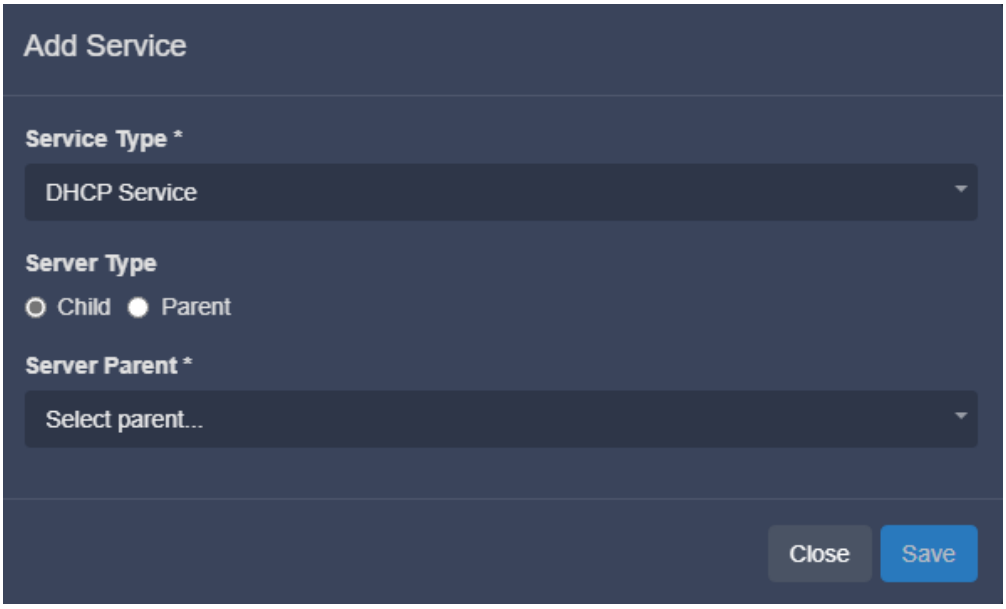
The "Add Service" button shows a popup to choose the service.



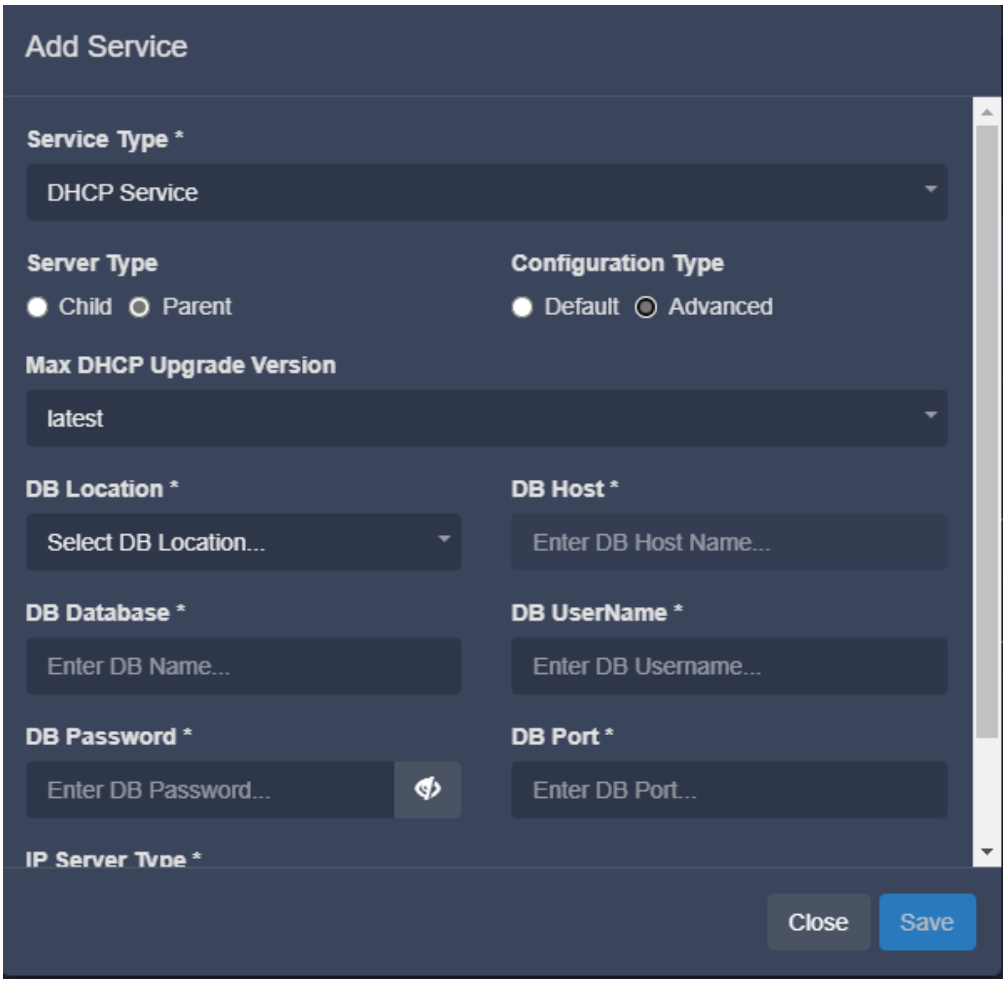
For DNS there is nothing to select:



For DHCP, the interface is the same as during the setup wizard:



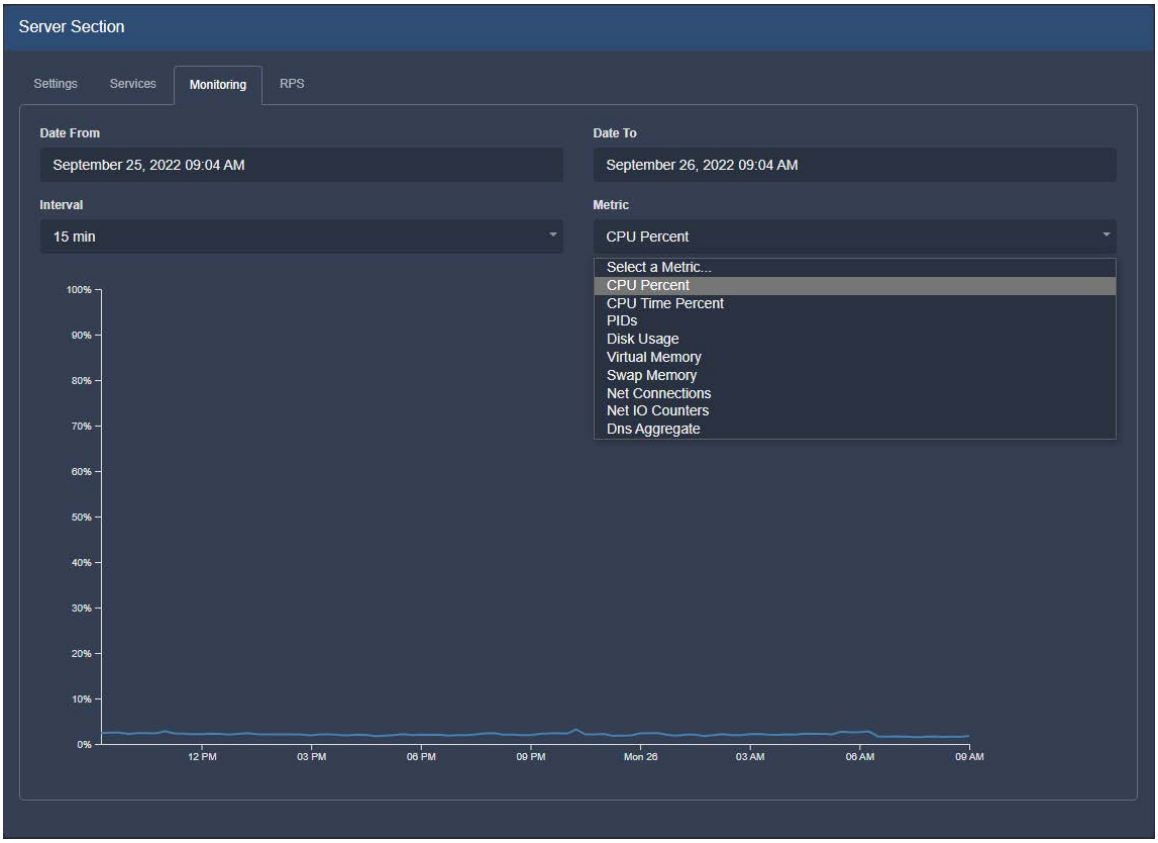
Here, you may edit your settings if changes are needed.



When done, click "Save" to ensure any changes are saved, or click "Close" to exit without saving.

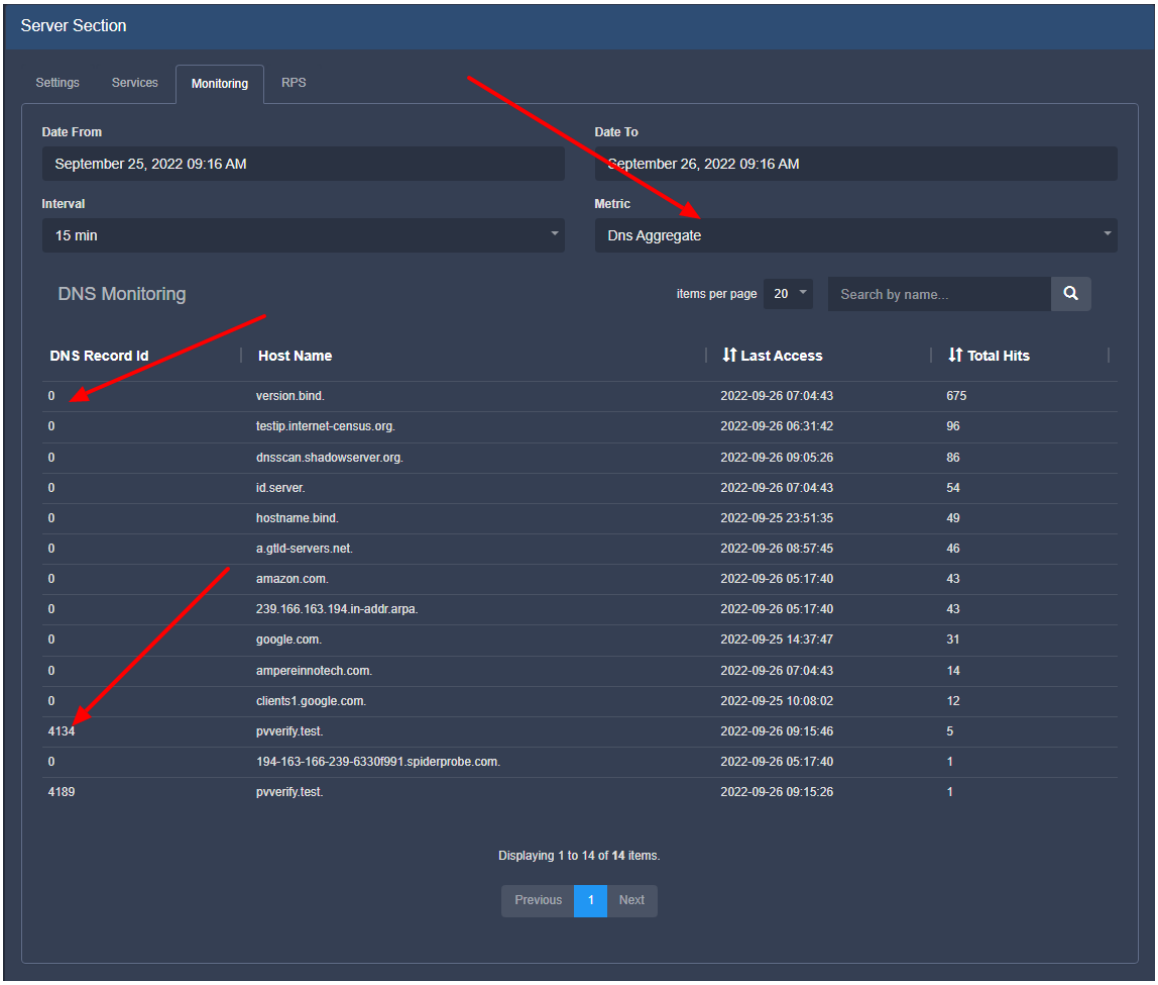
Monitoring

Under Monitoring, you can see the aggregated system statistics + "DNS aggregate":



Select a certain time interval (by default, the last 24h) and aggregation interval (5 min, 15 min, 30 min, 1 hour). Note - the charts are different for the different metrics.

For example, selecting "Dns Aggregate" shows a different set of information:

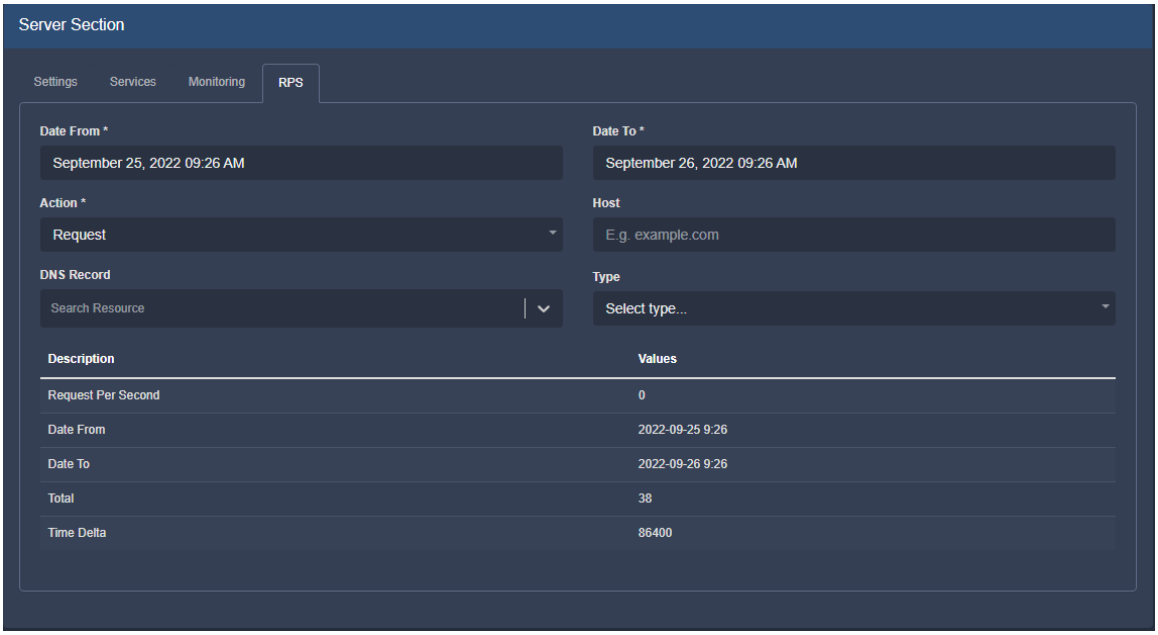


For the DNS records, we aggregate the overall total hits and the last time it was accessed. This is in order to be able to see the most/least used records and the ones which haven't been used for a long time and could be deleted. "Date From" and "Date To" here refer to the "Last Access".

If the request is for a record, for which we don't have resource, the ID will be 0. We have "pvverify.test" two times, because one of them is for "A" request and the other is for "TXT".

RPS (requests per second)

Under RPS, you can search for data for a given dns record.



The following search filters are available:

Date From/ Date To: Time interval to search

Action: Request or response

DNS Record: Search for a specific resource

Host: Search by host

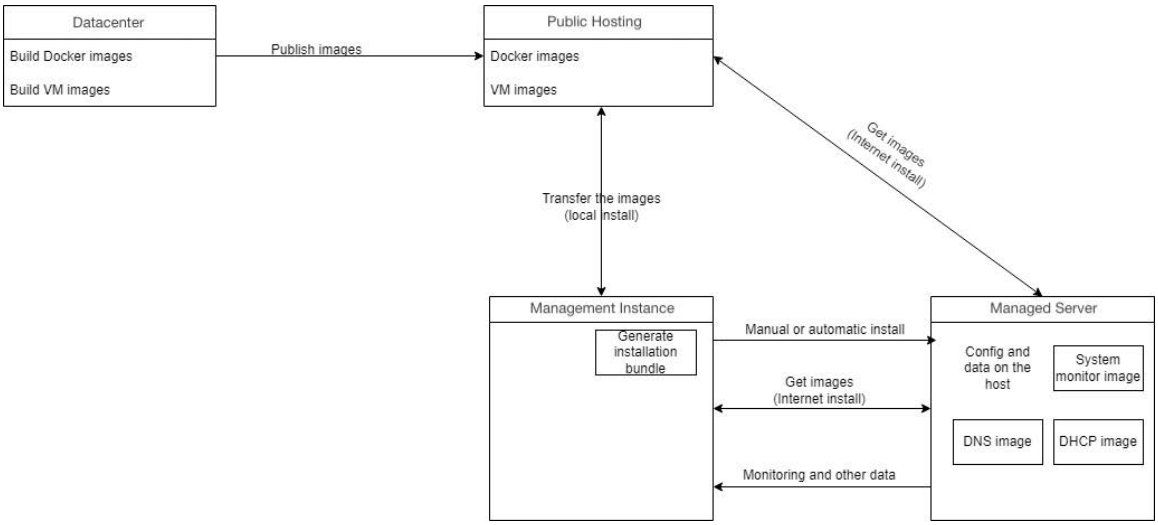
Type: DNS request type (A, AAAA, CNAME, MX, TXT etc.)

Update / Install Managed Server (Existing Component)

The installation can be run more than once. If we already have running components, they will be stopped before the real installation continues.

If there is newer version of any component, it will be downloaded and used.

The overall process is:



Requirements

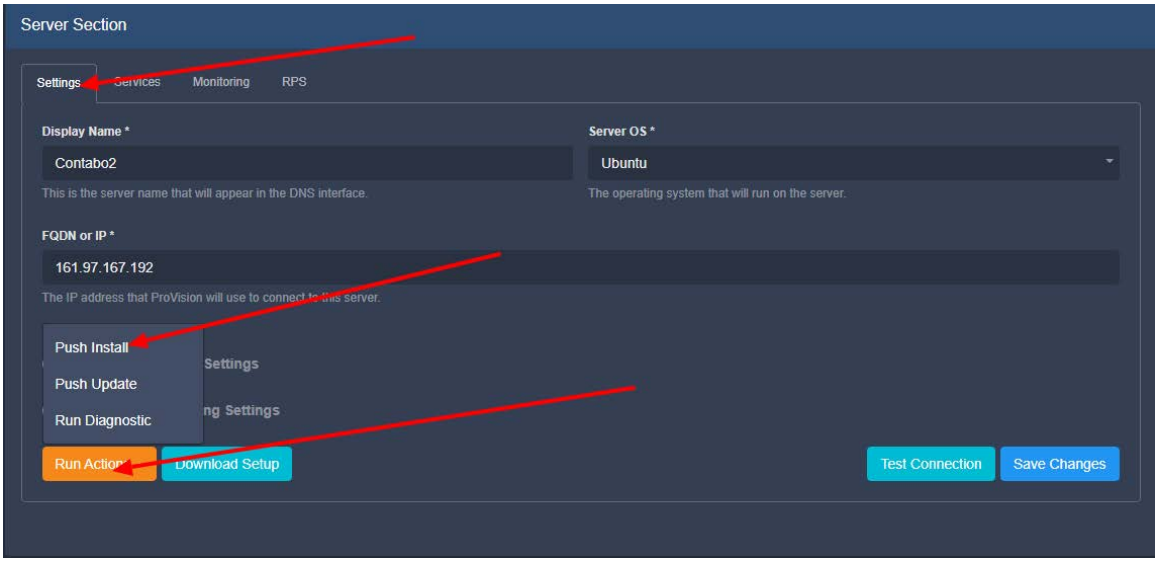
Python 3.6+ and Docker are the only requirements. If we run the installation with root (see below) and we have internet access, the installation process will install Docker.

The overall process is always the same - ProVision generates an install bundle, it is transferred to the server, extracted there and run some scripts from it. This can be done by ProVision (automatic install) or by the user (manual). In case of automatic install ProVision will automate the steps, which the user would do manually. All the components can run without root access, but we need it for user creation, folders creation, network and heartbeat service setup.

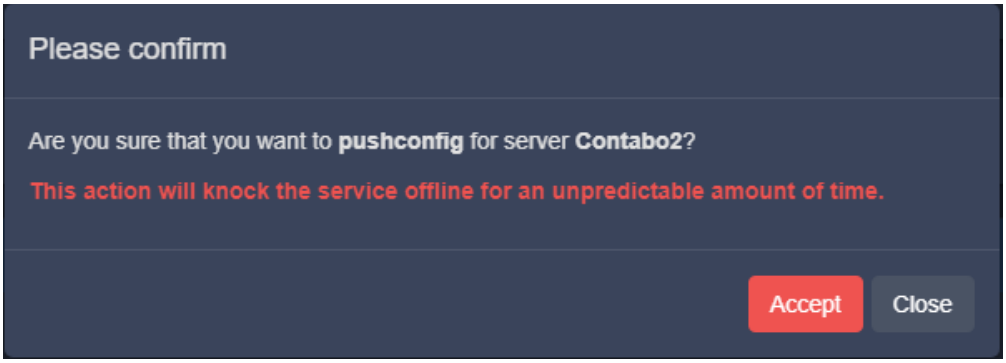
Automatic (Recommended)

This is the recommended and easiest setup method. If you have root access, ProVision can do all the necessary actions.

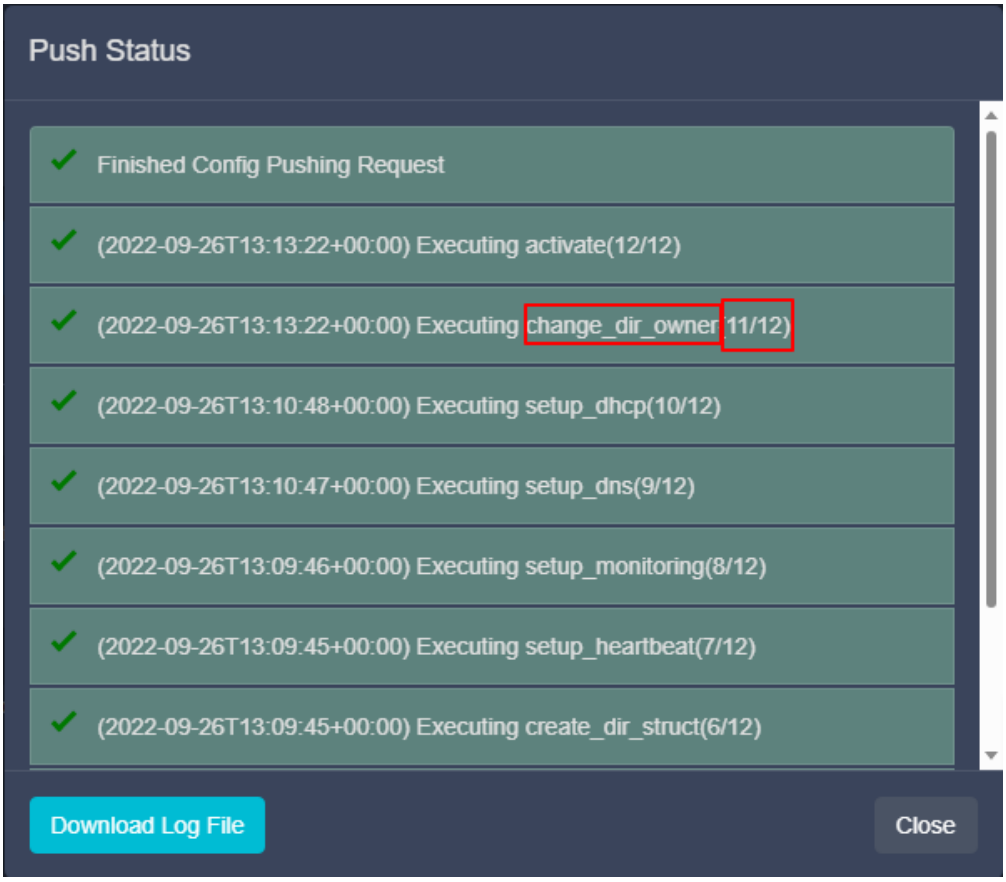
Go to the details page Settings tab "Run Actions" "Push Install"



Confirmation dialog will be shown:



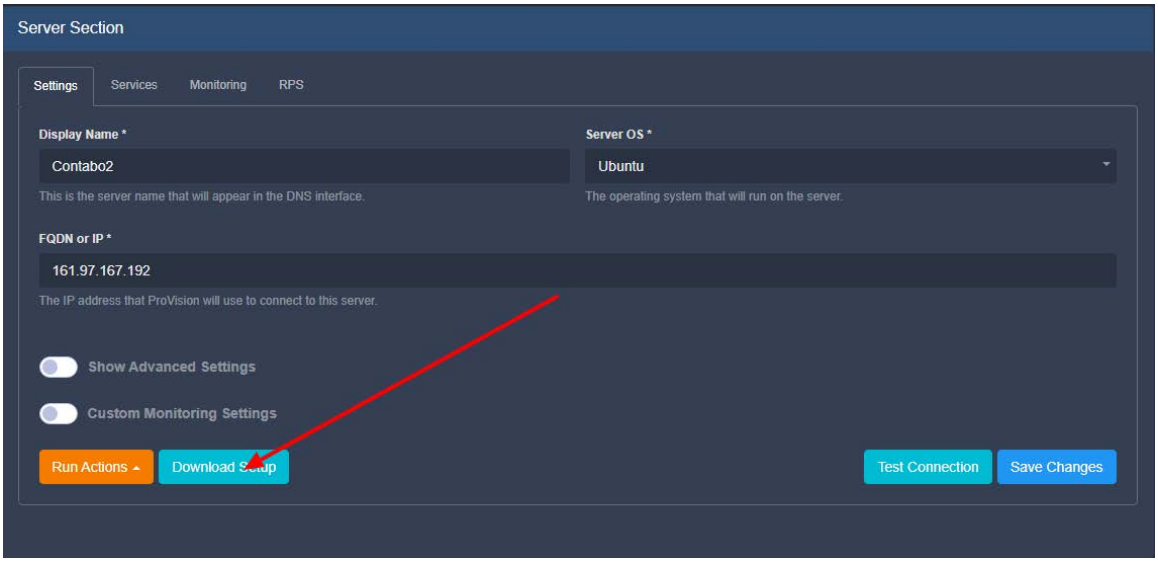
Popup with the progress will be shown.:



Each command/step is shown together with the overall progress.

Manual (from the command line)

This case is usually when the user doesn't want to input the root user in ProVision, but he has root access. The setup bundle should be downloaded and saved on your local computer:



The setup bundle name will be in format "setup-XXX.tar" where XXX is the resource ID of the managed server. The rest of the process is:

- copy the file to the managed server (with SCP or any other suitable way)
- extract it with "**tar -xf setup-XXX.tar**"
- execute "**sudo /bin/bash install_python3.sh**" - this should finish with "PVOK"

Without root

This is the used if root access to the server is not available. In this case, an admin with root access should first do the following:

- Install docker with the relevant commands for the OS. This can be done by running "**install_docker.sh**" from the setup bundle with root or any other suitable way

Install docker CentOS

```
yum update -y
yum install -y yum-utils bind-utils

yum-config-manager \
    --add-repo \
    https://download.docker.com/linux/centos/docker-ce.repo

yum install -y docker-ce docker-ce-cli containerd.io docker-compose-plugin

systemctl enable docker
systemctl start docker

docker run hello-world
```

Install docker Ubuntu

```
sudo apt-get update

sudo apt-get install -y \
    ca-certificates \
    curl \
    gnupg \
    lsb-release

# default start
KEYRING_FILE=/usr/share/keyrings/docker-archive-keyring.gpg
[ -f "$KEYRING_FILE" ] && rm $KEYRING_FILE

curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo gpg --dearmor -o $KEYRING_FILE

echo \
  "deb [arch=$(dpkg --print-architecture) signed-by=$KEYRING_FILE] https://download.docker.com/linux/ubuntu \
  $(lsb_release -cs) stable" | sudo tee /etc/apt/sources.list.d/docker.list > /dev/null

sudo apt-get update
sudo apt-get -y install docker-ce docker-ce-cli containerd.io
sudo docker run hello-world
```

- Create the relevant user, add it to "docker" group, create "**/provision**" directory and make the created user owner of this directory.

User and directory setup

```
useradd -m <user>
passwd <user>
usermod -a -G docker <user>
mkdir -p /provision
chown -R <user>:<user> /provision
```

- Make the necessary network changes. This can be done by running "**network_config.sh**" from the install bundle

Network config CentOS

```
yum update -y
yum install -y yum-utils bind-utils iptables-services

systemctl enable iptables
#iptables -I INPUT -p udp -m udp --dport 53 -j ACCEPT
#service iptables save

iptables -P INPUT ACCEPT
iptables -P FORWARD ACCEPT
iptables -P OUTPUT ACCEPT
iptables -t nat -F
iptables -t mangle -F
iptables -F
iptables -X
ip6tables -P INPUT ACCEPT
ip6tables -P FORWARD ACCEPT
ip6tables -P OUTPUT ACCEPT
ip6tables -t nat -F
ip6tables -t mangle -F
ip6tables -F
ip6tables -X
service iptables save
```

Network config Ubuntu

```
#!/usr/bin/sh
if [ "$(readlink /etc/resolv.conf)" != "/run/systemd/resolve/resolv.conf" ]; then
    ln -sf /run/systemd/resolve/resolv.conf  /etc/resolv.conf
fi

sed -i 's/^#DNSStubListener/DNSStubListener/;s/DNSStubListener=yes/DNSStubListener=no/' /etc/systemd
/resolved.conf

systemctl stop systemd-resolved
systemctl start systemd-resolved
```

- Create service file and edit user with the correct system user.

pv_heartbeat.service

```
# https://www.cloudsavvyit.com/3092/how-to-add-your-own-services-to-systemd-for-easier-management/
# https://www.opentechguides.com/how-to/article/centos/169/systemd-custom-service.html
# https://computingforgeeks.com/how-to-run-systemd-service-without-root-sudo/
# https://unix.stackexchange.com/a/497011

[Unit]
Description=pv_heartbeat Service, which reports the current status.
After=network.target
# StartLimitIntervalSec=0

[Service]
Type=simple
Restart=always
RestartSec=1
User=<user>
ExecStart=/usr/bin/python3 /provision/libs/pv_heartbeat.py

[Install]
# WantedBy=multi-user.target
WantedBy=deault.target
Alias=pv_heartbeat.service
```

- Make symlink to this file (replace /provision/libs/pv_heartbeat.service with the correct file path):

pv_heartbeat symlink

```
ln -s /etc/systemd/system/pv_heartbeat.service /provision/libs/pv_heartbeat.service
```

- Create sudoers file (user with the correct system user) and place it in /etc/sudoers.d:

CentOS sudoers

```
# https://unix.stackexchange.com/a/497011

Cmnd_Alias MANAGE_PV_HEARTBEAT = \
    /bin/systemctl enable  pv_heartbeat, \
    /bin/systemctl disable pv_heartbeat, \
    /bin/systemctl start   pv_heartbeat, \
    /bin/systemctl stop    pv_heartbeat, \
    /bin/systemctl restart pv_heartbeat, \
    /bin/systemctl status  pv_heartbeat

<user> ALL = (root) NOPASSWD: MANAGE_PV_HEARTBEAT
```

Ubuntu sudoers

```
# https://unix.stackexchange.com/a/497011

Cmnd_Alias MANAGE_PV_HEARTBEAT = \
    /usr/bin/systemctl enable  pv_heartbeat, \
    /usr/bin/systemctl disable pv_heartbeat, \
    /usr/bin/systemctl start   pv_heartbeat, \
    /usr/bin/systemctl stop    pv_heartbeat, \
    /usr/bin/systemctl restart pv_heartbeat, \
    /usr/bin/systemctl status  pv_heartbeat

<user> ALL = (root) NOPASSWD: MANAGE_PV_HEARTBEAT
```

- Reload the systemctl daemon:

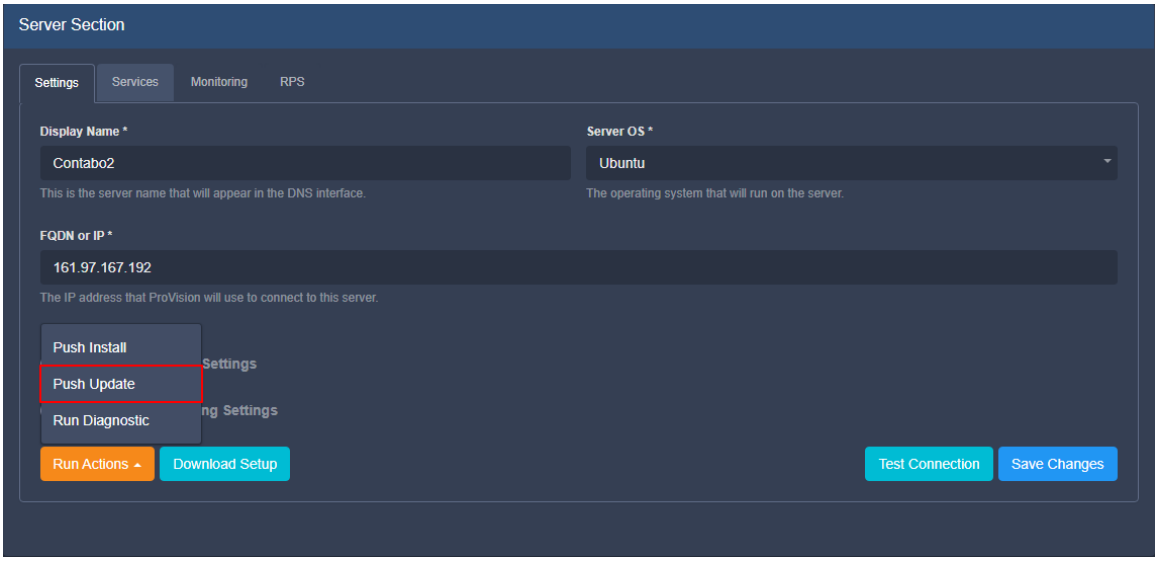
Reload services

```
systemctl daemon-reload
```

From this point automatic or manual setup can be done with the non-root user.

Update Managed Server

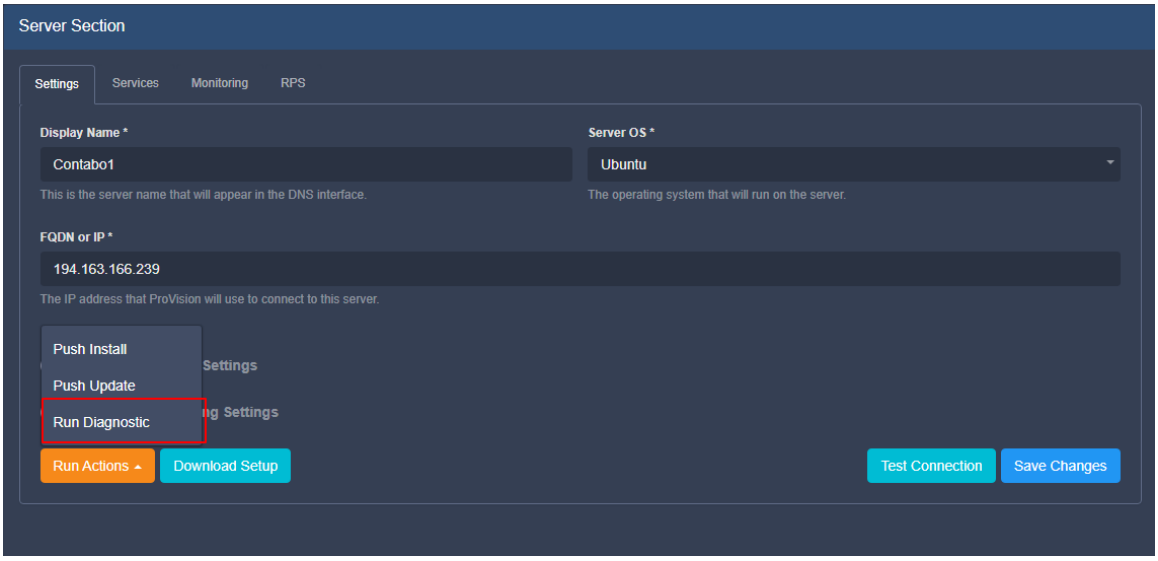
In ProVision's Managed Servers page, open the server details. Then, under the settings tab, click "Run Actions, and select "Push Update". ProVision will automatically create a backup file in /provision/backups/.



Managed Server Diagnostics / Debug

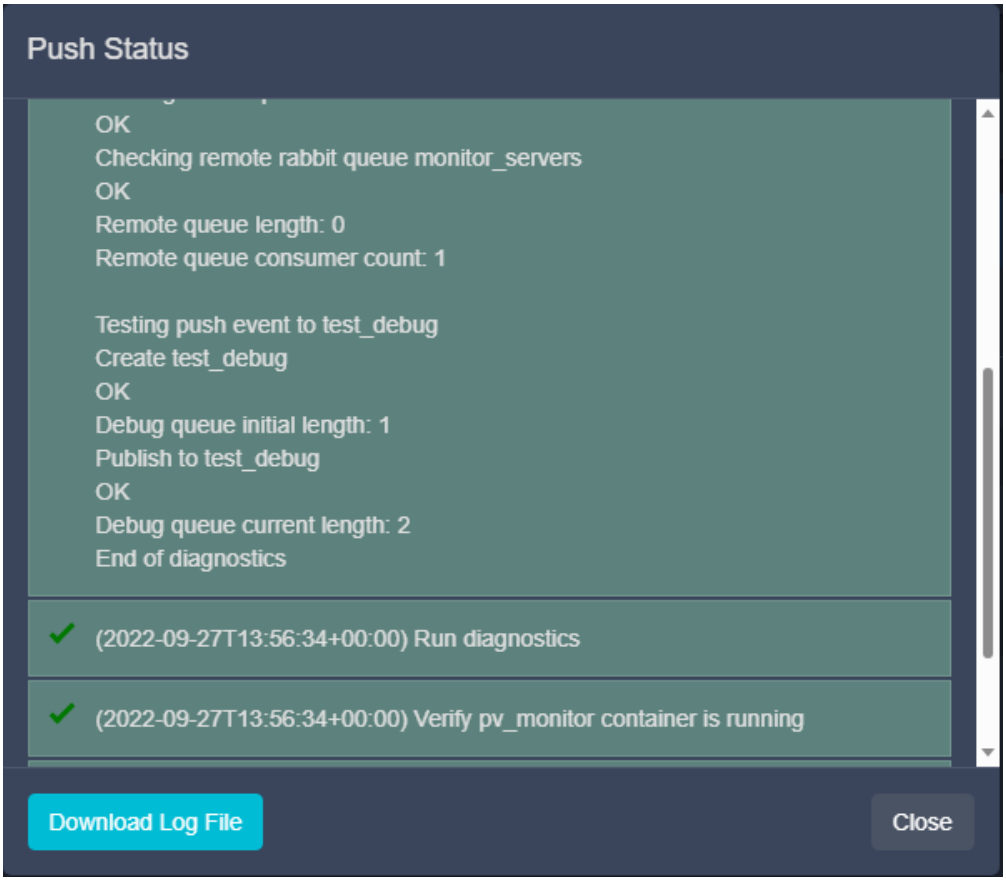
Automatic - GUI

The user can run some basic diagnostics from the Managed Serve details page, under the Settings tab. Click "Run Actions", then "Run Diagnostics":



All the debug and diagnostic tools are in the monitoring component, thus it needs to be running in order to function.

After clicking the button, a confirmation dialog will be shown with the results:



We verify if we have docker running, if the monitoring component is running and the RabbitMQ connection.

You may download the results by clicking "Download Log File", and "Close" when done.

Manual - Command Line Scripts

All the scripts are in "**/provision/libs/**".

All the scripts can be started with "**-h**" parameter to show relevant help.

- pv_install.py - used for the whole setup. The process itself is broken into separate steps, which can be executed individually with "-e/--exec-only=". The steps can be seen from the help (-h). This should be used by developers and for debugging purposes
- start_pv_*.sh - all these scripts are used to start given component. All of them support "-v/–version" to specify the version of the component to start and "-b/–bash" to start the container in debug mode. In debug mode the user will be logged into the container but without starting /start.sh (the entrypoint).
- stop_pv_*.sh - all these scripts are used to properly stop given component/container

Local

In addition to logging into any of the containers (starting the relevant script with -b/–bash) few other files are included into the monitoring component:

- mysql client for browsing the database
- dhtest (link) for DHCP testing
- dnsutils - dig, nslookup, nsupdate
- telnet

Delete Managed Server

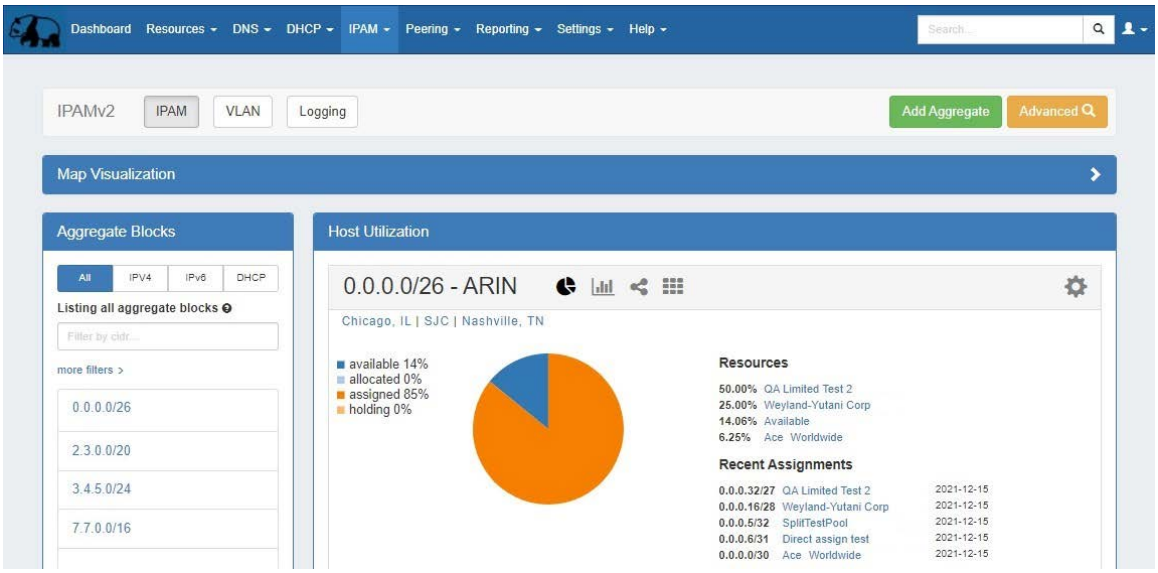
To delete a managed server, right click on the action menu/ row for the server, and select "Delete".

Additional Information

- Managed Servers Settings

IPAM Tab

IPAM



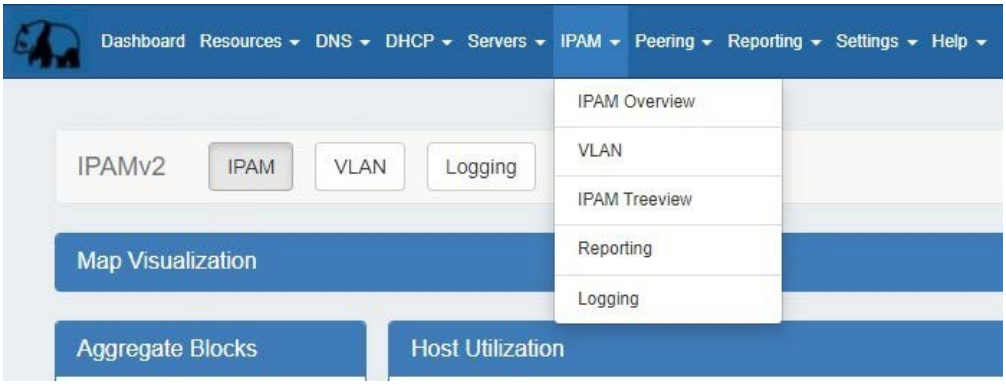
The IPAM tab contains three sub-tabs: **IPAM Overview**, **VLAN**, and **Logging**.

The **IPAM** tab (also accessible from the dropdown menu as IPAM Overview) provides a listing of top-level aggregate blocks, tools to add, merge, sparse allocate, and manage aggregates, as well as multiple data visualizations. The blocks under each aggregate may be individually assigned, edited, swip'ed, and managed from the IPAM Manage page for the aggregate. For detailed information on specific aggregate and block tasks, see Working with IP Aggregates, Working with IP Blocks, and Working with IP Rules. For administrative level tasks, see IPAM Administration.

The **VLAN** tab shows an overview of domains and VLANs on the left sidebar, and IPAM Utilization data organized by each domain / VLAN pair. From here, Admins may add, remove, and edit domains and VLANs. Standard users may add/remove VLAN associations with blocks (as long as they have permissions on those blocks), and browse VLAN Manage (similar to IPAM Manage). See Working with VLANs for details.

Logging provides a quick link to the logging system, where you can filter to view IPAM-only logs.

Two additional options are available in the IPAM Dropdown Menu: **IPAM Treeview** and **Reporting**:



IPAM Treeview opens a new window containing a minimalist, searchable list of all IPv4 and IPv6 blocks in ProVision.

Reporting provides a shortcut to the Reporting Tab IPAM reports area.

- IPAM Tab Overview
  - IPAM Treeview
  - Advanced Button
  - Add Aggregate
  - Map View

        - Map View Overview
        - Enabling Map View
        - Working in Map View
    - Aggregate Blocks List
        - Search / Filter Aggregates
    - Top-Level Aggregate / Host Utilization Box Overview
    - Additional IPAM Features
        - ProVision IPAM-As-WHOIS
            - Setup
        - GEO IP Exporter
- Working with IPAM Aggregates
- Additional Information

IPAM Tab Overview

IPAM Treeview

Clicking on IPAM Treeview from the IPAM menu opens a new sidebar window containing a searchable list of all IPv4 and IPv6 blocks in ProVision and IPAM Tab shortcuts.

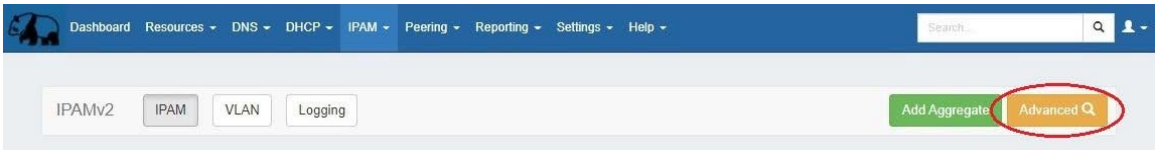


IPAM Treeview contains the following links that open in your main browser window:

- **Home:** Opens the Dashboard Tab
- **IPv4:** Opens the IPAM Tab, with aggregates filtered to IPv4 view
    - **IPv4 Folder:** Click the folder icon next to IPv4 to list all IPv4 blocks in ProVision (up to 200 blocks load per page). You may click on any block to open that block in IPAM Manage.
- **IPv6:** Opens the IPAM Tab, with aggregates filtered to IPv6 view
    - **IPv6 Folder:** Click the folder icon next to IPv6to list all IPv6 blocks in ProVision (up to 200 blocks load per page). You may click on any block to open that block in IPAM Manage.

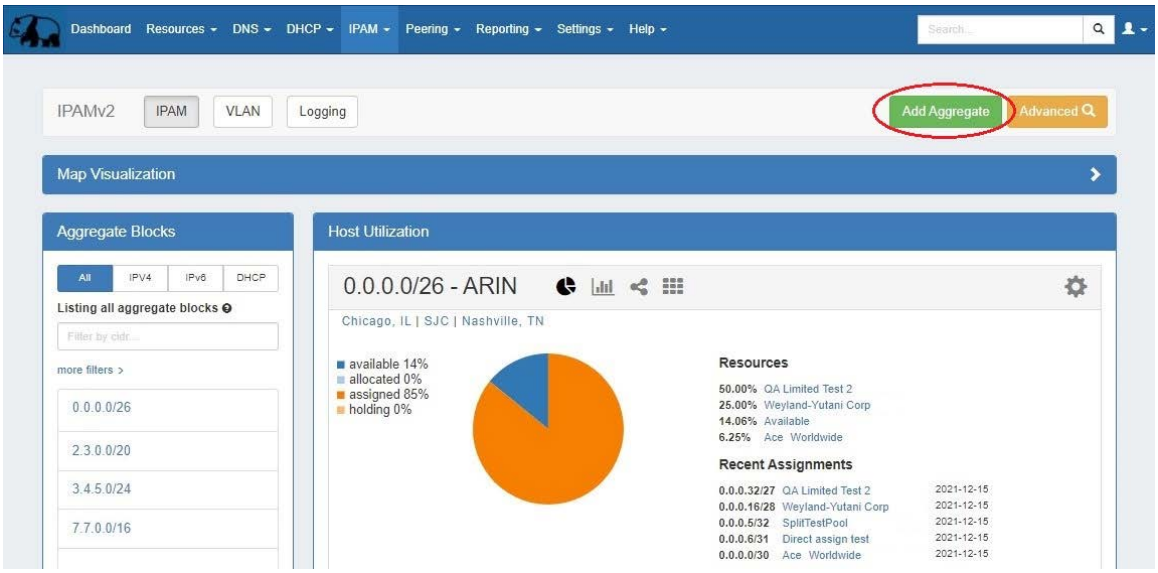
You may also filter the list by entering a full or partial CIDR in the search box at the top of treeview to limit your results.

Advanced Button

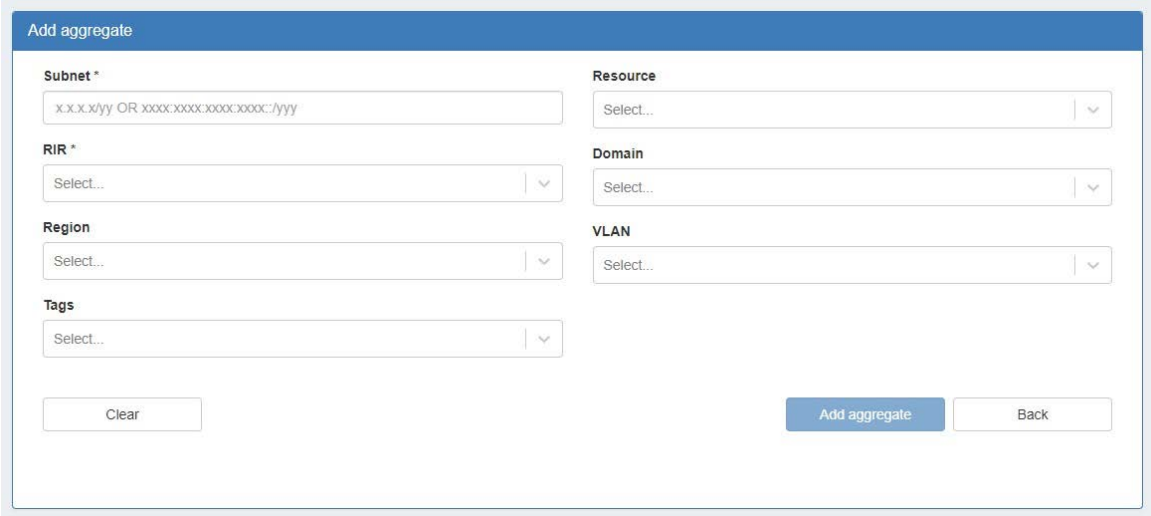


Opens the **IPAM Manage** screen for all blocks under all aggregates. See Working with IP Blocks for more information on working in IPAM Manage.

Add Aggregate



The "Add Aggregate" button opens a new page to add an aggregate block with options for RIR, VLAN, Tags, Region, Resource, and enabling sub assignments. A resource must be selected to enable sub assignments.

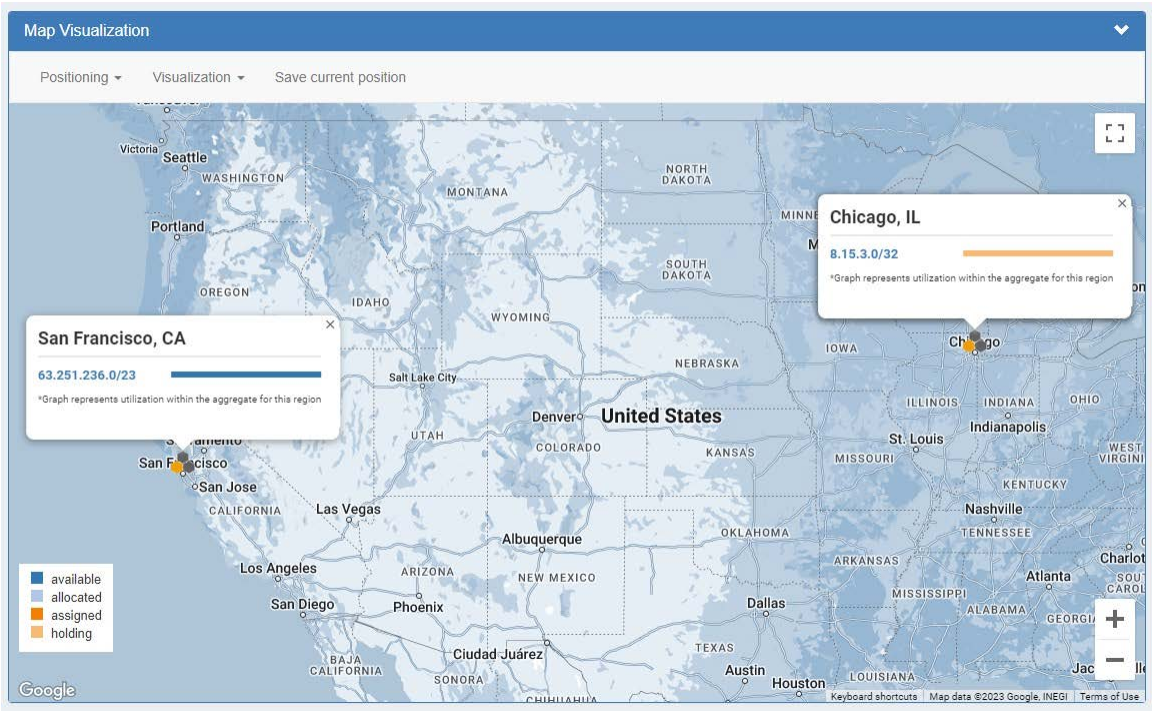


When done, click "Add Aggregate". A link to the newly created aggregate will be available or you may hit "Clear" and create another aggregate. New aggregates will be listed under the Host Utilization and Aggregate Blocks list of the IPAM Tab for further management.

Map View

Map View Overview

Map View shows aggregate locations / recent assignments in geographical format, based on the region assigned to those aggregates. Clicking on a location icon will bring up a current utilization graph and a link to that aggregate's IPAM Manage page if in Aggregates view, or recent assignment details if in Recent Assignments view.



Google Geocode API Key Requirement for Map View

Due to changes in Google's licensing and Geocoding API, the geolocation method used for Map View in ProVision versions pre-v7.1.0 is no longer supported.

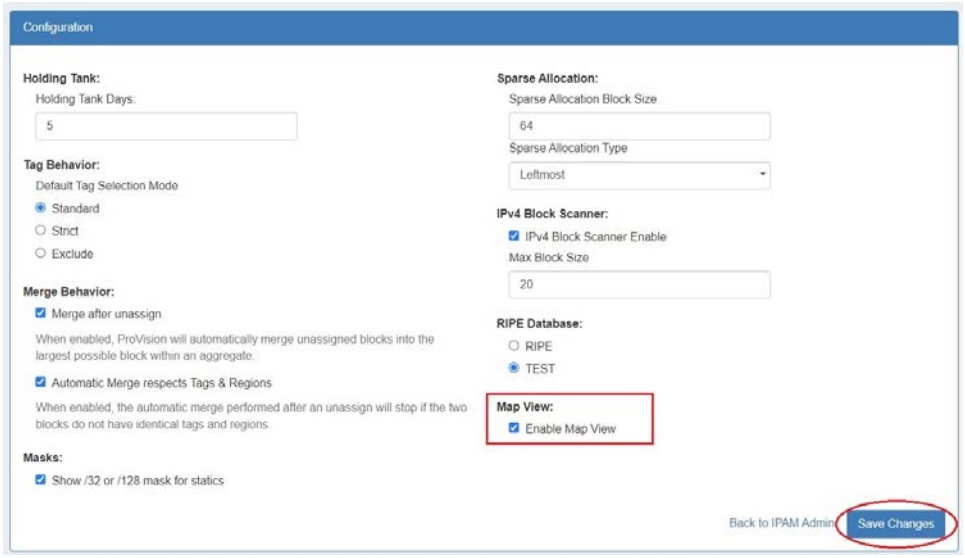
A Google Geocoding API Key is now required for geolocation data to be accessible by ProVision, and for IPAM Maps to properly determine a Region's location. As a result, IPAM Map View in versions older than 7.1.0 may not accurately display or update location information.

Enabling Map View

The IPAM aggregate map view may be enabled / disabled from the IPAM Configuration page. Once enabled, a map module will be able to be expanded in the IPAM Tab.

The following criteria must be met for Map view to correctly show data:

- Map View enabled on the IPAM Configuration page



- A Geocoding API Key provided in the Edit Regions page.

Step 1: Obtain a Google Geocoding API Key

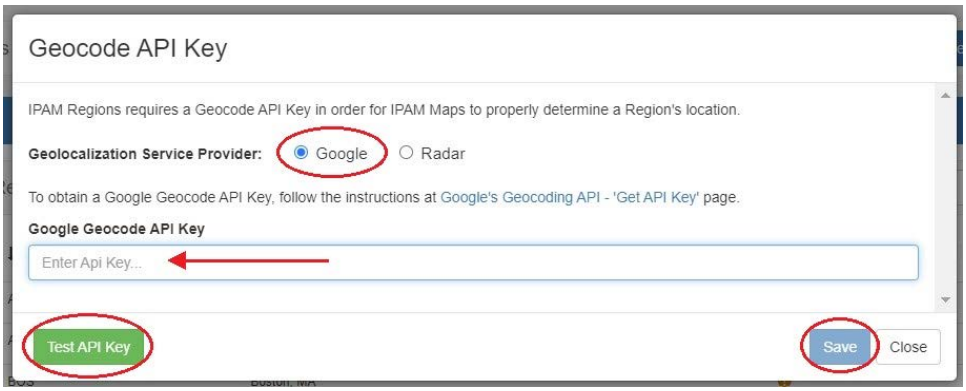
To get a Google Geocoding API Key, follow the instructions listed here:

How to get a Google Geocoding API Key

Note: In order to obtain a Google Geocoding API Key, a company must have a subscription enabled to Google Cloud Platform Console.

Step 2: Assign the API Key to IPAM Regions

Once assigned a Google Geocoding API Key, from the Edit Regions page, click "Geocode API Key". Then select the Google radio button, paste the API key into the Geocode API dialog, and click "Save" . You can test the API Key by clicking the Test button at lower left.



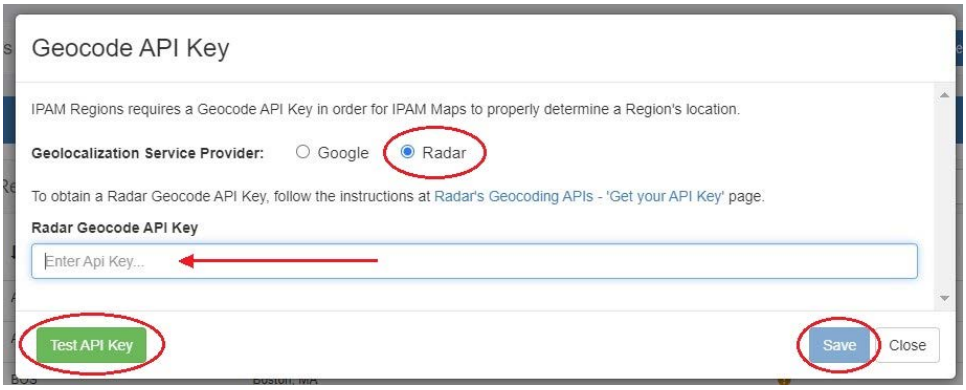
Step 1: Obtain a Radar Geocoding API Key

To get a Radar Geocoding API Key, follow the instructions listed here:

How to get a Radar Geocoding API Key

Step 2: Assign the API Key to IPAM Regions

Once assigned a Radar Geocoding API Key, from the Edit Regions page, click "Geocode API Key". Then select the Radar radio button, paste the API key into the Geocode API dialog, and click "Save". You can test the API Key by clicking the Test button at lower left.



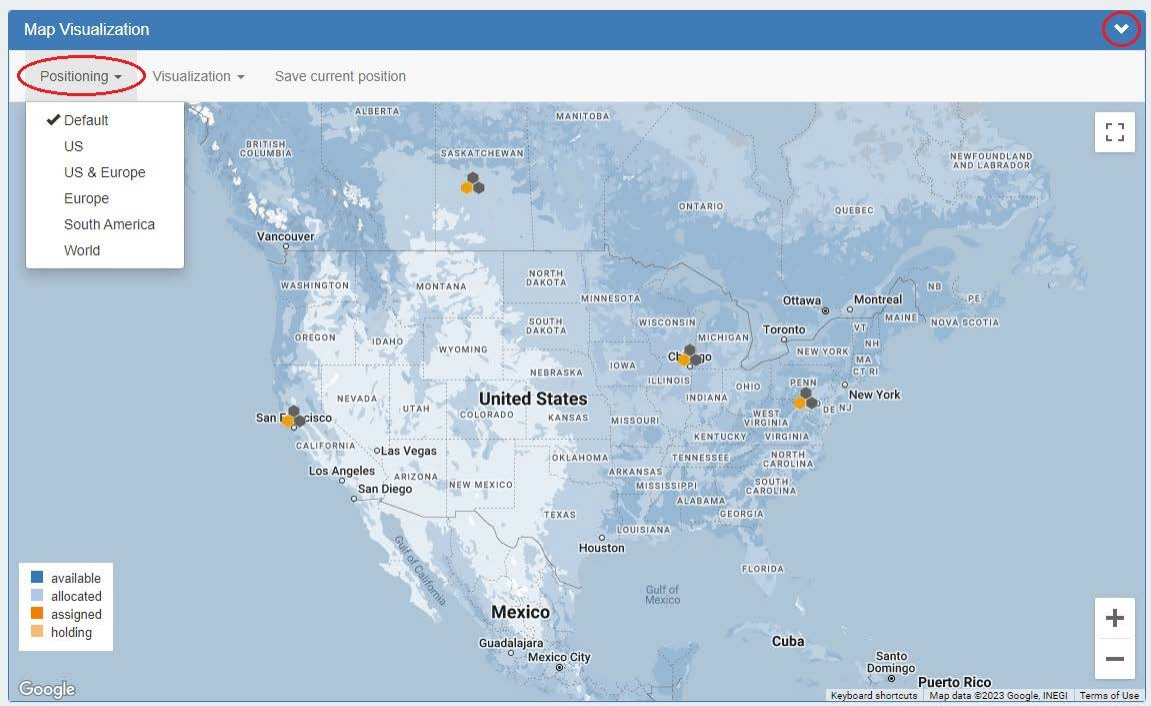
- Regions created with a valid "Address" (location) field. The "Address" field may be a street address, city, airport code, or geo-coordinates. See Edit Regions for additional detail.

> **Miscellaneous Terms as Addresses**
>
> Being that the validity of the "Address" field is determined by the Geocoding API, unexpected location mapping may occur if a company name or other non-location specific term is used in the Address field.
>
> Google treats the item as a search term and returns the most likely location result back - but it might not be what you were expecting! When in doubt, check the address term by pasting it into Google Search, and verify that the top result returns your desired location.

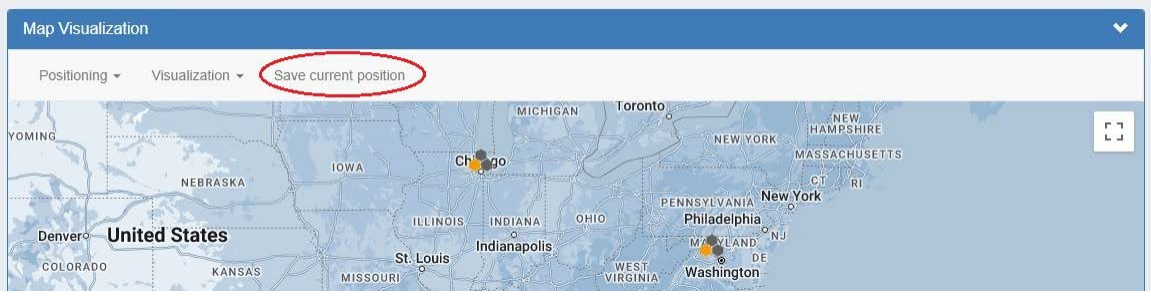
- Regions enabled in IPAM Columns and assigned to aggregates / blocks for the IPAM Map view to populate data. See Edit IP Block Attributes for additional detail.

Working in Map View

The map view may be set by either selecting a predefined map area from the "Maps Settings" "Positioning" dropdown (US, US & Europe, Europe, South America, World), or chose a custom area set by zooming / navigating to the desired map area.



To save the currently viewable area as the Default view, click "Save current position" at top.



Map View Settings:

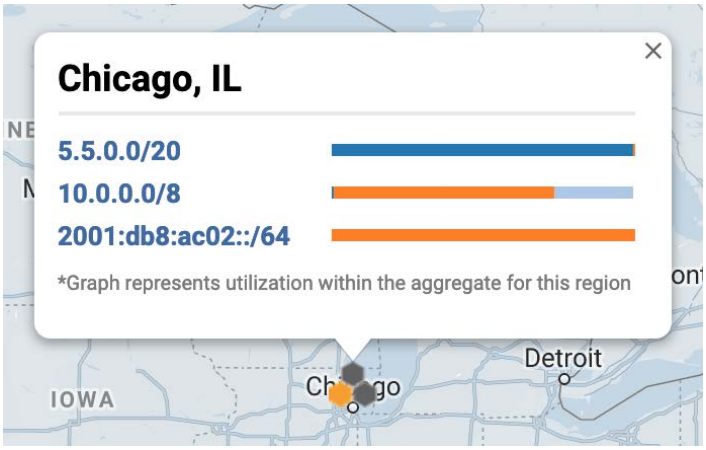
Visualization Dropdown: Select "Aggregates" to view all available aggregates with region data, or "Recent Assignments" to view block assignments made within the past 30 days.

Positioning Dropdown: Select a predefined area for the map view range: US, US & Europe, Europe, South America, or World.

Save current Position: Click to save the current map view range as the default view.

Toggle Full Screen: Click to view full screen map.

Aggregate Detail Box:

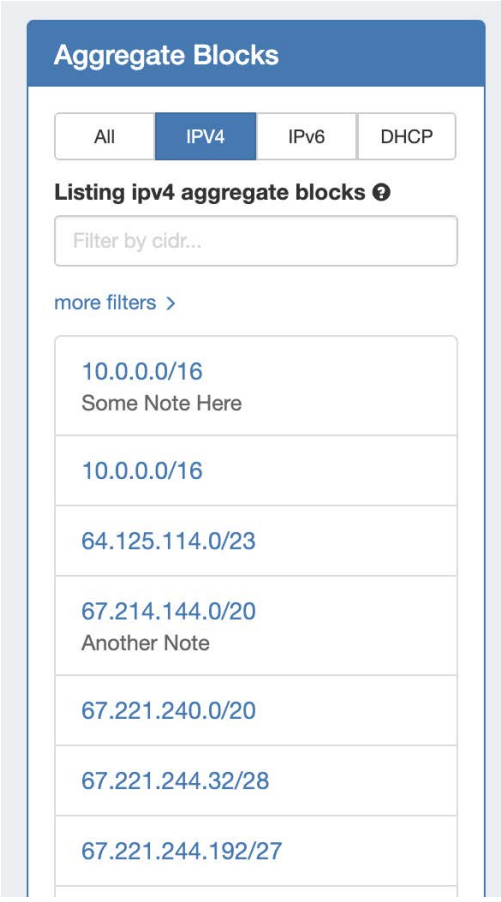


Provides utilization data and a shortcut link to the IPAM Manage screen for that aggregate if in "Aggregates" view, or assignment details if in "Recent Assignments" view.

Aggregate Blocks List

Provides a searchable / filterable listing of all aggregate blocks in the left sidebar, links IPAM Manage for the aggregates, and Merge Aggregate functionality.

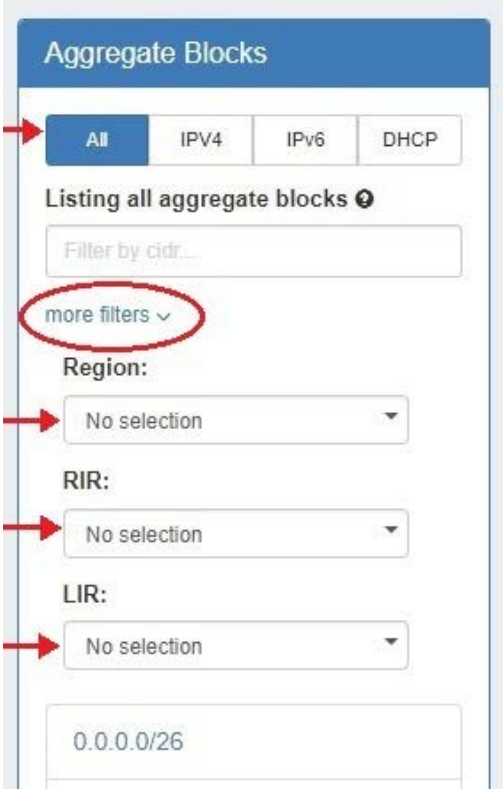
If a note has been entered for a top-level aggregate (the topmost parent block), the note will display under the aggregate listing.



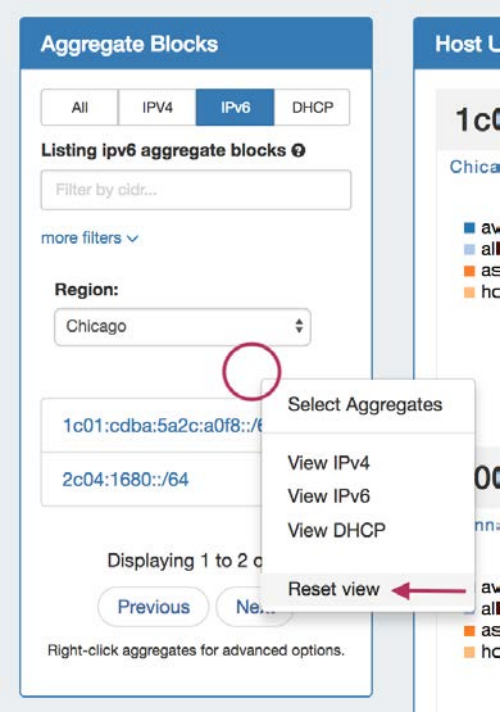
Search / Filter Aggregates

Search for and filter IPAM Aggregates from the Aggregate Blocks List:

- Select "All", "IPv4", IPv6", or "DHCP" to sort the list by type (You may also access the type filters by right clicking anywhere in the Aggregate Blocks box)
- User the filter / search box to search by CIDR
- Filter by Region, RIR, or LIR by clicking the "more filters" link, then selecting an item from the dropdown menus.
- Single click on the CIDR to zoom to the aggregate details in the Utilization list
- A shortcut to IPAM Manage for an aggregate is provided by clicking the "open" link that appears when hovering over an aggregate block in the list.



To reset the list, right click anywhere in the Aggregates Blocks list and select "Reset View".



Top-Level Aggregate / Host Utilization Box Overview



The Top-Level Aggregate Host Utilization box provides detailed information on that aggregate, including:

- **CIDR**: Single-click to IPAM Manage for the aggregate
- **RIR information:** displays the aggregate's RIR, as set at creation (1918, ARIN, RIPE, LACNIC, AfriNIC, APNIC)
- **Aggregate Chart Views**: Four Aggregate chart views are available, - **Pie**, **Bar**, **Tree**, and **Grid** view. Switch between each chart by clicking on the respective icons in the Aggregate header (marked above).
- **Aggregate Actions (Gear Icon):**
  - **Manage Aggregate:** Opens IPAM Manage for the aggregate. See Working with IP Blocks for information on working in IPAM Manage. Clicking on the Block CIDR in the header also opens the IPAM Manage page.
  - **Delete**: Deletes the Aggregate (provides a warning).
  - **Enable / Disable Sparse Allocation** (IPv6 only): Enable or disable Sparse Allocation for an IPv6 aggregate. Enabling will automatically generate a Numbering Authority Sparse Allocate Domain for use with the aggregate.
  - **Sparse Allocate** (IPv6 only): Appears only when Sparse Allocation is enabled for an IPv6 aggregate. Opens a menu to select or create a resource to assign a block to, using the sparse allocate algorithm to disperse the assignment(s) throughout the aggregate. See: Working with IP Aggregates
- **Region(s):** Displays the primary region(s) associated with the aggregate, either at aggregate creation or from regions associated with blocks under that aggregate. Clicking on the region link for an aggregate will open IPAM Manage for the aggregate, filtered to view blocks associated with that region.
- **Utilization:** Utilization displayed as both a pie chart and detailed percentages. Utilization statuses include:
  - **Available:** A status of "Available" indicates the block is free and able to immediately be assigned or allocated to a resource.
  - **Allocated:** Allocated blocks have been assigned to an overarching resource, but have subassignments enabled and may have smaller blocks assigned out of them to other Resources, such as customers or DHCP Pools.
  - **Assigned:** A status of "Assigned" indicates that the block has been assigned to a Resource, with no subassignment capability, and is unavailable.
  - **Holding:** Blocks in "Holding" have recently been unassigned, and are held for a set duration in the IPAM Holding Tank, unless otherwise overridden, reassigned, or reclaimed from Holding.
- **Resources:** The top five Resources assigned under that aggregate with the most assigned block space.
- **Recent Assignments:** The five most recent block assignments under that aggregate, with the CIDR, assigned resource link, and assignment date.

Additional IPAM Features

ProVision IPAM-As-WHOIS

ProVision supports utilization as a WHOIS server via REST API requests. You can query Resources, Contacts, and IP Blocks, just like a traditional WHOIS server, only ours serves data from the ProVision database.

This feature provides an alternate route to provide ProVision data to legacy workflows on your network. If a team is used to query WHOIS, they can query Provision. If a system needs to talk to WHOIS, it can talk to ProVision-as-WHOIS.

Setup

The ProVision WHOIS Server is a thin client for our REST API that listens on port 43 and accepts WHOIS requests that gets forwarded to our API. It is written in Python 3 using the **socketserver** module, and uses the ProVision endpoint **/api/ipam/whois** to receive all requests from the WHOIS server.

The main business logic is located in **services/WhoisService.php**

Running the Server manually

The server is located at **whois_server/main.py** in the ProVision repository.

Running the server can be done with: **sudo python3 main.py** (We need root because we are binding to port 43)

Quering the WHOIS server

1. install whois if not present (sudo apt-get install whois)
2. whois -h 127.0.0.1 query

Installing the WHOIS server as a service

Different Linux distributions might have different ways to setup a service that runs on startup.

systemd

There is a Unit file for systemd in the repository: **whois_server/provision_whois.service** that is used when a service is created in systemd env.

1) Edit the file to setup the proper path to the python server/file

```
ExecStart=/usr/bin/python3 /root/whois_server/main.py
WorkingDirectory=/root/whois_server/
```

2) Copy the file to **/etc/systemd/system** (on CentOS this directory should be: **/lib/systemd/system/**) -

sudo cp whois_server/provision_whois.service /etc/systemd/system/provision_whois.service

3) Start the service with **service provision_whois start**

4) Verify that is working with **service provision_whois status** and making a test query **whois -h 127.0.0.1 query**

The systemd services are run as root, so there shouldn't be issues with binding to port 43.

init.d

There is also init.d file located at **whois_server/provision_whois**

1) Edit the file to setup the proper path to the python server/file

```
DAEMON_OPTS="/var/www/projects/whois/app.py"
```

2) Copy the file to **/etc/init.d/**

3) **chmod +x /etc/init.d/provision_whois -v**

4) Verify that is working with **service provision_whois status** and making a test query **whois -h 127.0.0.1 query**

GEO IP Exporter

ProVision supports the entering and export of IETF format-compliant GeoIP data for resources which have assigned IP blocks.

The Geo IP Exporter may be enabled as a scheduled task (See: Scheduler Tab) that, at run time, searches the ProVision instance for resources which have IP addresses and an address provided in the Contact Info Gadget, then saves the resulting .csv to the ProVision root directory.

If a resource has an assigned a non-1918 IP address, and either Geo IP location data or a Mailing Address entered in the Contact Info Gadget, then the data will be included in the .csv output. If an IP address is not associated with the resource, or if neither Geo IP / Mailing Address has been provided, the resource will be skipped.

This feature includes updates to the following areas:

- Updates to the Contact Info Gadget to provide Geo IP fields
- A Geo IP Export Scheduler Task
- Writes files to the ProVision root directory

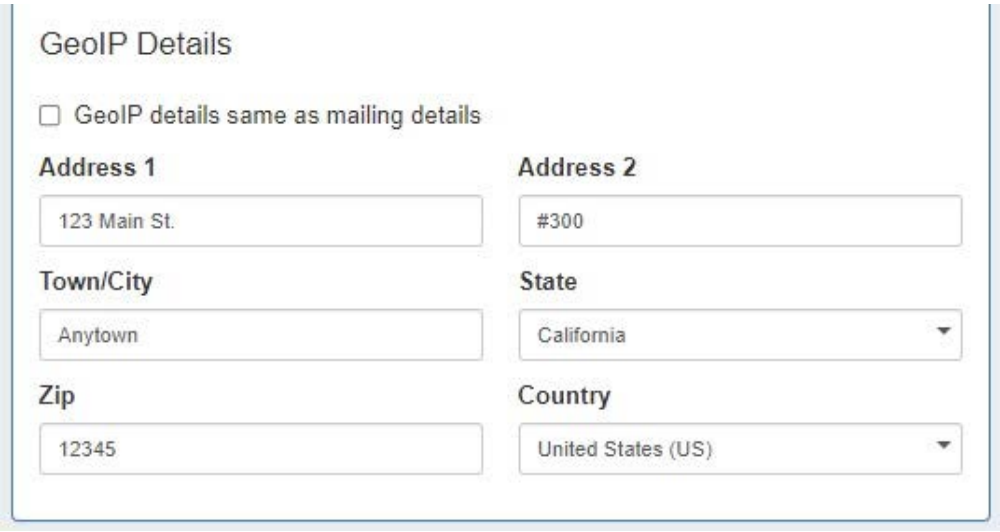
For additional information, expand the walkthrough below:

1) Enter GEO IP data to Resources

Add GEO IP location data to a Resource by selecting "Edit" for the Contact Info Gadget.

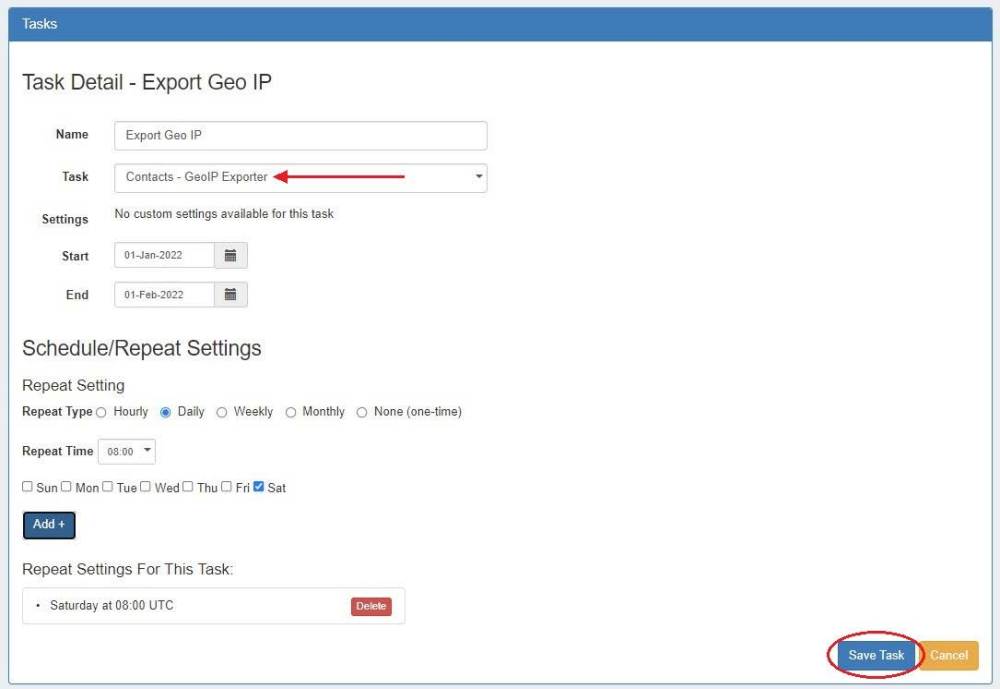


Enter a separate address to denote as the GEO IP location, or you may select "Same as Mailing Address":



2) Set up the Geo IP Export Scheduler Task

Create a Scheduler task to export GEO IP data:

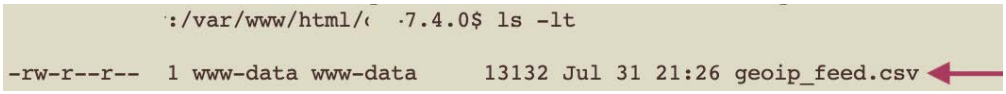


3) Run the Scheduler Task / File Access

Run the GEO IP scheduler task, either via "Run Now" or as a scheduled run - the task will search for resources with an assigned IP address, and either Geo IP location data or a Mailing Address entered in the Contact Info Gadget, and add the data to the .csv output.



Once the task has completed, the GEO IP data will be written to the ProVision root directory as "geoip_feed.csv":



Working with IPAM Aggregates

For additional information on performing IPAM tasks and working with aggregates and blocks, continue on to Working with IP Aggregates and Working with IP Blocks.

Additional Information

- IPAM Workflow
- Working with IP Aggregates
- Working with IP Blocks
- Working with IP Rules
- VLAN

IPAM Workflow

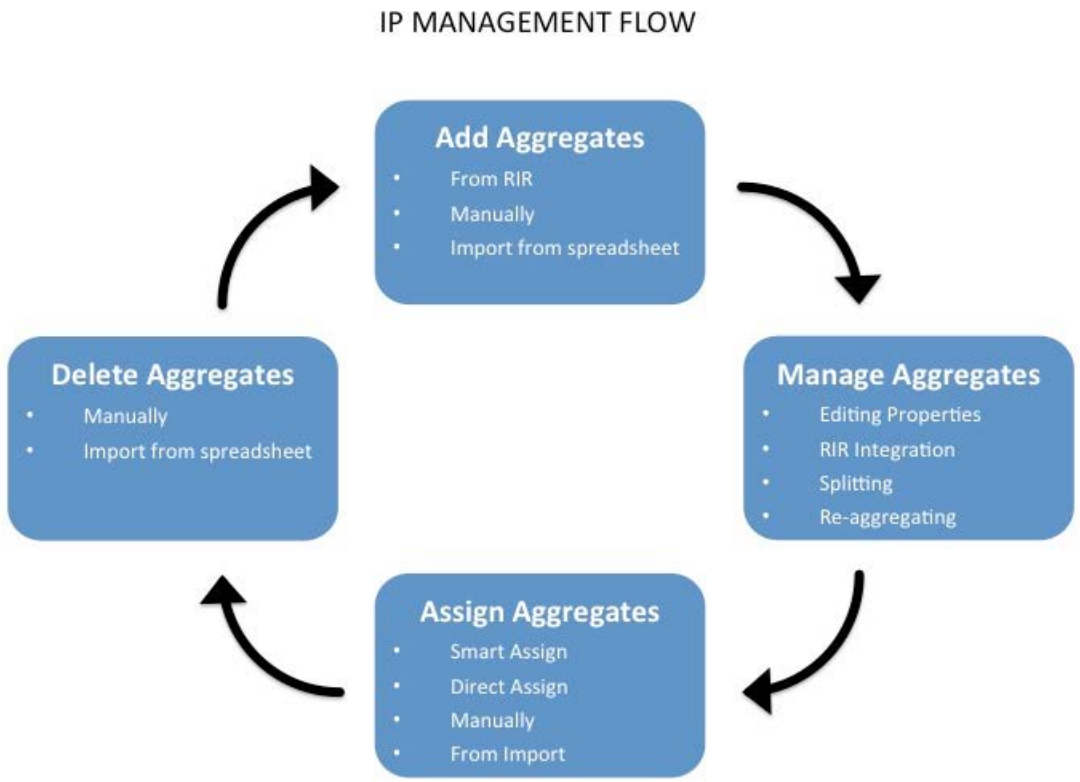
IPAM Workflow

- IPAM Workflow
  - IP Management
    - Add Aggregates
    - Manage Aggregates
    - Assign Aggregates
    - Delete Aggregates
  - IP Assignment Lifecycle
    - IP Block Status
  - Additional Information

IP Management

IP Management is comprised of four basic functions: adding aggregates into ProVision, managing those aggregate blocks, assigning them to a resource, and deleting the aggregates.

ProVision provides multiple ways for you to achieve each step, depending on your needs. For example, if your organization currently uses spreadsheet data to track aggregates, ProVision provides tools that can import your existing spreadsheets for bulk updates, saving you time. Need to just quickly assign a single IP? Direct Assign will allow you to do so with just a few clicks.



Add Aggregates

Adding new aggregate may be done manually, automatically from a RIR import, or imported from a .csv file.

- **Manually:** Create a new aggregate via the IPAM Tab. See: Working with IP Aggregates.
- **Import from RIR:** ProVision will automatically identify your RIR / organization and show available aggregates, or you can enter in an ORG ID or IP. See Import Aggregate .Blocks

- **Import from .csv:** Normalize your data as detailed in Importing Your Data - Normalize your Data, and then use ProVision's IP Import from .csv tool.

Manage Aggregates

Edit, Split, Merge, and connect with RIRs to architect the aggregates as needed and update WHOIS information, if applicable.

- For aggregate level actions, like splitting, merging, and editing, see Working with IP Aggregates - Common Tasks .
- RIR Integration requires LIR setup. See LIR Management and Use and RIR Integration: SWIP/RPSL .
- Editing individual blocks under an aggregate can be done from either IPAM Manage or the IPAM Gadget. See Working with IP Blocks and Working with IP Rules.

Assign Aggregates

Aggregates may be assigned to a Resource at their creation/import, or assigned later manually or via Smart / Direct Assign.

- To assign at manual aggregate creation, just select a resource from the dropdown in the IPAM Tab - Create Aggregate dropdown. See: Working with IP Aggregates.
- To assign during import, either include the resource assignment as a field in your .csv, or edit the import during the review step to assign a resource. See IP Import from .csv.
- Manual assignments may be done at any time in IPAM Manage or Smart/Direct Assign. See: Working with IP Aggregates and Working with IP Blocks.

Delete Aggregates

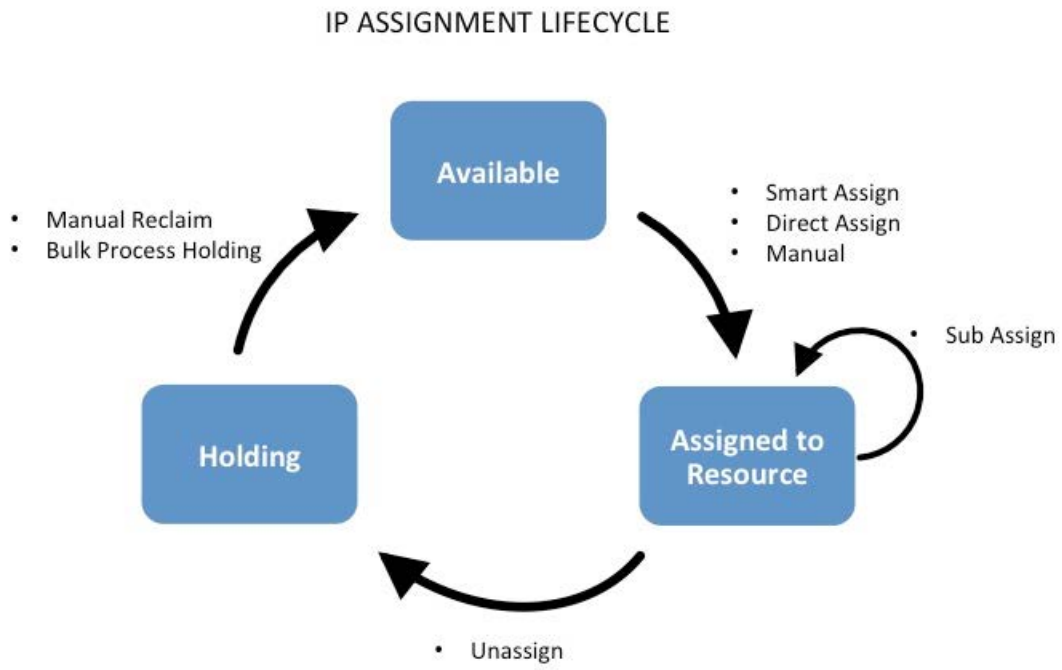
Delete an aggregate from the aggregate box in the IPAM Tab. See: Working with IP Aggregates.

IP Assignment Lifecycle

In ProVision, the IP assignment lifecycle starts with an available block which is free to be assigned to any IPAM-enabled resource holder. There are multiple methods that may be used to assign a block to a resource holder: Smart Assign, Direct Assign, or Manual Assign (Smart Browse). See Working with IP Blocks for details on assigning blocks.

Once an IP block is assigned, blocks can be further subassigned via the same methods, if desired, by using the "allow subassignments" toggle when editing an assigned block. If a block has subassignments enabled, but has not yet been subassigned, it is listed as "Allocated" - essentially held by the parent resource, but not fully assigned.

When an assigned block is un-assigned it proceeds into the Holding Tank: a special resource where blocks are held until either a set time has elapsed or until they are manually reclaimed to 'available' status. If a subassigned block is unassigned, it too proceeds to the Holding Tank if not overridden, and then reverts back to allocated to the original parent resource.



IP Block Status

- **Available:** A status of "Available" indicates the block is free and able to immediately be assigned or allocated to a resource. Available blocks may be assigned via any assignment method - manual, smart assign/browse, and direct assign.
- **Assigned:** A status of "Assigned" indicates that the block has been assigned to a Resource, with no subassignment capability, and is unavailable.
- **Allocated:** Allocated blocks have been assigned to an overarching parent resource, but have subassignments enabled and may have smaller blocks assigned out of them to other Resources, such as customers or DHCP Pools. Allocated blocks count as "Available" for reporting functionality until subassigned, but are shown as their own category on the IPAM Utilization charts. Once subassigned, the block is considered "Assigned".
- **Holding:** Blocks in "Holding" have recently been unassigned, and are held for a set duration in the IPAM Holding Tank, unless otherwise overridden, reassigned, or reclaimed from Holding.

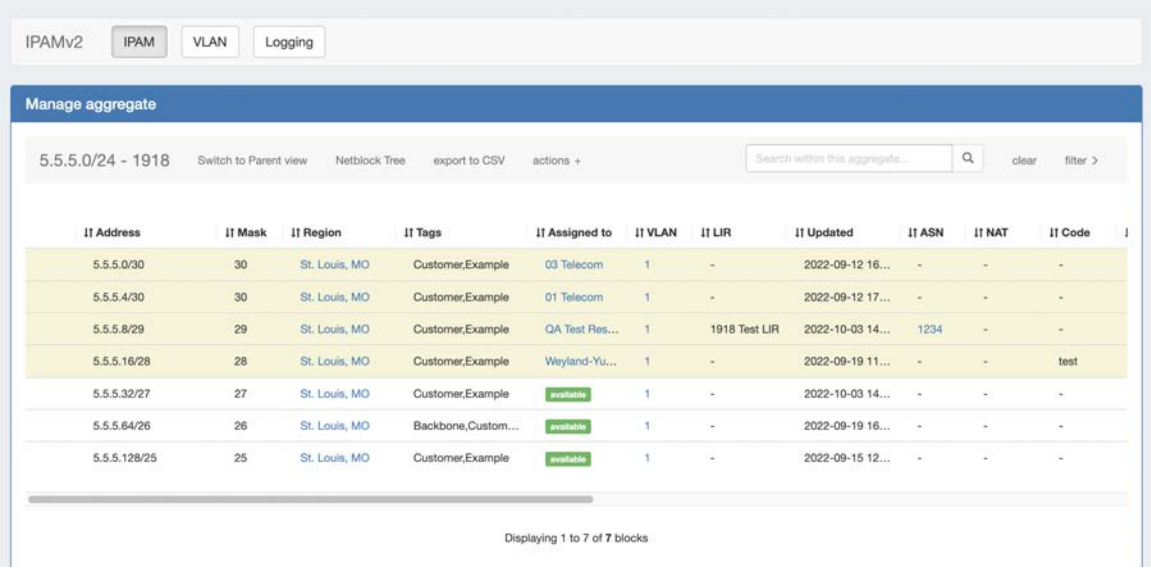
Additional Information

For more information on performing tasks in this IP Assignment Lifecycle, see the following documentation sections:

- Working with IP Aggregates
- Working with IP Blocks
- IPAM Administration

Working with IP Aggregates

Working with IP Aggregates



IPAM Aggregates

IP Aggregates are edited and managed from the **IPAM** Tab and IPAM Manage page.

Aggregates may be viewed, filtered, created, and deleted from the **IPAM** Tab, and setting IPAM alerts and using Aggregate Templates are performed in IPAM Manage.

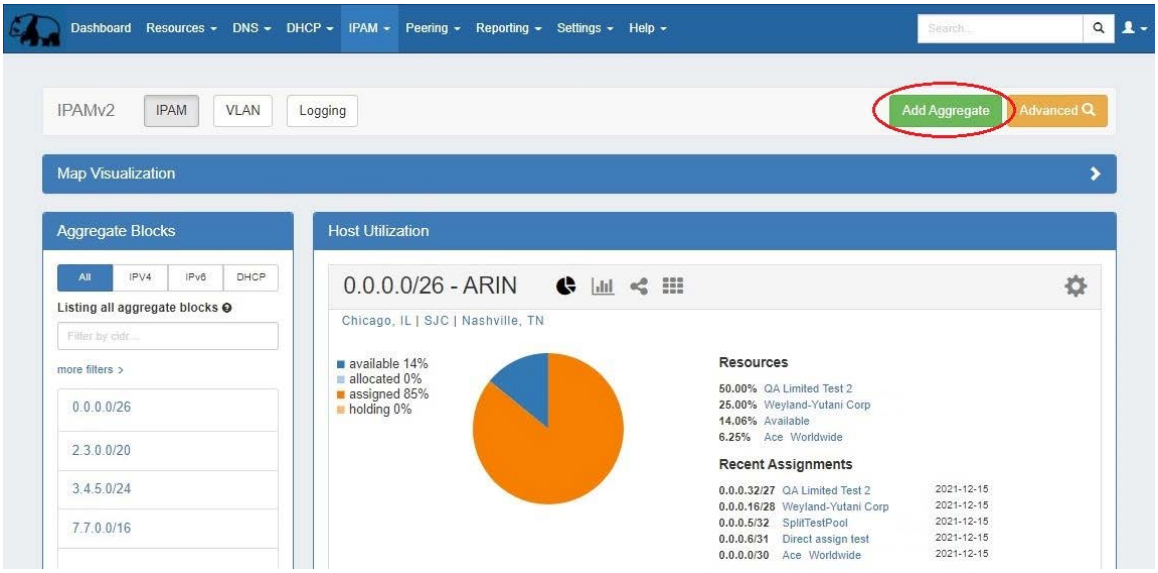
For an overview of the IPAM Tab, see IPAM Tab. For information on working with individual blocks, continue to Working with IP Blocks.

- Working with IP Aggregates - Common Tasks
  - Add an Aggregate
  - Delete an Aggregate
  - Merge Aggregates
  - Sparse Allocate in an IPv6 Aggregate
    - Sparse Allocation Schemes
    - Enable/Disable Sparse Allocation
    - Sparse Allocate
  - Manage an Aggregate
    - Open IPAM Manage for an Aggregate
  - Aggregate Actions
    - Auto Split Aggregate
    - Clean Up Aggregate
    - Set Aggregate Alerts
- Working with IP Blocks
- Additional Information

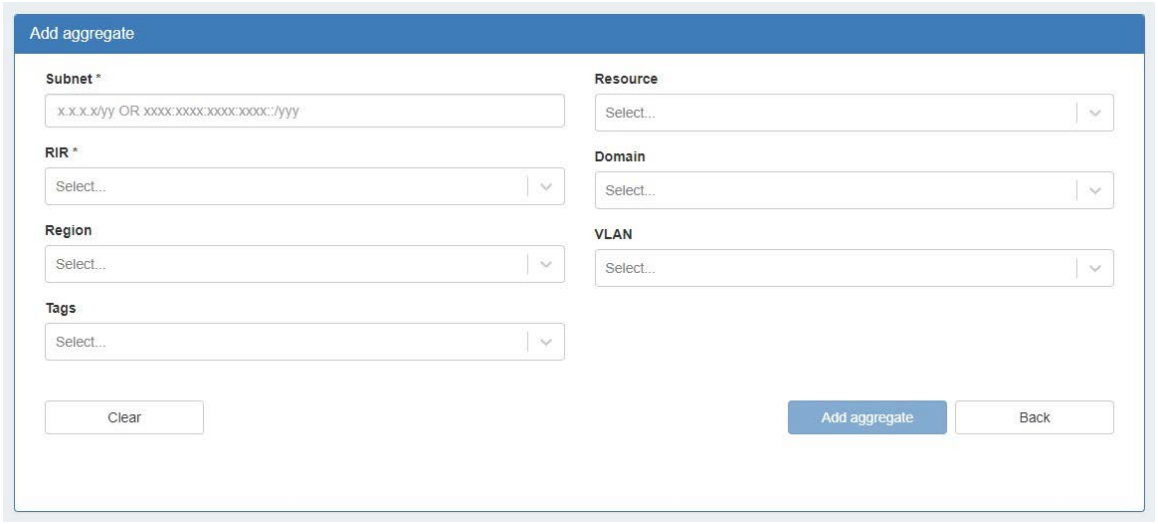
Working with IP Aggregates - Common Tasks

Add an Aggregate

On the main **IPAM** Tab, click the "Add Aggregate" button. A new page will open to fill in details for a new aggregate block.

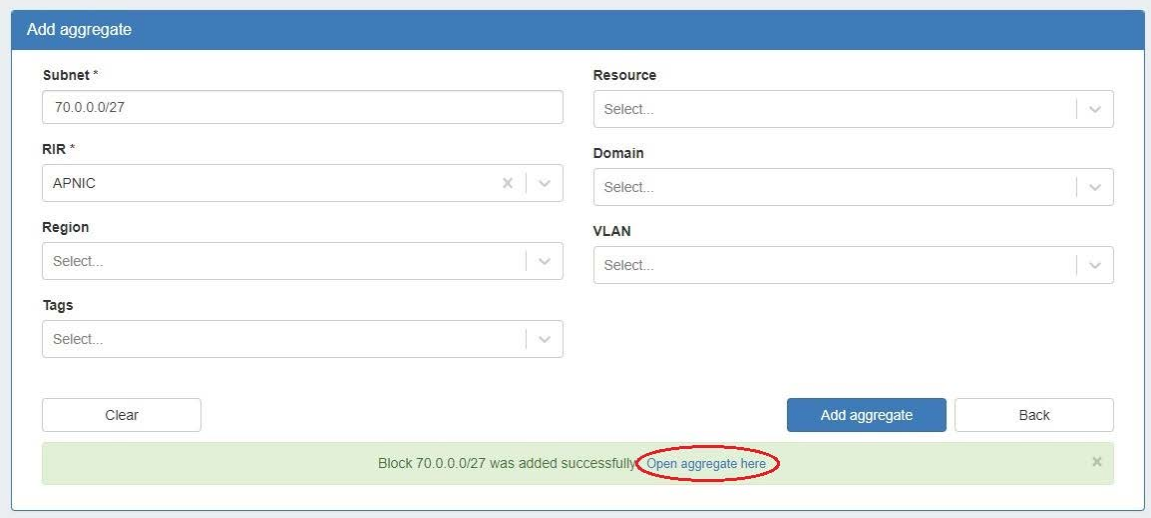


Enter in the desired IPv6 / IPv6 CIDR and RIR, at minimum. Region, Tags, Resource, Domain, VLAN, and subassignment status are optional, if desired. To enable subassignments, a resource must be selected.



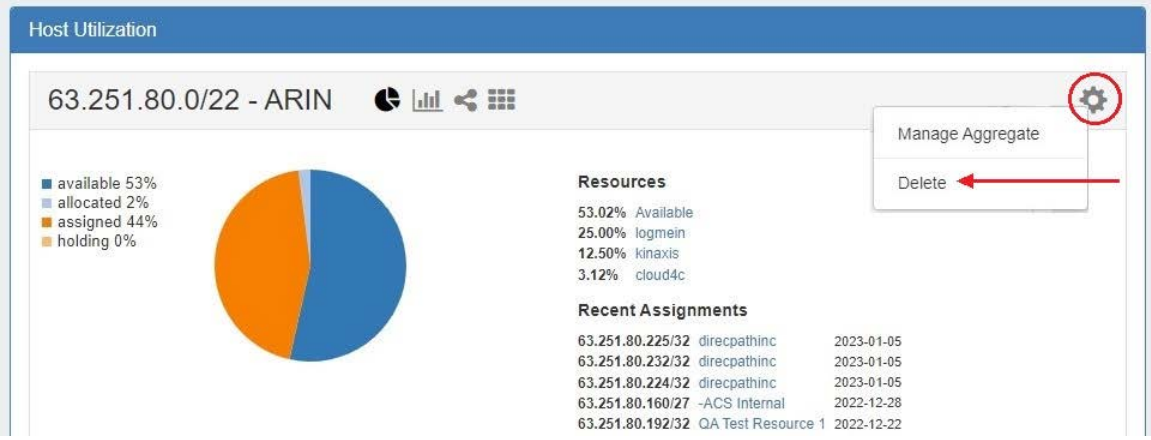
If creating the aggregate for a specific use, keep in mind that certain uses may require additional information is provided in the aggregate, such as requiring 1918 space (DHCP Pools), a region to be provided (DHCP Customer Configuration Gadget), or a resource to be assigned with subassignments enabled. In such cases, it may be useful to assign a specific IPAM tag to associate with that use to assign at aggregate creation (such as "DHCP")

When done, click "Add Aggregate", and a link to the newly created aggregate will be available. You may also click "Clear" and create another aggregate. Aggregates will be listed under the Host Utilization and Aggregate Blocks list of the IPAM Tab.



Delete an Aggregate

Aggregates may be deleted from the Gear Icon in the top right corner of their Host Utilization box display.

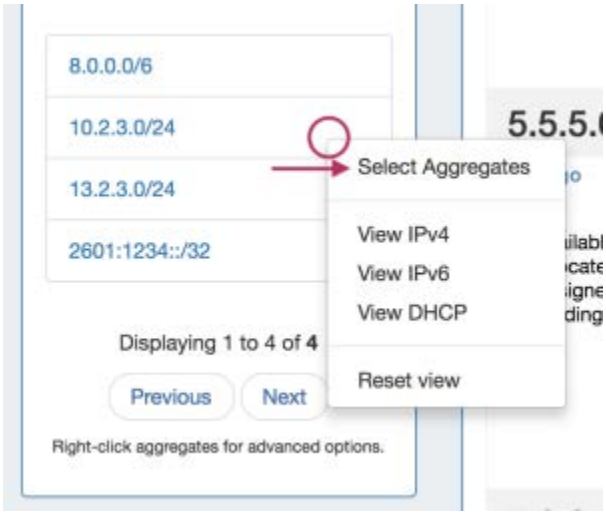


A warning dialog box will appear confirming the deletion, and noting whether assigned blocks exist in the aggregate that would also be deleted.

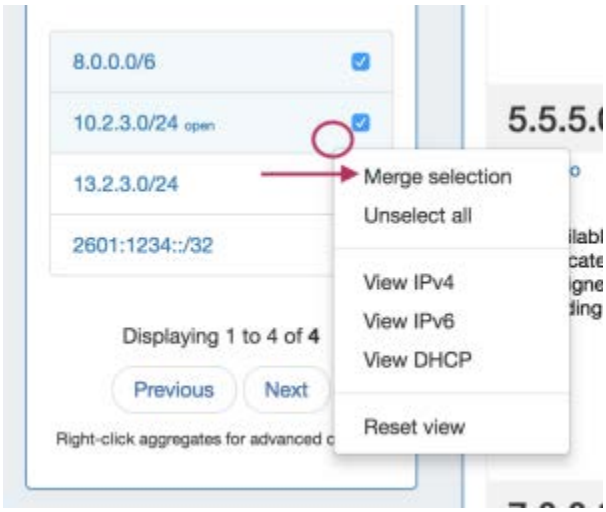
Merge Aggregates

Adjacent Top Level Aggregates may be merged into a single aggregate, if meeting validity criteria (adjacent, but not overlapping).

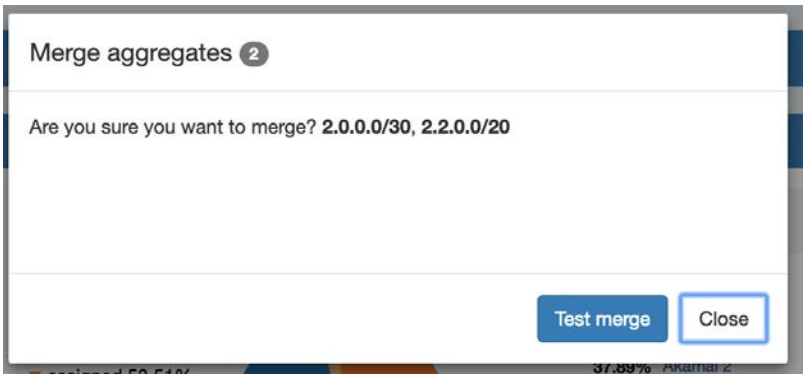
To do so, right click anywhere on the Aggregate Blocks list, and choose "Select Aggregates" from the menu.



Then, click the check boxes for the two aggregates you wish to merge, and then right click and select "Merge Selection".

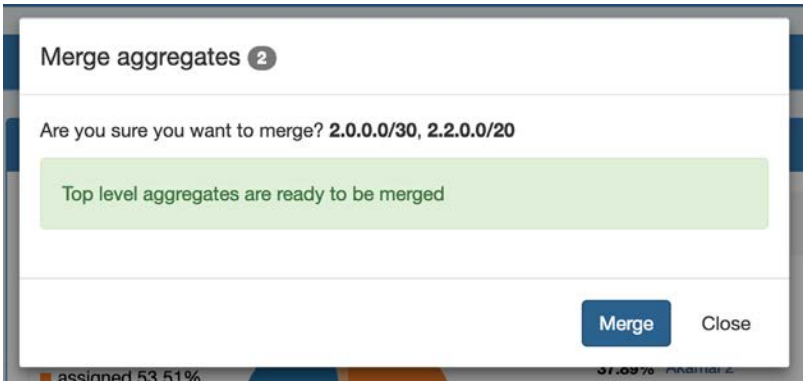


A confirmation dialog box appears to confirm the blocks to merge, and proceed with testing to see if the merge is valid. Click "Test Merge" to proceed.



ProVision will pre-test the merge, and if valid, give you the option to proceed.

Otherwise, an error message will display detailing why the aggregates are unable to be merged.



Complete the aggregate merge by clicking "Merge".

To Exit out of the selection prior to merging, select "Close".

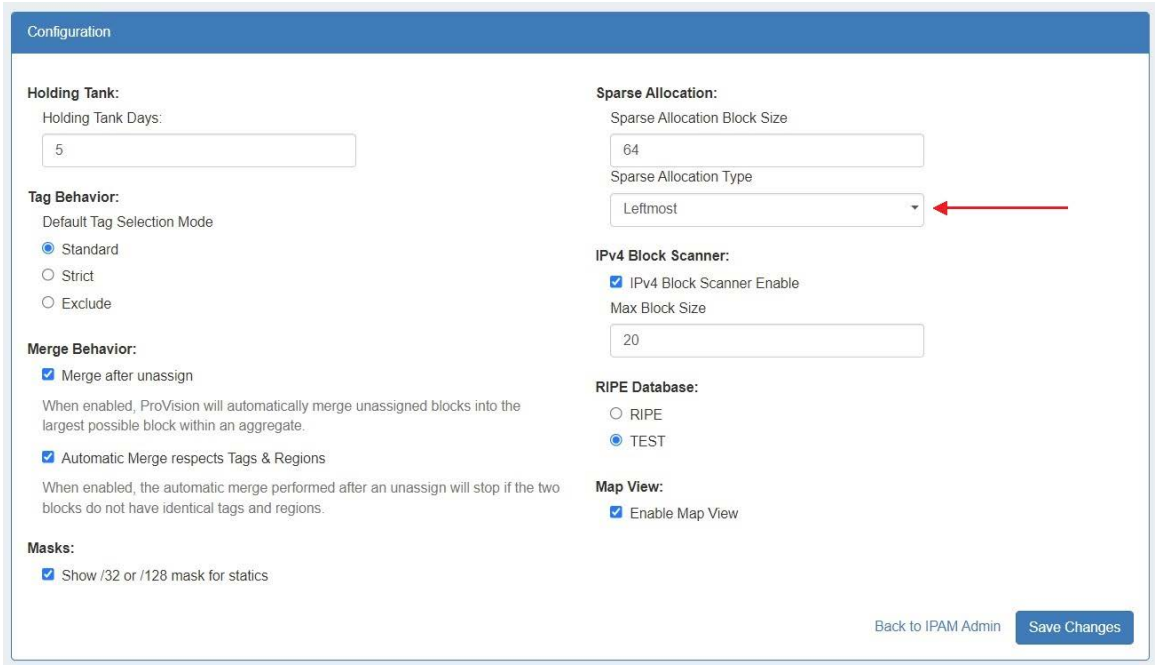
Sparse Allocate in an IPv6 Aggregate

Sparse allocation evenly distributes assignments throughout an IPv6 range, using either a manually configured or automatically generated "Sparse Allocate" Numbering Authority domain algorithm to calculate the next block to assign.

Sparse Allocation Schemes

Admins may select a system default Sparse Allocation scheme to use for IPv6 Sparse Allocation. Available values are Leftmost, Center, and Rightmost. If not otherwise specified, Leftmost is the ProVision Default.

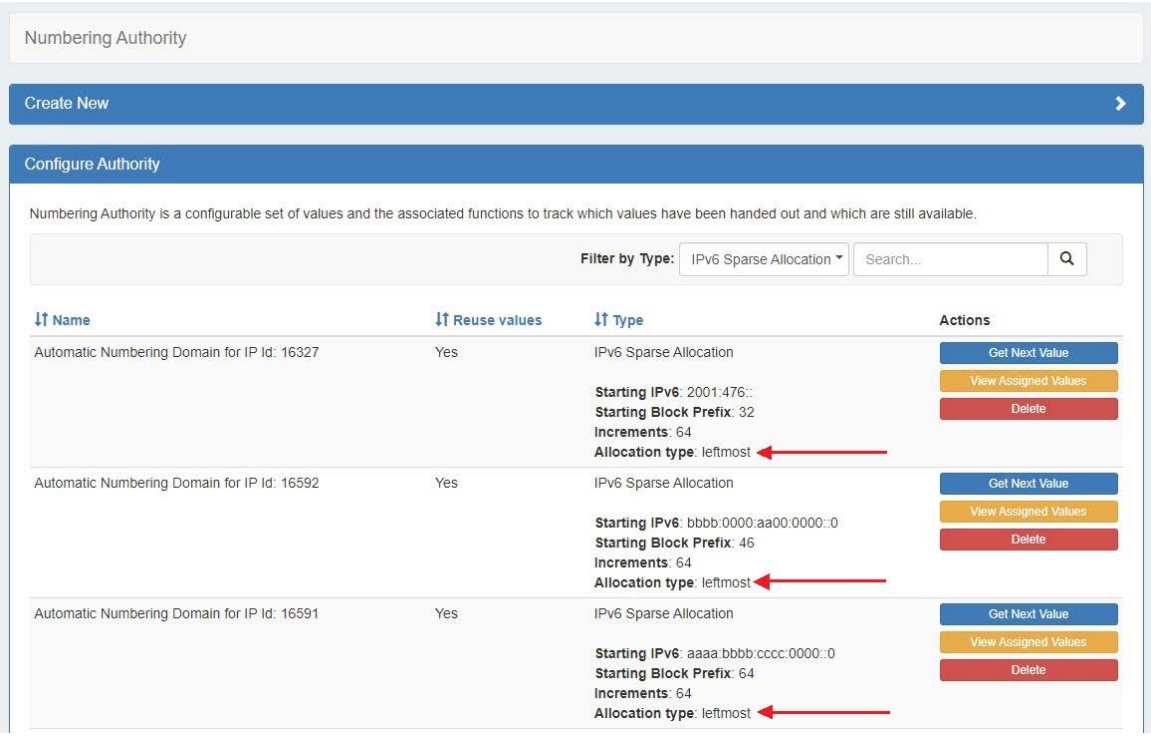
To edit the Sparse Allocation Scheme, select the desired scheme in IPAM Configuration, then enable sparse allocation for the desired IPv6 aggregate. The Sparse allocation scheme is applied to the aggregate when sparse allocation is enabled for the aggregate, thus, pre-existing sparse allocation schemes will not be altered by later changes.



If you wish to change the scheme for an existing sparse allocated-enabled aggregate, you must

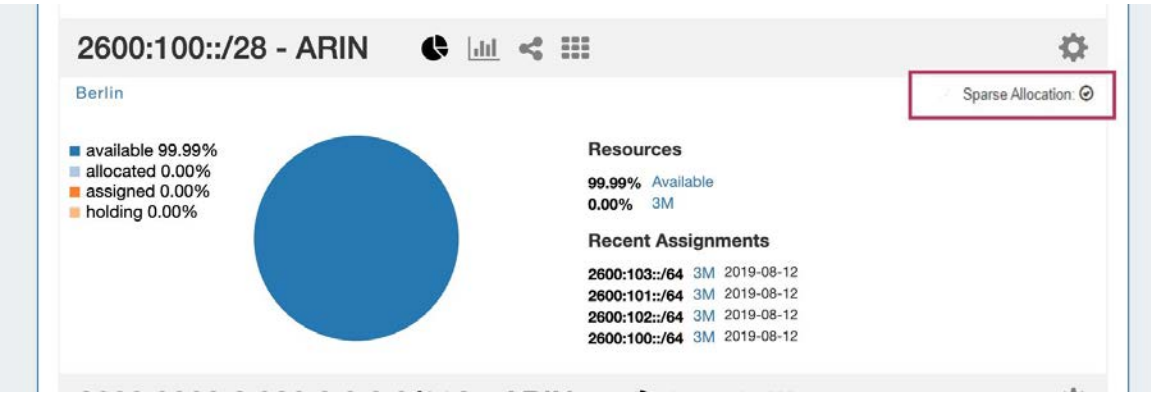
1) Disable sparse allocation for the aggregate 2) Edit the selected scheme 3) re-enable sparse allocate for the aggregate.

To verify which scheme is applied to aggregates, you may view the aggregate and scheme details in the Numbering Authority Sparse Allocate listings.



Enable/Disable Sparse Allocation

Sparse allocation options are accessed from the IPv6 Aggregate's Action Menu (gear icon). The top right corner of the Utilization module for the IPv6 aggregate will display whether sparse allocation is enabled or disabled for the particular aggregate.

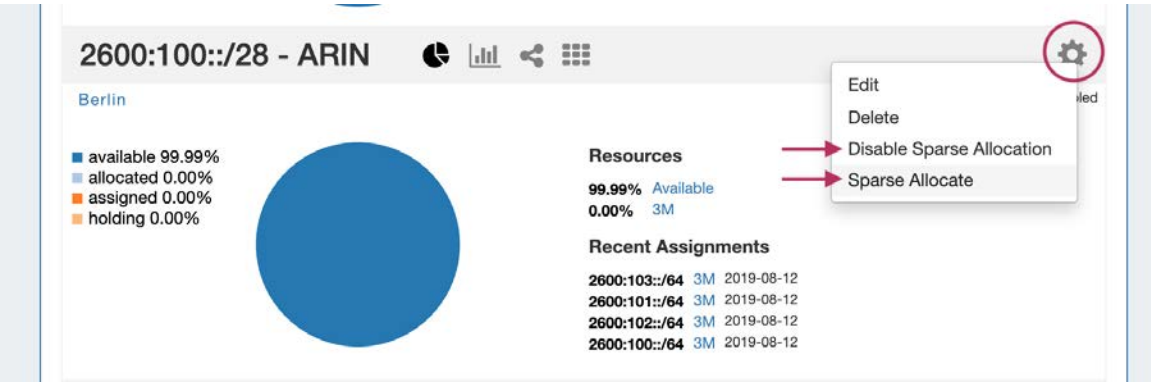


Enable or disable Sparse Allocation for the aggregate by clicking on the aggregate menu, and select to Enable / Disable Sparse Allocation for the aggregate. A "Sparse Allocate" Numbering Domain will automatically be generated for the aggregate in the Admin IPAM Admin area of ProVision, using the currently set Sparse Allocation Scheme setting.

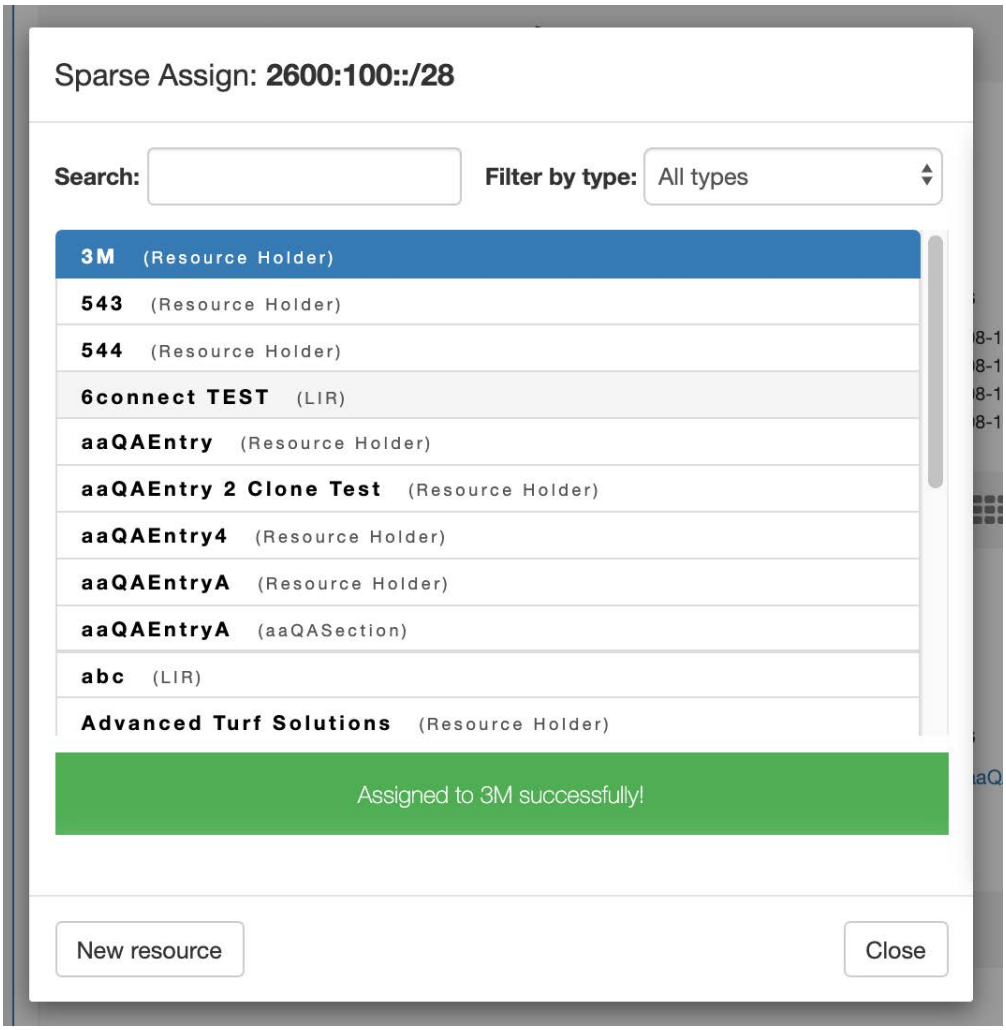
Once enabled, the "Sparse Allocate" option will be available for the aggregate.

Sparse Allocate

To Sparse Allocate assign the next IP generated, select "Sparse Allocate" from the aggregate action menu.



Then, select the resource to assign (or create a new one) and click "Assign".



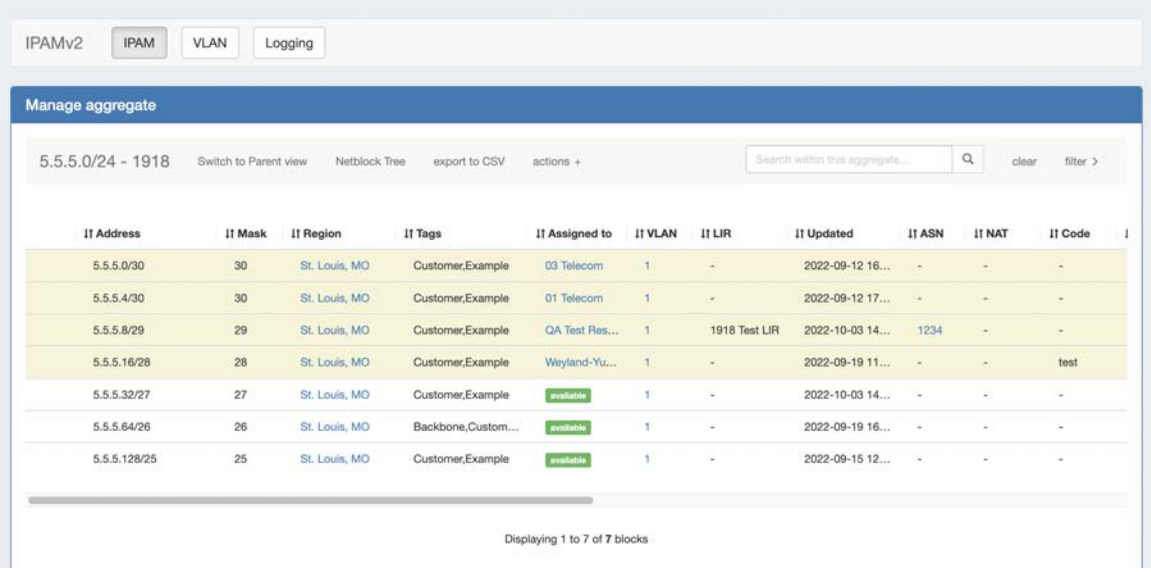
The resource will be assigned according to the distribution algorithm and may be further managed in IPAM Manage for the aggregate.

Manage an Aggregate

Managing an aggregate is mostly performed in the IPAM Manage screen for the aggregate.

From IPAM Manage, you can perform the aggregate template actions of Auto-Split / Clean-Up, Set IPAM Alert information, export the block list, as well as manage individual blocks.

For detailed information on using the IPAM Manage screen and managing at a block level, see Working with IP Blocks.



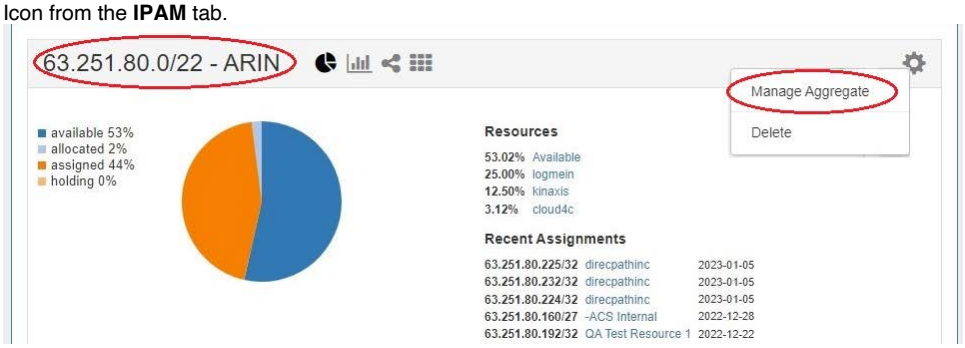
Open IPAM Manage for an Aggregate

Open the IPAM Manage screen for a block by:

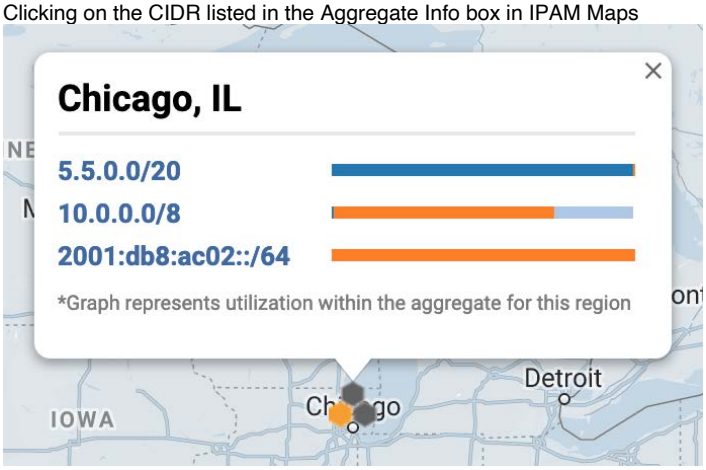
- Searching for the block in the Global search, and clicking on the resulting CIDR
- Clicking the "Open" link in the aggregate blocks list from the **IPAM** tab.



- Clicking on the CIDR header of the Aggregate Block Host Utilization module, or selecting "Manage Aggregate" from the module's Gear Icon from the **IPAM** tab.



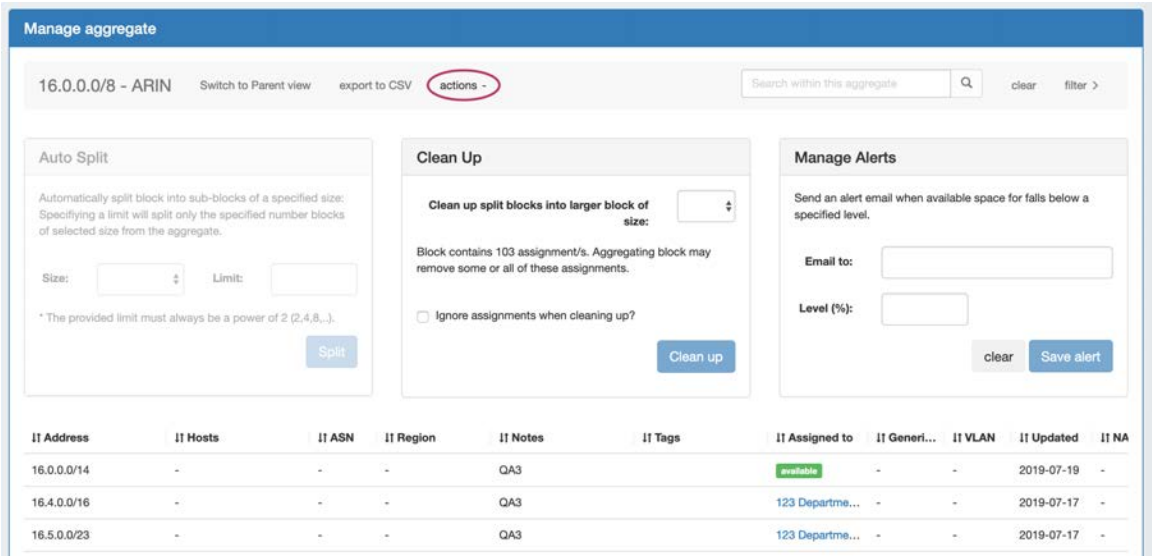
- Clicking on the CIDR listed in the Aggregate Info box in IPAM Maps



Aggregate Actions

Open up aggregate level actions in IPAM Manage by clicking on the "Actions" link in the Manage Aggregate header.

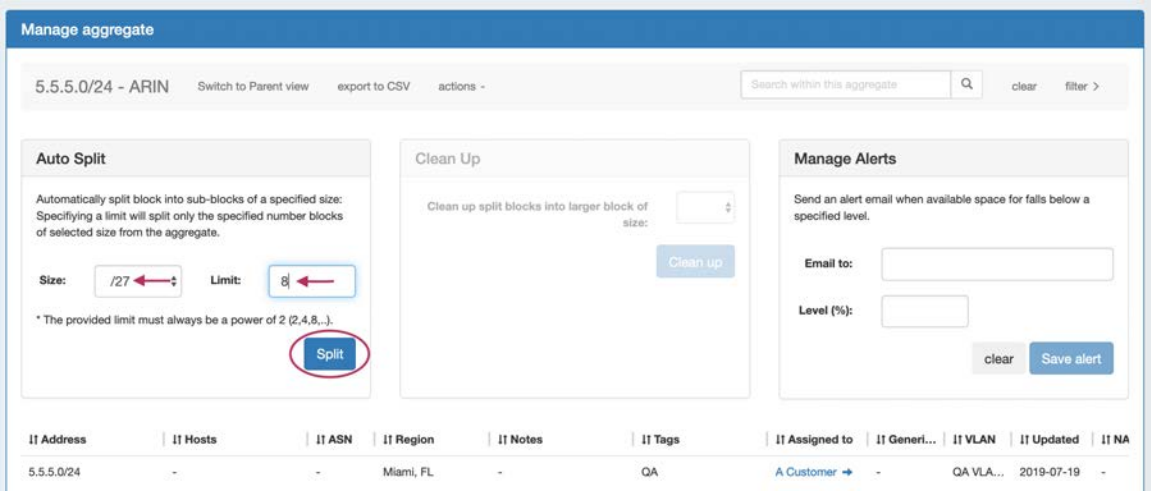
Three options are available - Auto Split, Clean Up, and Manage Alerts.



Auto Split Aggregate

Auto Split an available aggregate into blocks of a specific size, up to a specific quantity of blocks by selecting "Size" and "Limit" under "Auto Split".

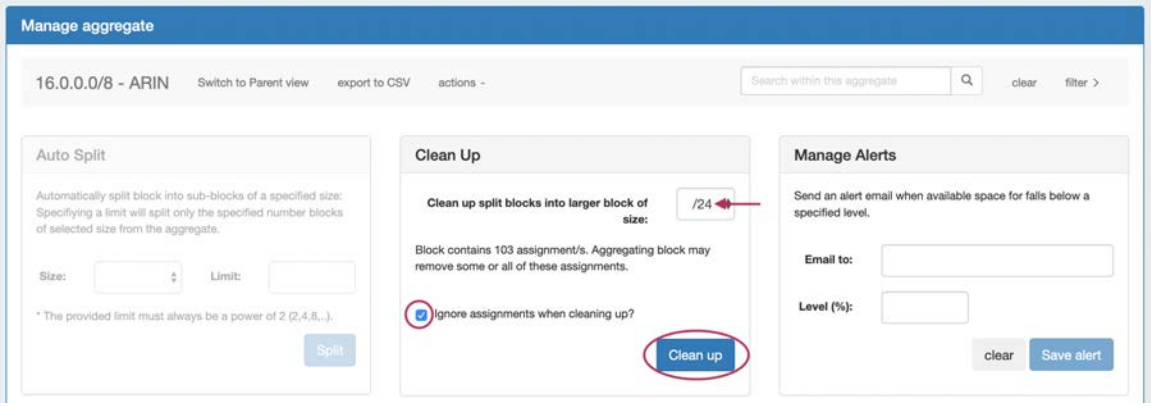
The block limit must be a power of two, or an error will appear. When done, click "Split".



Clean Up Aggregate

Clean up an Aggregate into fewer blocks of a specific size, by selecting your desired block size and clicking "ignore assignments" (if blocks have assignments that would prevent merging).

When done, click the "Clean Up" button.



A confirmation modal will display the scope of the potential change.



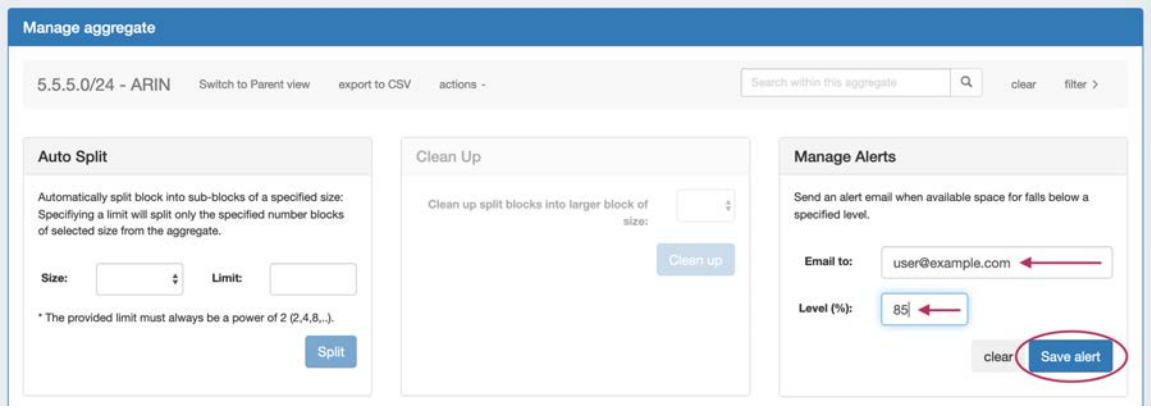
Click "Continue" to confirm and all blocks will be merged to the set size and reset to available. Click "Cancel" to exit.

Set Aggregate Alerts

Enable or clear aggregate alert emails for the aggregate by setting an email address and utilization percentage level.

When the aggregate is utilized to the set percent, an email alert will be sent to the provided address.

> Note: the "IPAM Alerts" task is enabled by default when an alert is set. You can set the task to the desired notification frequency and review history in the Admin Scheduler Tab.



When done, click "Save Alert". To clear an existing alert, hit "Clear Alert", and the alert information will be removed and status saved.

For more on IPAM Alerts Management at the Admin level see Alerts Management in the ProVision Admin Guide.

> IPAM alerts may also be set on individual IP blocks. For more information see Working with IP Blocks - Common Tasks.

Working with IP Blocks

For additional information on performing IPAM tasks and working with blocks, continue on to Working with IP Blocks.

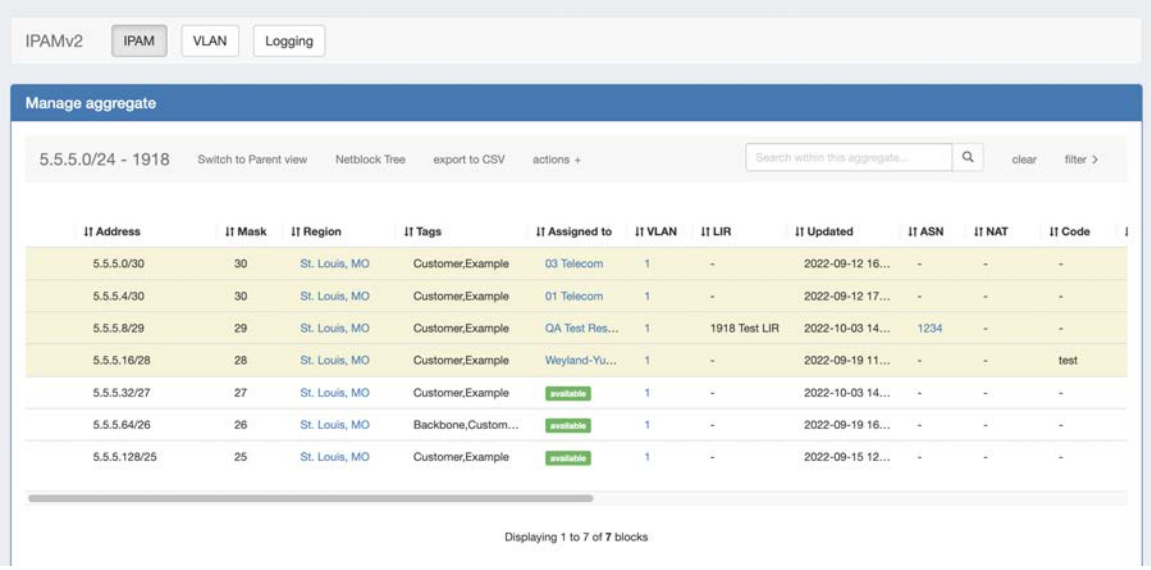
Additional Information

For additional information on working with the IPAM system in ProVision, see the following areas:

- IPAM Tab
- Gadgets
- Working with IP Rules
- IPAM Administration
- Alerts Management

Working with IP Blocks

IP Block Management



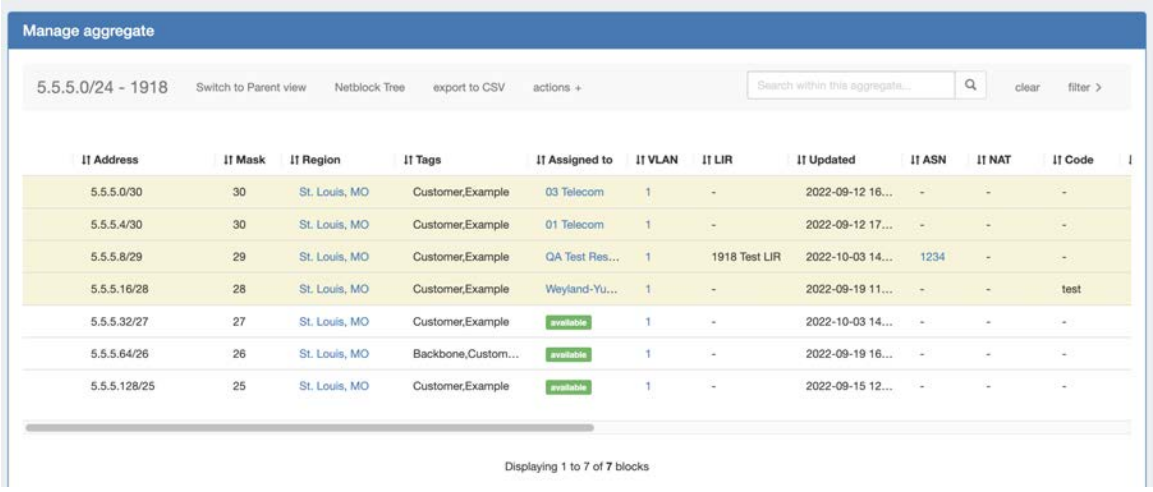
Managing IP Blocks

IP Blocks are edited and managed in either IPAM Manage or the IPAM Gadget.

From either area, you can perform standard block-level actions such as assign, unassign, split, merge, edit attributes, track NAT associations, and more.

The primary difference between the two areas is that IPAM Manage shows all blocks (or all blocks under an aggregate), regardless of assignment or status, where the IPAM Gadget shows only the blocks assigned to the specific resource that you are currently viewing on the Resource Entry Page. However, the IPAM Gadget has more advanced assignment options and criteria available (Direct Assign, Smart Assign, Smart Browse).

IPAM Manage Features



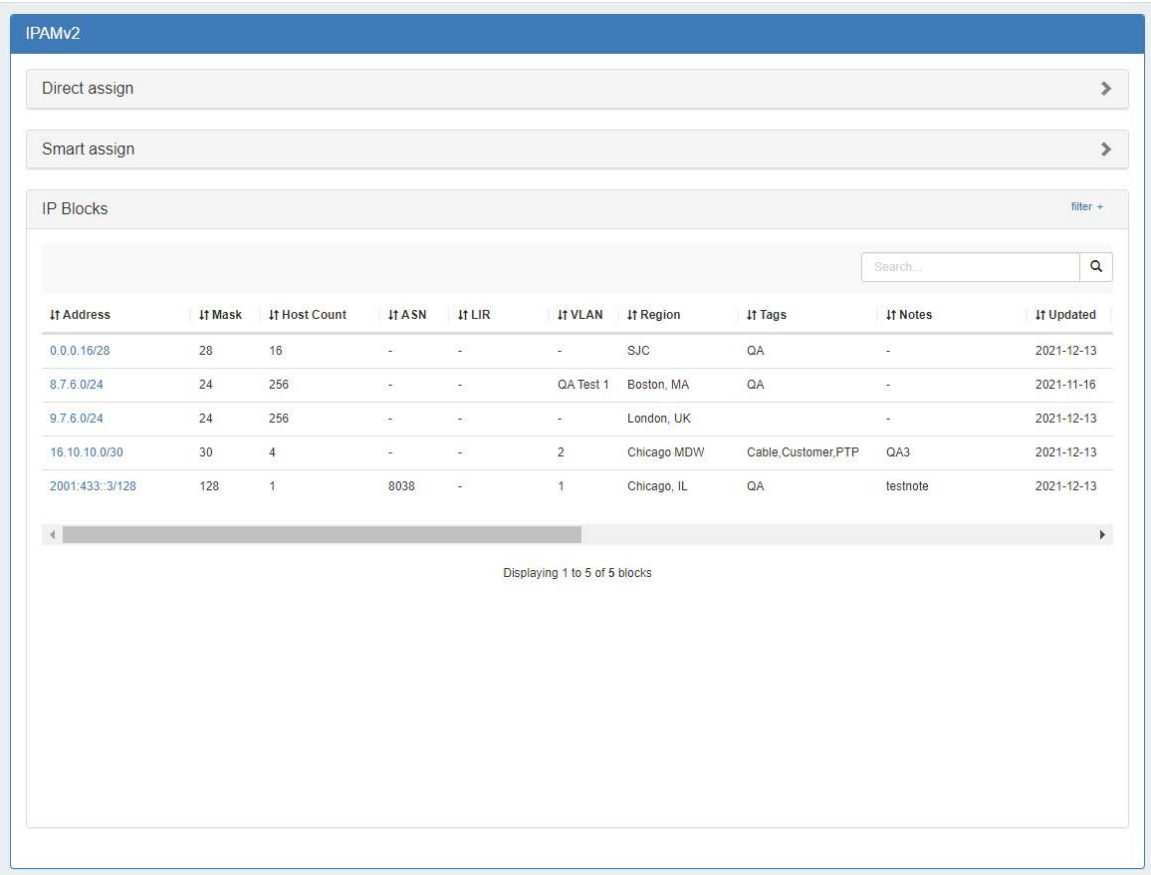
IPAM Manage is accessed from:

- **IPAM** Tab open aggregate / edit aggregate links
- **IPAM** Tab Advanced button
- Most block CIDR Links in ProVision

In IPAM Manage, you can:

- Sort, Filter, and Export the block list
- Auto-Split and Clean-up templates available for aggregates
- View all blocks (IPAM Advanced), or all blocks under an aggregate, regardless of assignment
- See blocks by Blocks List, Parent View, or Netblock Tree view
- Shows blocks from all statuses - available, in holding, assigned, subassignable
- Perform Single and Multi-block assignments and edits
- Click on an assigned region link for a block to generate or view a region resource

IPAM Gadget Features



Address	Mask	Host Count	ASN	LIR	VLAN	Region	Tags	Notes	Updated
0.0.0.16/28	28	16	-	-	-	SJC	QA	-	2021-12-13
8.7.6.0/24	24	256	-	-	QA Test 1	Boston, MA	QA	-	2021-11-16
9.7.6.0/24	24	256	-	-	-	London, UK		-	2021-12-13
16.10.10.0/30	30	4	-	-	2	Chicago MDW	Cable,Customer,PTP	QA3	2021-12-13
2001:433::3/128	128	1	8038	-	1	Chicago, IL	QA	testnote	2021-12-13

The IPAM Gadget is accessed from the **Resource Entry Page** IPAM Gadget, once it has been enabled for the section.

Here, you can:

- View only the blocks assigned or assigned-and-subassignable for the resource that you are currently viewing
- Sort and Filter the block list
- Advanced assignment functions - Direct Assign, Smart Assign, and Smart browse with additional field criteria available.
- Perform single and multi-block edit, and assign subassignable blocks.
- Autogenerate reverse zones from block CIDR

Both IPAM Manage and the IPAM Gadget have customizable column names, order, and visibility, as well as options for user-defined meta columns (for details on setting up customization of the IPAM Manage / IPAM Gadget block list, see IPAM Lists Management Edit Columns).

Aggregate-Level Actions

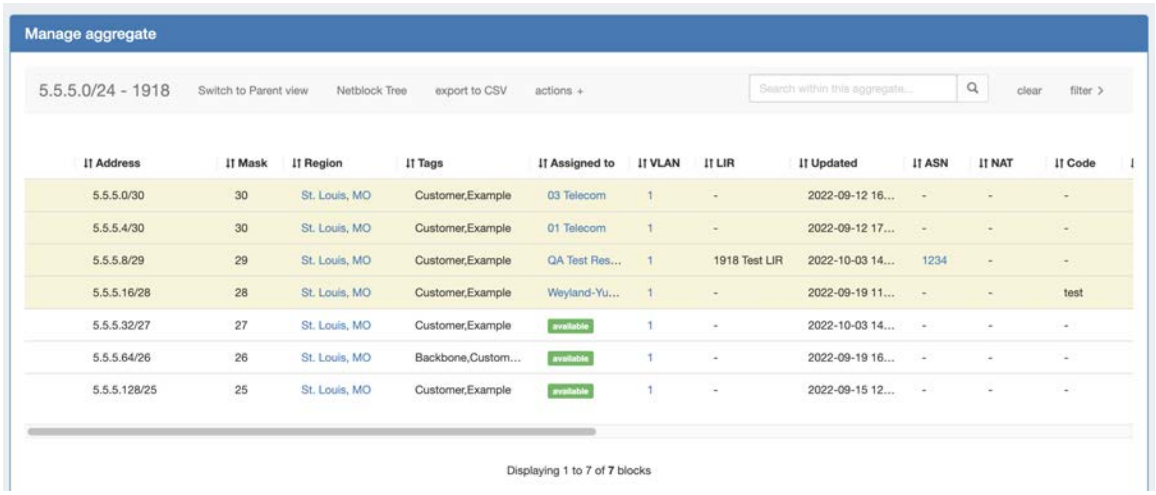
Some aggregate-level actions are performed in IPAM Manage, such as setting IPAM alerts and using Aggregate Templates.

These actions are detailed on the IPAM Tab page under *Working with IPAM Aggregates.* This page will focus primarily on block-level actions and management.

- IP Block Management
- Working in IPAM Manage
    - Open IPAM Manage for a specific Aggregate

- Open IPAM Manage for all Aggregates/Blocks
- IPAM Manage Views
  - Block View (Default)
  - Parent View / Blocks Tree
  - Netblock Tree
- Working in IPAM Manage Views
  - Sort Blocks
  - Filter / Search Blocks
  - Important Blocks
- Working with IP Blocks - Common Tasks
- Additional Information

Working in IPAM Manage

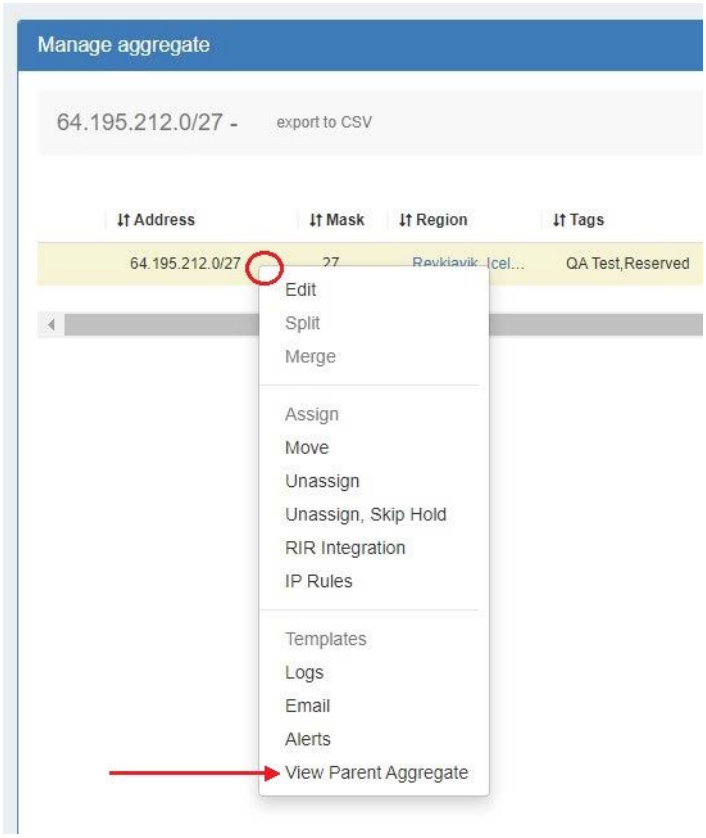


In IPAM Manage, you can manage aggregate level actions, such as Split , Clean Up, Alerts, and Export, as well as viewing and managing individual blocks. In IPAM Manage - Advanced, aggregate-level actions are not available.

Open IPAM Manage for a specific Aggregate

Open the IPAM Manage screen for a block or aggregate by:

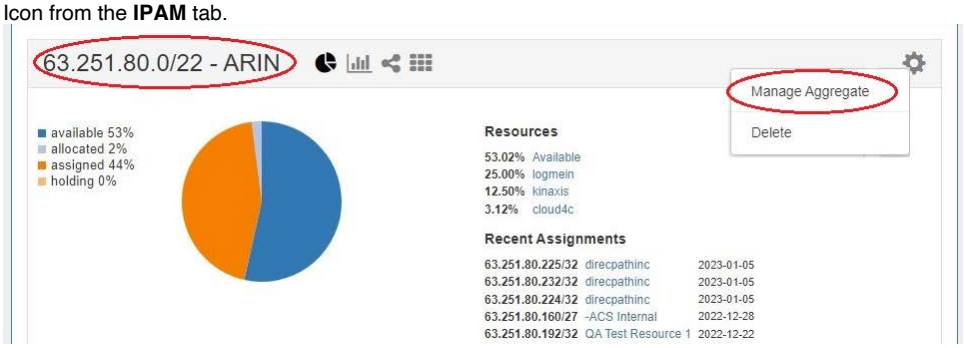
- Searching for the block in the Global search, and clicking on the resulting CIDR
- View the parent aggregate for a Global search / IPAM search result by right clicking to open the action menu for the block, then select "View Parent Aggregate".



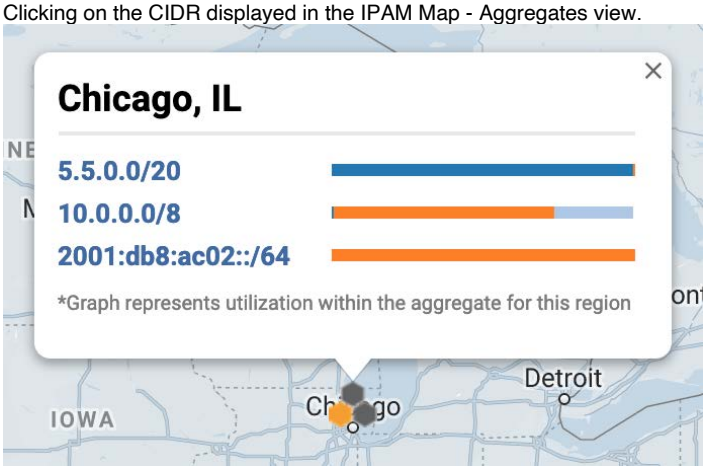
- Clicking the "Open" link in the aggregate blocks list from the **IPAM** tab.



- Clicking on the CIDR header of the Aggregate Block Host Utilization module, or selecting "Manage Aggregate" from the module's Gear Icon from the **IPAM** tab.

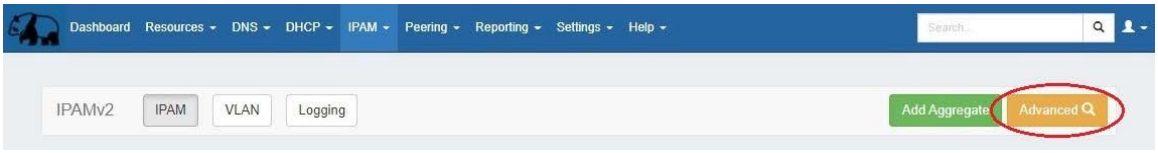


- Clicking on the CIDR displayed in the IPAM Map - Aggregates view.



Open IPAM Manage for all Aggregates/Blocks

Open IPAM Manage for all blocks under all aggregates by clicking the "Advanced" button at the top of the **IPAM** tab.



This will open IPAM Manage for all blocks in ProVision, with all the same filters, block edit functions, and search capabilities as in 'standard' IPAM Manage for an aggregate, but with no aggregate-level actions available.

When working in IPAM Manage - Advanced, be aware of the following:

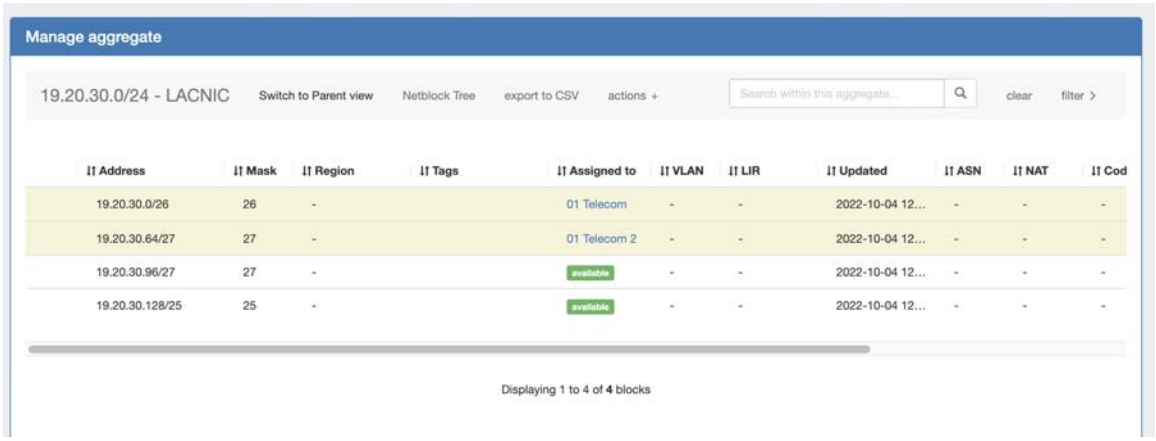
- Due to the large volume of combined data that may be available, filter/search results may take slightly longer than load than a standard aggregate level view.
- Users should take care to ensure that they are working with the correct block(s), as duplicate 1918 space is permitted and blocks may be difficult to distinguish.

IPAM Manage Views

There are multiple view options in IPAM Manage to view and/or edit blocks: **Block View**, **Parent View**, and **Netblock Tree**.

Block View (Default)

Block View is the default IPAM Manage Aggregate screen. Block View displays only the lowest level leaf nodes of aggregates / blocks that exist in ProVision. In this view, all blocks displayed are ProVision objects able to be edited or managed.



Parent View / Blocks Tree

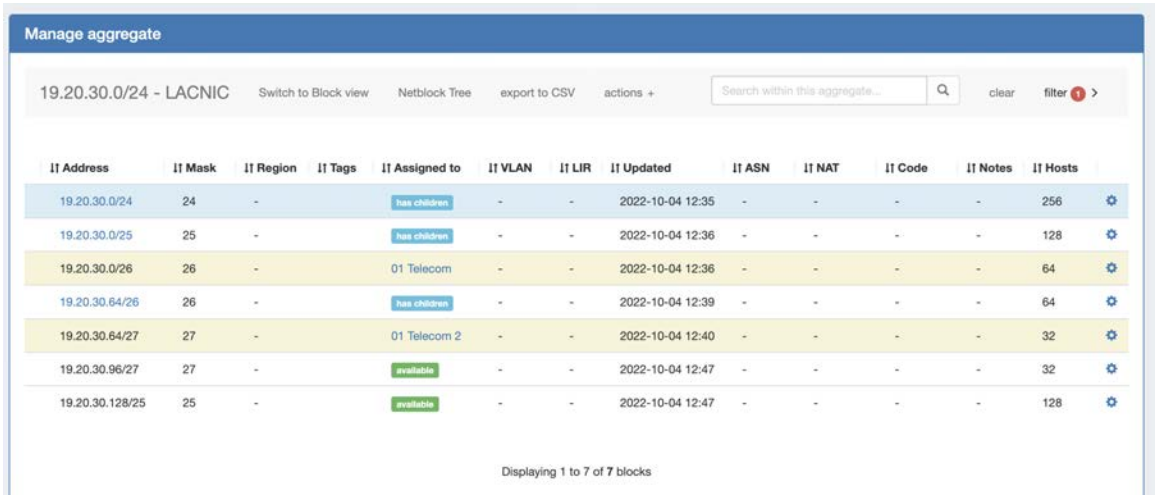
Parent View shows both low level child blocks and the parent blocks that contain them.

While in Manage aggregate, view parent blocks / IP block hierarchy, click on "Switch to Parent View" at the top of the block list.



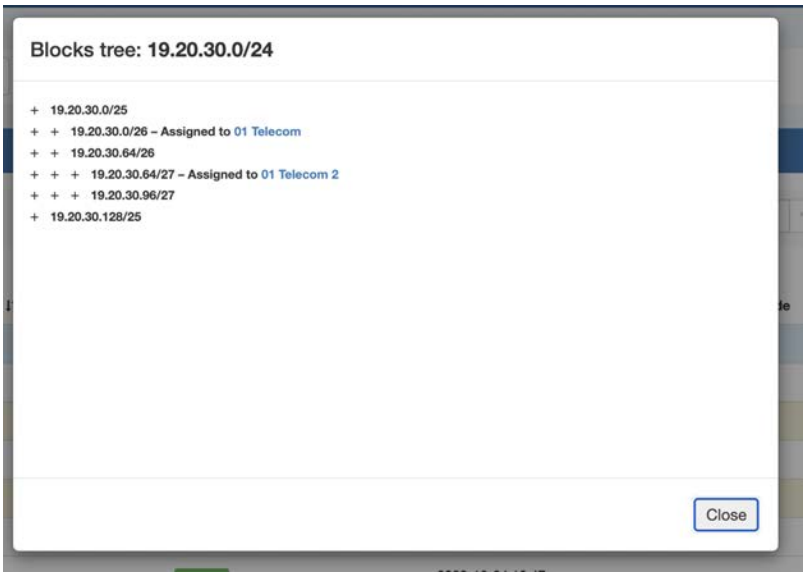
You may also enter Parent View via the "Filter" menu, by checking the "Select All Masks" checkbox and clicking "Apply", to show all masks and parent blocks.

Parent Blocks are distinguished by having a CIDR address link, and displaying a blue bar denoting "Has Children" under the "Assigned to" column.



Both Parent and Child blocks may be edited in this view.

Clicking on the Parent Block blue CIDR link will display the Parent View **Blocks Tree**, providing a simplified hierarchy view.

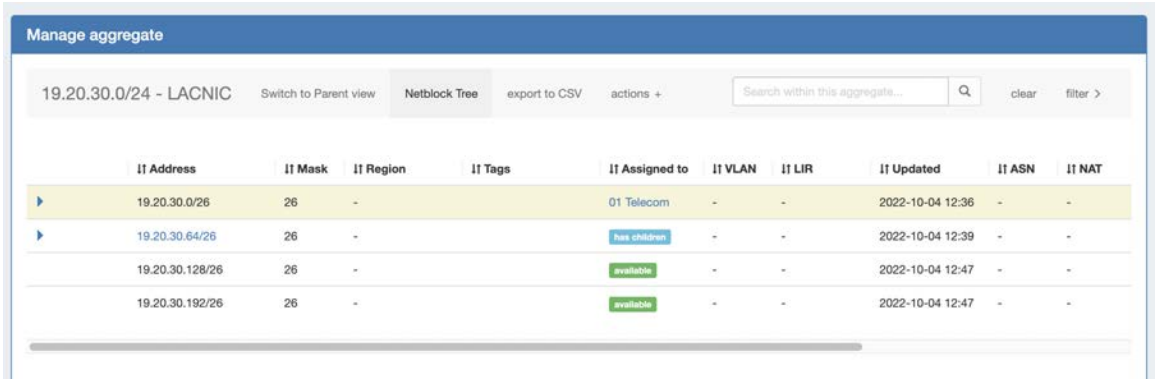


Netblock Tree

Netblock Tree View displays the hierarchy organization of Parent / Child blocks under a Top Level Aggregate, but eliminates intermediate "bookkeeping" / allocated blocks, and prioritizes masks with assigned blocks. This provides a more effective view at the specific hierarchy levels used for assignments and management.

The Netblock Tree view detects which subnet masks have changes in assignments applied, and then automatically builds branches or displays individual addresses at those levels. This view includes the display of theoretical blocks which do not currently exist as ProVision objects, providing a more holistic working overview of the netblock structure.

While in Netblock Tree View, click on the expansion caret to expand / close a hierarchy branch parent block. Only blocks which exist in ProVision will be able to be edited or expanded.



Netblock Tree Logic:

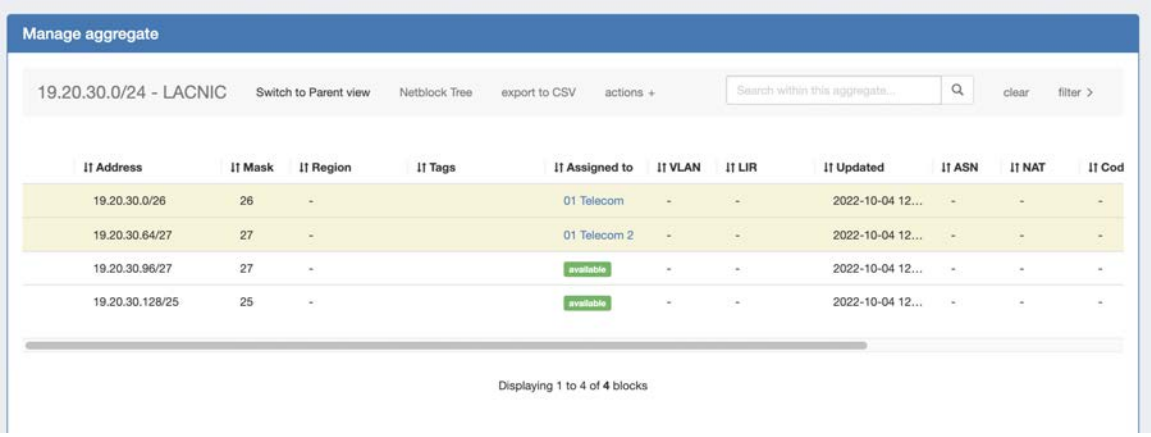
- The top level at which an assignment exists denotes the top starting mask of the Netblock Tree View
- Proceeding down the tree, if one of the following conditions are detected, a new branch is created showing all blocks with a prefix at that level - regardless of of whether they exist as editable ProVision block objects.
    - A change in assignment is detected (a block is assigned to a different resource than its parent)
    - A manual split has been performed at the assignment level of a sibling/cousin block
- If no more changes in assignment are detected down the block tree, the lowest branch will display as containing individual addresses (/32s or /128s). The addresses may be both theoretical and those existing in ProVision.
- Expandable branches display with blue arrows, and denote that the block with that prefix also exists in ProVision Block View
- Blocks and addresses which exist in ProVision will be editable in Netblock Tree View, but theoretical blocks at any level are not editable unless created in ProVision.

Example Walkthrough:

For a simplified example of the how Netblock Tree View displays compared to Block View, we will be using an example aggregate of 19.20.30.0 /24 (assigned to 'Available').

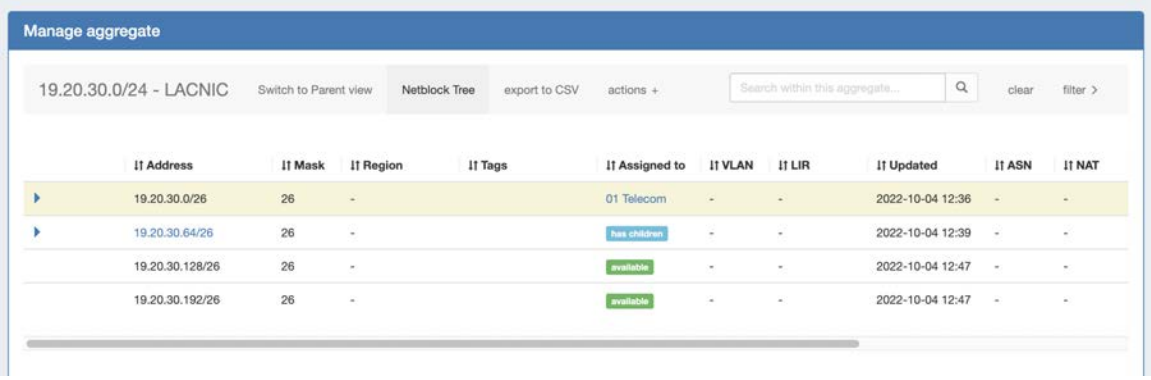
The standard Block View for this aggregate shows it has been split to contain a /25, a /26, and two /27s. The /26 and one of the /27s have been assigned to different resources.

In Block View, we only see the lowest child blocks that exist in ProVision:



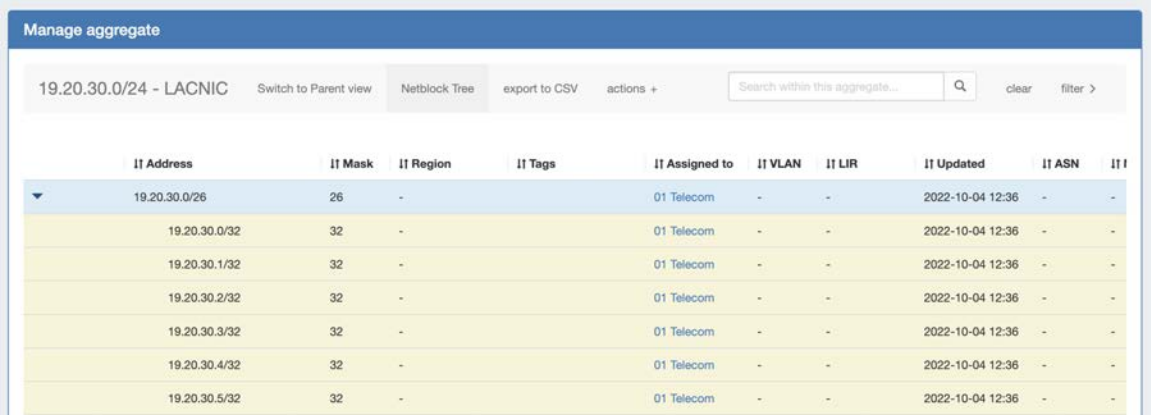
When we switch to Netblock Tree View (by clicking "Netblock Tree") we see only /26s in the top level of the view. This is because 19.20.30.0/26, assigned to '01 Telecom', is the first assigned block encountered.

Netblock Tree View will ignore 19.20.30.0/25 and 19.20.30.128/25 because they are assigned to the same resource as 19.20.30.0/24 ('Available').



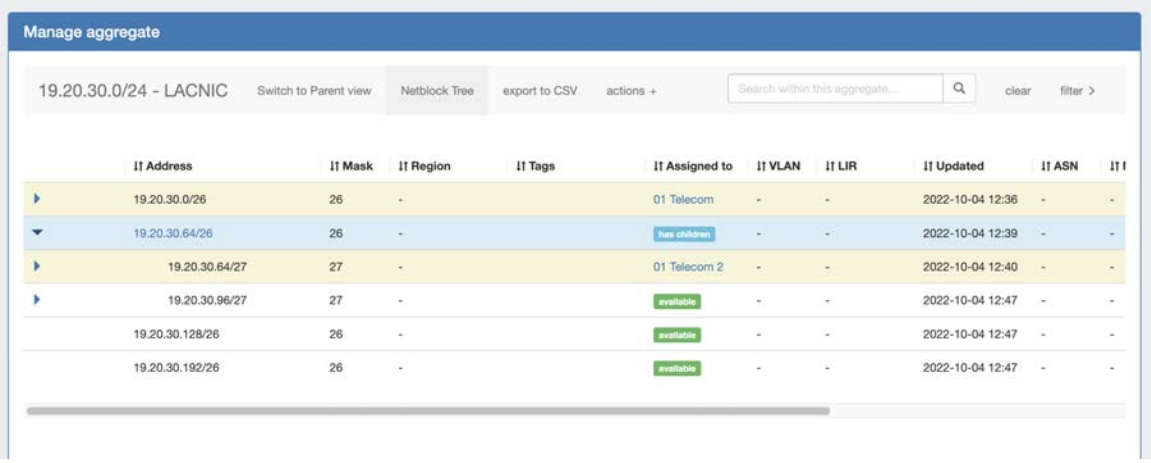
You can edit and expand 19.20.30.0/26 and 19.20.30.64/26 because these netblocks exist in the ProVision IPAM tree. You can verify this by switching to Block View, where you see only blocks which exist in ProVision.

There are no different assignments under this 19.20.30.0/26. Thus, when you expand it you will see only /32 addresses. As these /32s have not yet been created in ProVision Block View, they only exist as "theoretical" blocks and are not editable, but aid in viewing the totality of available addresses under that prefix.

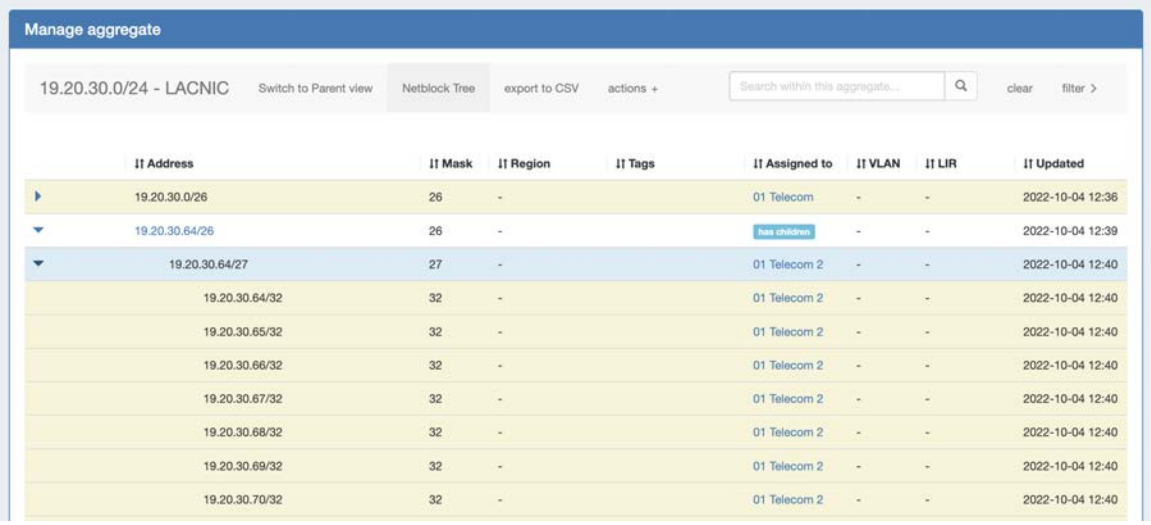


If you would like these addresses to be assigned or editable in ProVision, you may split the /26 down to the desired number of /32 addresses using templates or manual splits. This will create the addresses in ProVision and allow those addresses to be edited.

Now, go back up and try to expand 19.20.30.64/26. You will see expandable branches with mask /27, because 19.20.30.64/27 is assigned to '01 Telecom 2'. Since a change in assignment was detected at this level, branches were created for both the assigned block and its available sibling block.



Under those branches display individual /32 addresses, because the /27 is assigned.



As far as the remaining /26 blocks: In 'Netblock tree view' you can't edit or expand 19.20.30.128/26 and 19.20.30.194/26 because they don't exist in ProVision - because 19.20.30.128/25 is not split, so both /26s are "theoretical".

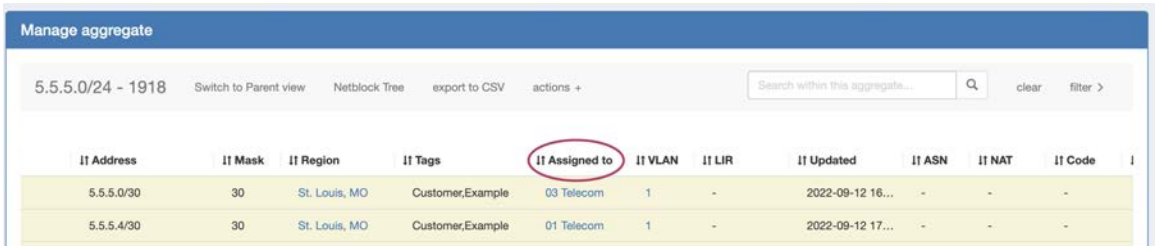
However, if 19.20.30.128/25 is split into two /26s in ProVision, the previously theoretical blocks of 19.20.30.128/26 and 19.20.30.194/26 become 'real' objects, and will display as expandable and editable.

Working in IPAM Manage Views

Sort Blocks

Sort the IPAM Manage blocks list by clicking on any column name the in list with the up-down arrows icon ().

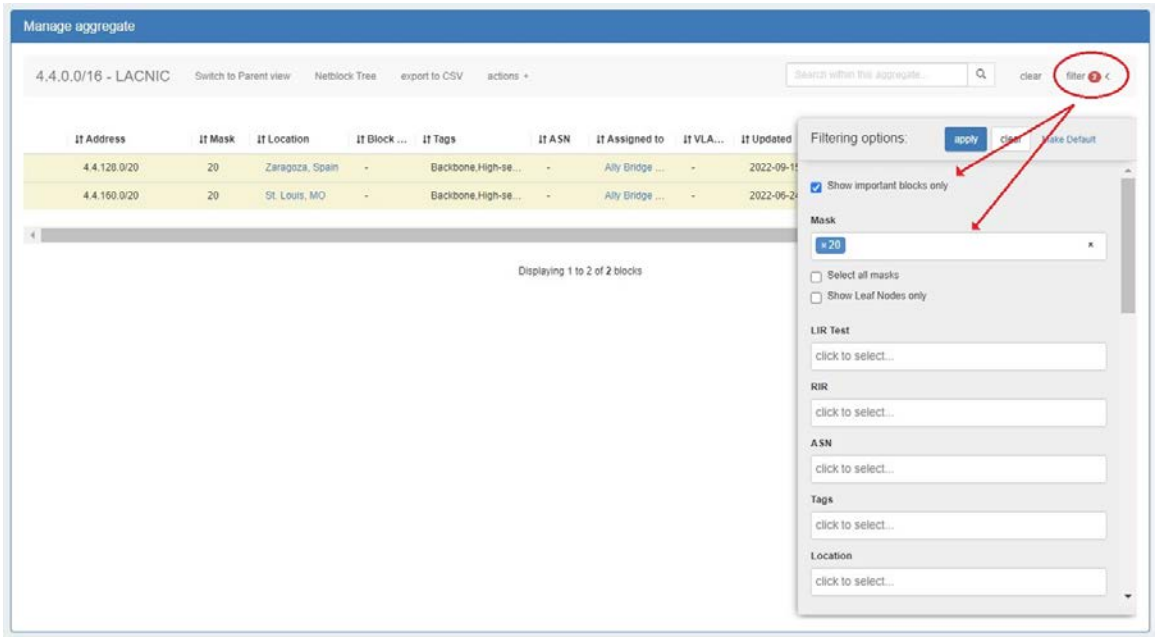
The list will sort between ascending and descending order for that field.



Filter / Search Blocks

Filter the block list in IPAM Manage by toggling the "Filter +" link in the top right corner of the aggregate header.

A flyout will appear with filter criteria options. Select or type the option under your desired field, and hit "Apply". A red filter flag indicates the number of filters applied to the list. When done, click "clear". To hide the filter flyout, just click the "filter -" link again.



Once a filter(s) has been applied, click on "Make Default" and the filtered block list will be saved as the default view for that aggregate. When a filtered view is saved as the default the filter flag will continue to display.

You may also search for a specific block entering a full or partial CIDR, assigned resource name, or other search term into the search box at the top of the list.

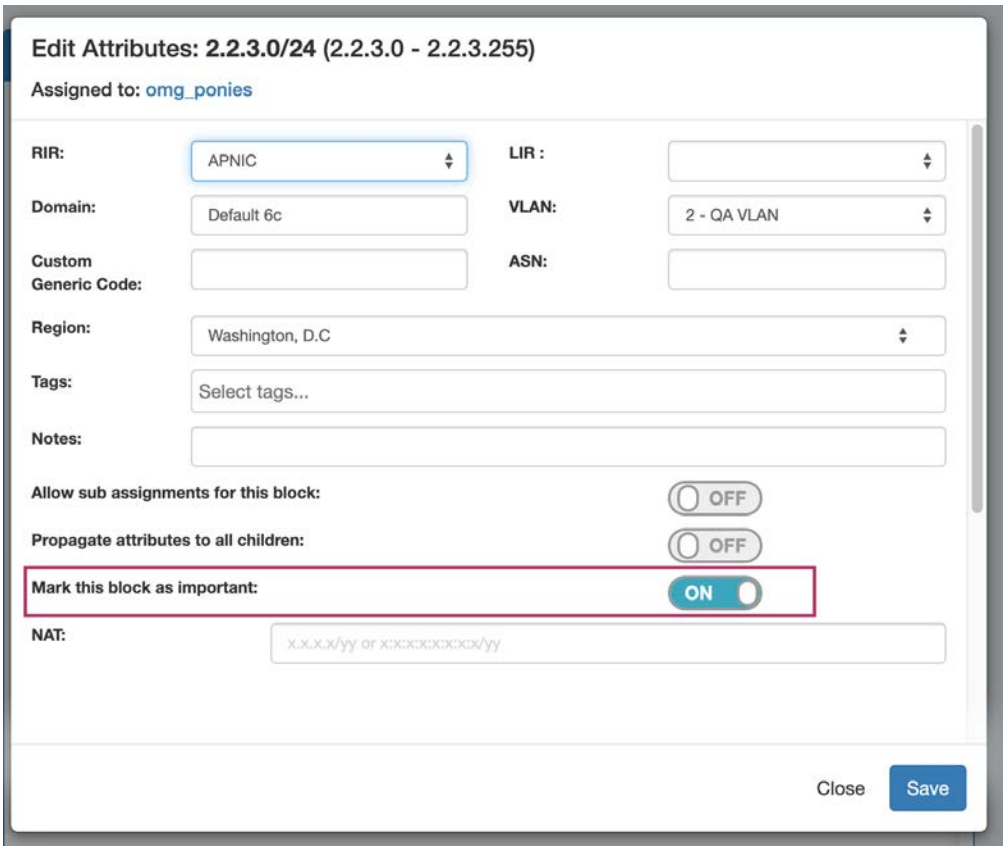
Important Blocks

"Important" IP blocks display with a yellow background highlight. By default, any block that has been manually assigned, unassigned, or had other high-level manual interactions performed will be automatically marked as "Important".



Blocks may be manually marked or unmarked as "Important" from either the "Edit Block" interface or from the API.

To edit the important flag, open Edit block, then select / deselect the toggle for "Mark this block as important", and save your changes.



If multiple blocks are selected with mixed "important" statuses, then the toggle will display in the "Off" position.

To update all selected blocks to flag as important, switch the toggle to "On", and save changes. To switch all to the "Off" position, you may either toggle all blocks to "On", save changes, then switch all blocks back to "Off" and re-save, or adjust your selection to only include the blocks that need the Important Flag removed. (Tip: Use the list filter to show only "important" blocks!)

Working with IP Blocks - Common Tasks

Individual Blocks may be managed from either IPAM Manage, or the IPAM Gadget. (if assigned to a resource, and the IPAM Gadget is enabled on the Resource's Entry Page).

In general, standard actions from the Action Menu will be performed the same in either area, with "Assign" being the exception.

For details on some common tasks to perform with IP Blocks, see the next section: Working with IP Blocks - Common Tasks:

Additional Information

For additional information on working with the IPAM system, see the following areas:

- IPAM Gadgets
- Working with IP Rules
- IPAM Administration
- Working with NAT Blocks

Working with IP Blocks - Common Tasks

Working with IP Blocks - Common Tasks

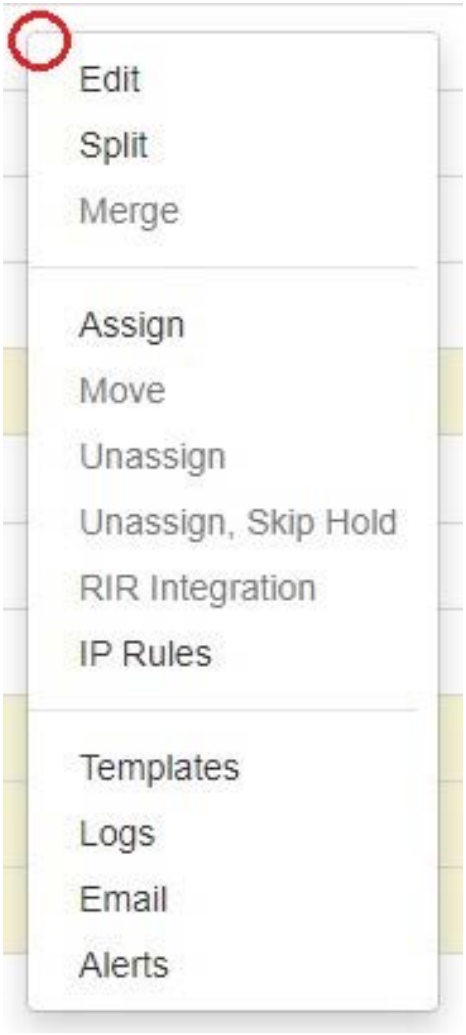
Individual Blocks may be managed from either IPAM Manage, or the IPAM Gadget. (if assigned to a resource, and the IPAM Gadget is enabled on the Resource's Entry Page).

In general, standard actions from the Action Menu will be performed the same in either area, with "Assign" being the exception.

- Working with IP Blocks - Common Tasks
  - IPAM Block Action Menu - Overview
  - Split or Merge Blocks Manually
  - Split or Merge Blocks Using Templates
  - Edit IP Block Attributes
    - Edit Attributes Overview:
    - IPAM Auto AS-Resource
  - Assign IP Space
    - Assign Space from the IPAMv2 Gadget
    - Direct Assign
    - Smart Assign / Smart Browse
    - Predefined Filters
      - Smart Assign Templates
  - Manually Assign Space from IPAM Manage
  - Sub Assigning IP Space
  - Set IP Block Alerts
  - Unassign IP Space
  - Additional Information

IPAM Block Action Menu - Overview

Most actions performed with block managed are contained under the IPAM Manage - Action Menu. Open the Action Menu by left clicking on the Gear Icon, or right clicking anywhere on the block's row. The same Action Menu is also available to manage blocks via the IPAM Gadget.



The Action Menu contains the following options:

- **Edit:** Opens the blocks "Edit Attributes" page, used to add, change, or remove data associated with a block. Can also be opened by double clicking on a block's row.
- **Split:** Splits the selected single block into two equal smaller blocks, of the next smallest mask, e.g. a /24 will be split into two /25s. The Split option is not available for blocks that are already of the smallest available size (IPv4 /32s or IPv6 /128s), for blocks in "Holding", or for blocks that are already assigned and do not have subassignments enabled. If more than one level of splitting is needed, use "Templates - Auto Split" instead.
- **Merge:** The opposite of Split. Merge combines two blocks of equal size into the next largest mask, e. g., two /25s will be merged into one /24. Merge is only available for adjacent blocks of the same size that are "Available", in "Holding", or is subassignable.
- **Assign**: Assigns the block to a ProVision Resource, making it unavailable for other assignment actions and certain block actions (unless edited to be subassignable).
- **Move:** Moves IP Blocks from one resource to another without the need to pass through either the Holding or Available status.
- **Unassign:** Unassigns the Resource from the current block, and moves the block into the Holding Tank. The block may then be eligible for certain actions such as direct assignment, merge, and split - but not for automated assignments until it is removed from Holding and regains the "Available" status. Unassigning a subassigned block will first place the block in "Holding", and then restore it to the parent assignment. (Tip: You can "Unassign" twice in a row to bypass "Holding", or select "Unassign, Skip Holding".)
- **Unassign, Skip Holding**: Unassigns the Resource from the current block, and bypasses the Holding Tank, restoring the block to "Available" status (or to the parent assignment if the block was subassigned).
- **RIR Integration:** Provides SWIP/RPSL functions for ARIN and RIPE blocks through simple reassigns, sending the updated block assignment information back to the coordinating RIR (ARIN or RIPE). See LIR Management and Use and RIR Integration: SWIP/RPSL.
- **IP Rules:** Create or Associate an IP Rule to the block to reserve portions of the block from assignment. See IPAM Rules.
- **Templates:** Provides options to 'Auto-Split' a standard block (that is available for standard "split" functionality) down to a certain mask and limit, or "Clean Up"(Auto-merge) a Parent Block to a certain mask level.

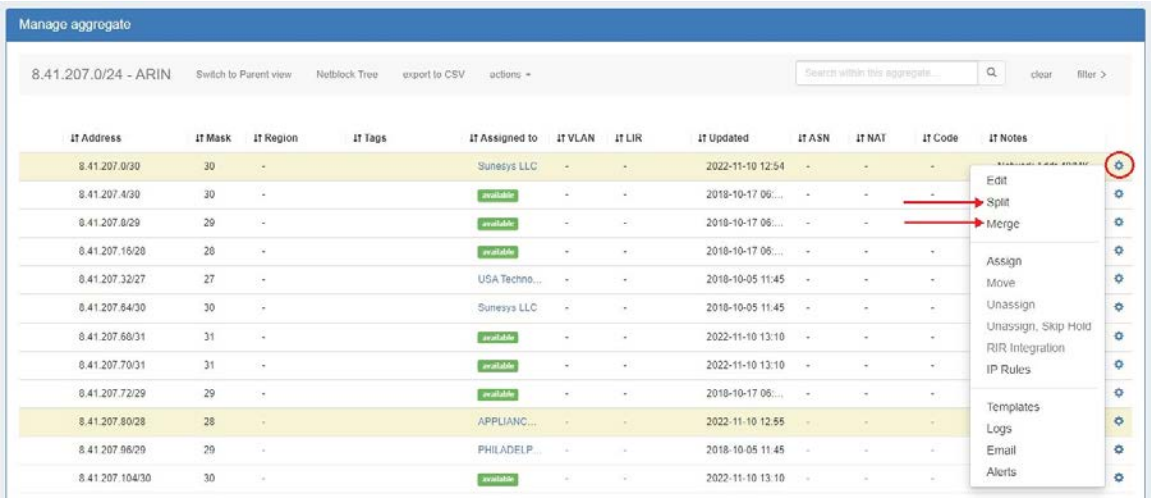
- **Logs:** Shows recent log event actions associated with that block.
- **Configure NAT:** Only displays for NAT'ed blocks. Configures the NAT'ed block to the selected router.
- **Email:** If a Contact is associated with the Resource assigned to the block, an email form with display to email the Contact with the template options provided in Admin Settings.
- **Alerts:** Enable or clear alert emails for a block by setting an email address and utilization percentage level. When the block is utilized to the set percent, an email alert will be sent to the provided address.

Split or Merge Blocks Manually

To split a block manually, click on the Action Menu (Gear icon), or right-click anywhere in the row for the available block you wish to modify.

In the menu that appears, select the "Split" function.

To aggregate blocks, select "Merge" from the same menu.

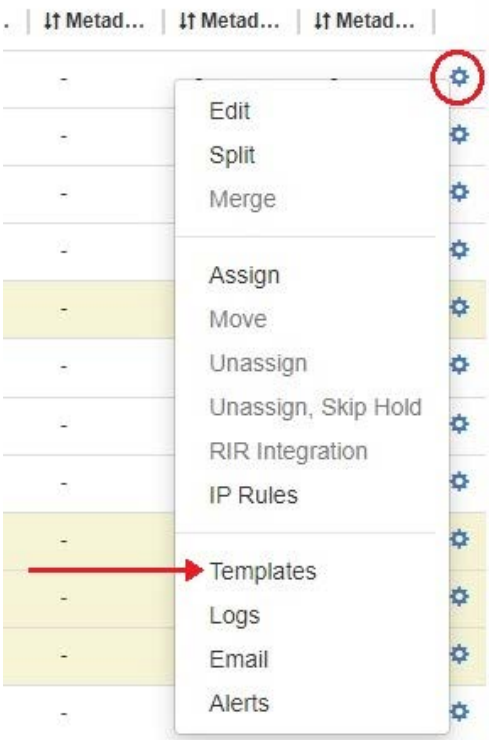


The Split option is not available for blocks that are already of the smallest available size (IPv4 /32s or IPv6 /128s), for blocks in "Holding", or for blocks that are already assigned and do not have subassignments enabled. If more than one level of splitting is needed, use "Templates - Auto Split" instead.

Merge is only available for adjacent blocks of the same size that are "Available", in "Holding", or are subassignable.

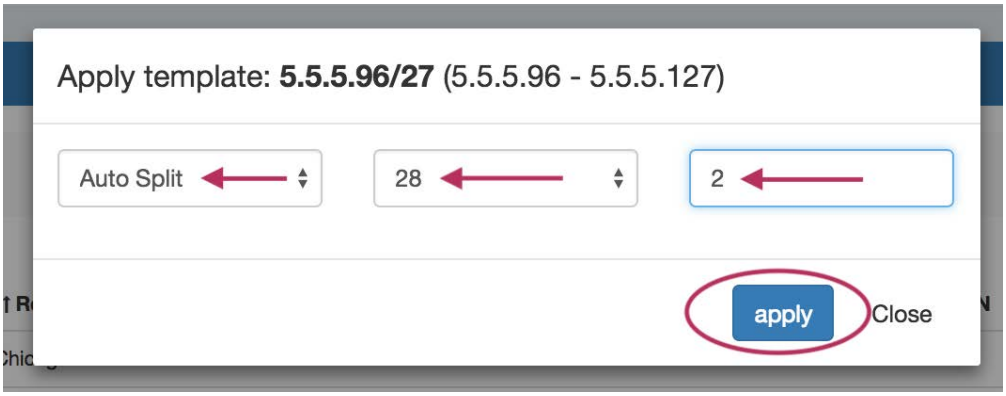
Split or Merge Blocks Using Templates

Templates for a block are available under the Action Menu (gear icon or right-click) for that block. Templates are only usable from IPAM Manage.



There are two templates available: Cleanup (Only available for parent blocks) which auto-aggregates the block, and Auto-split.

Select the available template action, the mask, and the limit. When done, click the "Apply" button.

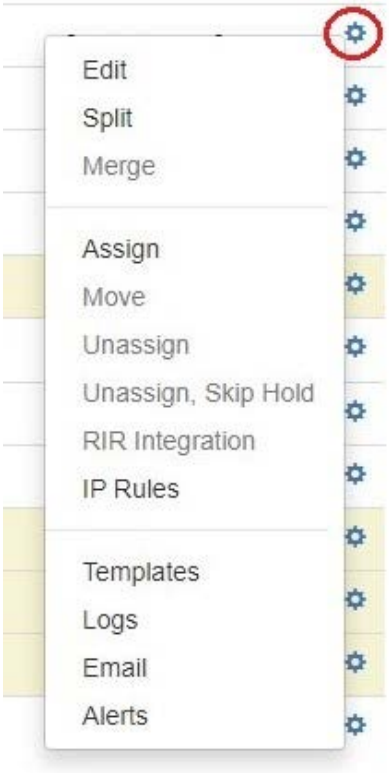


You can also use the "Templates" option from the Action Menu on the IPAM Manage screen for the specific block.

Edit IP Block Attributes

You may edit a block / multiple blocks from either IPAM Manage or the IPAM Gadget, with the same options available.

Select the "Edit" option from the Action Menu (or double click on the block row) for a given block to get the Edit Attributes menu.



To edit multiple blocks at a time, shift-click each block you wish to edit - they will highlight in blue. Once selected, right-click on any highlighted block to open the multi-edit attributes screen.

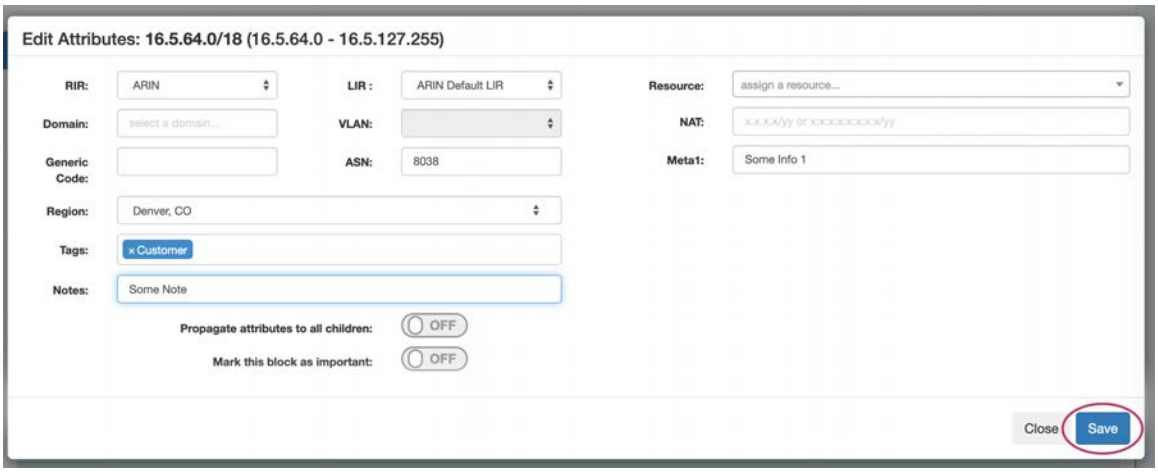


Once selected, right-click on any highlighted block to open the multi-edit attributes screen.

From here you can set a variety of attributes for a given block. These values are also customizable from the Admin screen - see IPAM Administration and IPAM Lists Management to customize, enable, or disable the available parameters.

> If a field that you know is supported in ProVision appears to be 'missing' from the IPAM Mange, IPAM Manage filters, or Edit Attributes screens, check the following:
>
> Have an Admin verify that the field is set to "enabled" in Admin IPAM Admin Edit Columns. Any field disabled here will be hidden throughout ProVision, and some functions are dependent on certain fields being enabled - for example, filtering by Mask in IPAM Manage requires the "Host" field to be enabled.
>
> In IPAM manage, verify that the column widths of each field are set wide enough to display the column header
>
> Check for a scroll bar - when all attributes are enabled, many screens will require scrolling down or to the right in order to see all of the available data.

After editing the desired attributes for the block, simply hit "Save".



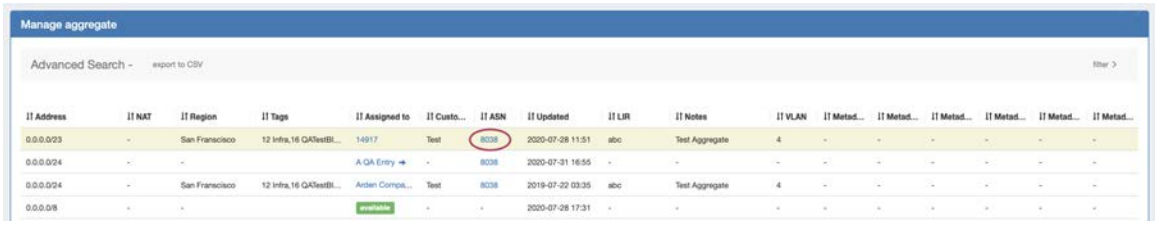
Edit Attributes Overview:

- **RIR:** The RIR associated with the aggregate / block.
- **LIR:** If LIRs are set up in IPAM Admin for the associated RIR, they will be selectable in this dropdown. See LIR Management and Use.
- **Domain:** The VLAN Domain to associate with the block. To set up domains in ProVision, see VLAN - Working with Domains.
- **VLAN:** VLAN information for the block, must have domain selected to view available VLANs.
- **Generic:** This is a customizable text field that can be used to track information specific to your needs. It can be filtered in the IPAM Manage screen. The header, display, and enable/disable settings for this field are set under IPAM Configuration in the IPAM Administration section.
- **ASN:** The ASN to associate with the block. ProVision auto-generates AS-Resources when an ASN is provided for the field in standard ASN format.
- **Region:** Select the region from the drop down menu. Regions can be added and customized in the IPAM Admin section of ProVision - see IPAM Administration and IPAM Lists Management.
- **Tags:** Tags can be set under Edit Tags in the IPAM Administration section.
- **Notes:** Freeform text field for additional information you wish to capture.
- **Resource:** The resource assigned to the block. Click "Create and assign" to create a new resource to assign the block to if desired.
- **NAT**: The corresponding public or private block CIDR that is associated with the current block.
- **Metadata1 - Metadata 10:** User-defined text fields, as set in IPAM Administration Edit Columns.
- **Allow Sub-assignments:** When editing a block that has been assigned, toggling this setting to "On" allows for further subassignments, indicated by a blue arrow next to the assignment in the Manage screen. Note: Subassign status cannot be changed if a block has children.
- **Propagate Attributes to Children:** Toggle this setting to "On" when editing a parent block to carry through attribute changes to all children of that block *for that edit* (Only the changes made during that edit will propagate, instead of all values). This is not a persistent setting - it only applies to the specific edit you are in the process of making. To view parent blocks, and see which children would be affected, view the aggregate / parent block in Parent View or set filters to "Select all masks".

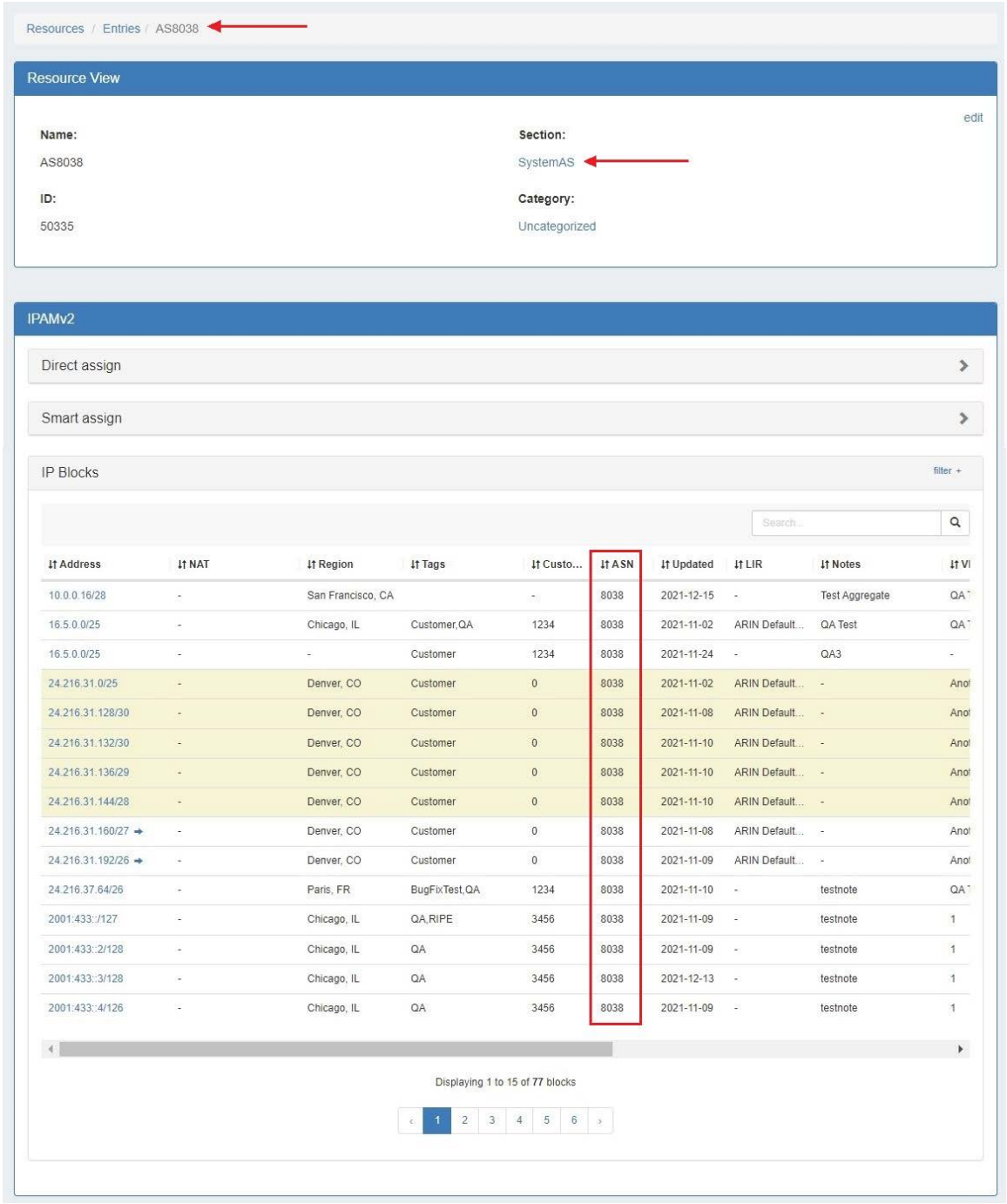
> Note: The VLAN of a child cannot be different from that of its parent, so for multi-level situations (Parent -> Child -> Grandchild), VLAN should be updated at the top tier parent level.

IPAM Auto AS-Resource

ProVision automatically creates an AS resource for ASN's entered into IPAM Manage (formatted as "AS1234" or "1234").



An ASN in IPAM Manage will link to the created resource, which will display all IP Blocks in ProVision with that ASN value. SystemAS resources may not be edited, however they may be deleted by an admin if desired.



Assign IP Space

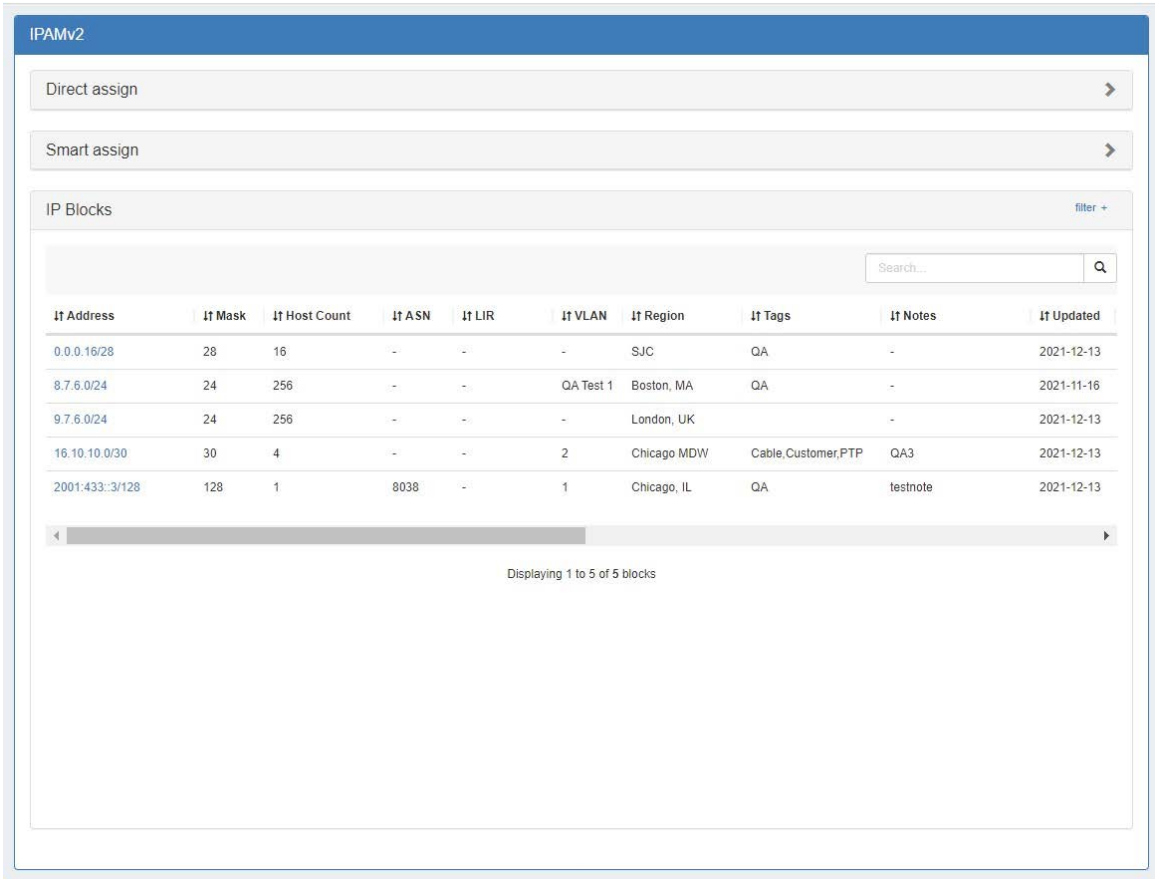
There are two areas where you can assign IP Space: in the IPAM Gadget for the particular Resource, or through IPAM Manage for manually assigning a block to a resource.

The IPAM Gadget allows for more detailed assignment options including Direct Assign, Smart Browse, and Smart Assign with advanced options, and is the primary tool for space assignment.

Assign Space from the IPAMv2 Gadget

The IPAM Gadget is accessed from a Resource Entry page, once enabled for the Section (to add Gadgets, see Customizing Sections and Add Gadgets to your Section).

For additional details on the IPAMv2 Gadget, see Gadgets.



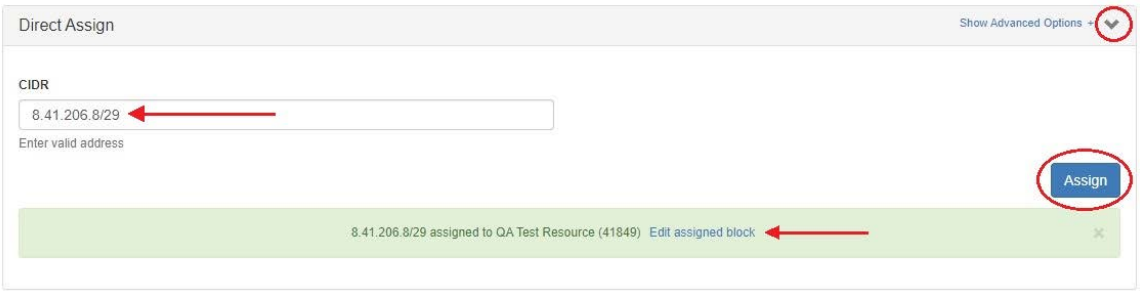
You have three options for assigning IP space using the IPAM Gadget: Direct Assign, Smart Assign, and Smart Browse.

Direct Assign

Direct Assign is used when you know the exact CIDR that you wish to assign to the Resource. You can use "Simple" direct assign, for straightforward assignments of a CIDR to the Resource, or "Advanced", used in cases where duplicate blocks may exist and you need additional criteria to differentiate between them.

Simple Direct Assign:

Expand the "Direct Assign" module of the IPAMv2 Gadget by clicking the "Expand" arrow on the right side of the header.

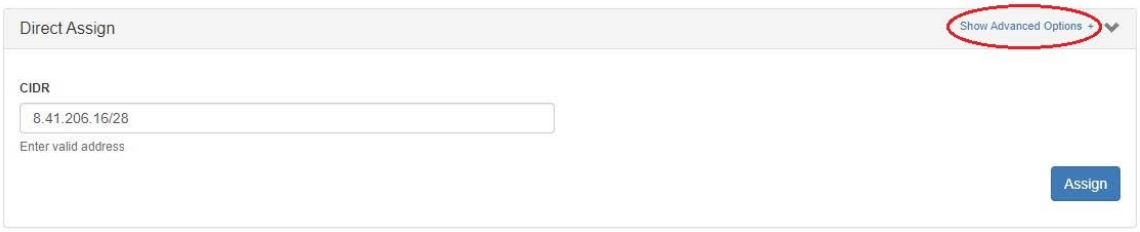


Type the desired CIDR to assign in the CIDR input box, then click "Assign". A message will appear to confirm success, or provide details on an error. A newly assigned block may be edited immediately by clicking "Edit assigned block" in the message bubble.

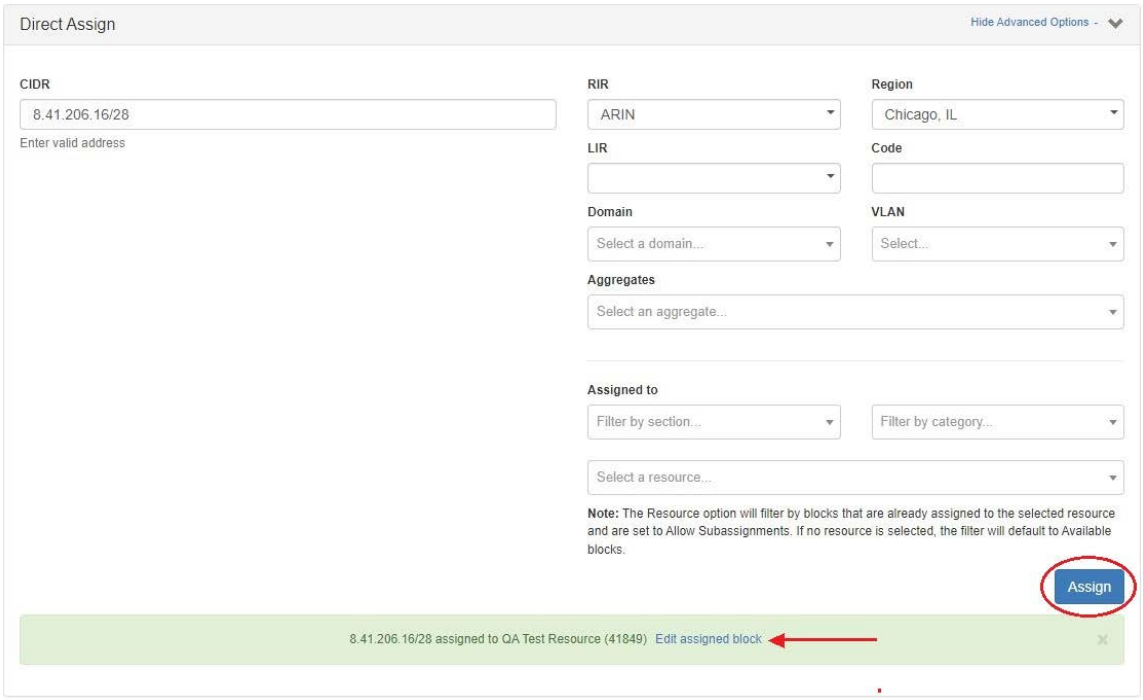
Advanced Direct Assign:

In some cases, you make need the ability to further specify a block to direct assign - such as if you have duplicate 1918 blocks. The "Show Advanced Options" filters allow for further detail to be provided to ensure ProVision assigns the specific block that is intended.

Expand the "Advanced Options + " link to the right of the "Direct Assign" module header.

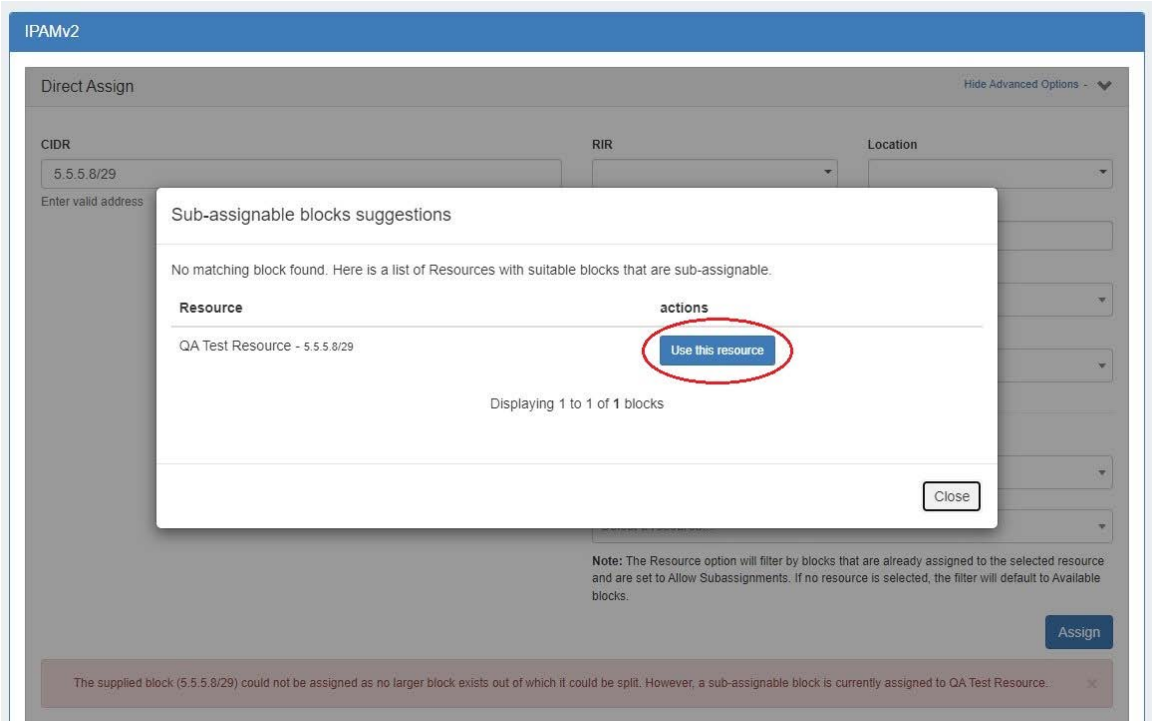


Then, add in the desired CIDR, and set your additional filter criteria, such as RIR, region, LIR, VLAN, and so forth. To assign a sub-assignable block, select the resource under which the block is allocated. Section and category options are available to filter the resource selector. When done, hit "Assign".



A newly assigned block may be edited immediately by clicking "Edit assigned block" in the success message bubble.

If no available blocks are found meeting the Direct Assign filter conditions, but one or more subassignable blocks are found, a modal will inform the user and suggest resources with allocations that meet that criteria. To assign the suggested block, simply click "Use this resource".



Smart Assign / Smart Browse

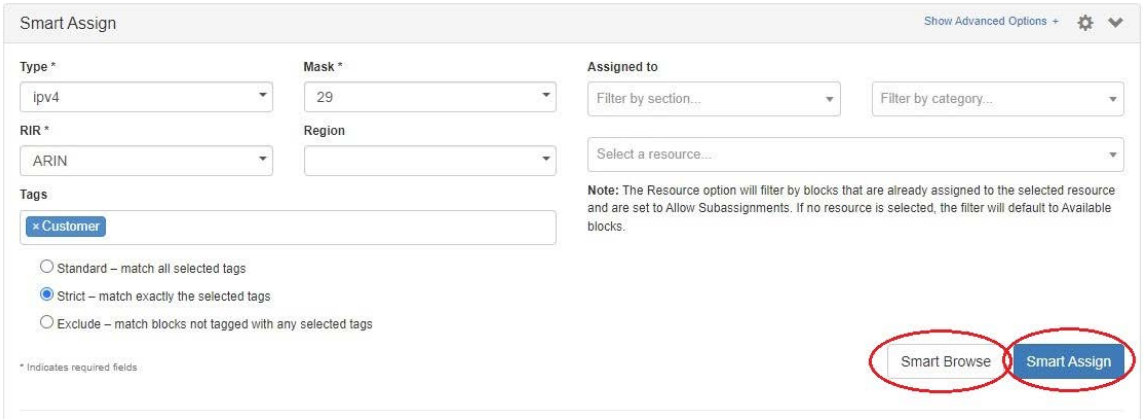
Smart Assign and Smart Browse are used when you have criteria that you need to meet for the assignment, and any block meeting that criteria is acceptable for assignment.

With Smart Assign, you enter criteria such as IP Type, Size, RIR, Region, and Tag information, then ProVision's automation will automatically assign a block meeting that criteria, if any exist. Smart Browse uses the same criteria, but provides a browsable list of blocks meeting that criteria for you to select from. Users can also save commonly applied Smart Assign / Smart Browse filter criteria for repeat use as Predefined Filters.

Expand the "Smart Assign" module in the IPAMv2 by clicking the expansion arrow in the right side of the Smart Assign header.

For a basic assignment, enter at least the IP type, RIR, and block size.

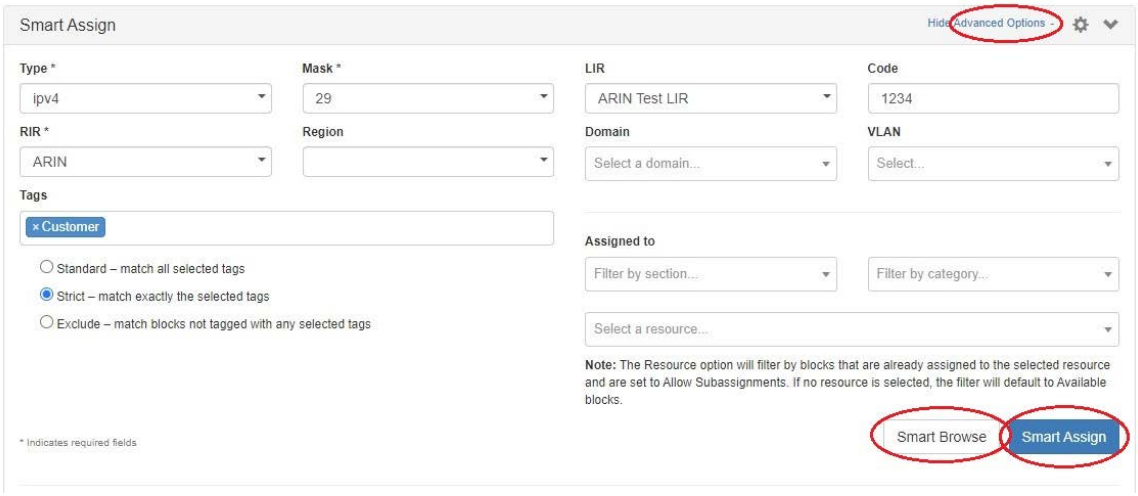
To assign a sub-assignable block, select the resource under which the block is allocated. Section and category options are available to filter the resource selector.



IP Tag filters are optional. IP Tag filters exist in three modes:

- Standard - checks to see if the selected tag is associated with the block
- Strict: limits results to blocks with exactly the selected tag(s)
- Exclude - blocks without the selected tag(s)

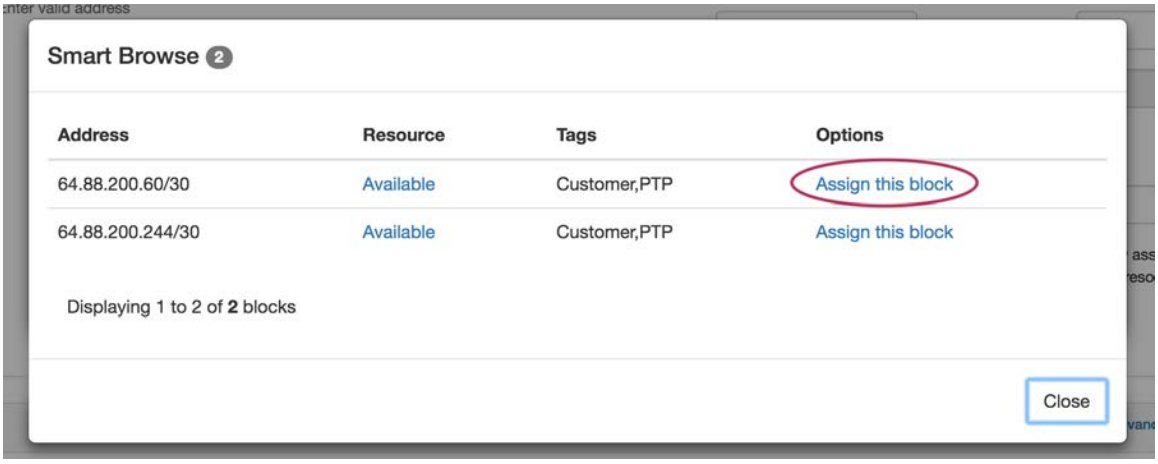
For Advanced Options, Click the "Show Advanced Options +" expansion link in the top right of the header. Additional filter criteria will be available to apply to both Smart Browse and Smart Assign.



Then click "Smart Browse" or "Smart Assign".

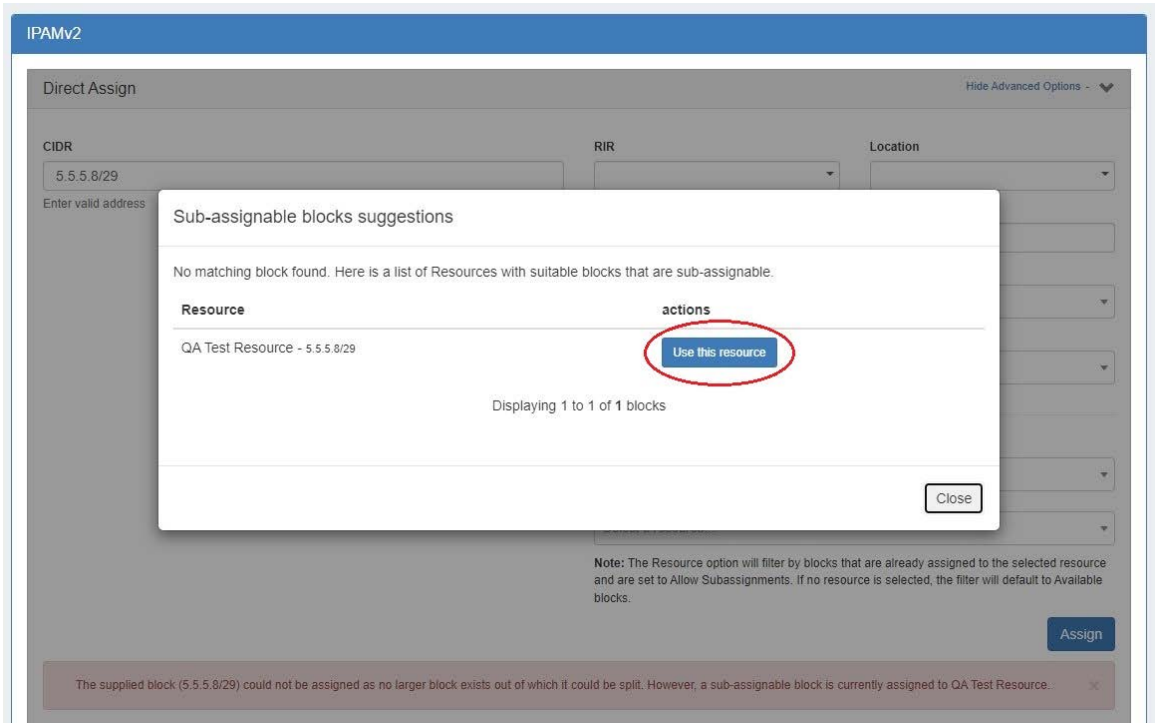
For Smart Assign, you will receive a message indicating a successful assignment, or information regarding an error. If no blocks are available meeting the criteria, the message will say so. In this case, try removing one or more of your filter criteria and try again. As with Direct Assign, a newly assigned block may be edited immediately by clicking "Edit assigned block" in the success message bubble.

For Smart Browse, a screen will pop up showing blocks meeting your criteria. Browse to the block you want to assign, and click either "Assign this block", or "Assign from this block"(splits a larger block down).



Successful assignments will be added to the "IP Blocks" list in the IPAMv2 Gadget, and are able to be managed in the IPAM Gadget, IPAMv2 Gadget, or IPAM Manage Screen.

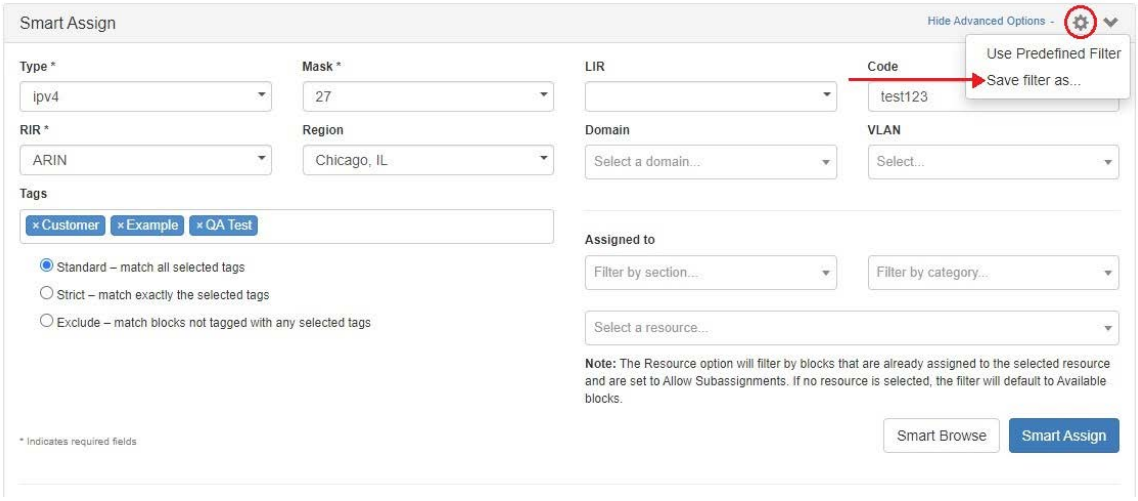
If no available blocks are found meeting the Smart Assign or Smart Browse filter conditions, but one or more subassignable blocks are found, a modal will inform the user and suggest resources with allocations that meet that criteria. To assign the suggested block, simply click "Use this resource".



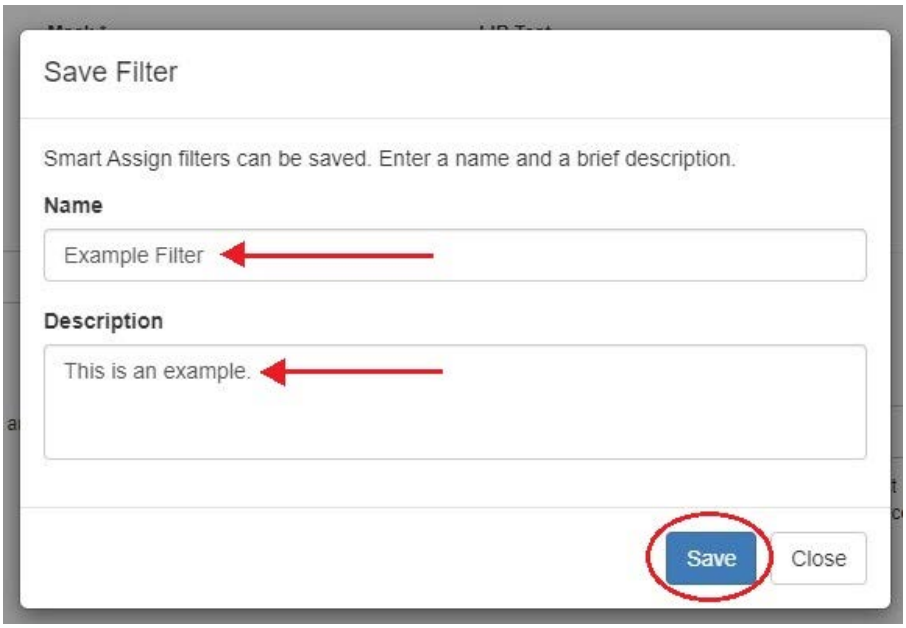
Predefined Filters

Users can save Smart Assign filter criteria for repeat use by saving them as Predefined Filters, accessible through the gear menu at upper right of the Smart Assign section.

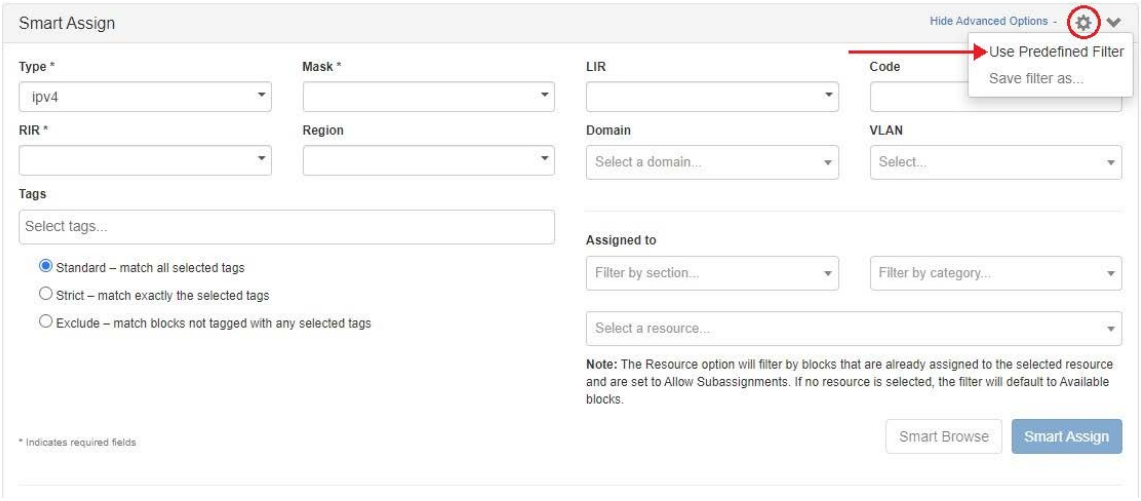
To create a Predefined Filter, select Smart Assign filter criteria. Click on the gear icon at upper right and select "Save filter as..."



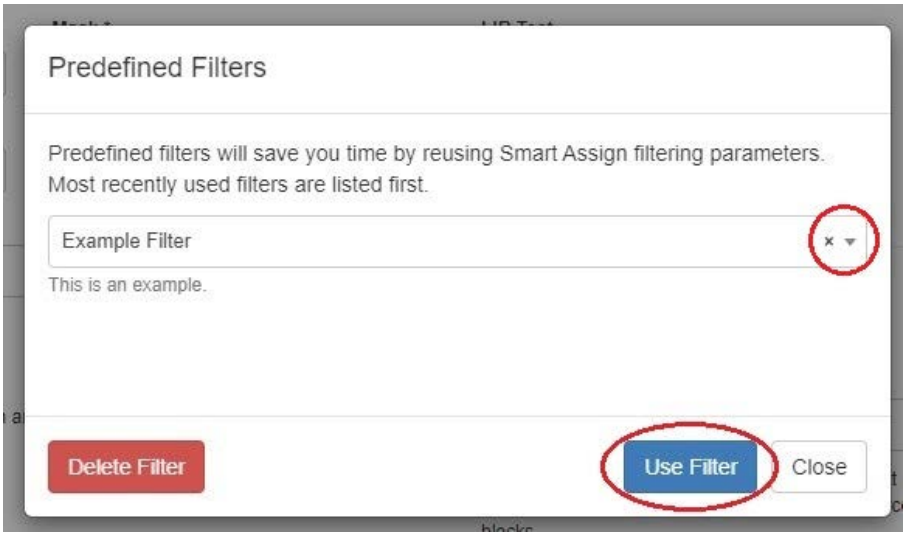
Enter a name and brief description for the filter and click "Save".



To use a saved filter, click on the gear menu and click "Use Predefined Filter".



Select a filter from the dropdown and click "Use Filter". A saved filter may be deleted by selecting "Delete Filter".

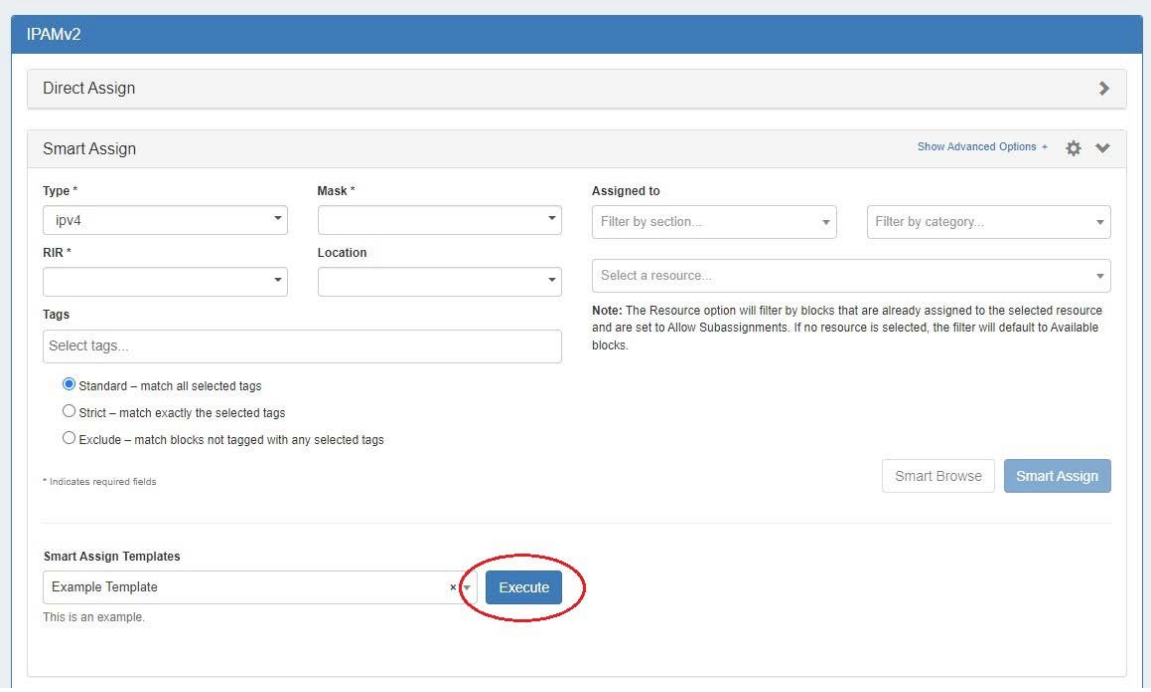


Once the filter is applied, click "Smart Browse" or "Smart Assign" as normal.

Smart Assign Templates

Smart Assign Templates provide the ability to define complex assignment scenarios including those with multiple steps. Once a template has been created in IPAM Admin, it may be selected for use in the IPAM Gadget.

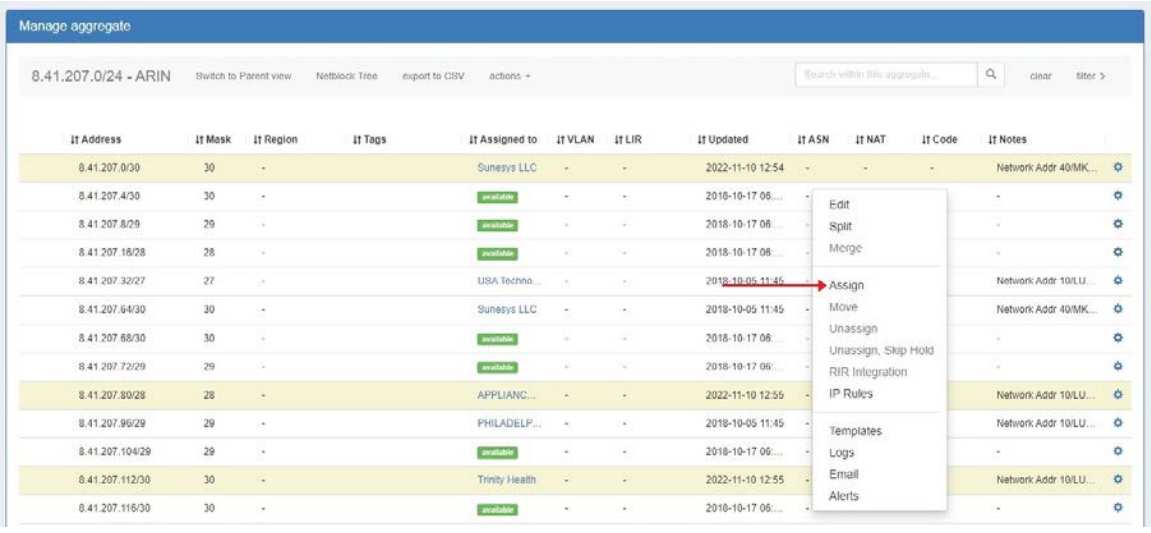
To run a smart assign template from the IPAM Gadget, expand Smart Assign and select the template from the "Smart Assign Templates" dropdown and click "Execute".



For information on setting up a smart assign template (Admin only), see Smart Assign Templates.

Manually Assign Space from IPAM Manage

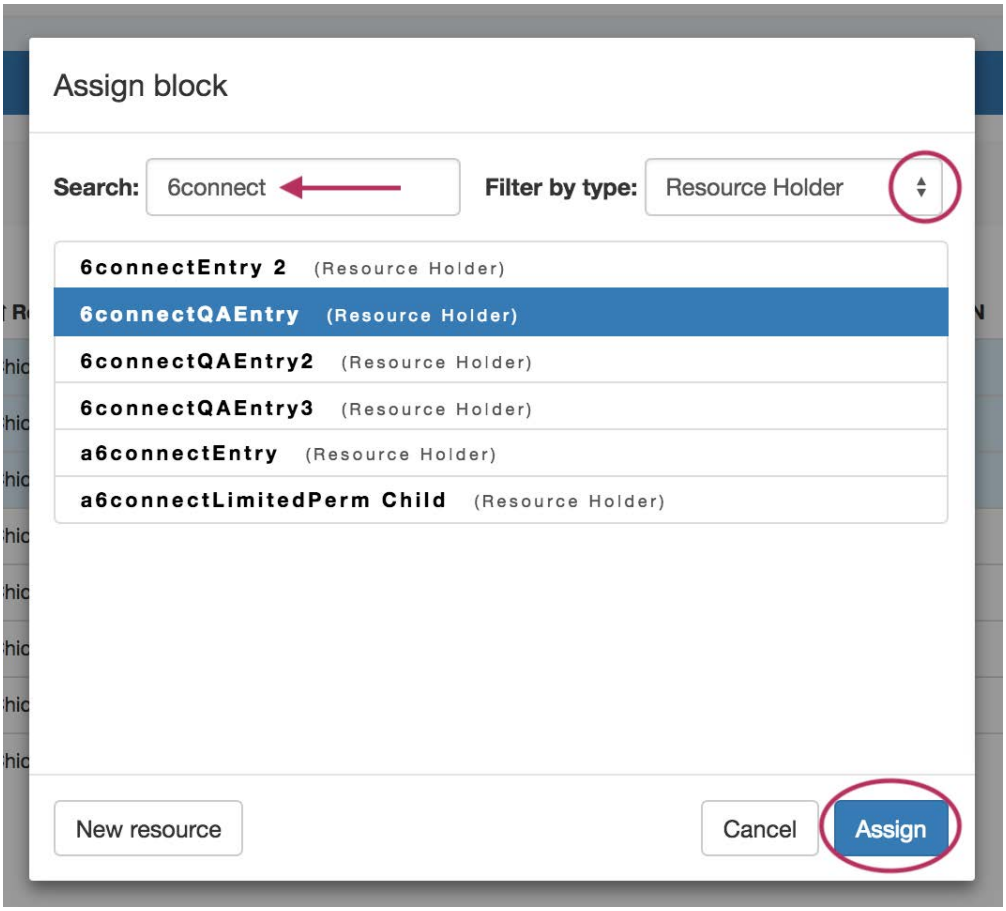
You can also assign blocks manually using the "Assign" function from the IPAM Manager screen (accessible from the IPAM Tab). Open the Action Menu for a block, then select "Assign".



Assignments may also be performed for multiple blocks at a time, by shift-clicking the desired blocks, and right-clicking on any highlighted row to open the multi-block menu (choose "Assign Selected Blocks") :



Then, search for / select the Resource to assign the block. A filter tool is provided to narrow the list to a particular Section type.



When the correct resource has been selected, click the "Assign" button. If needed, a new resource can be created by clicking the "New Resource" button.

After assigning, you can further edit the block attributes or subassign space.

'Reserving' IP Space

If you need to create a 'reserved' pool from which to assign blocks, you can achieve this by creating a "Reserved" Section. Create a Section called "Reserved", add the IPAM gadget to it, then create an Entry with that Section to be the address group. From there, use the IPAM gadget and the IPAM Manage page to assign and unassign IP space from that pool.

For more details, see the FAQ entry: "How do I 'reserve' IP Space?"

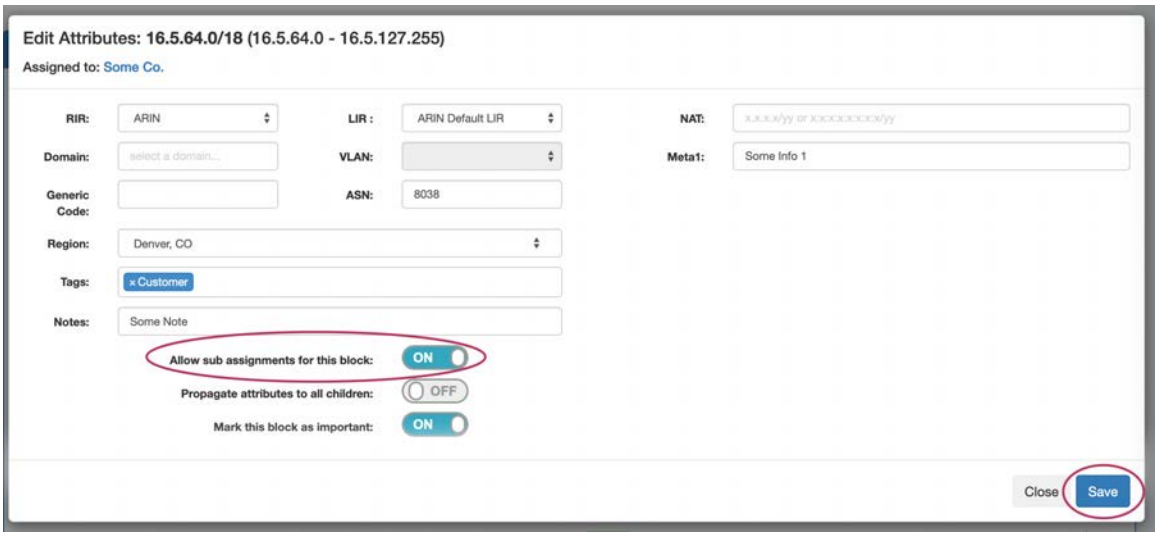
Sub Assigning IP Space

To allow sub assignments, just toggle the "Allow sub assignments" button to "On" under Edit block.

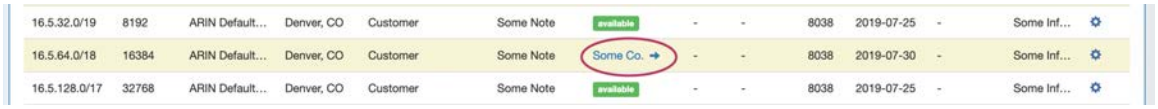
Once the allow sub assignments box is checked the block is set to the "allocated" status, and may be further split and assigned to other resources, using IPAM Manage or the IPAM Gadget.

Split blocks may also be re-claimed to the originally assigned resource and re-aggregated. When "allow sub assignments" is checked, the block is counted as allocated, but not assigned - various statistics in IPAM, on the dashboard, and reporting will reflect this.

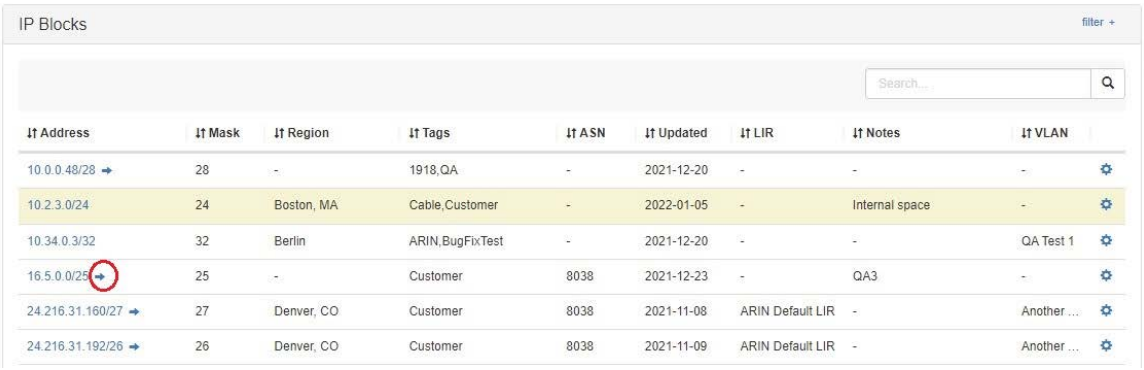
Sub assignments can be useful for tracking IPs assigned to a customer with multiple subsidiaries, or locations.



If a block is subassignable, a blue arrow will display in the "Assigned To" field in IPAM Manage.



In the IPAM gadget, subassignable blocks display a blue arrow in the 'Address' field.



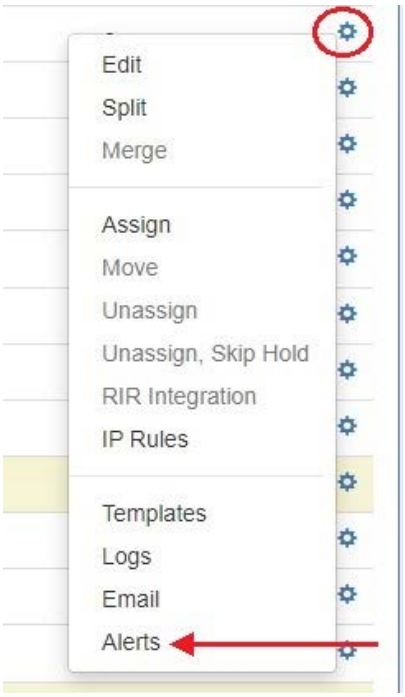
Subassignable blocks will be offered as suggestions when assigning from Direct Assign / Smart Assign / Smart Browse, if they meet the filter criteria but no available blocks are suitable.

You may also specifically select the resource allocated the block when entering Direct Assign / Smart Assign criteria, to specifically assign blocks under that allocation.

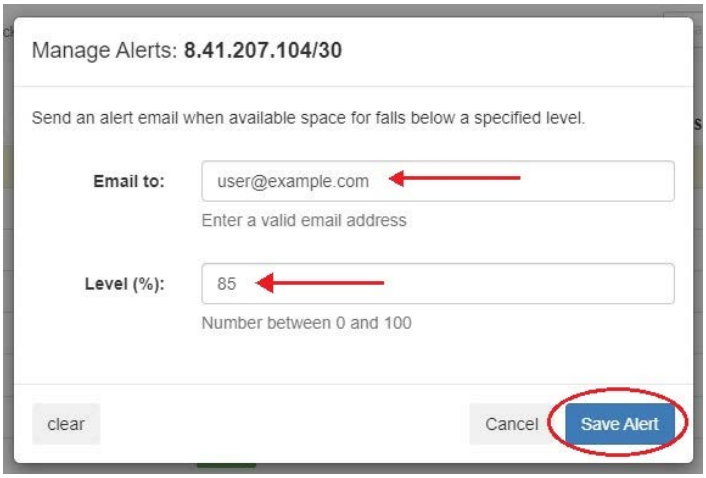
Set IP Block Alerts

Enable or clear alert emails for an IP block by setting an email address and utilization percentage level. When the block is utilized to the set percent, an email alert will be sent to the provided address.

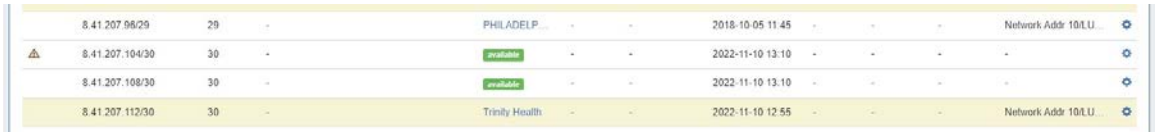
To set an alert, select the "Alerts" option from the Action Menu.



Enter an email address and utilization level for the alert.



When done, click "Save Alert". To clear an existing alert, hit "Clear Alert", and the alert information will be removed and status saved.



An alert icon will be visible in IPAM Manage next to any block that has an active alert set.

> Note: the "IPAM Alerts" task is enabled by default when an alert is set. You can set the task to the desired notification frequency and review history in the Admin Scheduler Tab. For more information on setting an IPAM alert at the aggregate level see Working with IP Aggregates. For more information on managing alerts at the Admin level see Alerts Management in the ProVision Admin Guide.

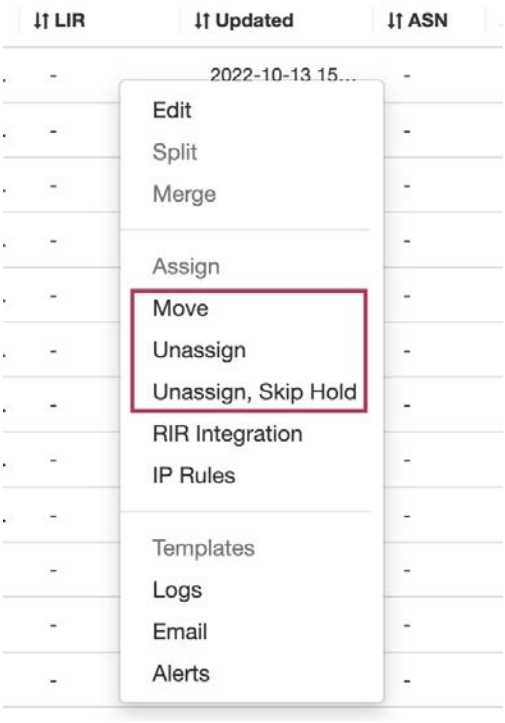
Unassign IP Space

When a block is assigned, you will have the option of unassigning the block from the resource and returning it to the Holding Tank:

To unassign the block, simply open on the Action Menu for the block in either IPAM manage or the IPAM Gadget, and select "Unassign".

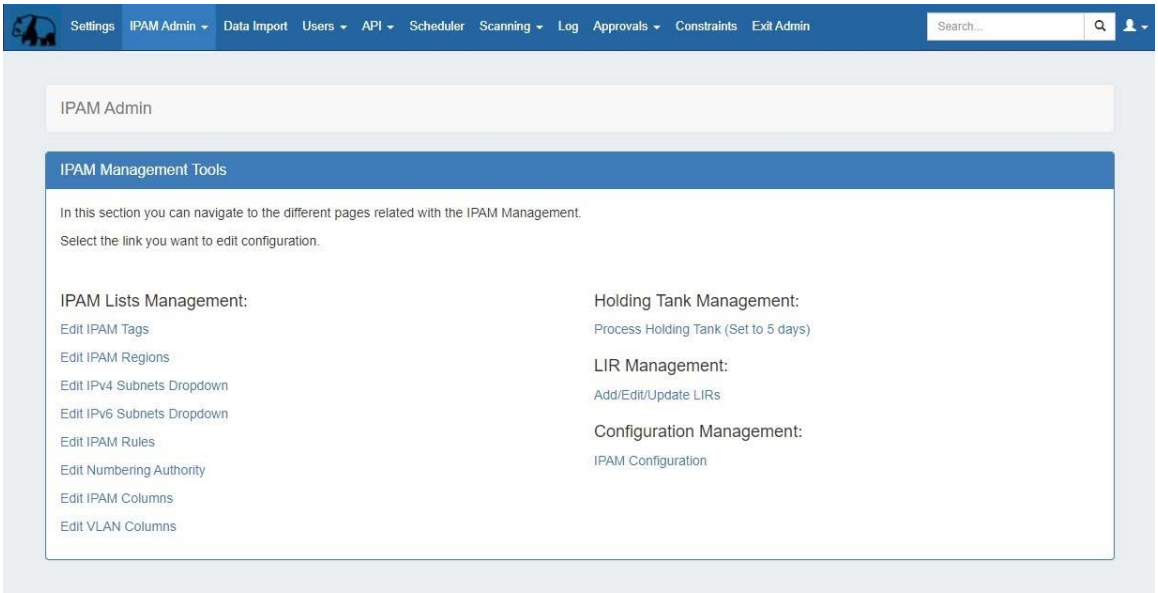
You may also chose "Unassign, Skip Hold", which unassigns the block and immediately returns it to available, bypassing the holding tank.

Another option is "Move", which moves the block from one resource directly to another without passing it through either available or holding status. Enabling the checkbox "Propagate to children" in the dialog will move all the child blocks to the selected resource as well.



After unassigning blocks / skipping holding, newly available blocks will be merged upon next page refresh. Blocks which had been subassigned will revert back to the parent resource.

To return IP space in the Holding Tank to the available pool, process the Holding Tank via the Admin screen under **IPAM Admin** (this will only process blocks that have been present for the specified number of days). You may also manually move a block from Holding to Available by selecting "Unassign" for the block.



For more information on the Holding Tank, see Holding Tank Management.

For a fast method of unassigning all blocks from a particular resource, you may also bulk-unassign IPs from the Resource List! See Working with Entries

Additional Information

For additional information on working with the IPAM system in ProVision, see the following areas:

- IPAM Gadgets
- Working with IP Rules
- IPAM Administration
- Working with NAT Blocks
- Alerts Management

Working with NAT Blocks

Working with NAT Blocks

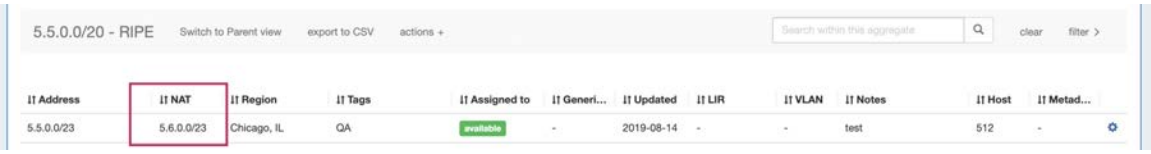
The following section contains details on working with NAT blocks, from within the IPAM system.

- Working with NAT Blocks
  - Track IP NAT Associations
    - Working with NAT'ed Blocks
    - Enable NAT
    - Create NAT Association
    - Configure NAT to Router(s)
  - NAT Rotate Dynamic IPs
    - Before you Begin
    - Add Dynamic Tags to Blocks
    - Set up Scheduler Task
  - Additional Information

Track IP NAT Associations

Track NAT associations between public and private (1918) blocks via the IPAM "NAT" Field.

The "NAT" field accepts a single IPv4 CIDR to associate with the current block, and automatically updates the corresponding block with the NAT association.



Working with NAT'ed Blocks

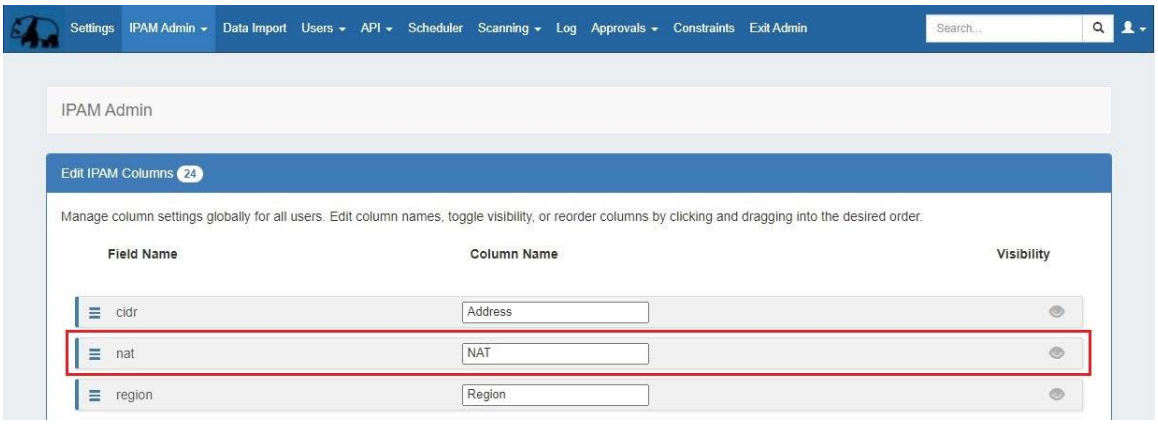
Use caution when managing NAT'ed blocks or aggregates - major actions that change either block's assignment or size (assign, unassign, split, merge, autosplit/cleanup) removes the NAT association.

In this case, complete the necessary high-level block tasks, and then re-save the NAT CIDR association to either block.

Enable NAT

Enable the NAT field by navigating to IPAM Admin Edit IPAM Columns.

From there, ensure that the NAT column is enabled (visible), and customize the column location if desired. Be sure to click "Update" to save any changes.

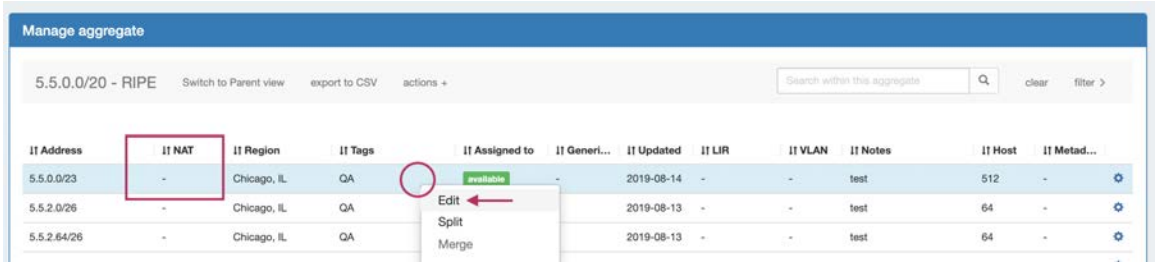


Create NAT Association

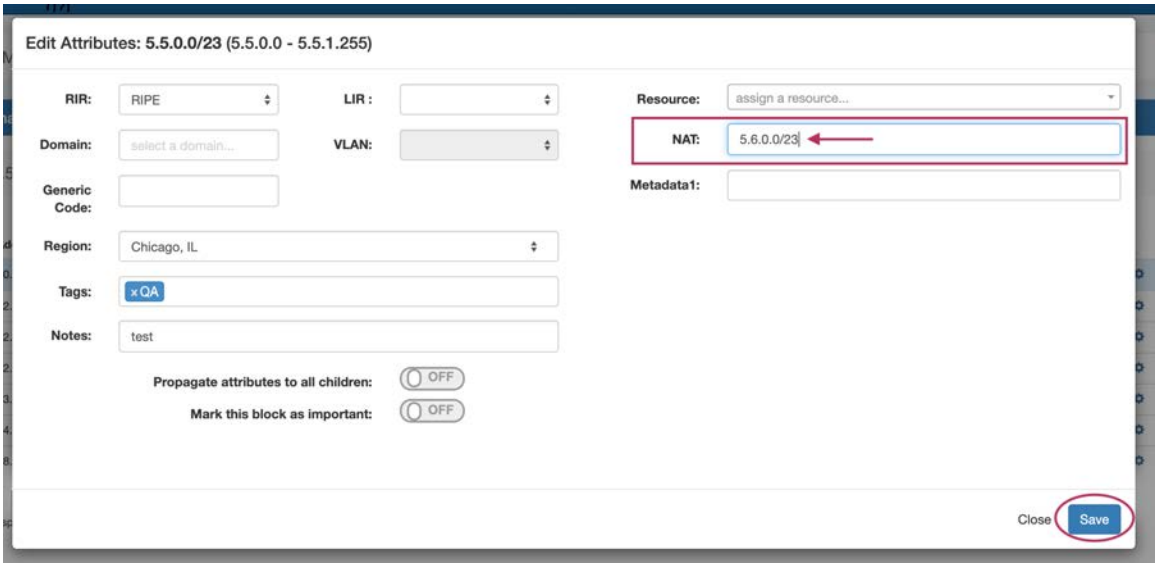
Ensure that the two appropriate IP Aggregates (one public, one 1918 private space) containing the desired blocks to NAT have been added into ProVision. (See: Working with IP Aggregates)

After verifying the aggregates and blocks, you may add the NAT association:

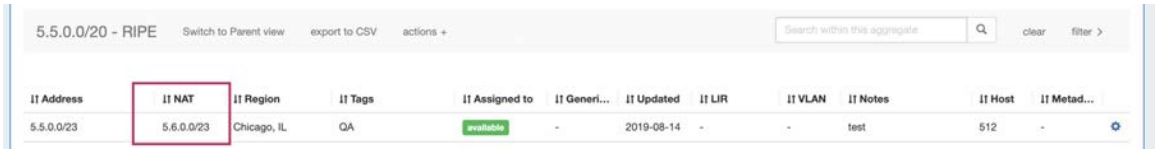
Open IPAM Manage for either aggregate, then open "Edit Block" for the specific block you wish to NAT. (See: Working with IP Blocks)



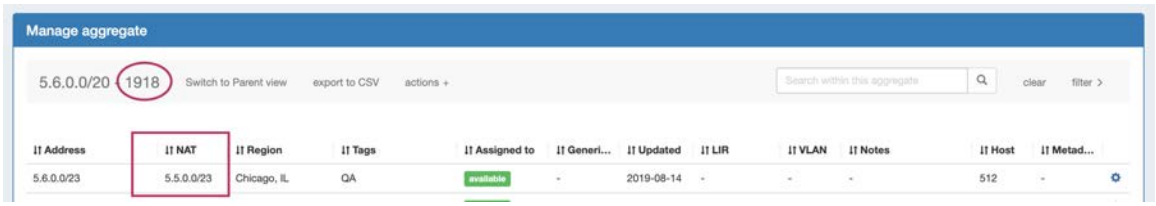
In the Edit Block dialog, enter the IPv4 CIDR of the corresponding NAT block. When complete, click "Save".



Once the NAT field has been saved, the association will display in the NAT Column.



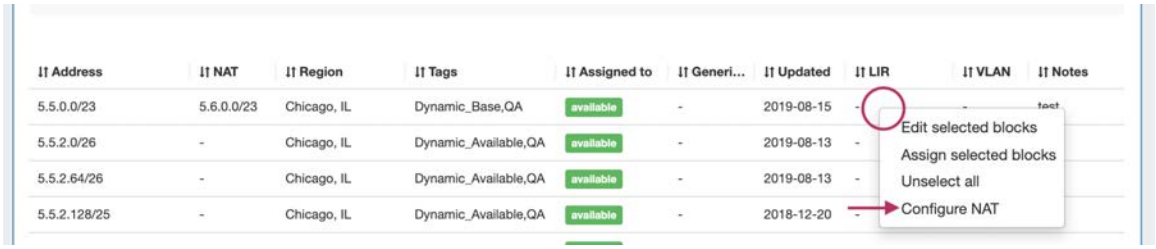
The corresponding block (here, the private 1918 space block) will automatically have the NAT associated applied.



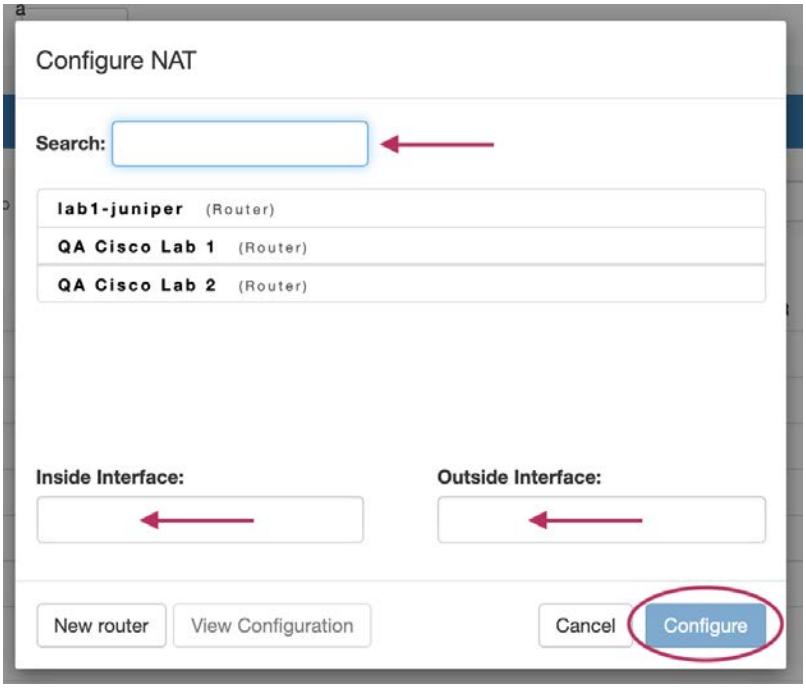
Configure NAT to Router(s)

To push the NAT association to a router, go to the IPAM Manage Action Menu, and select "Configure NAT" for the NAT'ed block(s) (For information on adding a router to ProVision, see Peering Routers).

Open the Action Menu for the NAT'ed block(s) and select "Configure NAT".



Then, select the router. Add the custom configuration / interface information for the router and click "Configure".



NAT Rotate Dynamic IPs

NAT'ed block assignments may be automatically rotated to other available IPs via the "Rotate Dynamic IPs" scheduler task available in the Admin Scheduler tab.

"Rotate Dynamic IPs" reassigns single IPv4 NAT addresses (/32s) after 'x' days (since last config push) to an available address denoted by blocks associated with the Dynamic_Available tags.

Prior to using this task, two blocks (one public, one private) must be NAT'ed in IPAM, the NAT Config pushed to a router, and appropriate blocks tagged with "Dynamic_Base" and "Dynamic_Available".

Before you Begin

Before setting up NAT Dynamic IP Block Rotation, ensure the follow has been completed:

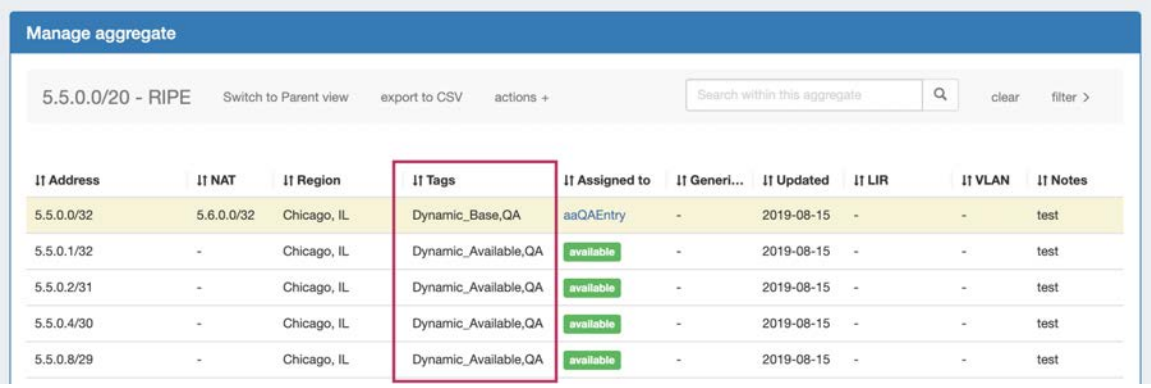
- The public/private IP blocks exist in ProVision (as /32s) and have been set up with NAT Metadata and matching IP Tags
- The NAT'ed blocks have been configured with a router
- The Aggregate(s)/IP's exist in ProVision with sufficient "Available" space to use for Rotating the NAT'ed block(s)
- IPAM Tags match between the NAT'ed blocks and intended available blocks

Add Dynamic Tags to Blocks

After NAT blocks and aggregates have been set up in ProVision with sufficient size, matching IPAM tags, and NAT metadata, you can identify which blocks to use for dynamic rotation by adding the "Dynamic_Base" and "Dynamic_Available" tags.

Go to IPAM Manage and:

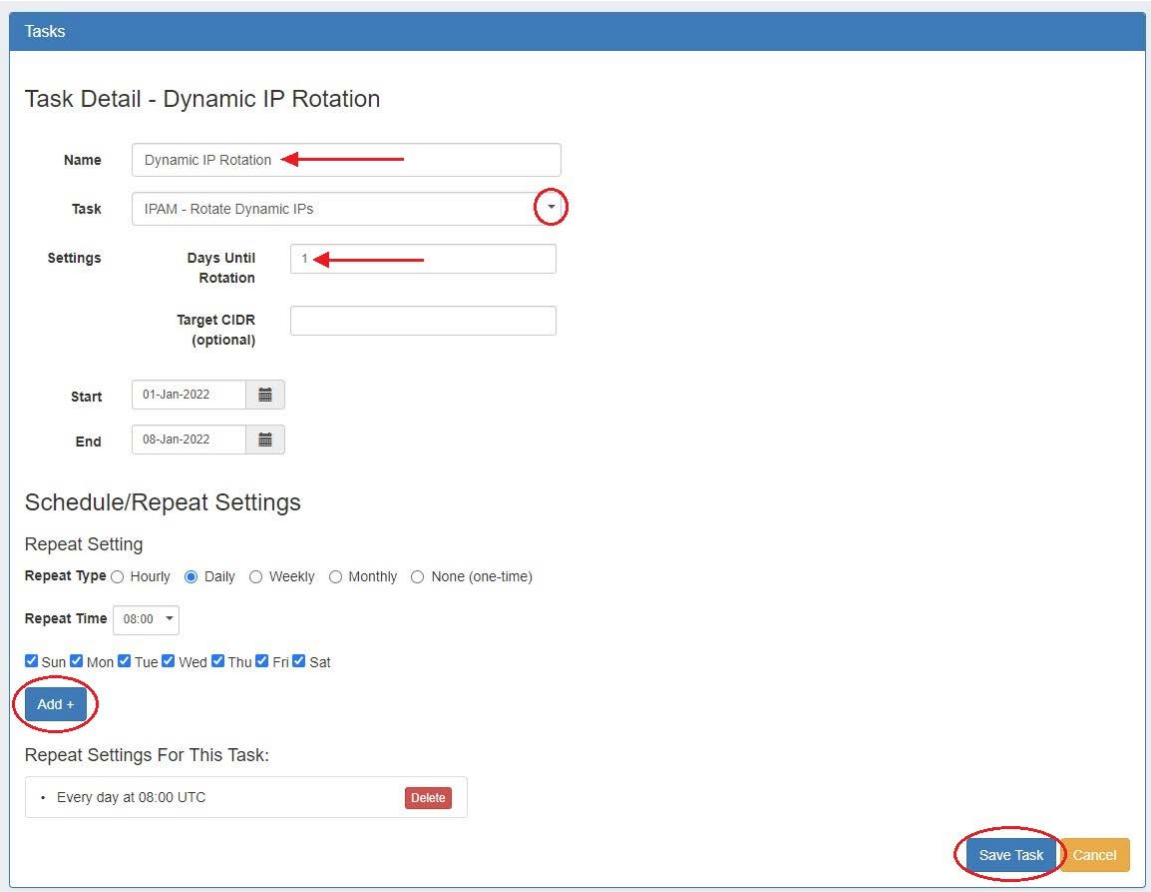
- Add the IPAM tag "Dynamic_Base" to the /32 block(s) currently NAT'ed.
- Add the IPAM tag "Dynamic_Available to the aggregate or blocks which match the NAT'ed blocks, and are available for rotation use. If used on a block larger than the Dynamic_Base block, the available block will be automatically split.



Set up Scheduler Task

Go to Admin Scheduler, Add the scheduler task "IPAM - Rotate Dynamic IPs".

Enter a number for the days to wait (since last configure) until rotation.



Enter scheduled start / end dates, repeat settings, and click "Save" when complete.

The scheduled task will look for NAT'ed, /32 "Dynamic_Base" blocks that have last configuration times older than the provided day count, and rotate those IPs to "Dynamic_Available" blocks. Dynamic_Available blocks larger than than the Dynamic_Base block will be automatically split.

Additional Information

For additional information on working with the IPAM system in ProVision, see the following areas:

- IPAM Gadgets
- Working with IP Rules
- IPAM Administration

Working with IP Rules

Working with IP Rules

- IP Rules
  - Creating a new rule
    - IP Rule Positions
  - Apply an existing rule
  - Remove a rule from a block

Additional Information

IP Rules

IP Rules allow users to exclude IP addresses from being assigned (via Smart Assign or Direct Assign) based on the address position in the block (i.e., first address, last address, nth from last).

IP Rules can be accessed from IPAM Manage or the IPAM Gadget, in the block's Action Menu (gear icon). IPAM users may view rules applied to a block, apply an existing rule to a block, or create a new rule for a block. Only one rule may be applied per block, and rules applied to a parent block affect the child blocks below it in the tree.

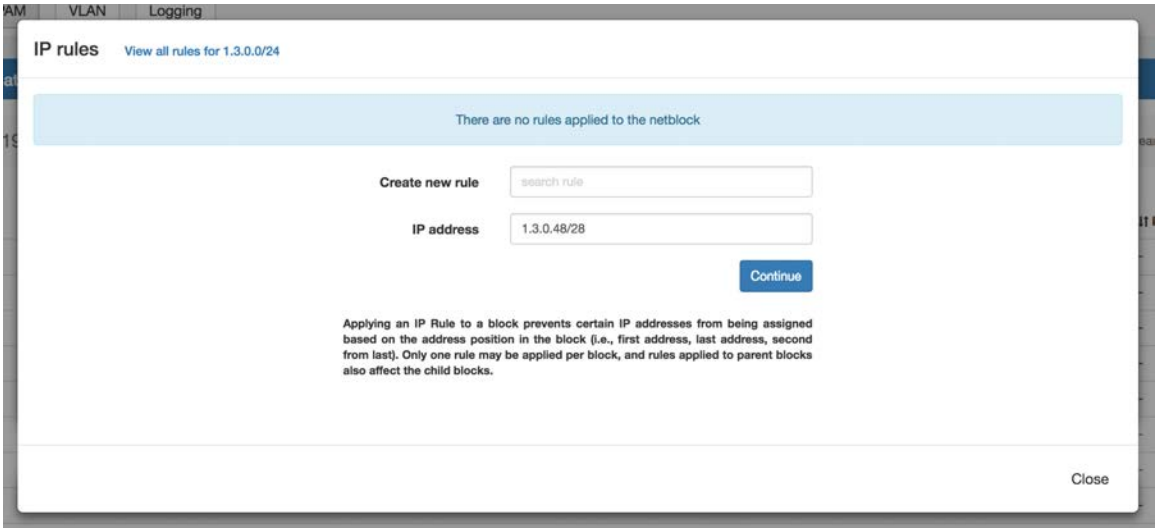
Admin users may view all existing IPAM Rules, the blocks affected by each rule, and delete rules through the IPAM Admin - IP Rules page.

Creating a new rule

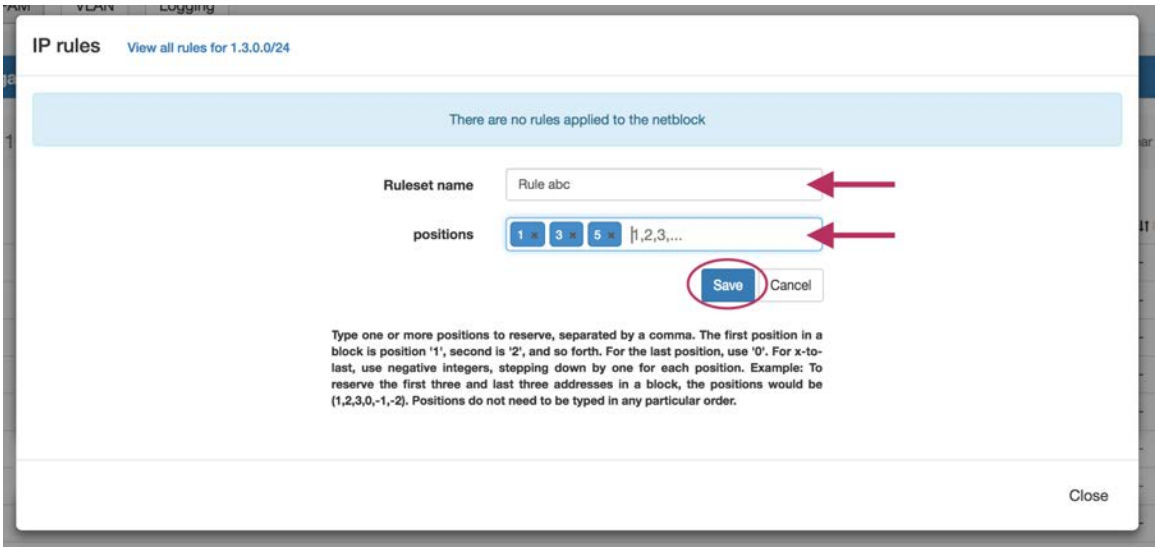
From the IPAM Manage screen or IPAM Gadget, click on the Action Menu (gear icon) for the block you wish to apply a rule. Select "IP Rules".



The IP Rules screen will pop up. From here, you can view existing rules applied to the block (or the parent block), search for and apply an existing rule, or create a new IP Rule.



To create a new rule, leave the "Search Rule" input empty, and hit the "Continue" button.



The Manage Ruleset screen will appear, prompting you to enter a Ruleset name, and select positions to reserve.

Type in the desired name for the new rule, and one or multiple positions (denoted by integers separated by commas) into the box below the name.

When complete, click the "Save" button, or hit "Cancel" to exit without saving. The Rule preview screen will appear.

IP Rule Positions

Reserved addresses are set by their position in the block. Positions start at '1', for the first address in a block, and step up by one for each subsequent IP address. The last position in a block is '0', representing the last address, and steps down a negative integer for each position from last - so the last three addresses in a block would be represented by (0, -1, -2). When reserving multiple positions, the typed order of the positions does not matter.

Position examples:

(1) - Reserves the first IP

(0) - Reserves the last IP

(1,2,3) - Reserves the first three IPs

(0, -1, -2) - Reserves the last three IPs.

(1,2,3,0,-1,-2) - Reserves the first three and last three IPs

Review the list of excluded IP addresses affected by the rule, then click "Apply" to finalize the selection.

If desired, you can exit out of applying the rule by clicking "Discard", and closing the screen.



Once changes are applied, the rule will show the name, affected CIDR(s), affected IPs, and an option to remove the rule.

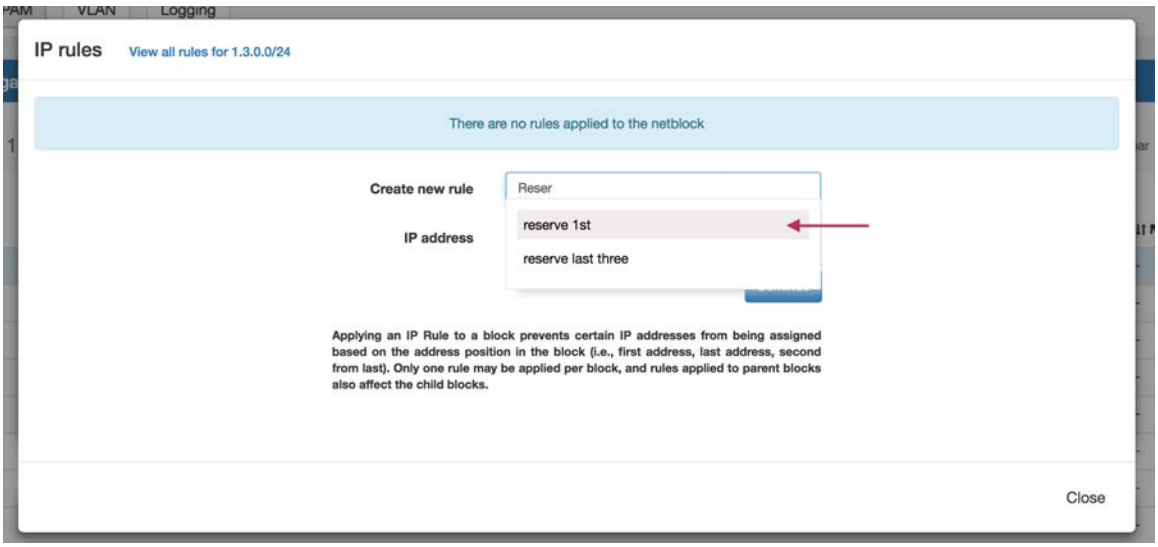


Apply an existing rule

From the IPAM Manage screen or IPAM Gadget, click on the Action Menu (gear icon) for the block you wish to apply a rule. Select "IP Rules".

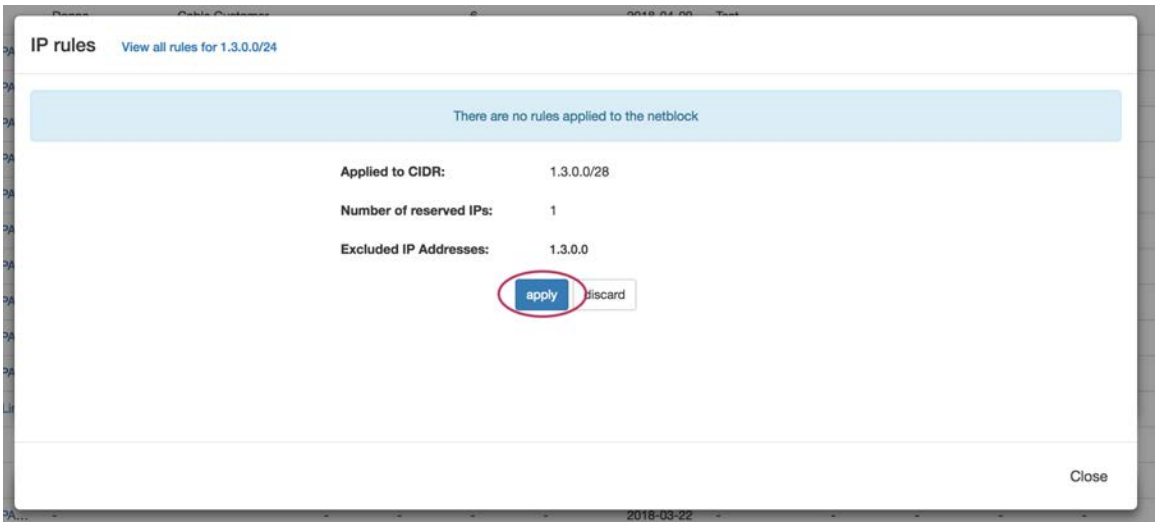


The IP Rules screen will pop up. From here, you can search for existing rules by typing a few letters of the Rule name in the search box, then selecting the desired rule.



Once selected, hit the "Continue" Button.

Review the list of excluded IP addresses affected by the rule, then click "Apply" to finalize the selection.



If desired, you can exit out of applying the rule by clicking "Discard", and closing the screen.

Once changes are applied, the rule will show the name, affected CIDR, affected IPs, and present with an option to remove the rule.



Remove a rule from a block

From the IPAM Manage screen or IPAM Gadget, click on the Action Menu (gear icon) for the desired block. Select "IP Rules".



The details for the existing rule applied to the block will be shown. To remove the rule from the block, click the "Remove" button and confirm.

The rule will still be able to be re-applied and usable by other blocks, simply no longer applied to the current block.



Additional Information

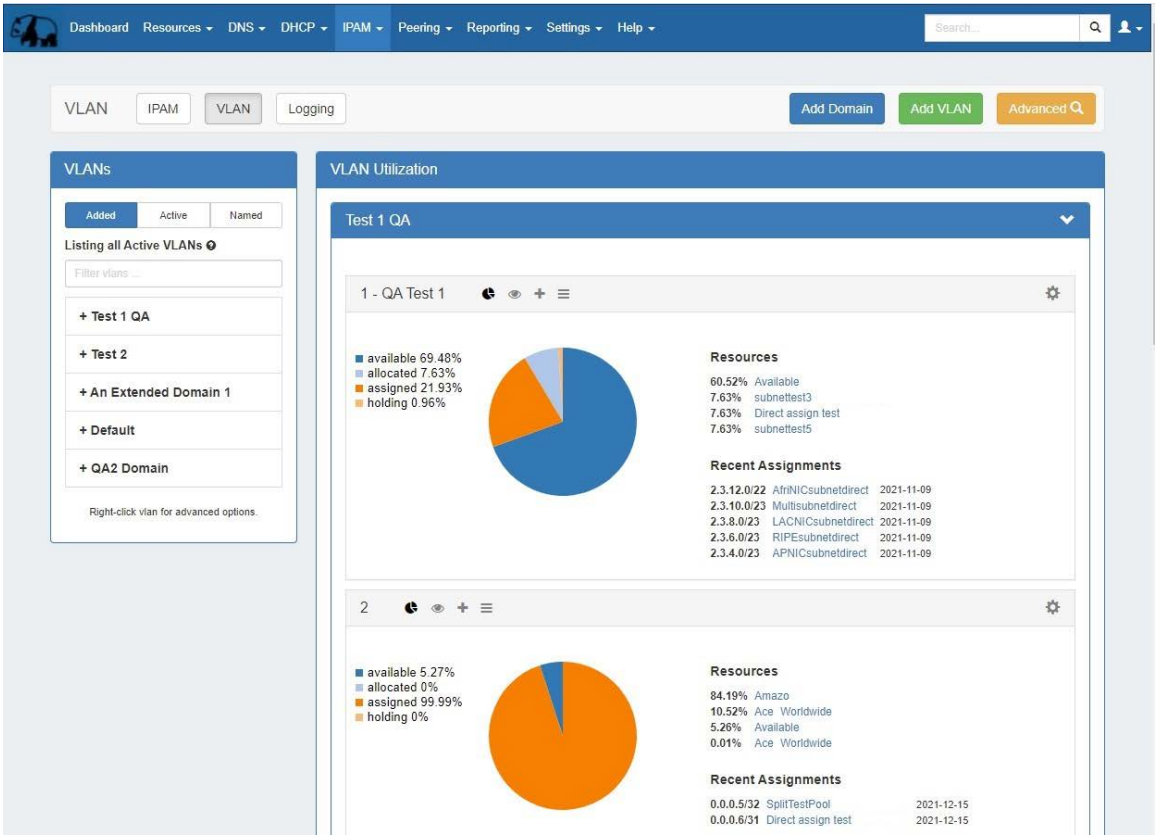
For additional information on working with IP Blocks and IP Rules, including Admin-level tasks, see the following areas:

- IPAM Tab
- Working with IP Blocks
- IPAM Administration
    - IPAM Lists Management
    - IPAM Rules (Admins)

VLAN

VLAN

To access the VLAN pages, go to the **IPAM** Tab, and then either select VLAN from the IPAM dropdown menu, or click the VLAN sub-tab button.



ProVision's VLAN Management is located under the **IPAM** Tab, and has three main VLAN sub-areas: **VLAN Home**, **VLAN Manage**, and **VLAN Advanced**.

The **VLAN Home** page shows an overview of domains and VLANs on the left sidebar, and IPAM Utilization data organized by each domain / VLAN pair. From here, users may add domains, VLANs, add/remove VLAN associations with blocks, perform domain / VLAN management tasks, and access additional VLAN areas - **VLAN Manage** and **VLAN Advanced**.

VLAN Manage lists all of the IP blocks currently associated with that VLAN, and allows you to perform all of the IP block actions available in IPAM Manage for those blocks. For information on working with individual blocks and using IPAM Manage functions inside VLAN Manage, please refer to Working with IP Blocks.

VLAN Advanced shows a global view of all domains and VLANs present in ProVision, and the associated metadata. VLAN advanced is the primary area from which to manage domains (edit / delete domain), and concisely view VLAN data side-by-side. It also provides access to manage VLANs, add domains, and add vlans to a domain.

VLAN Feature Overview:

- Supports custom domain ranges and exclusions, using ProVision's Numbering Authority
- Create domains and add VLANs directly from the VLAN Home page
- Customizable VLAN Metadata Columns (IPAM Admin VLAN Columns)
- Action shortcut panels in VLAN Utilization and VLAN Manage - Utilization View, Quickview, Assign IP, and Edit VLAN
- Integrates administrative functions directly into the VLAN Tab.

- VLAN
  - VLAN Feature Overview:
- VLAN Manager Overview
  - VLAN Workflow:

        - 1) Create Domain(s)
        - 2) Add / Edit VLANs
        - 3) Add IP Blocks to VLANs
        - 4) Manage Domains and VLANs
- VLAN Home Page
    - VLAN Sidebar
    - VLAN Utilization Area
        - Open VLAN Manage
        - View VLAN Panels
        - Remove VLAN
        - VLAN Manage / VLAN Utilization Action Panels
            - Utilization
            - Quickview
            - Assign Blocks to VLAN
                - Direct Assign to VLAN
                - Smart Browse to VLAN
                - Assigning from Smart Browse
            - Edit VLAN
- VLAN Manage Page
- VLAN Advanced (Global View)
    - VLAN Advanced (Global View) Actions
- System VLAN Resources
    - Additional Information

VLAN Manager Overview

The VLAN Manager allows users to add domains and VLANs to their ProVision instance, and associate them with IP Blocks. Customizable VLAN columns - including up to ten user-defined metadata columns - allow you to rename column headers, set the display order, select which columns are visible, and display your own information fields.

Permissions and VLAN

The Permissions structure in VLAN includes the following items of note:

The following VLAN tasks requires Admin-level permissions:

- Adding new Numbering Authority ranges for VLAN use
- Editing IPAM / VLAN Columns
- Adding, editing, and removing domains
- Adding, editing, and removing VLANs

Non-Admin users may:

- View the VLAN Home page and utilization data, however, only resources that the user has view permissions for will display under the "Resources" and "Recent Assignments

VLAN Workflow:

1) Create Domain(s)

The workflow starts with creating a domain in the **IPAM** Tab VLAN section of ProVision, by clicking the "Add Domain" button and entering domain information.

VLAN domains may be created as pre-set Numbering Authority ranges, or defined manually. Two default Numbering Authority VLAN ranges are provided, one for a Cisco Standard domain, and another for a Cisco Extended domain. Admins may create new Numbering Authority ranges at any time to support other router types, range extents, or exclusions. Those ranges will then be available as options when adding a new domain from the VLAN area. If you select to create a new domain by defining a manual range, you may enter the range extents and any exclusions.

2) Add / Edit VLANs

VLANs may be added to the domain at the time the domain is created (via the "Add VLANs" input area) or added to an existing domain later via the "Add VLANs" button. You can add one VLAN, multiple VLANs, a large range of VLANs, or a mixed selection at the same time.

Once a VLAN has been added to a domain in ProVision, the VLAN may be edited to add a VLAN name or metadata information, and have IP blocks associated with it.

3) Add IP Blocks to VLANs

Once a VLAN has been added to a domain in ProVision, IP blocks may be associated with ('assigned to') that VLAN. There are multiple methods to set the VLAN for a block:

- **Individual block edit** - Edit one or more blocks and set the domain and VLAN fields to the desired values. Direct edit may be performed from IPAM Manage, VLAN Manage, and the IPAM Gadget, by selecting Edit Block.
- **Direct Assign a block** - Open the Assign Blocks panel, expand Direct Assign, and type in the CIDR to assign to the VLAN. Advanced options are available to distinguish between duplicate blocks. The Assign Block panel is available from the VLAN's Utilization Box, and/or the VLAN Manage header bar.
- **Smart Browse for blocks** - Open the Assign Blocks panel, expand Browse Assign, and enter filter criteria to create a list of blocks meeting that criteria. Then, select one or blocks from the list to assign to the VLAN. The Assign Block panel is available from the VLAN's Utilization Box, and/or the VLAN Manage header bar.

After assigning a block to the VLAN by any method, that block will immediately display in VLAN Manage for that VLAN, in the VLAN's Quickview panel, and the VLAN Utilization display panel will be updated to include the new block.

4) Manage Domains and VLANs

Managing VLANs and blocks under the VLANs may include standard IPAM tasks, such as editing blocks, splitting / merging blocks, or allocating/ assigning / unassigning the blocks to a resource. All of these functions, and more, may be performed from either VLAN Manage or IPAM Manage.

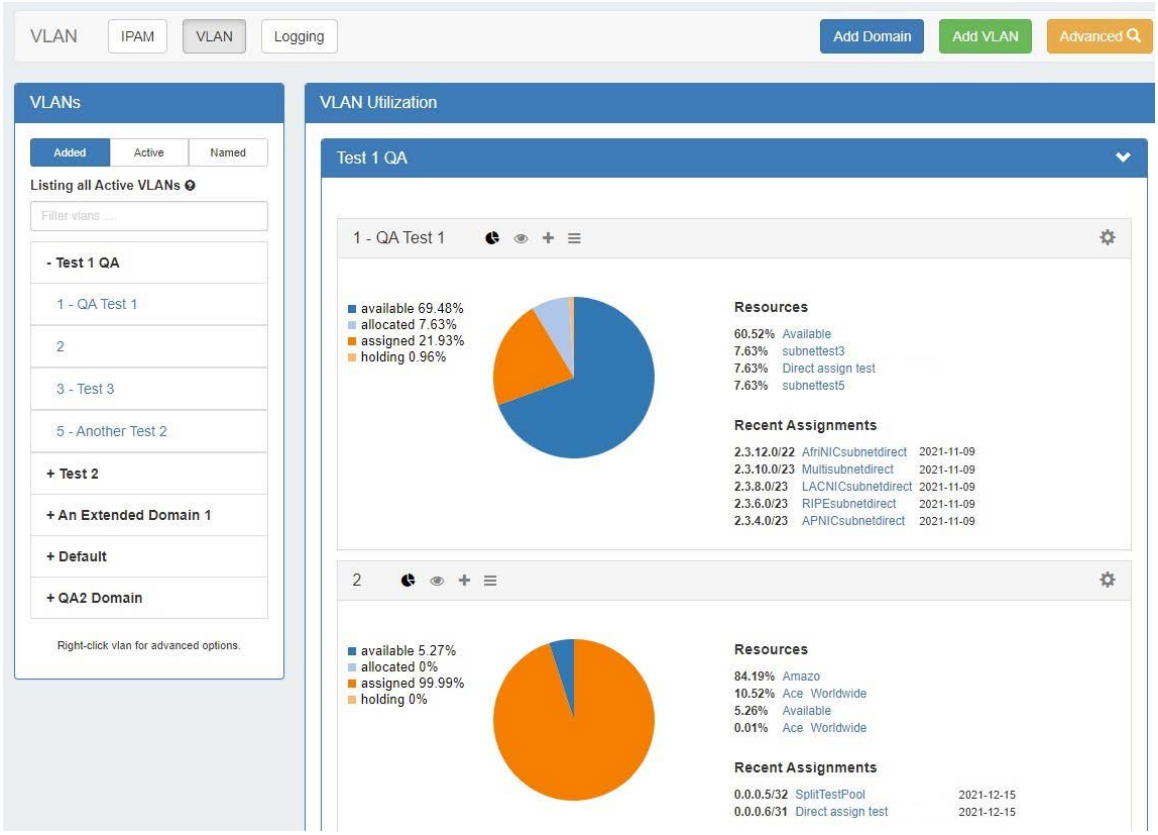
Other tasks, such as editing VLAN names, metadata, or adding/removing VLANs from a domain are performed from the VLAN action panels on the VLAN Home page, or from VLAN Manage.

Editing domains - including renaming, adding metadata, and deleting - may be performed from VLAN Advanced.

VLAN Home Page

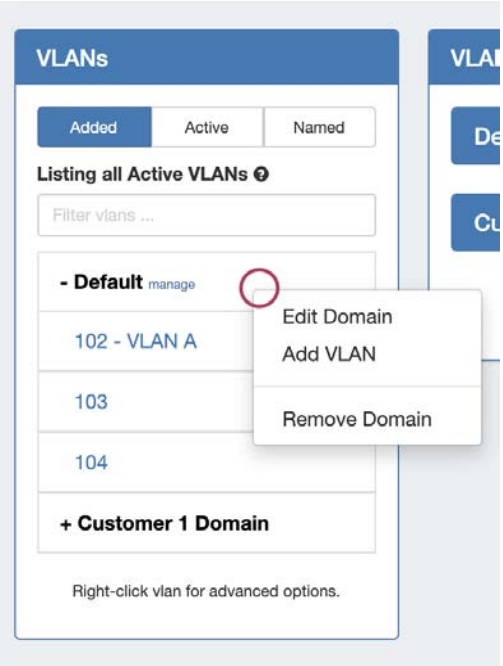
The **VLAN Home** page is accessible from the **IPAM** Tab. Navigate between IPAM, VLAN, and Logging by clicking on the sub-tab buttons at the top of the page.

- Navigate between IPAM, VLAN, and Logging by clicking on the sub-tab buttons at the top of the page
- Open VLAN Advanced (Global View), by clicking the Advanced button
- Add new domains or VLANs by clicking Add Domain or Add VLAN
- Domains and VLANs are listed in a searchable, filterable, paginated sidebar with access to additional navigation and common tasks
- Expand or collapse domains in the VLAN Utilization area, and view pages of VLANs
- Access common VLAN management tasks from the VLAN Utilization box - either from action panels or the gear menu

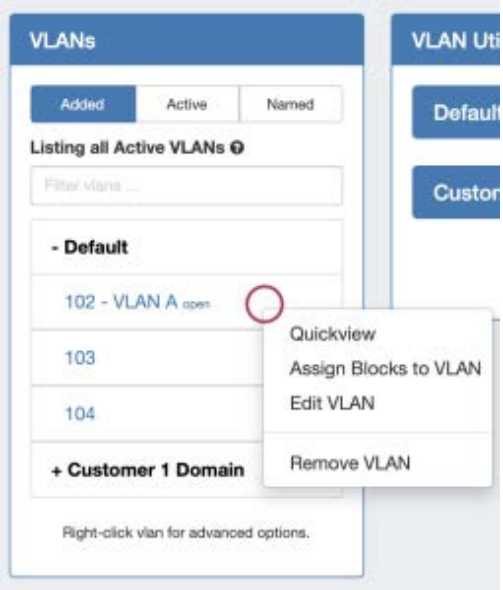


VLAN Sidebar

The VLAN Sidebar lists domains and the VLANs under those domains, and is similar to the IPAM aggregate sidebar. The VLAN sidebar provides options for searching and filtering domains and VLANs, as well as menu options for navigation shortcuts to perform basic actions.



Above: VLAN Sidebar - Domain Menu



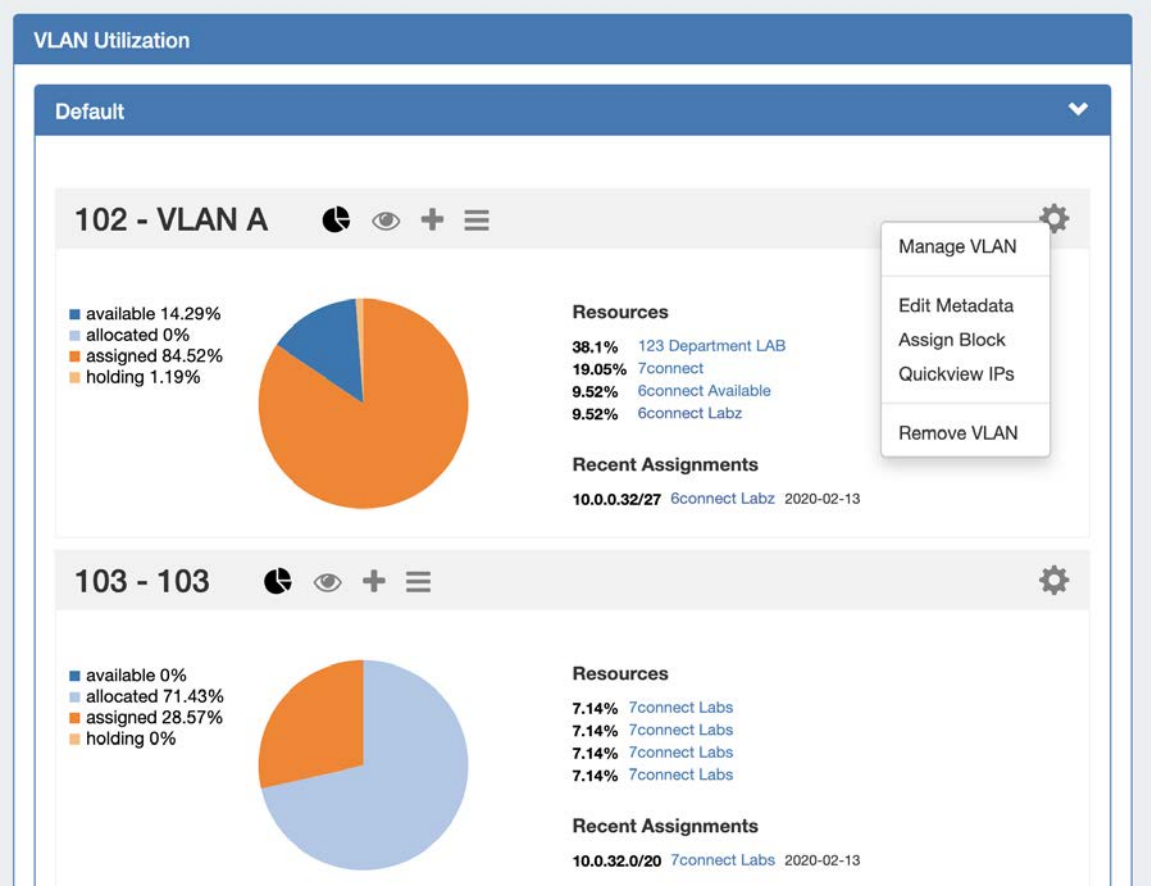
Above: VLAN Sidebar - VLAN Menu

- The VLAN sidebar contains search, filters, and right-click menu options
  - Filter the VLAN sidebar to display either "Added" VLANs, "Active" VLANs that have blocks assigned, or "Named" VLANs with user-provided names
  - Search the VLAN sidebar for a particular domain, VLAN Number, or VLAN name by typing into the search/filter field "Filter VLANs"
  - Right click to open context menus for both domains and VLANs

- Domain Sidebar Actions
  - Click on a domain name to show/hide the VLANs contained under that domain
  - Click "manage" next to the domain name to open VLAN Advanced for that domain
  - Right click on a domain to open options to:
    - Edit Domain- Opens VLAN Advanced Edit Domain panel for that domain
    - Add VLAN - Opens the Add VLAN page for that domain
    - Remove Domain - Deletes the domain and all VLAN data under it

- VLAN Sidebar Actions
  - Click on a VLAN number/name to navigate to its location(QuickNav) in the VLAN Utilization area of the page
  - Click on "open" next to a VLAN to open VLAN Manage for that VLAN
  - Right click on a VLAN to open options to:
    - QuickView - QuickNavs to the VLAN's Utilization area listing, and opens the VLAN's Quickview panel
    - Assign Blocks to VLAN - QuickNavs to the VLAN's Utilization area listing, and opens the VLAN's Assign Blocks panel
    - Edit VLAN - QuickNavs to the VLAN's Utilization area listing, and opens the VLAN's Edit VLAN panel
    - Remove VLAN - deletes the VLAN, removing the VLAN assignment from any blocks assigned to it

VLAN Utilization Area

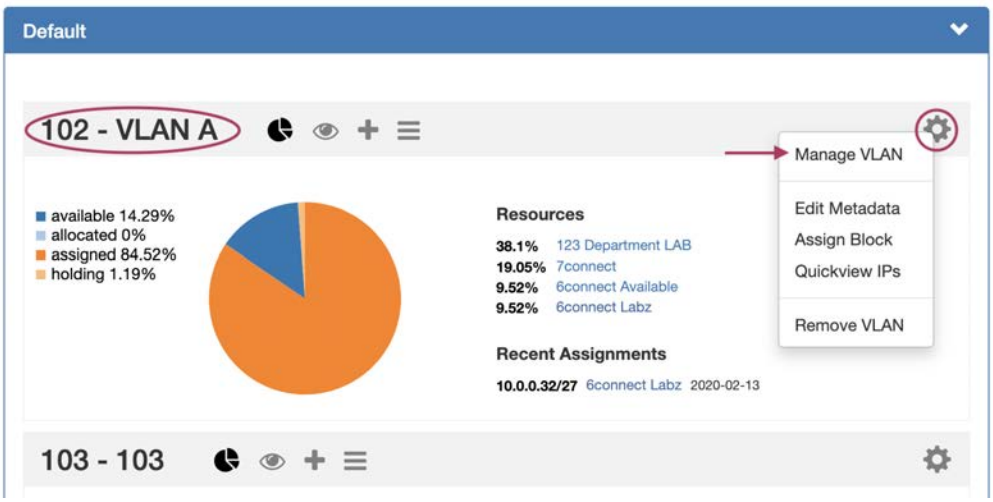


The VLAN Utilization area lists domains and the VLANs under those domains (both able to be expanded/collapsed), with each active VLAN (one that has assigned blocks) displaying the Utilization panel by default.

Inside the Utilization Box for each VLAN, you may do the following:

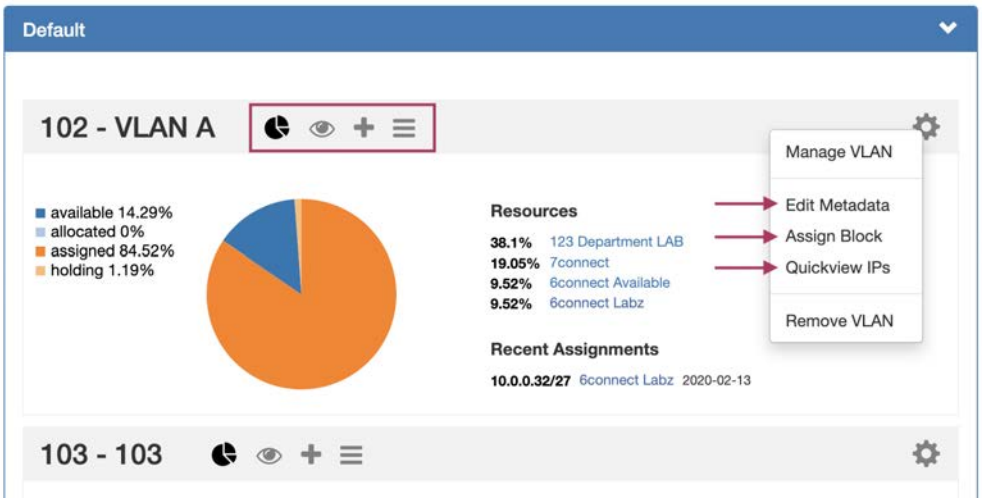
Open VLAN Manage

Open VLAN Manage for the VLAN by either clicking on the VLAN Name in the header, or clicking on the gear icon and selecting "Manage VLAN" from the menu.



View VLAN Panels

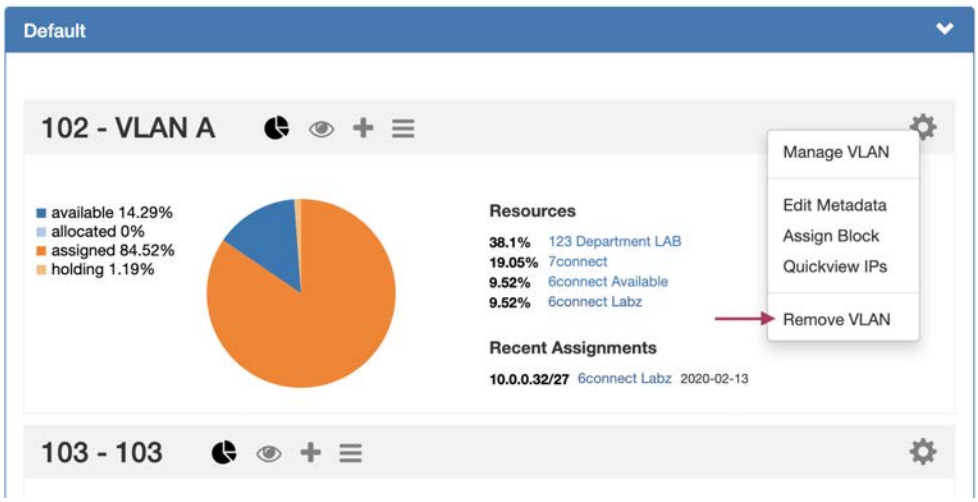
The four VLAN panels (Utilization, Quickview, Assign Block, Edit VLAN Metadata) may be open or closed by clicking on each respective icon in the header bar. Additionally, you may open any non-default panel by going to gear icon and selecting the action option from the menu. These panels are also available in VLAN Manage.



For detail on each panel, see the following section on this page: VLAN Manage / VLAN Utilization Action Panels

Remove VLAN

Remove (delete) the VLAN by clicking on the gear icon and selecting "Remove VLAN". This removes the VLAN from the domain, removes the VLAN association from any blocks assigned to that VLAN, and permanently deletes the VLAN's metadata. VLANs may also be deleted from the VLAN sidebar and VLAN Advanced areas.

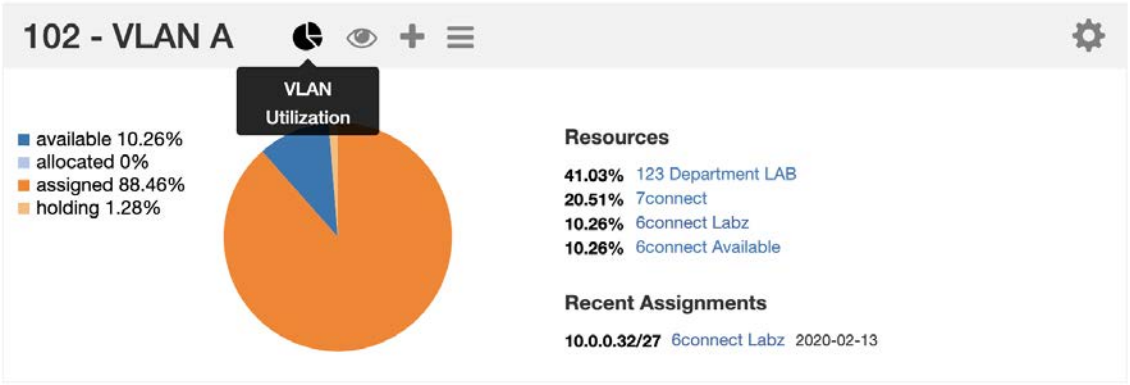


VLAN Manage / VLAN Utilization Action Panels

These action panels are available from both the VLAN Home page Utilization Boxes and VLAN Manage, and may be opened or closed by clicking on the associated header bar icons. Each panel allows you to view data specific to that VLAN, or perform common management actions.

Utilization

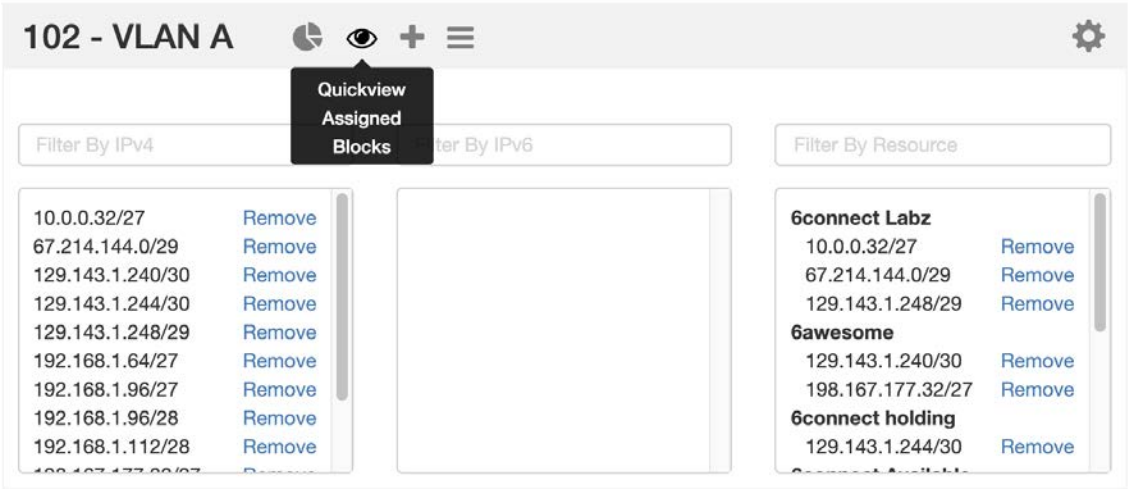
The Utilization panel displays breakdowns for all blocks assigned to the VLAN by both status (available, allocated, assigned, holding) and by resource. Recently assigned blocks are noted under the "Recent Assignments" section, and links are provided to the Resource Entry page for each resource listed. To open or close the Utilization panel, click on the "Pie" icon in the grey header bar.



Quickview

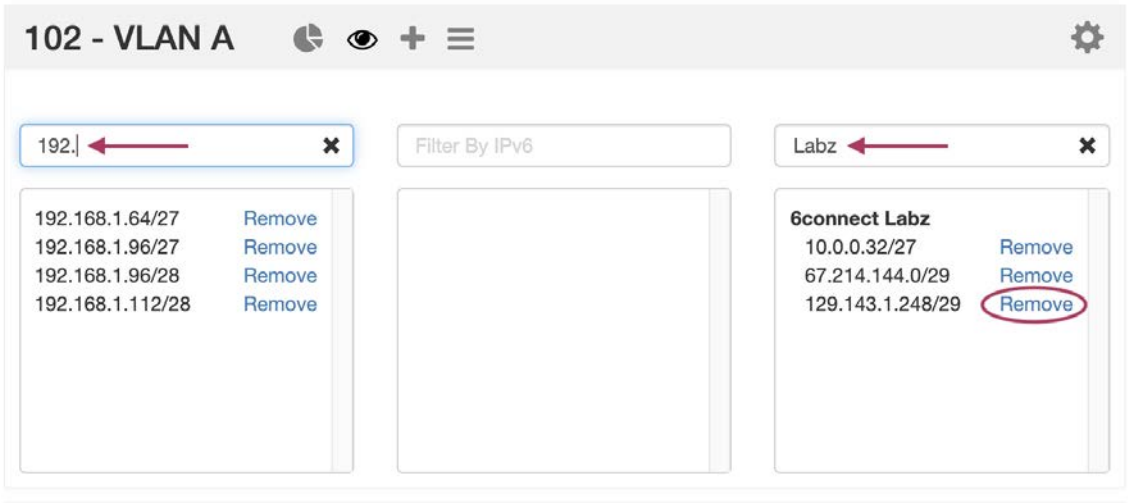
The Quickview panel provides a condensed, filterable list of all blocks assigned to that VLAN, separated into three columns - IPv4 blocks, IPv6 blocks, and grouped by resource.

To open or close the Utilization panel, click on the "Eye" icon in the grey header bar.



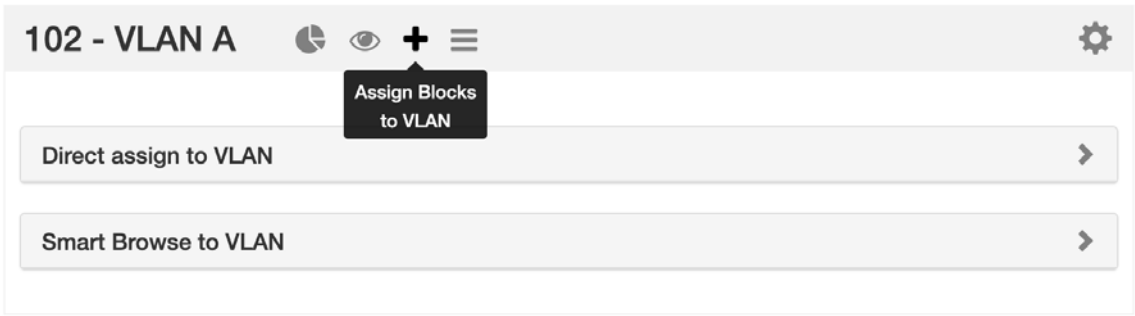
While in the Quickview panel, you may easily search for a block by typing the all or part of the CIDR into the IPv4 or IPv6 Filter boxes - useful for verifying an assignment or quickly scanning ranges.

You may also remove a block from the VLAN with a single click of the "Remove" button.



Assign Blocks to VLAN

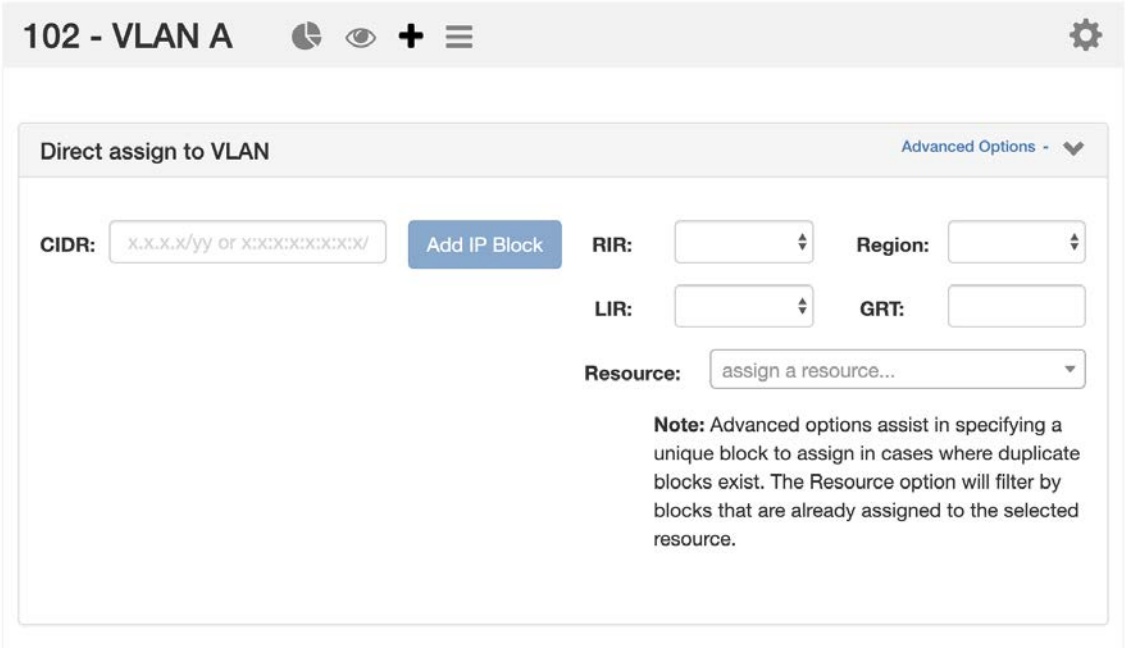
Blocks may be assigned to the VLAN from the Assign Blocks panel, opened or closed by clicking on the plus-sign icon. Two assignment options are available - Direct Assign to VLAN, if you know the specific block to assign, and Smart Browse to VLAN, where you can specify filter conditions and select one of more blocks meeting those conditions.



To open either option, click on the appropriate header bar to expand the module. Expand the area below for more details on Direct Assign to VLAN and Smart Browse to VLAN:

Direct Assign to VLAN

To Direct Assign a specific block to the VLAN, expand the "Direct Assign to VLAN" module, then enter the CIDR to assign into the "CIDR" box, and click "Add IP Block" .



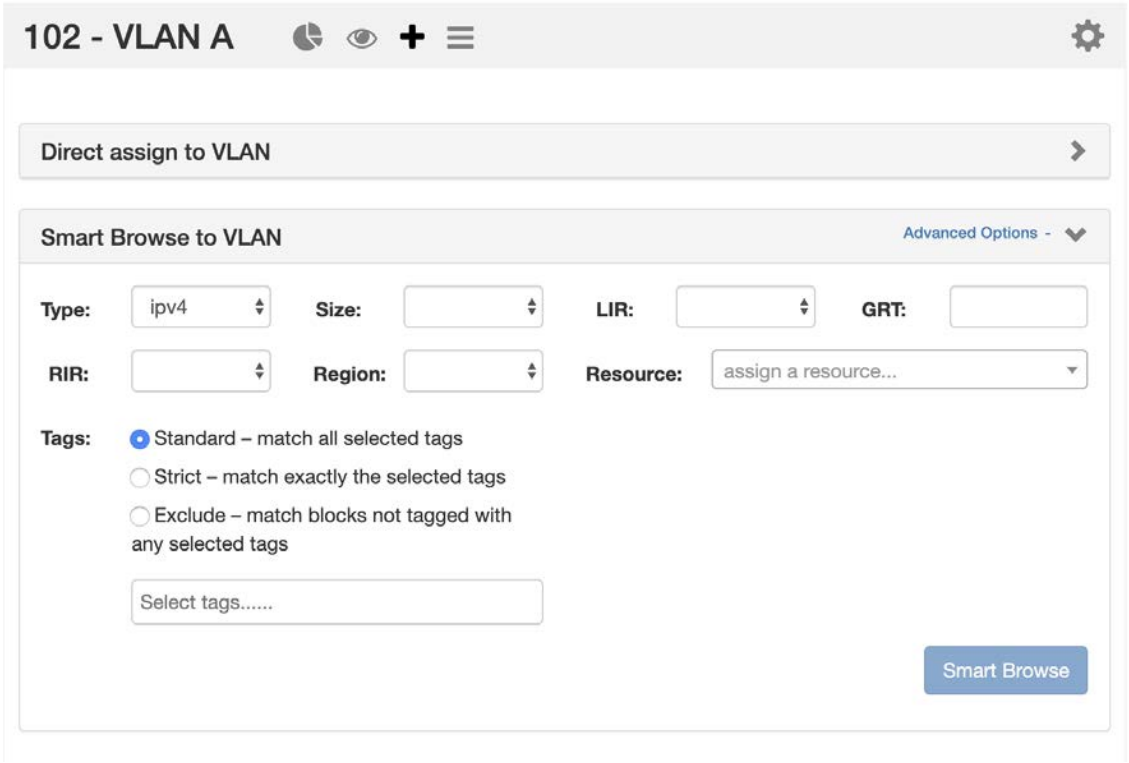
If blocks exist with the same CIDR (such as in duplicate 1918 space), you may differentiate between the two by clicking on the "Advanced Options" link and providing additional filter criteria to use to assign a specific block.

Smart Browse to VLAN

Smart Browse to VLAN is used to search for a general list of blocks available to assign to the VLAN that meets certain criteria.

Expand the "Smart Browse" module by clicking on the header bar .

Then, enter your filter criteria. At minimum, block "Type", "Size", and "RIR" must be provided; "Region" and "Tags" are optional.



If further filtering is needed, you may click on "Advanced Options" to open the "LIR", "Custom Code" (here: as "GRT"), and assigned "Resource" fields to use.

Once you have entered your filter criteria, click on the "Smart Browse" Button to display your results.

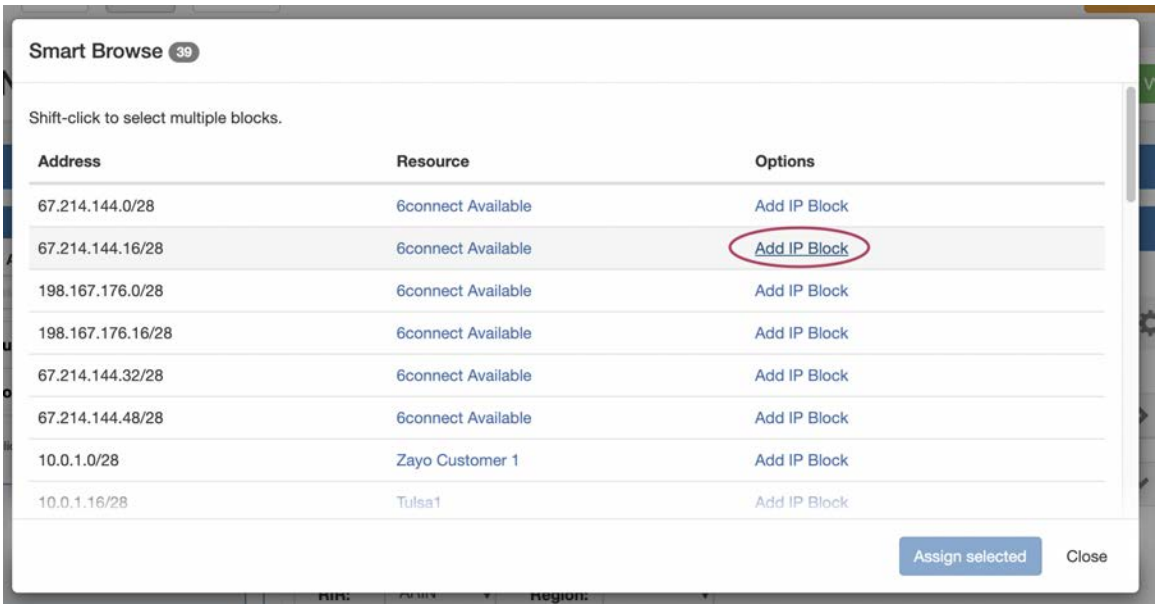
Assigning from Smart Browse

The Smart Browse results list will display a list of blocks that a) meet your filter criteria, and b) do not already have a VLAN assigned.

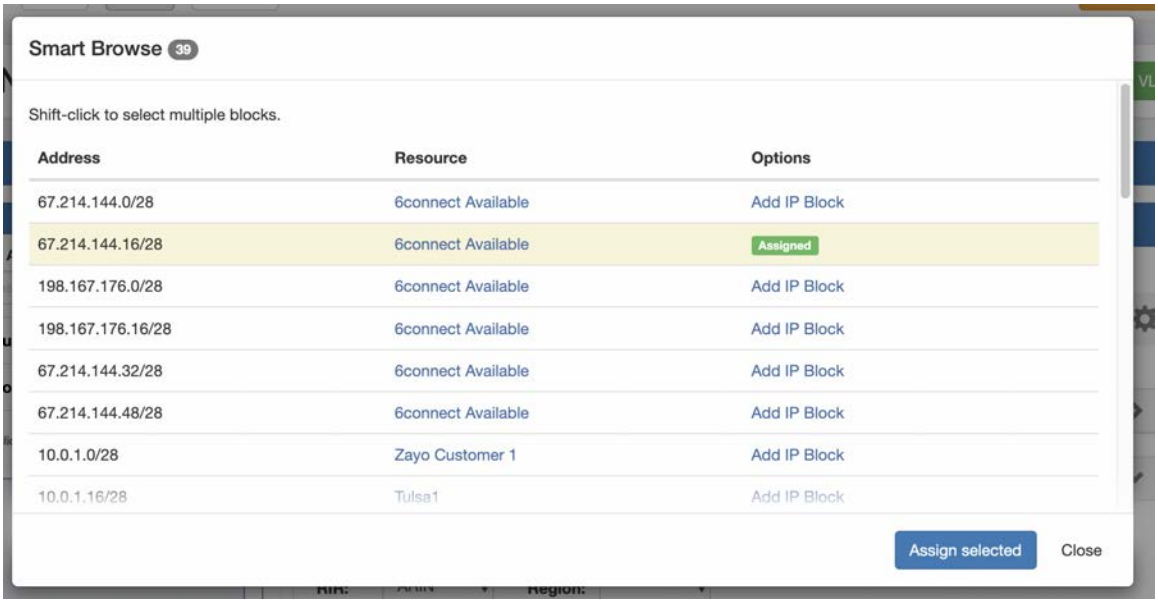
You may assign individual blocks immediately ("Add IP Block"), or select multiple blocks and delay assignment until after your final selections are complete ("Assign Selected").

Immediate Assignment:

To assign an individual block immediately from the list to the VLAN, click "Add IP Block" for the desired block.



After clicking "Add IP Block", the block will immediately be assigned to the VLAN, and an "Assigned" status will display for the block in the Smart Browse list.



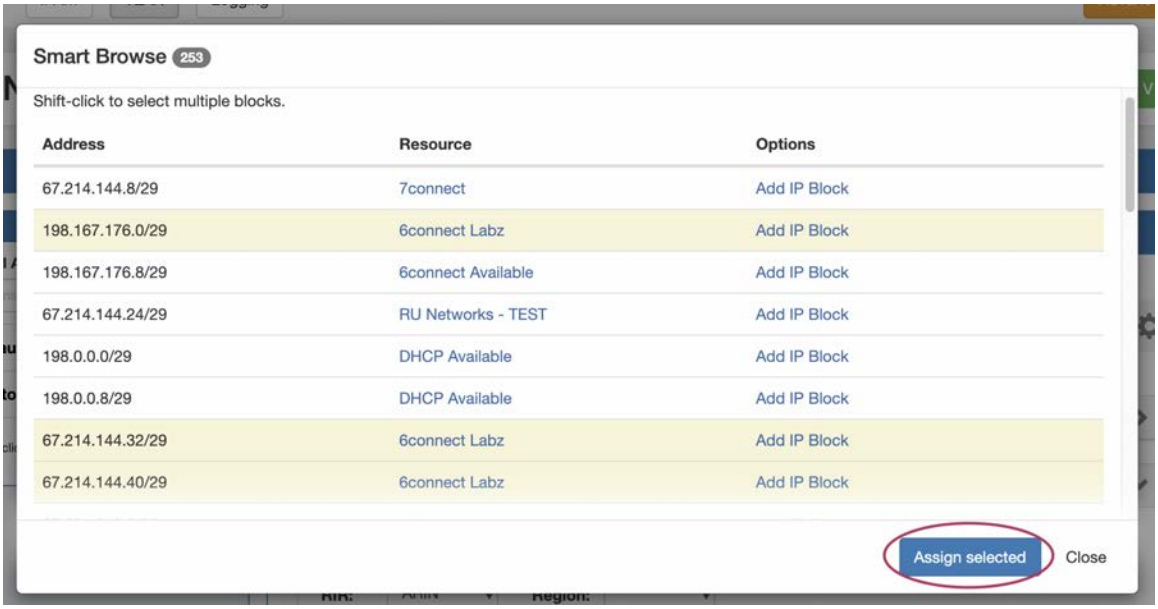
From here, you may assign additional blocks, clicking "Close" to exit when complete.

If the "Assigned" status displays for all blocks you intend to assign, then you may skip clicking "Assign Selected"- as nothing else remains to assign - and instead click "Close" exit.

Delayed Assignment / Selecting Multiple Blocks:

If you wish to assign multiple blocks to the VLAN at the same time, or mark a single block to assign later while continuing to browse the list, you may select a block to mark for later assignment and then assign all selected blocks at once.

To select a single block, left click on row for the block, taking care not to accidentally click on a blue link. Note that the row will have a yellow highlight indicating it is selected:



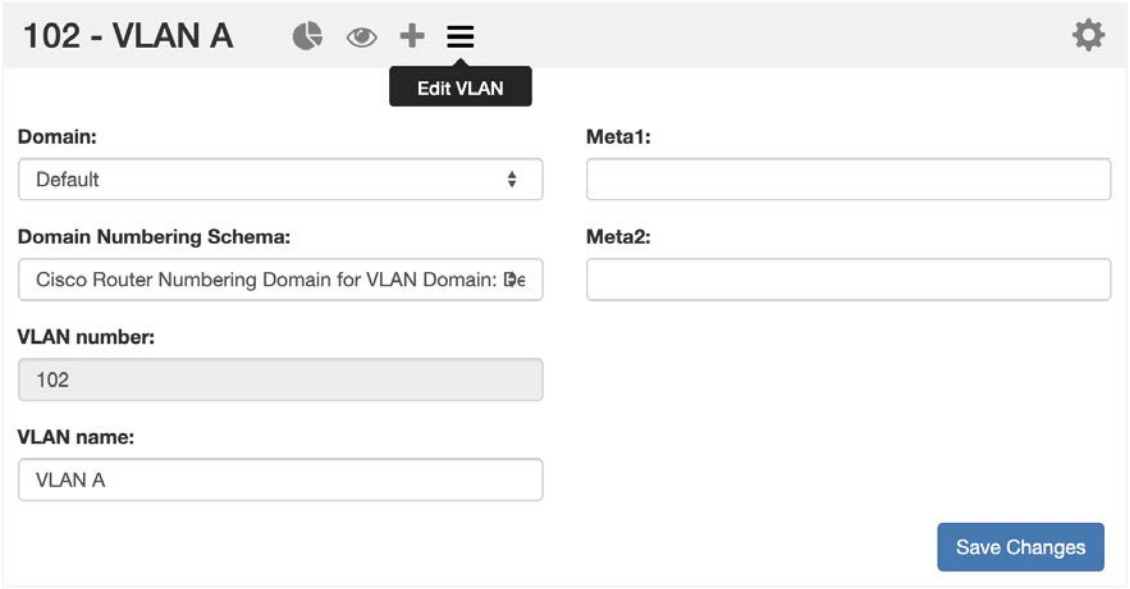
To select additional blocks, shift-click on each row you wish to mark for assignment. You may freely scroll through the results to review your selection.

When done, click Assign Selected. All highlighted blocks will be assigned to the VLAN at the same time, and the Smart Browse window will close.

Edit VLAN

The Edit VLAN panel allows you to view and edit the data associated with the VLAN (Note: not all VLAN fields may be editable).

To open or close the Edit VLAN panel, click on the "List" icon in the grey header bar.



Typically, editable VLAN fields include the VLAN Name and any enabled VLAN "Metadata 1-10" fields enabled in VLAN Columns. To change the information in these fields, click inside the relevant box, type your change, and then click "Save Changes". The information provided in these fields will also display in the "VLAN Advanced" Global View.

VLAN Manage Page

VLAN Manage lists all blocks associated with a VLAN, using an interface that matches IPAM Manage and provides the same block management functionality as in IPAM Manage.

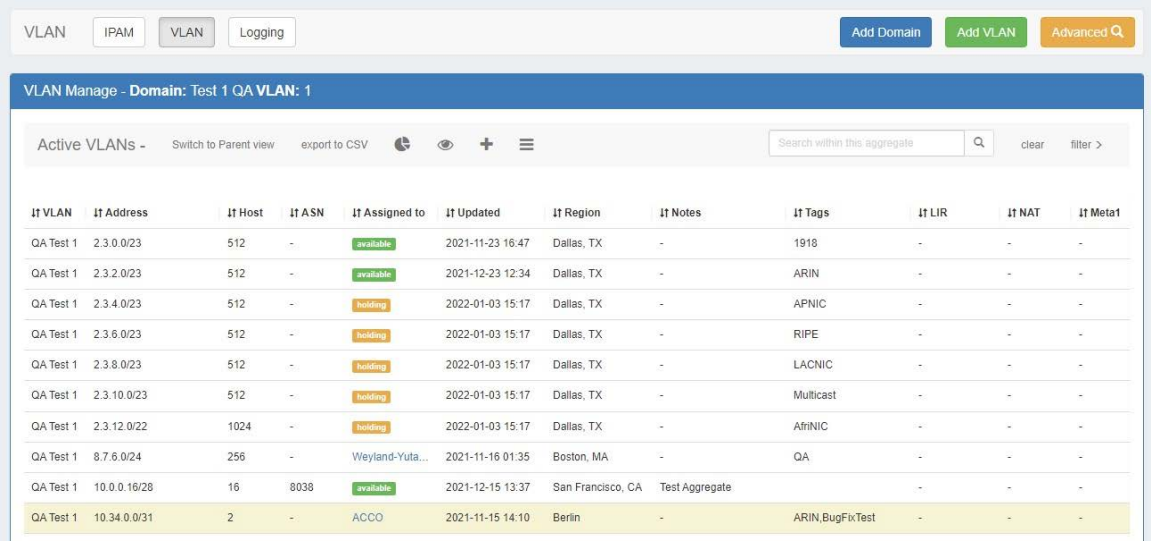
In addition, you can access common VLAN management areas, such as Add Domain and Add VLAN, and manage the VLAN through four action panels - Utilization, Quickview, Assign Block, and Edit VLAN.

VLAN Manage has the same interface options as IPAM Manage:

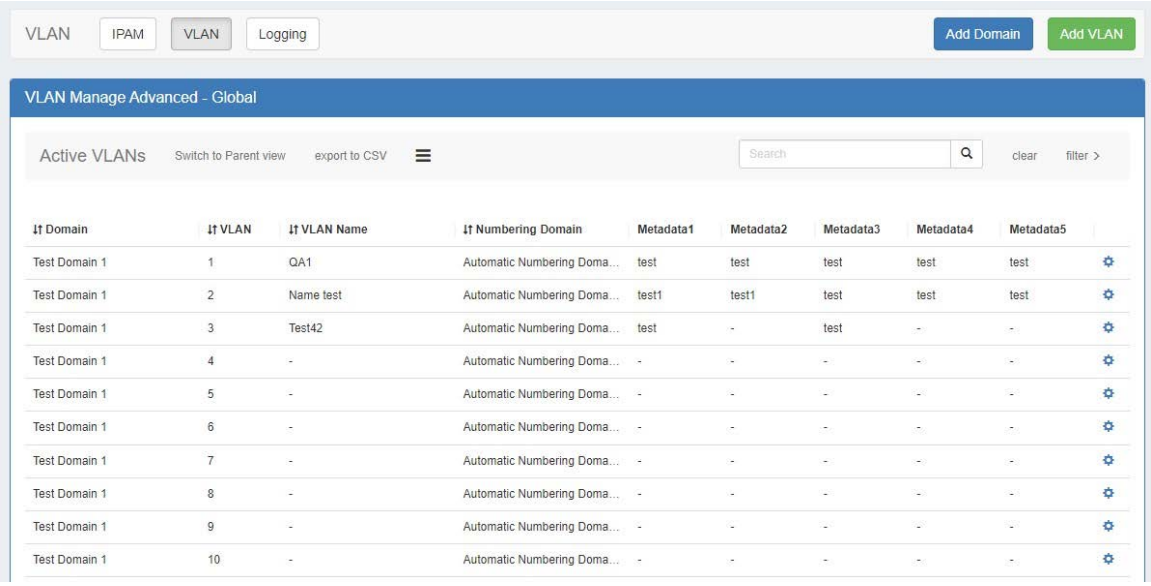
- Sort the block list by clicking on column names
- Resize columns by dragging the vertical divider between column names to the left or right
- Edit column order, visibility, names, or add custom metadata columns from IPAM Admin VLAN Columns
- Double-click to open the Edit Block dialog for any block in the list
- Right-click on a block (or click on the gear icon) to open the IPAM Action Menu
- Shift-click to select multiple blocks, and then right-click for multi-block menu options
- Filter the block view by clicking on "filter >", then selecting filter criteria. When done, click Apply.
- Export the list to .csv
- View "Parent View", showing the parent blocks with an option to display the block's tree

VLAN Manage also has the same action panels as in the VLAN Home page - Utilization Boxes:

- Open VLAN Action panels from inside VLAN manage to review data or perform standard tasks, including:
    - VLAN Utilization Charts (Pie Icon)
    - Quickview (Eye Icon)
    - Assign Blocks to VLAN (Plus Sign)
    - Edit VLAN (List icon)



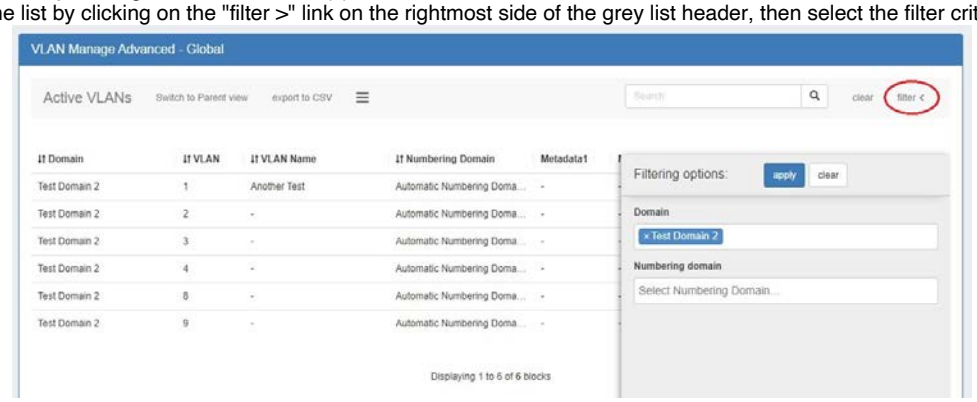
VLAN Advanced (Global View)



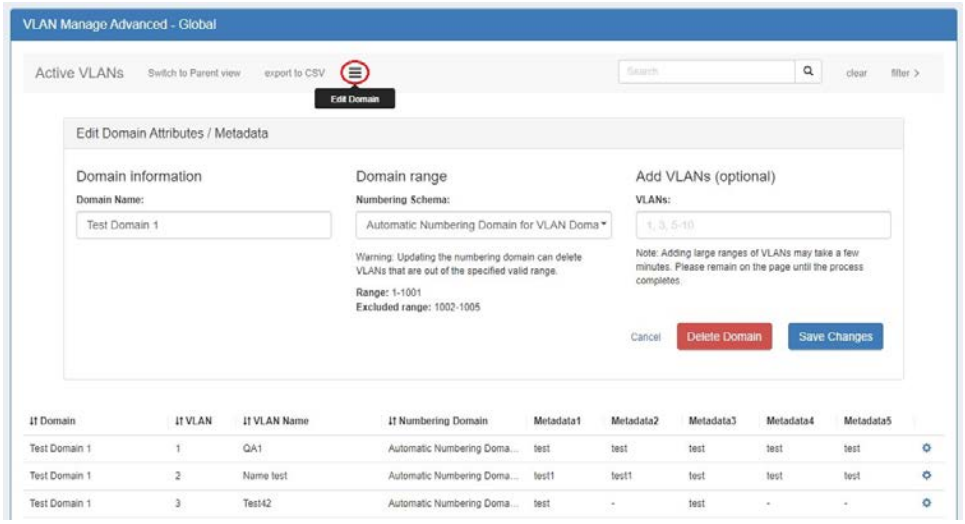
VLAN Advanced displays a list of all domains / vlans added to ProVision. Here, you can perform domain level management tasks, view data on added VLANs, including domain, VLAN Name, applied numbering domains, and any enabled VLAN metacolumn data.

From this page, you may add domains or vlans, edit a domain (by clicking the "List" icon), and perform various actions from the VLAN Action Menu (right click on a VLAN entry).

VLAN Advanced (Global View) Actions

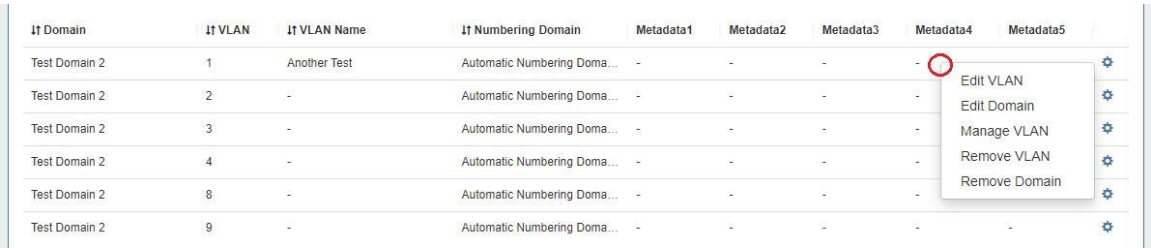
- Sort the list by clicking the column header(s)
- Filter the list by clicking on the "filter >" link on the rightmost side of the grey list header, then select the filter criteria and click Apply.
  - 

- Search for a specific domain name, vlan name, vlan number, or metadata field value by typing the search term into the search box, then hit *enter* or click the Search icon.
- Export the list to .csv by clicking "export to CSV" in the list header
- Edit or remove a domain by clicking on the Edit Domain panel (list icon)



- Add domains or VLANs by clicking Add Domain or Add VLAN buttons at the top right of the page

Additionally, you may right click on any VLAN while in this view to open a VLAN action menu with the following options:

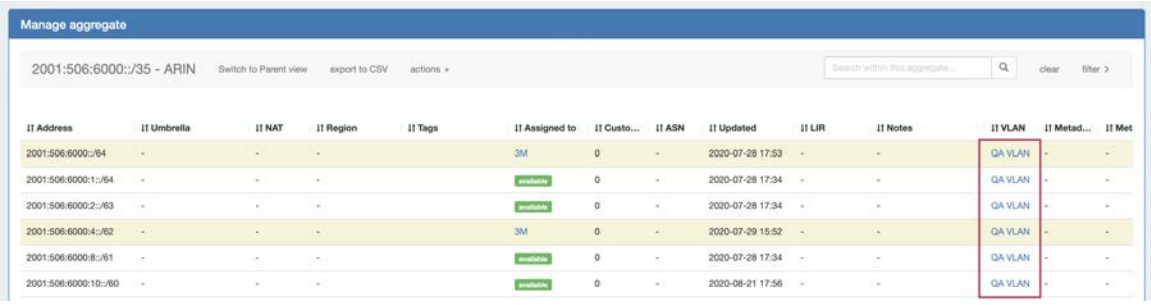


- Edit VLAN (opens the Edit VLAN panel for that VLAN)
- Edit domain (opens the Edit Domain panel for the VLAN's domain)
- Manage VLAN (links to the VLAN Manage page for the VLAN)
- Remove VLAN
- Remove domain

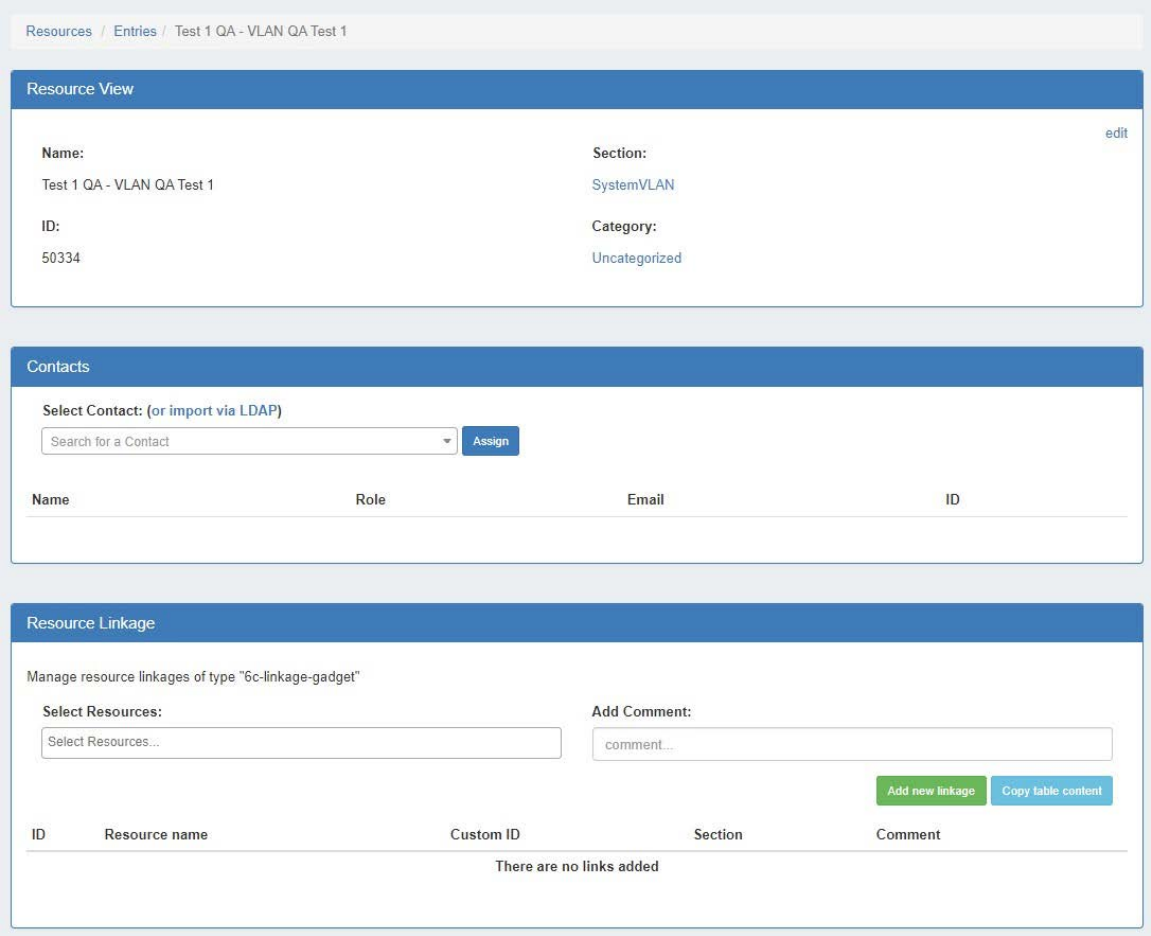
System VLAN Resources

ProVision auto-generates a SystemVLAN resource for Domain-VLAN pairs associated with IPAM blocks.

After associating an IPAM Block with a Domain and VLAN, save the changes and a new resource link will appear for the VLAN. Click on the link to navigate to the VLAN resource.



This allows users to document additional information for the VLAN, such as POC / Contacts, Linked Resources, Notes, and create or edit Custom Resource Fields. SystemVLAN sections may not be edited.



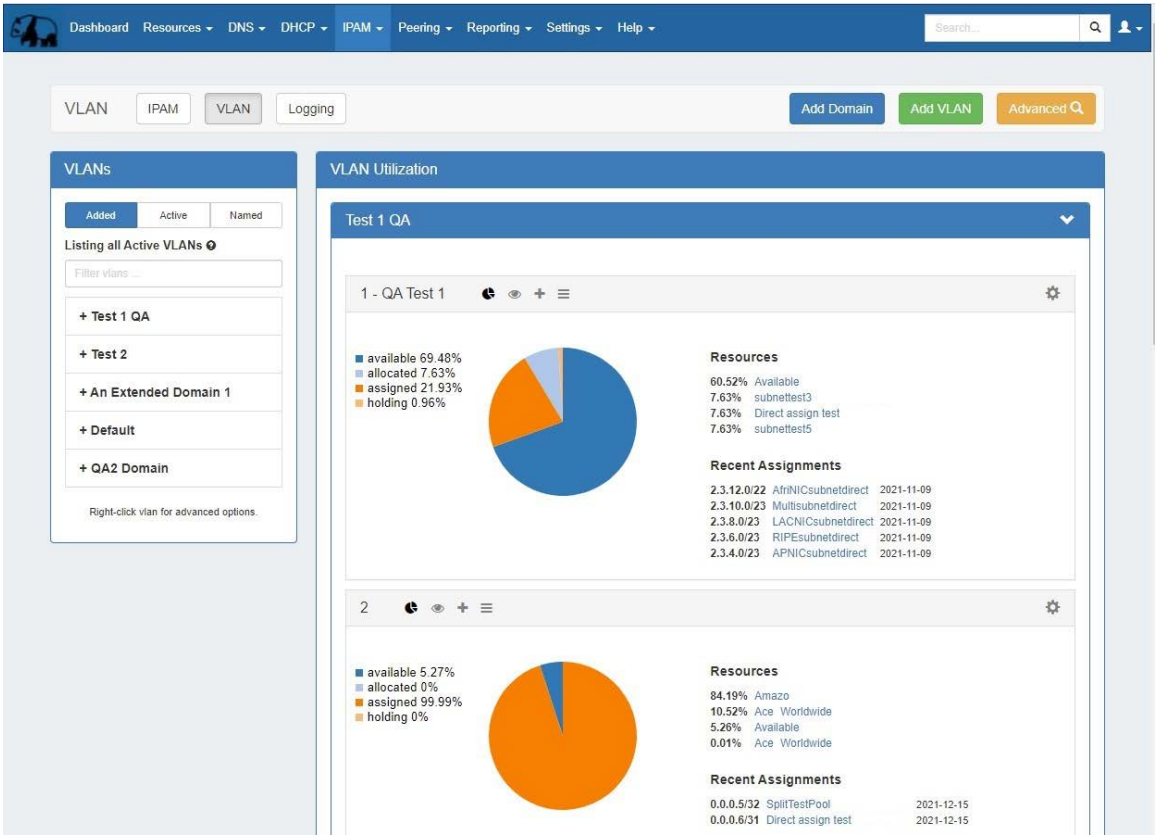
Additional Information

For detailed information on working with domains and VLANs, continue on to:

- Working with Domains
- Working with VLANs

Working with Domains

Working with Domains



This page provides detailed instructions on performing specific tasks in ProVision's VLAN Manager. Before reading this section, please ensure that you are familiar with navigating to the VLAN areas, including the VLAN Sidebar, VLAN Utilization area, VLAN Manage, and VLAN Advanced. For a broader overview of the VLAN system, its workflow, and basic navigation through the available VLAN pages, please refer to the VLAN page.

- Working with Domains
  - Viewing / Managing Domains
    - VLAN Sidebar
    - VLAN Utilization
    - VLAN Advanced (Global View)
  - Add Domain
    - Add a Domain - Numbering Authority Type
    - Add a Domain - Manually
  - Edit Domain
  - Remove Domain
- Additional Information

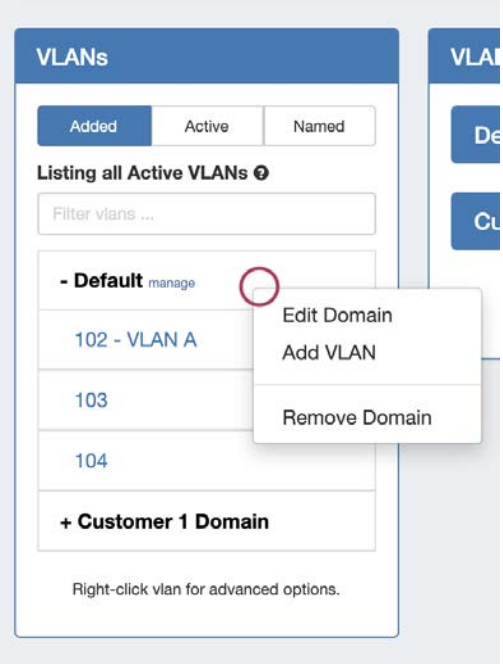
Working with Domains

Viewing / Managing Domains

You may view active domains from the VLAN Home Sidebar, the VLAN Home Utilization area, or from VLAN Advanced.

VLAN Sidebar

The VLAN sidebar lists the domains and VLANs that have been added to ProVision. Here, you can search for domains / VLANs by name, filter by Added/Active/Named status, and access common tasks.

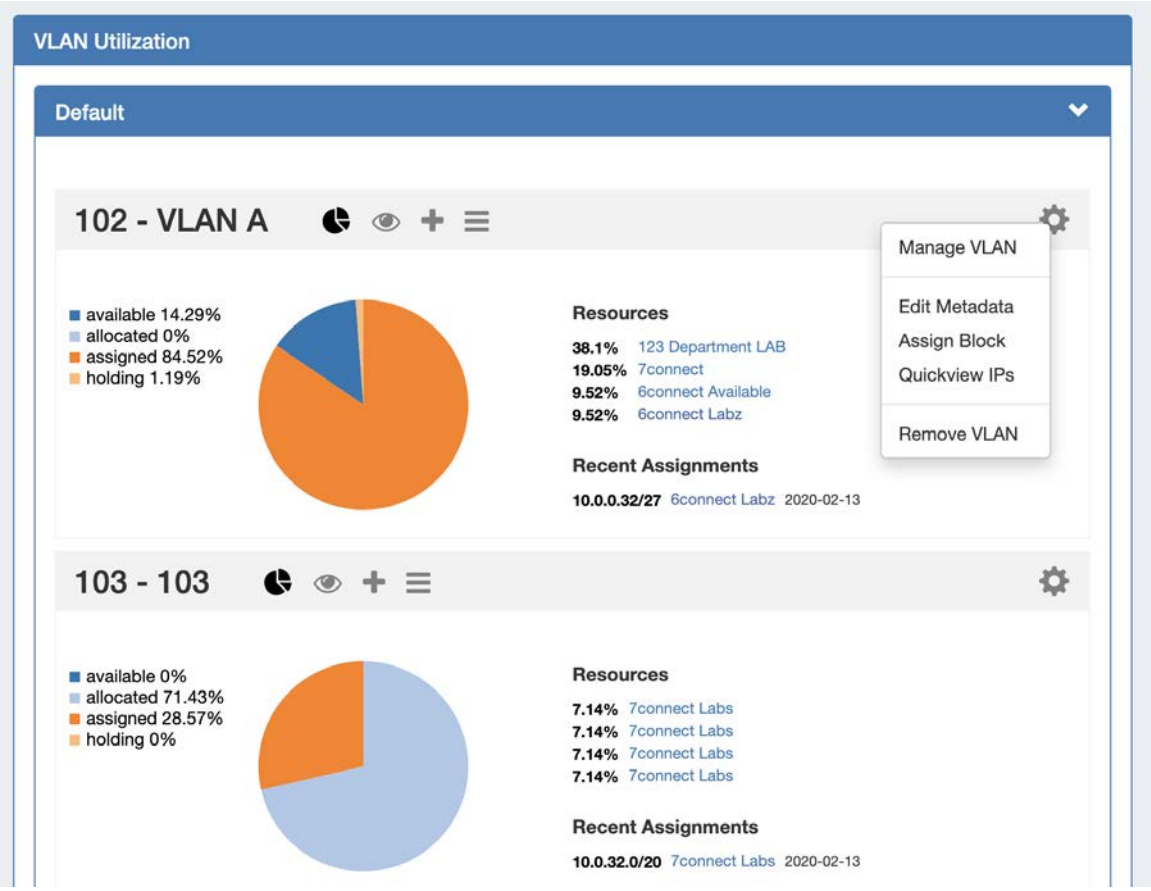


VLAN Sidebar Domain Actions:

- Click on a domain name to show/hide the VLANs contained under that domain
- Click "manage" next to the domain name to open VLAN Advanced for that domain
- Right click on a domain to open options to:
    - Edit Domain - Opens VLAN Advanced Edit Domain panel for that Domain
    - Add VLAN - Opens the Add VLAN page for that domain
    - Remove Domain - Deletes the domain and all VLAN data under it

VLAN Utilization

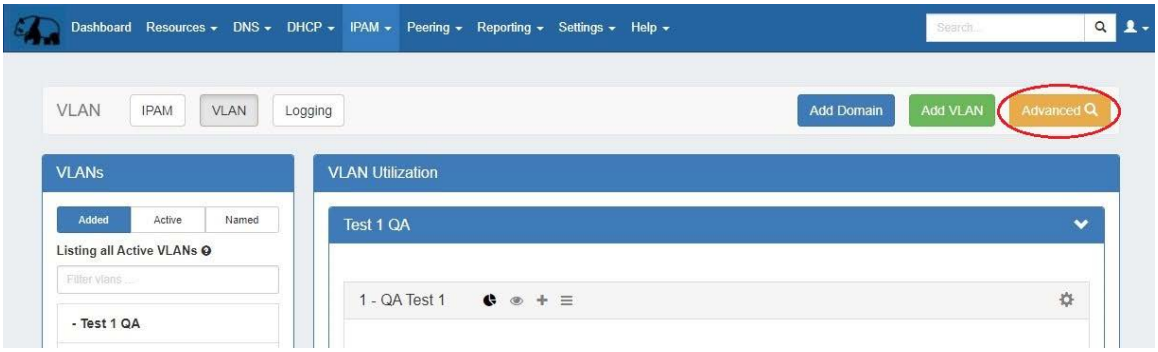
The VLAN Utilization area displays all domains and VLANs added to ProVision in collapsable modules. Here, you may view all VLANs under a domain with their utilization data, and perform VLAN level managements tasks.



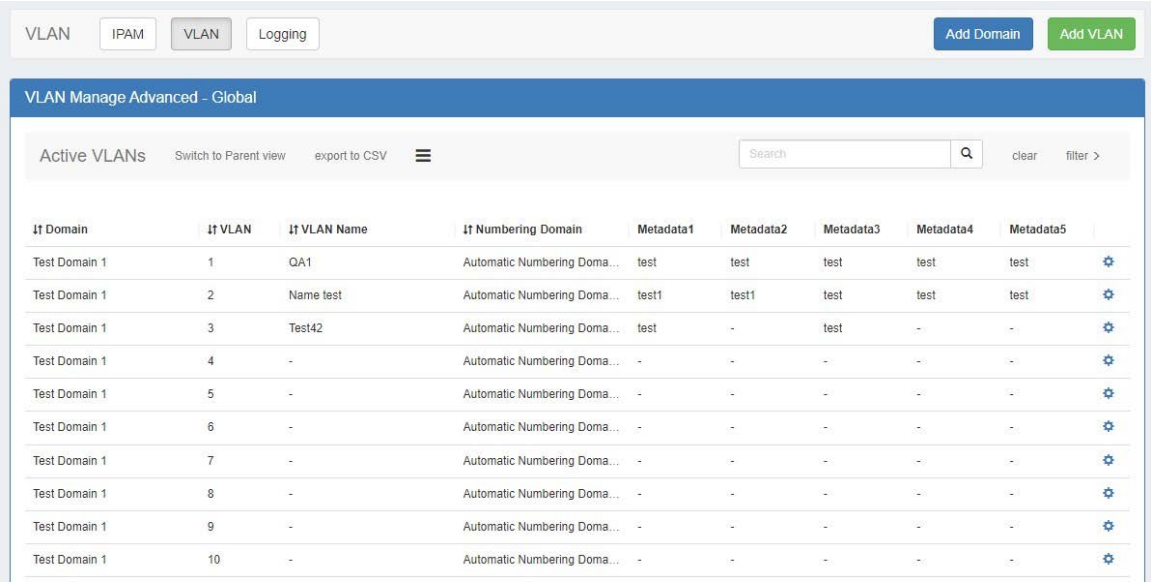
VLAN Advanced (Global View)

VLAN Advanced displays a sortable and filterable list of all the domains / VLANs added to ProVision and the associated metadata.

Open VLAN Advanced by clicking the Advanced button.



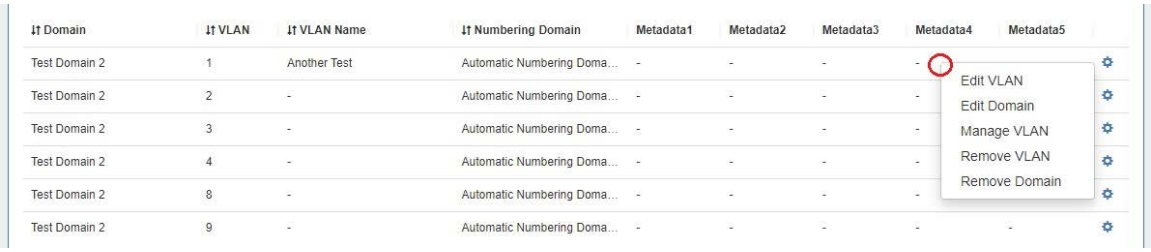
From this page, you may add domains or VLANs, edit a domain (by clicking the "List" icon), export the list, and perform various actions from the VLAN Action Menu (right click on a VLAN entry).



VLAN Advanced (Global View) Actions:

- Sort the list by clicking the column header(s)
- Filter the list by clicking on the "filter >" link, then select the filter criteria and click Apply
- Search for a specific domain name, VLAN name, VLAN number, or metadata field value by typing the search term into the search box, then hitting *enter* or click the Search icon.
- Export the list to .csv by clicking "export to CSV" in the list header
- Edit or remove a domain by clicking on the Edit Domain panel (list icon)
- Add domains or VLANs by clicking the Add Domain or Add VLAN buttons

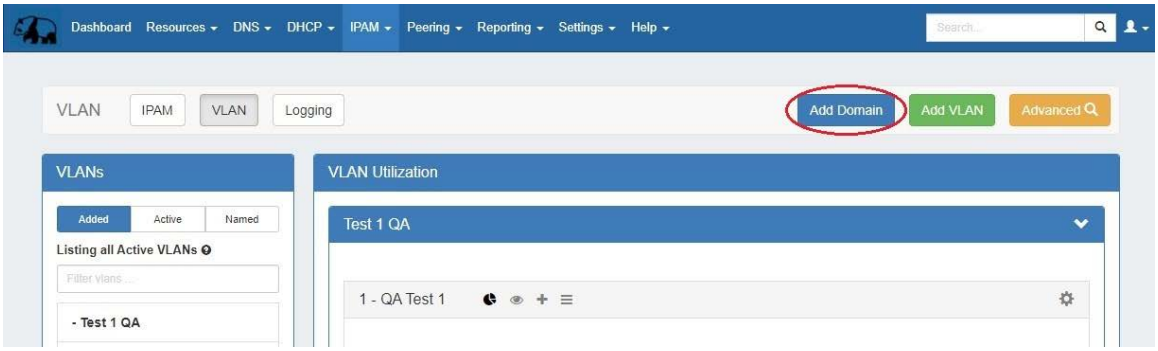
Additionally, you may right-click on any VLAN while in this view to open a VLAN action menu with the following options:



- Edit VLAN (opens the Edit VLAN panel for that VLAN)
- Edit domain (opens the Edit Domain panel for the VLAN's domain)
- Manage VLAN (links to the VLAN Manage page for the VLAN)
- Remove VLAN
- Remove domain

Add Domain

Add a new domain by clicking the Add Domain button at the top of the VLAN Home page.



This opens the "Add Domain" page. Here, you can choose to add a domain by using a pre-set Numbering Authority range, or by creating a new range manually.

Numbering Authority Ranges

Two default Numbering Authority VLAN ranges are provided, one for a Cisco Standard domain, and another for a Cisco Extended Domain. These default ranges use Cisco Standard and Cisco Extended range extents and exclusions:

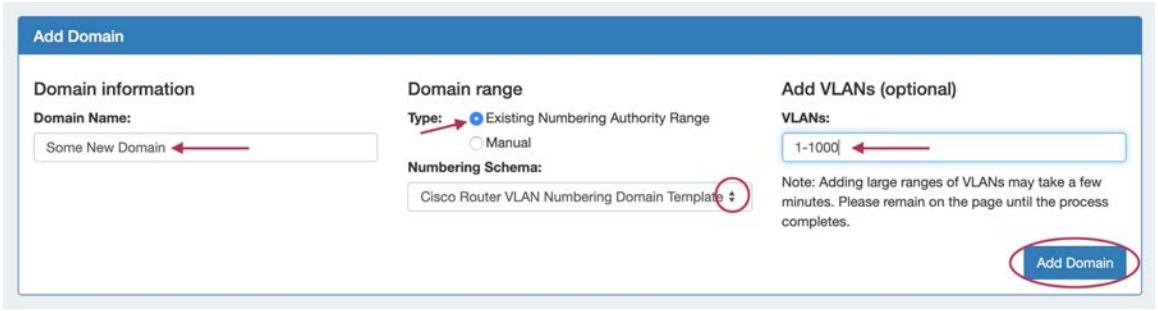
Name	Reuse values	Type	Actions
Cisco Router VLAN Numbering Domain Template	Yes	Multi-range **Ranges**: 1-1001 **Excluded Ranges**: 1002-1005	Get Next Value View Assigned Values Delete
Cisco Router VLAN Extended Numbering Domain Template	Yes	Multi-range **Ranges**: 1-4094 **Excluded Ranges**: 1,3968-4047,4094	Get Next Value View Assigned Values Delete

Admins may create new pre-set Numbering Authority ranges at any time to support other router types, range extents, or exclusions. Those ranges will then be available as options when adding a new domain from the VLAN area.

Add a Domain - Numbering Authority Type

In the Add Domain section, under Domain Information, enter a new domain name.

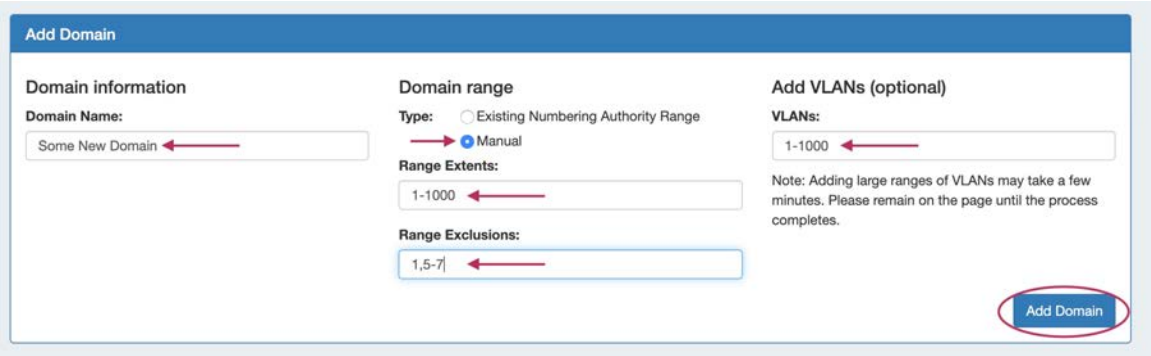
Under Domain Range, select to use an existing Numbering Authority range for your domain. If desired, you may choose to add VLANs to the domain at the same time, by specifying the VLAN or VLAN range(s) - any exclusions will automatically be skipped.



When done, click Add Domain. The new domain will be added to the VLAN Sidebar, along with any added VLANs.

Add a Domain - Manually

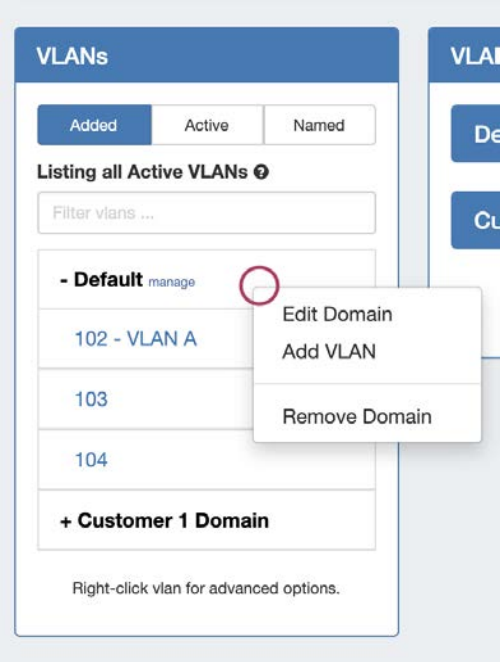
To add a new manual domain range, enter the domain name and select Manual for the Domain range Type. Once Manual has been selected, fields will display to enter the range extents (such as 1-1000), and range exclusions (here, 1, 5-7). If desired, you may choose to add VLANs to the domain at the same time, by specifying the VLAN or VLAN range(s) - any exclusions will automatically be skipped.



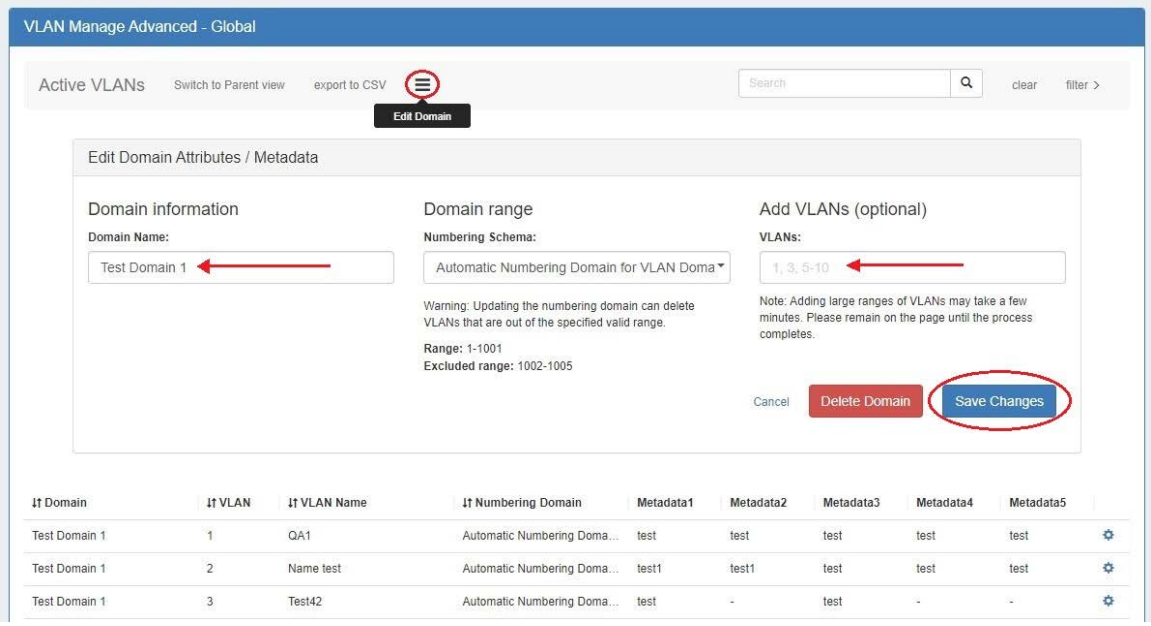
When done, click Add Domain. The new domain will be added to the VLAN Sidebar, along with any added VLANs. In addition, the manually created range will become a new Numbering Authority range, and able to be used as a template for a future domain.

Edit Domain

From the VLAN sidebar, right-click on the domain to edit and select Edit Domain. This opens the VLAN Advanced Edit Domain panel for that domain.



You may also access the Edit Domain panel directly from **VLAN Advanced** clicking on Edit Domain (List icon) and selecting the desired domain.

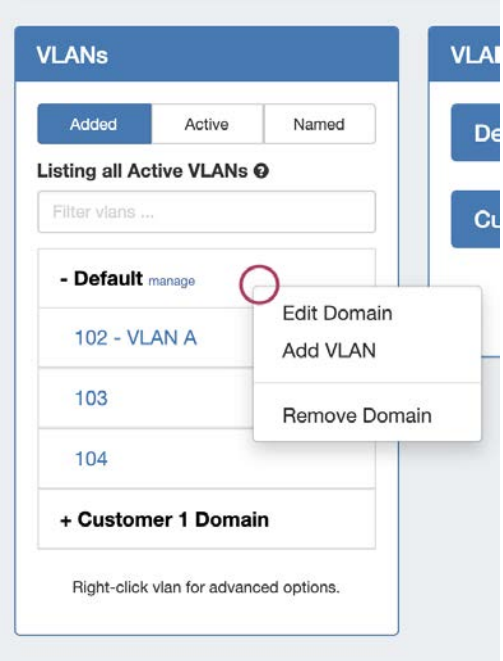


Here, you can edit the domain name, view its range and range exclusions, and add VLANs to the domain. Enter your desired change(s), then click Save Changes.

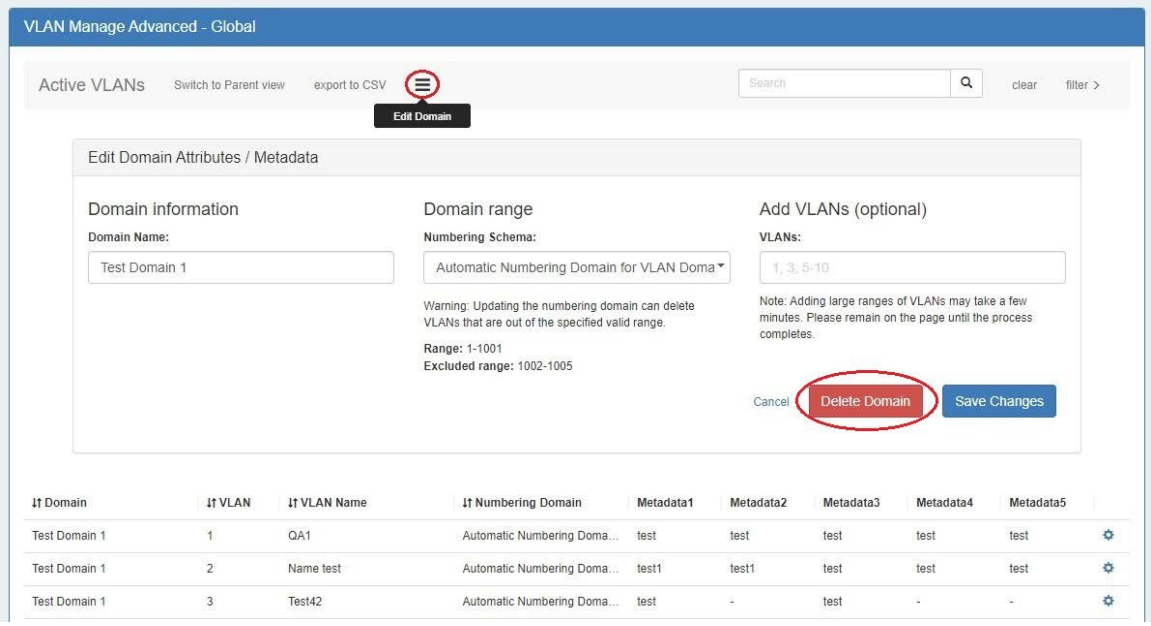
Remove Domain

Deleting a domain may be done from either the VLAN Sidebar or from the VLAN Advanced Edit Domain panel.

To delete a domain from the sidebar, right click on the domain name and select Remove Domain.



To delete the domain from the Edit Domain panel, open VLAN Advanced for the Domain, then click Delete Domain.



When deleting a domain, both the domain and all VLANs under it will be deleted. Any IP blocks associated with the deleted domain will have its Domain and VLAN association removed.

Additional Information

For information on working with VLANs, continue on to:

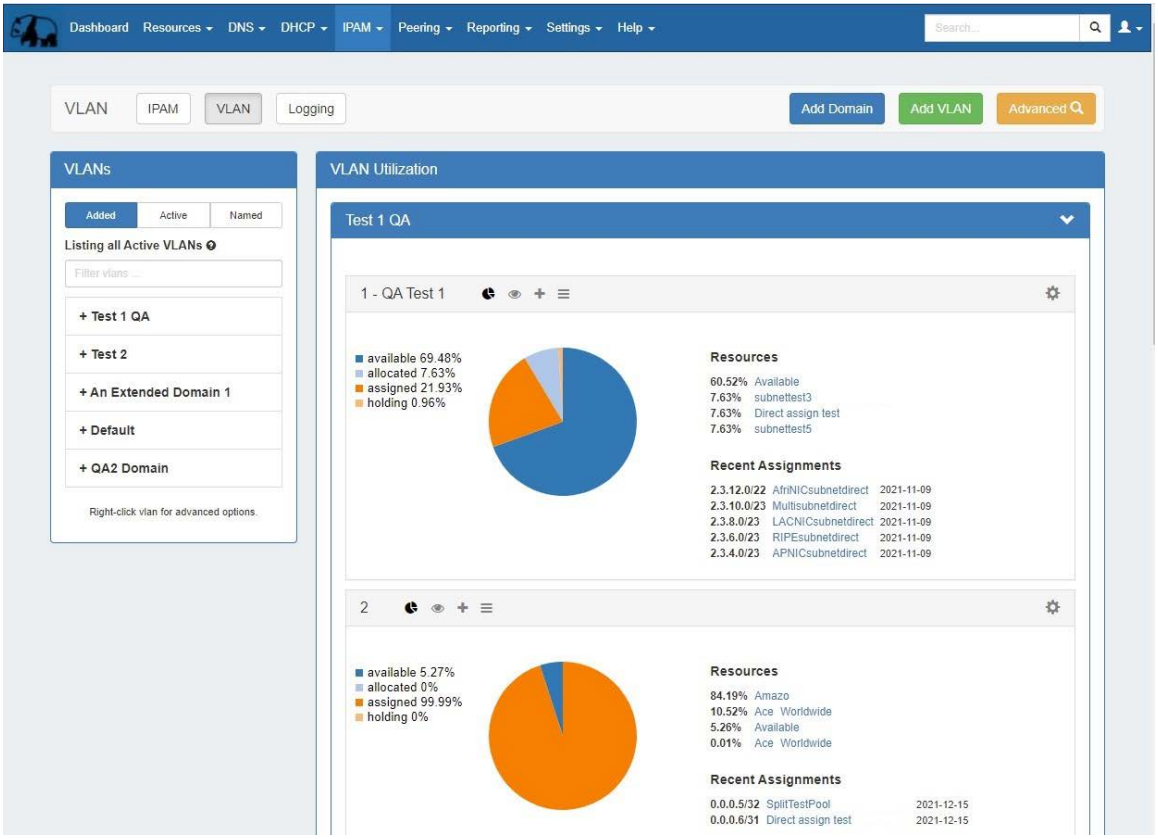
- Working with VLANs

For a higher level overview of ProVision's VLAN Manager, see:

- VLAN

Working with the VLAN Manager

Working with VLANs



This page provides detailed instructions on performing specific tasks in ProVision's VLAN Manager. Before reading this section, please ensure that you are familiar with navigating to the VLAN areas, including the VLAN Sidebar, VLAN Utilization area, VLAN Manage, and VLAN Advanced. For a broader overview of the VLAN system, its workflow, and basic navigation through the available VLAN pages, please refer to the VLAN page. For domain level tasks, see Working with Domains.

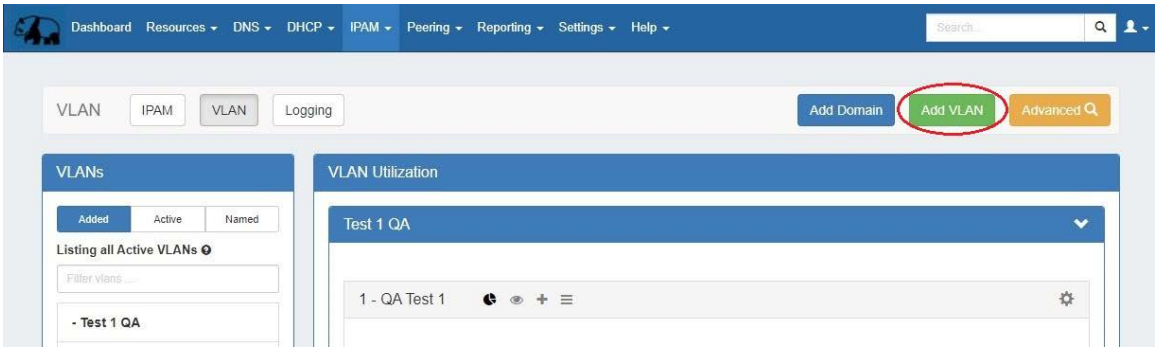
- Working with VLANs
  - Add VLANs to a Domain
  - Remove VLANs
  - Edit VLAN (Edit VLAN Panel)
  - Add Blocks to VLANs
    - Using the "Assign Blocks" Panel
      - Assign Blocks to VLAN
        - Direct Assign to VLAN
        - Smart Browse to VLAN
        - Assigning from Smart Browse
    - Add / Update VLAN to Blocks from IPAM Manage or VLAN Manage:
    - Add / Update VLAN to Blocks from IPAM Gadget:
  - Remove Blocks from a VLAN
    - Quickview
  - Working with VLAN Metadata
    - Enable / Disable VLAN Metadata Fields
    - View / Edit Metadata Field Information
- Additional Information

Working with VLANs

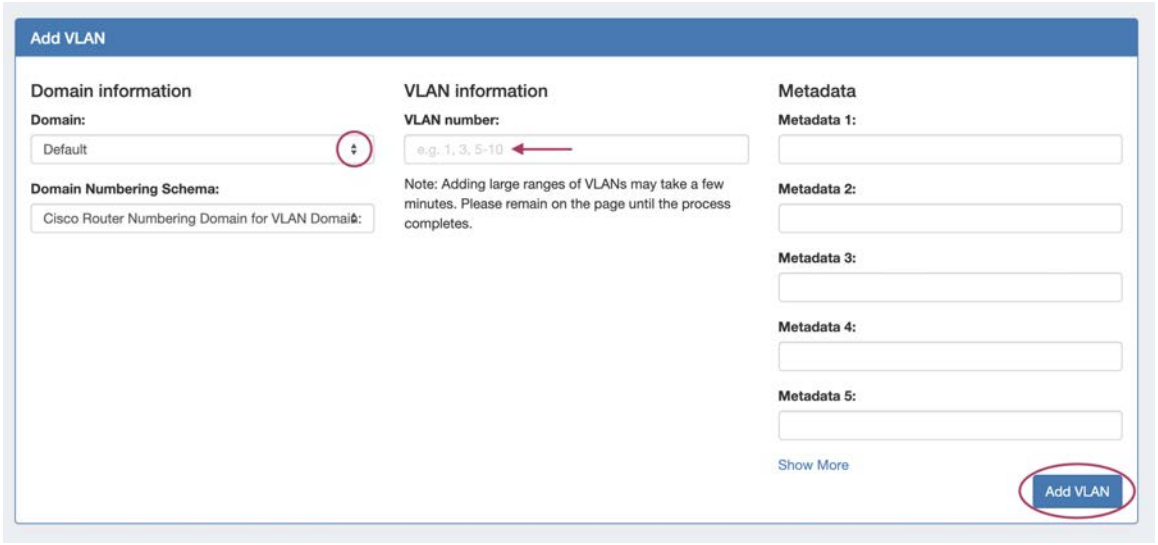
Add VLANs to a Domain

After creating domains, VLANs need to be added for that domain out of the pool of available VLANs.

From the VLAN Home page, click Add VLAN.



Select the domain, and then enter the individual or range of VLANs to add. Optionally, you may enter VLAN metadata field values, if metadata fields are enabled.

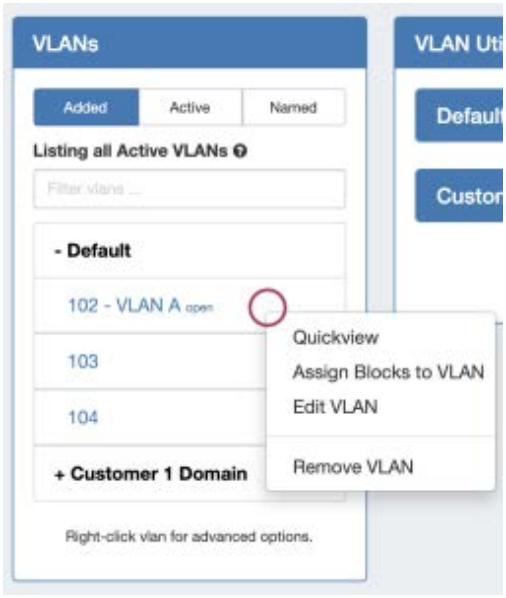


When done, click Add VLAN.

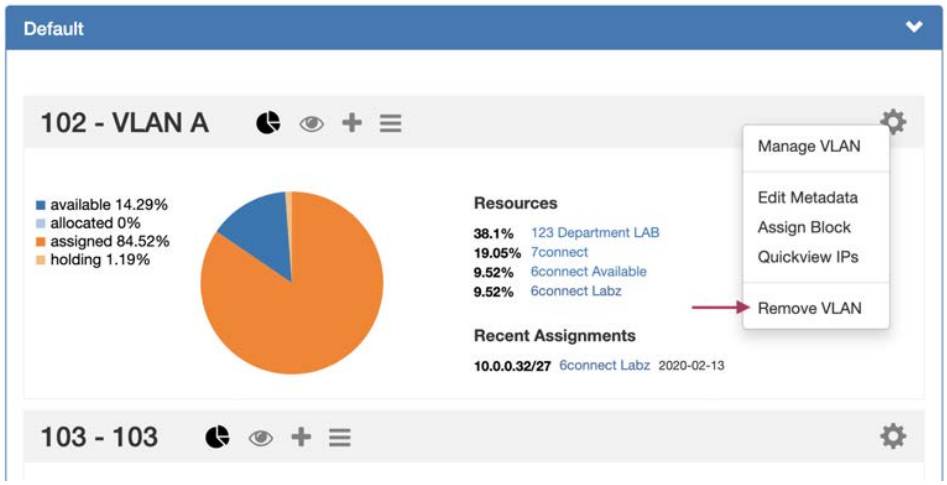
Remove VLANs

Removing VLANs may be performed from multiple areas:

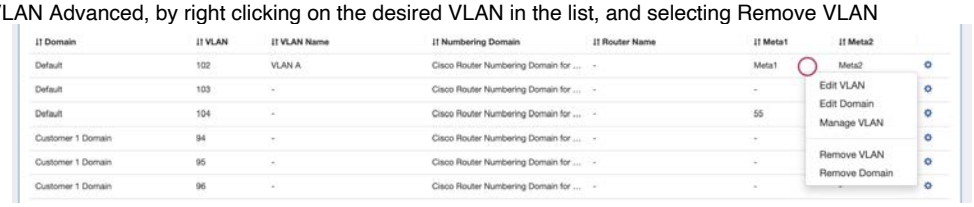
- On the VLAN Home page sidebar, by right clicking on the VLAN and selecting Remove VLAN from the menu



- From the VLAN Utilization Box for the VLAN, by clicking the gear icon and selecting Remove VLAN



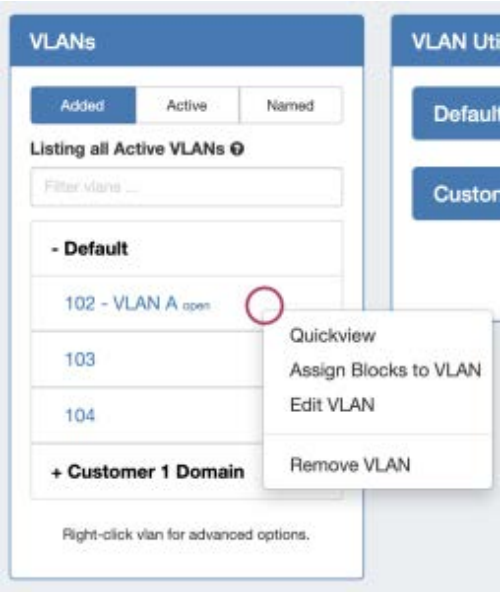
- From VLAN Advanced, by right clicking on the desired VLAN in the list, and selecting Remove VLAN



Deleting a VLAN permanently removes the VLAN from the domain, and removes the VLAN association from any blocks assigned to that VLAN, and permanently deletes the VLAN's metadata.

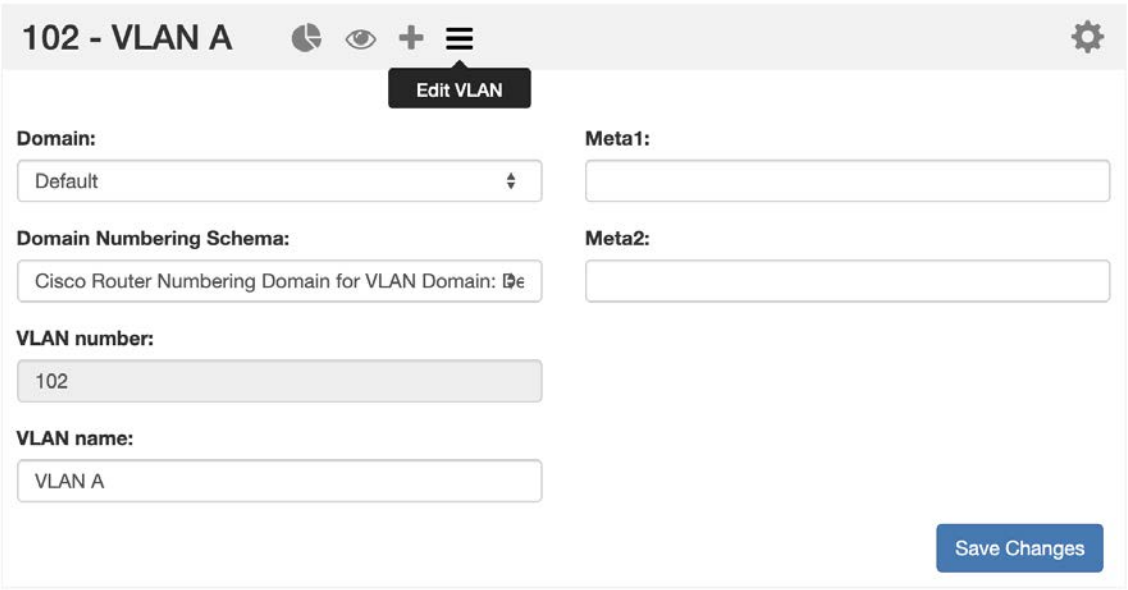
Edit VLAN (Edit VLAN Panel)

You can edit a VLAN by clicking on the VLAN in the VLAN List sidebar, then selecting Edit VLAN.



This opens the Edit VLAN panel for the selected VLAN. You may also click on the "List" icon in the VLAN Utilization box or in VLAN Manage to open the Edit VLAN panel.

The Edit VLAN panel allows you to view and edit the data associated with the VLAN (Note: not all VLAN fields may be editable).



Typically, editable VLAN fields include the VLAN Name and any enabled VLAN metadata fields enabled in VLAN Columns. To change the information in these fields, click inside the relevant box, type your change, and then click Save Changes. The information provided in these fields will also display in the VLAN Advanced Global View.

You cannot change the domain of the VLAN, but you may add a descriptive name or edit VLAN Metadata (if enabled).

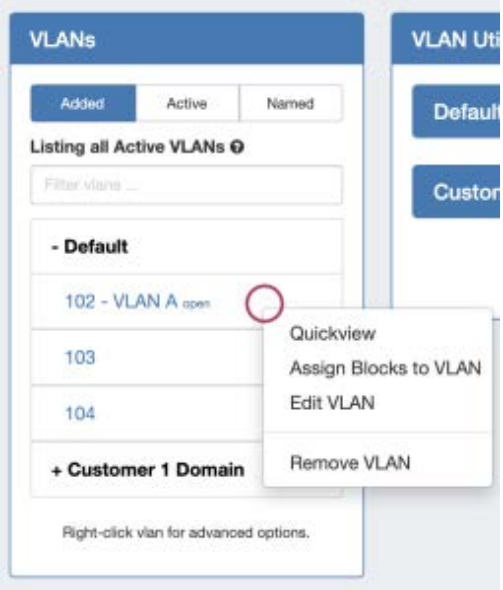
After making your changes, click Save Changes. The named VLAN will now show both VLAN number and name when viewing domain / VLAN lists or when working with blocks.

Add Blocks to VLANs

After VLANs have been enabled for domains, you can associate those VLANs with IP blocks.

Using the "Assign Blocks" Panel

While on the VLAN Home Page, expand the desired domain in the sidebar and right click on a VLAN. Then select Assign Blocks to VLAN.

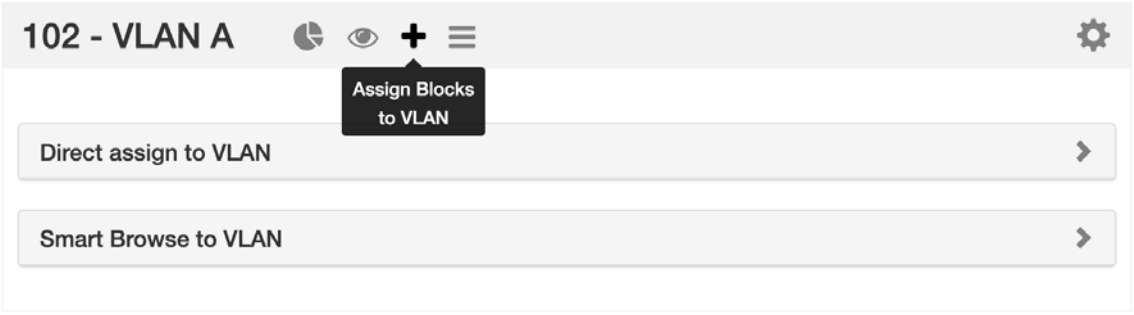


This navigates to the VLAN's Utilization Box, and opens the Assign Blocks panel. You may also access the panel directly from the Utilization Box or VLAN Manage by clicking on the plus-sign icon.

From the Assign Blocks panel, you can choose to Direct Assign a block to the VLAN, or use filter criteria to user Smart Browse to assign blocks.

Assign Blocks to VLAN

Blocks may be assigned to the VLAN from the Assign Blocks panel, opened or closed by clicking on the plus-sign icon. Two assignment options are available: Direct Assign to VLAN, if you know the specific block to assign, and Smart Browse to VLAN, where you can specify filter conditions and select one of more blocks meeting those conditions.

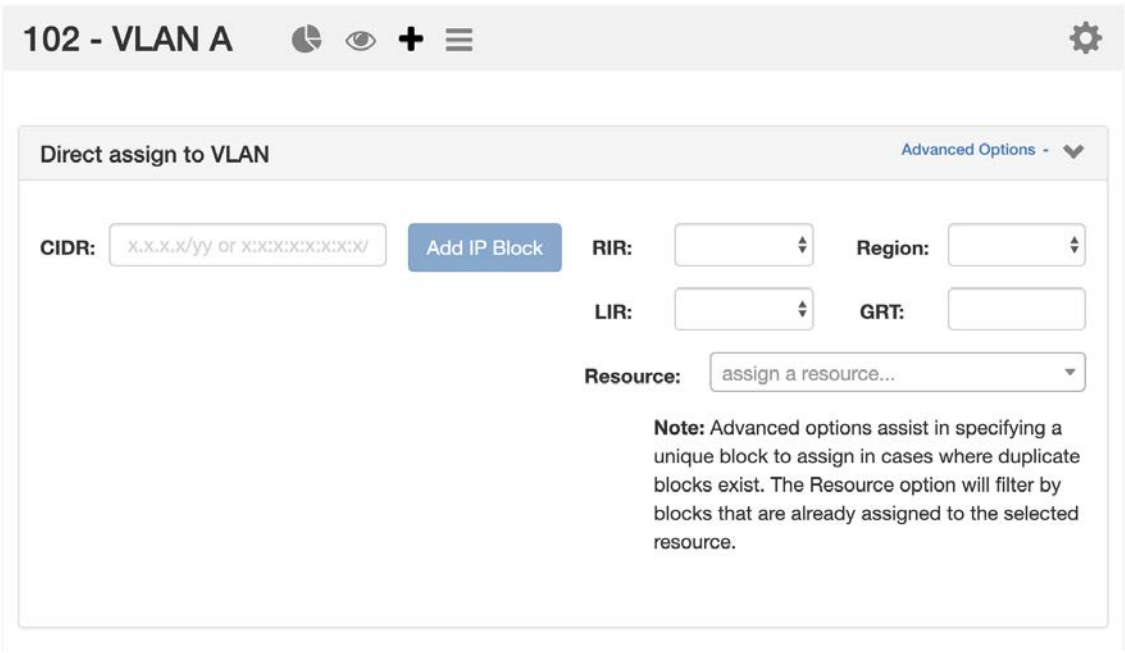


To open either option, click on the appropriate header bar to expand the module.

Expand the area below for more details on Direct Assign to VLAN and Smart Browse to VLAN:

Direct Assign to VLAN

To Direct Assign a specific block to the VLAN, expand the Direct Assign to VLAN module, then enter the CIDR to assign into the CIDR" box, and click Add IP Block .



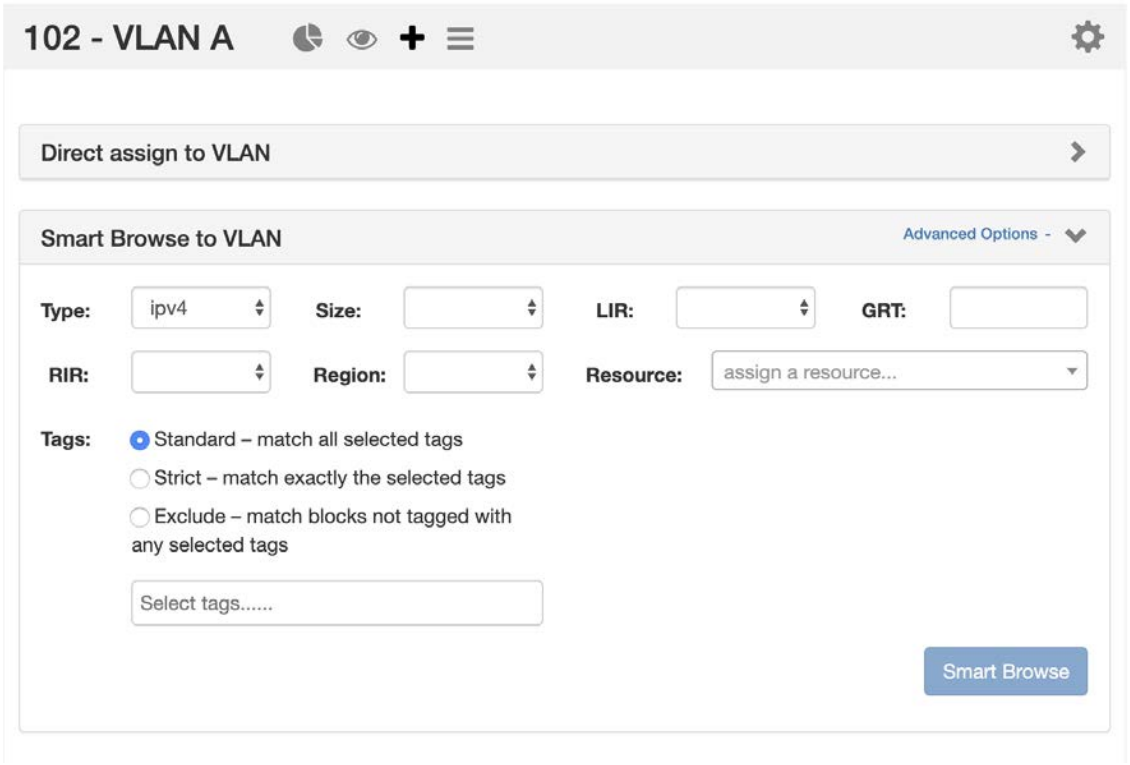
If blocks exist with the same CIDR (such as in duplicate 1918 space), you may differentiate between the two by clicking on Advanced Options, and providing additional filter criteria to use to assign a specific block.

Smart Browse to VLAN

Smart Browse to VLAN is used to search for a general list of blocks available to assign to the VLAN that meets certain criteria.

Expand the Smart Browse module by clicking on the header bar .

Then, enter your filter criteria. At minimum, block type, size, and RIR must be provided; region and tags are optional.



If further filtering is needed, click Advanced Options to open the LIR, Custom Code (here: as "GRT"), and assigned resource fields to use.

Once you have entered your filter criteria, click Smart Browse to display your results.

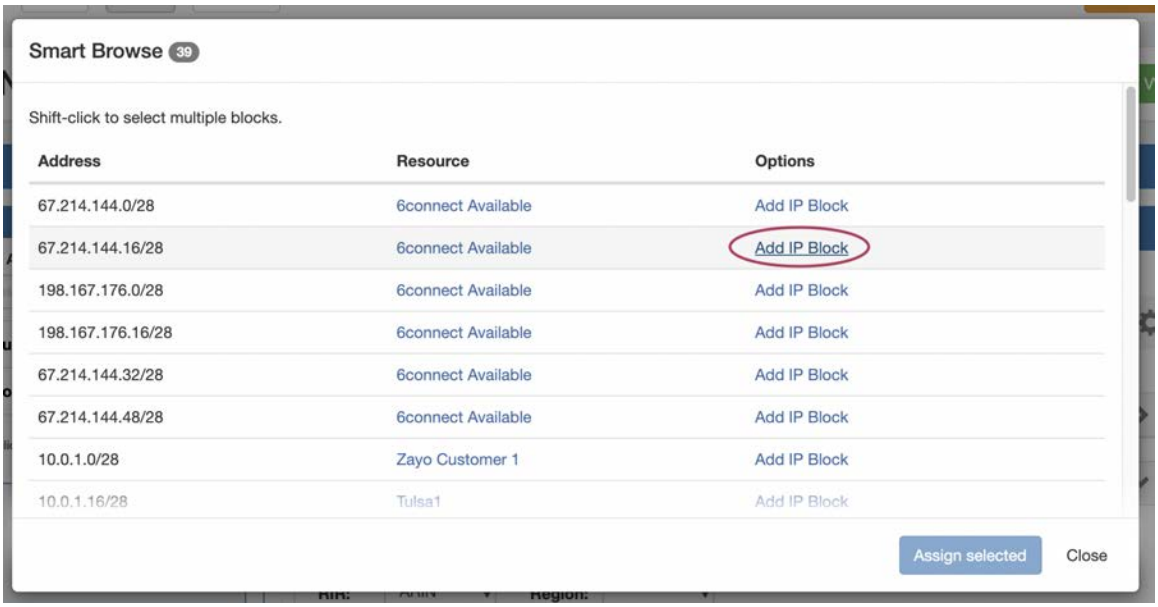
Assigning from Smart Browse

The Smart Browse results list will display a list of blocks that a) meet your filter criteria, and b) do not already have a VLAN assigned.

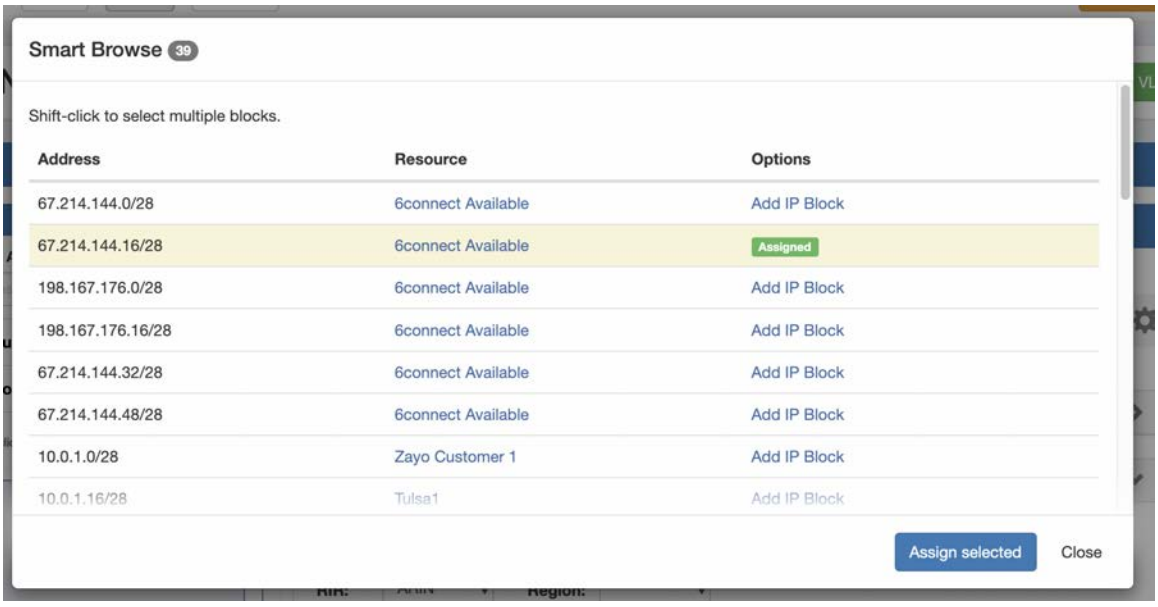
You may assign individual blocks immediately (Add IP Block), or select multiple blocks and delay assignment until after your final selections are complete (Assign Selected).

Immediate Assignment:

To assign an individual block immediately from the list to the VLAN, click Add IP Block for the desired block.



After clicking Add IP Block, the block will immediately be assigned to the VLAN, and an "Assigned" status will display for the block in the Smart Browse list.



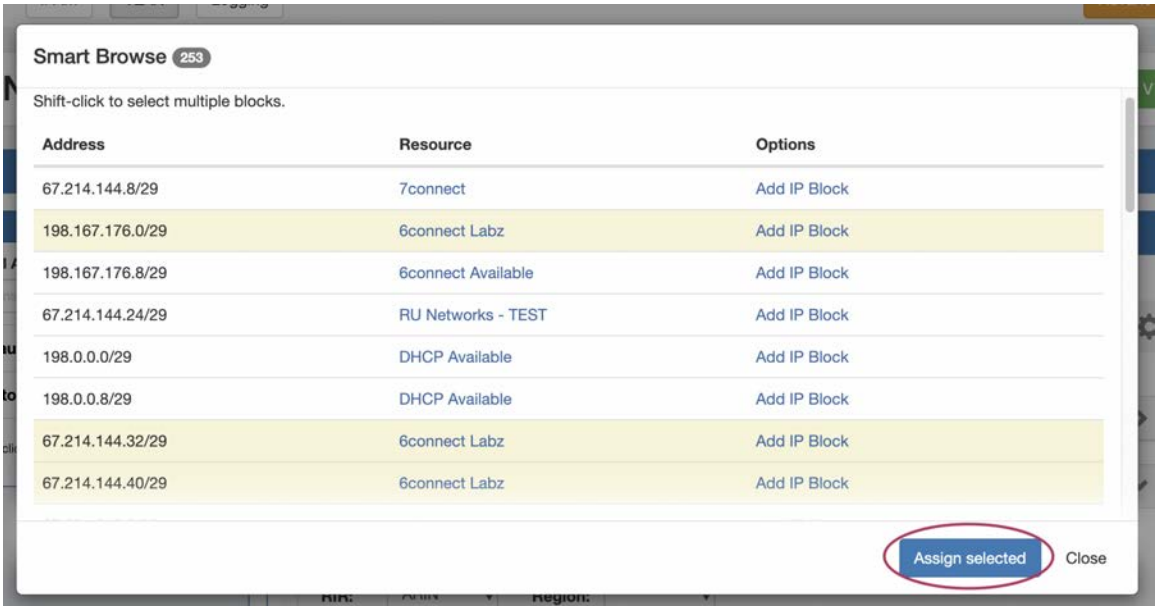
From here, you may assign additional blocks. Click Close to exit when complete.

If the "Assigned" status displays for all blocks you intend to assign, then you may skip clicking Assign Selected - as nothing else remains to assign - and instead click Close to exit.

Delayed Assignment / Selecting Multiple Blocks:

If you wish to assign multiple blocks to the VLAN at the same time, or mark a single block to assign later while continuing to browse the list, you may select a block to mark for later assignment and then assign all selected blocks at once.

To select a single block, left click on row for the block (taking care not to accidentally click on a blue link). Note that the row will have a yellow highlight indicating it is selected:



To select additional blocks, shift-click on each row you wish to mark for assignment. You may freely scroll through the results to review your selection.

When done, click Assign Selected. All highlighted blocks will be assigned to the VLAN at the same time, and the Smart Browse window will close.

Add / Update VLAN to Blocks from IPAM Manage or VLAN Manage:

When editing a block in either IP Manage (**IPAM** Tab -> Action Menu (wrench) -> Manage), or VLAN Manage (IPAM Tab - VLAN -> Action Menu (wrench)) , you can select an existing domain and VLAN to associate to the block.

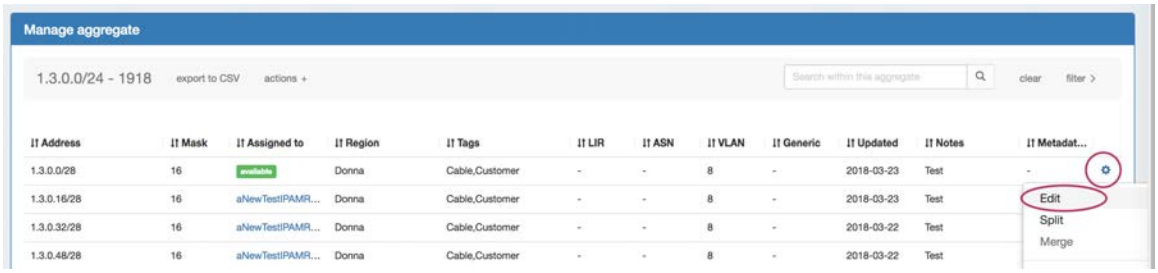
VLAN Manage:

From the VLAN Manage page, click on the Action Menu (gear icon) for the desired block, the select Edit. You may also double-click on the block to open the same screen.

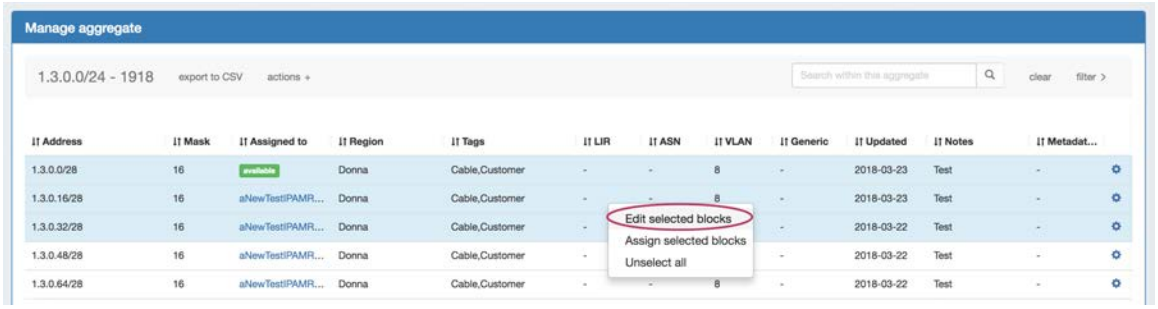
In the Edit Attributes dialog for the block, change the domain to the desired item, then select the VLAN. Click Save when done.

IPAM Manage:

From the IPAM Manage page, right click on the Action Menu (gear icon) for the desired block, then select Edit"

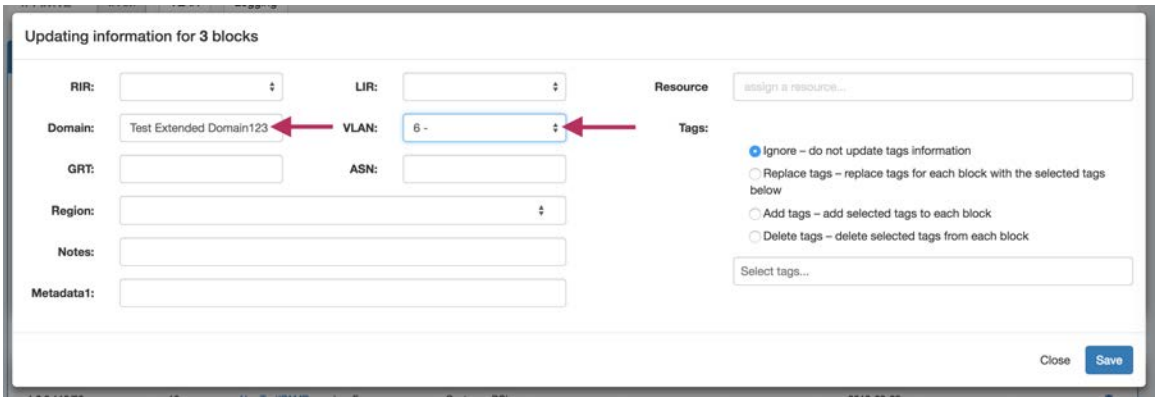


To select multiple blocks to edit, hold down the shift key and click on the blocks you wish to edit - the selected blocks will be highlighted. Right-click anywhere in the blue highlighted area, and select Edit Selected Blocks.



The Edit Block dialog will pop up for the selected block(s). Edit the domain by clicking in or typing in the domain search box, and select the desired domain.

Then, select the VLAN for the blocks from the enabled VLAN list. When done, click Save.



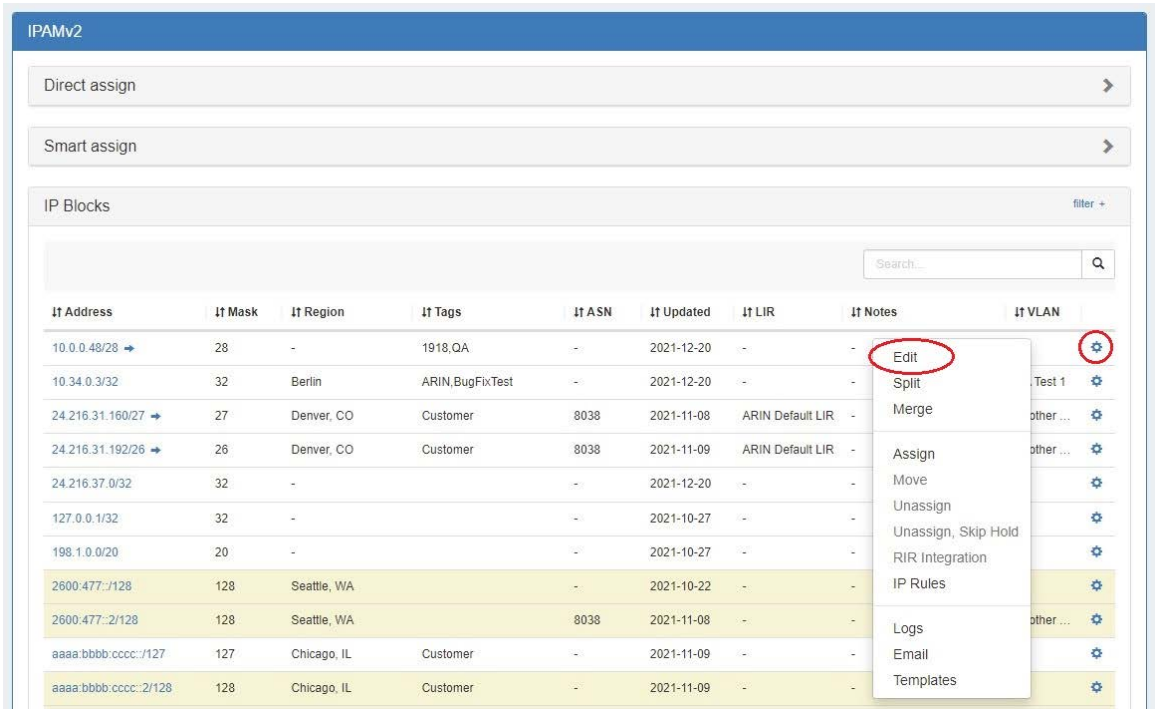
VLANs and Child Blocks

NOTE: Child blocks whose Parent blocks already have an assigned domain / VLAN, may not have domains and VLANs changed to be different than the Parent Block's values. If you attempt to save domain / VLAN changes to a child block under this situation, an error will occur.

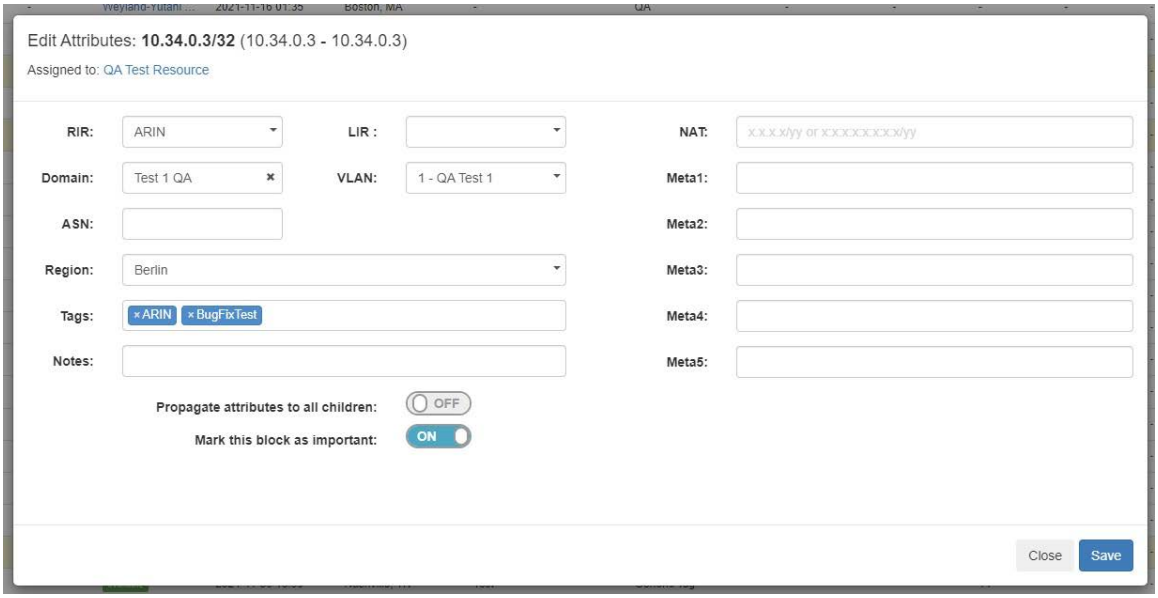
i.e., Parent and Child IP Blocks must have matching domain / VLAN values.

Add / Update VLAN to Blocks from IPAM Gadget:

You may also add / edit domain /VLAN information when editing a block in the IPAM Gadget. From the IP block's Action Menu (gear icon), select Edit.



Then, in the Edit Attributes dialog, search for or type the desired domain, select VLAN information, and click Save.

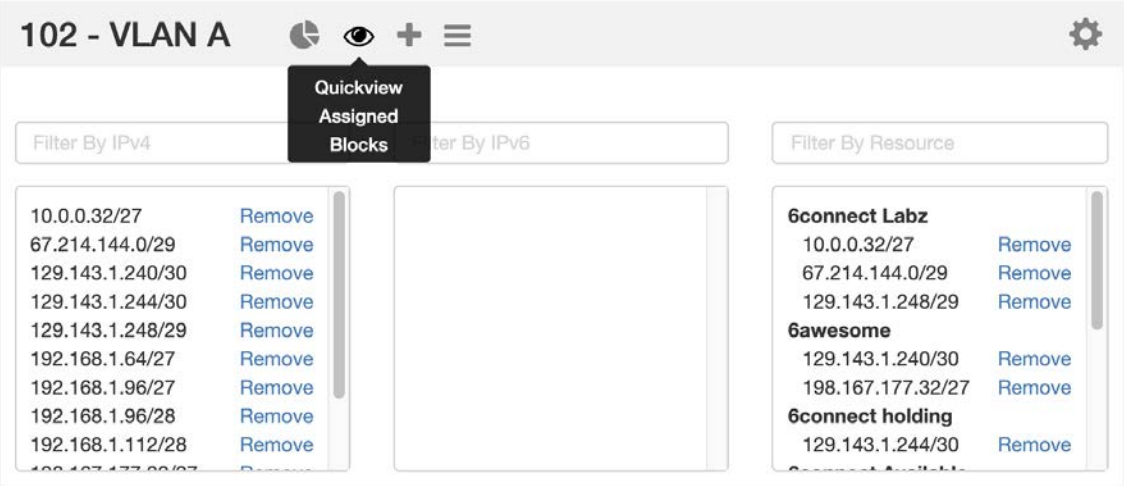


Remove Blocks from a VLAN

Quickview

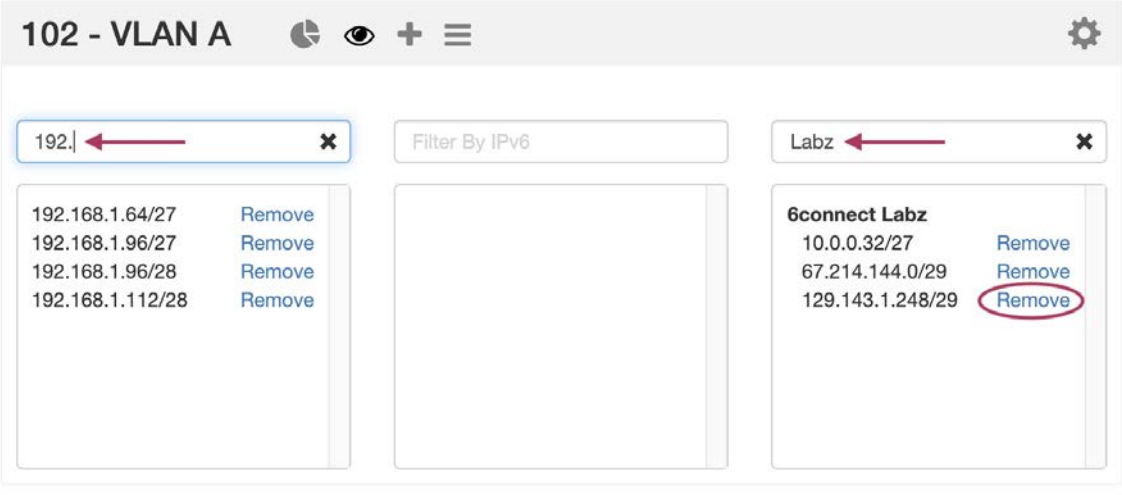
The Quickview panel provides a condensed, filterable list of all blocks assigned to that VLAN, separated into three columns - IPv4 blocks, IPv6 blocks, and grouped by resource.

To open or close the Utilization panel, click on the "Eye" icon in the grey header bar.

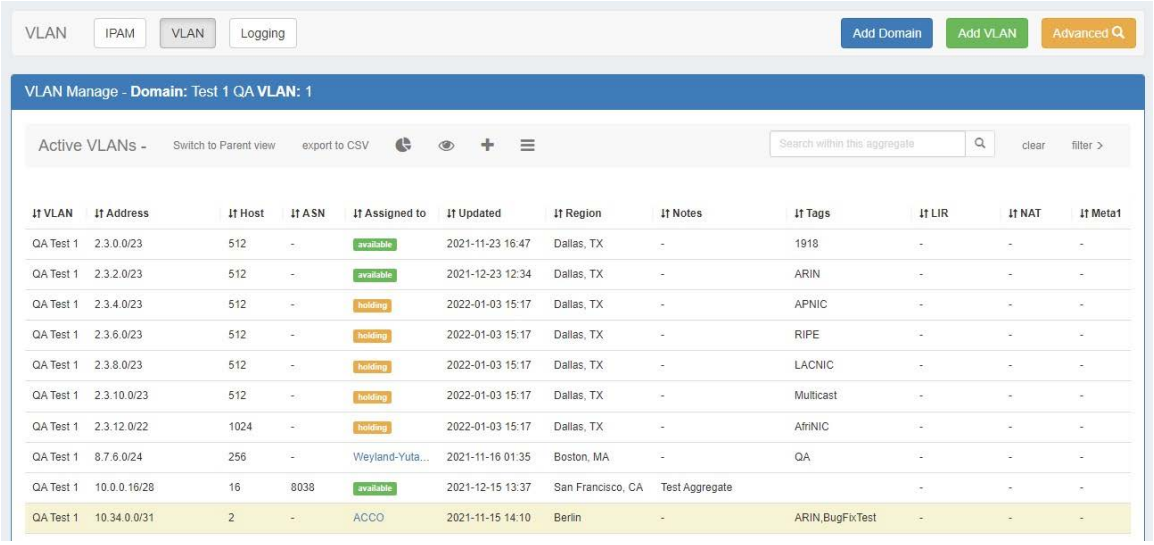


While in the Quickview panel, you may easily search for a block by typing the all or part of the CIDR into the IPv4 or IPv6 Filter boxes - useful for verifying an assignment or quickly scanning ranges.

You may also remove a block from the VLAN with a single click of the Remove button.



Working with VLAN Metadata

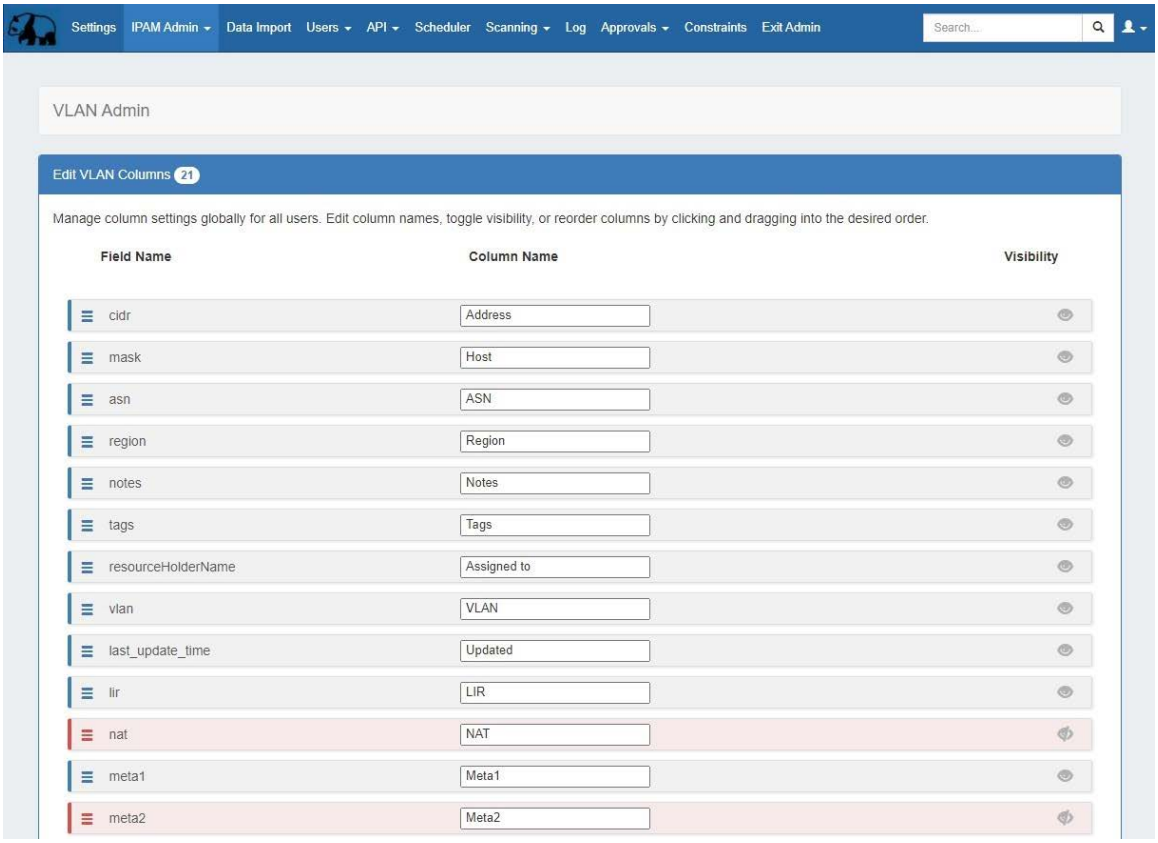


Customizable metadata fields are available to hold VLAN-specific information such as Location, Client, Firewall, Gateway, and more.

These fields can be enabled and disabled in **IPAM Admin** Edit VLAN Columns, and viewed / edited under Edit VLAN in the **VLAN** Tab and in VLAN Manage.

Enable / Disable VLAN Metadata Fields

VLAN metadata fields can be enabled and disabled under the IPAM Admin VLAN Columns area of ProVision.



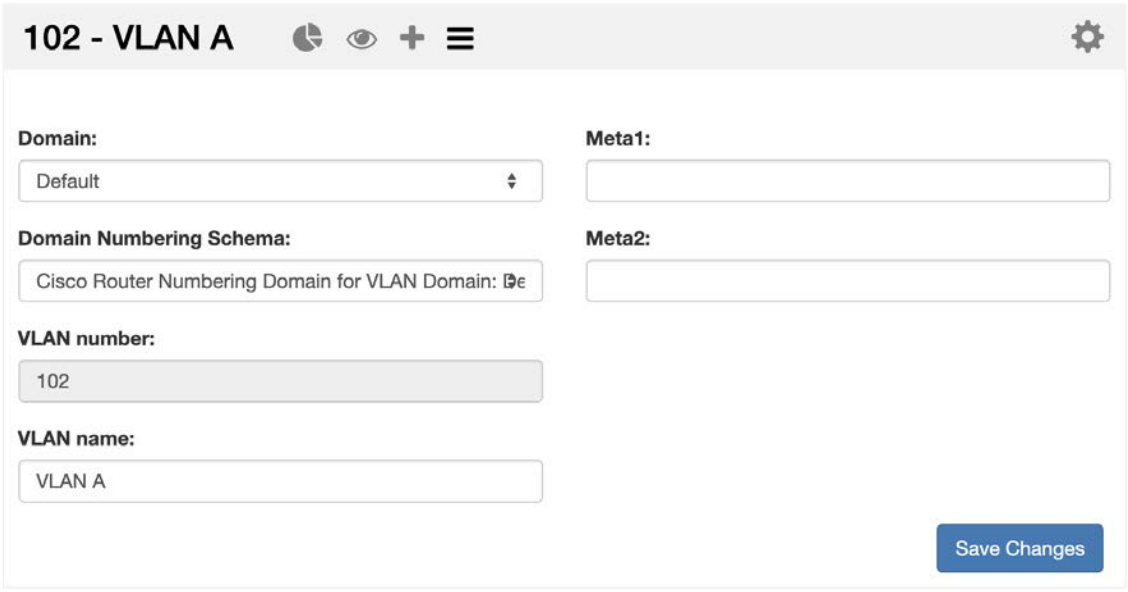
Here, you may edit the order of columns, rename columns, and enable/disable column visibility.

Any columns that are disabled will hide the column from VLAN Manage, as well as hide the applicable field from any VLAN filters or Edit VLAN actions.

View / Edit Metadata Field Information

VLAN metadata may be viewed and edited from VLAN Home, VLAN Manage, and VLAN Advanced.

While in the **IPAM** Tab -> **VLAN Home** page, expand the desired domain from the left sidebar and right click on a VLAN. Then open the Edit VLAN panel.



The Edit VLAN panel may also be opened from VLAN Manage (click on the List icon), or from VLAN Advanced (right-click on the desired VLAN and select Edit VLAN).

Additional Information

For information on working with domains, see:

- Working with Domains

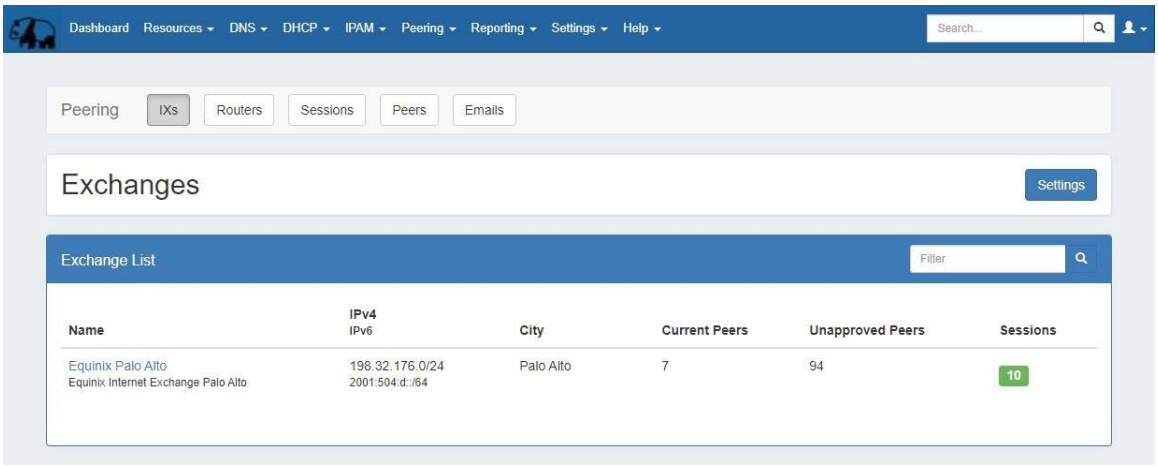
For a higher level overview of ProVision's VLAN Manager, see:

- VLAN

Peering v2

Peering

The **Peering** tab displays allows you to add and manage exchanges, routers, sessions, and peers. Admin users may view and manage recent emails for a company peering email address, and associate email communications with ProVision peers.



ProVision's **Peering** tab has five subtabs to manage various peering functions: **IXs** (Exchanges), **Routers**, **Sessions**, **Peers**, and **Emails**.

The **IXs** tab shows the exchange list. From here, you can edit exchange settings and view, manage, and mark peer status and communications via the exchange details page.

The **Routers** tab shows the list of routers in ProVision. From here, you can add new routers or manage existing routers.

The **Sessions** tab lists the current sessions in ProVision. You may also add new sessions, or click on a session name to show session details, from which you may configure and manage each session.

On the **Peers** tab, you can view and manage session peers.

In the **Email** tab (Global Admins only), recent email communications to and from a company peering email account may be managed.

- Peering Overview
- Set up ProVision Peering
  - Add ASN(s) to ProVision
  - Add PeeringDB Credentials
  - Additional Options for Local Installations
- Peering Workflow
  - Peering Workflow Steps
    - 1) Add Router(s)
    - 2) Add Peer Groups
      - From Peering "Router Details" Page:
      - From the Peer Group Gadget:
    - 3) Add Session(s)
    - 4) Configure Sessions
      - Configure Sessions Individually by Exchange / Session:
      - Configure Sessions by Peers:
    - 5) Manage Communications
      - New Peer:
      - Outgoing Peer Request:
      - Incoming Peer Request:
    - 6) Repeat for new Routers, Sessions, and Peers.
- Additional Information

Peering Overview

In ProVision's **Peering** tab, you can add multiple exchanges, routers, sessions, view peer details, as well as send and receive peering requests. ProVision directly interfaces with PeeringDB's API to update exchange and peering data, to ensure up to date information.

This requires Peering users to have a PeeringDB account, and for the account credentials to be set in ProVision.

> **Peering Setup - Local Installations**
>
> If you are using a locally hosted instance of ProVision, verify that you have followed the instructions on the Local Installations: Peering Setup page to set up Peering for your instance.

Set up ProVision Peering

Two components need to be set up before you can begin to do common peering tasks in ProVision - set at least one ASN, and set PeeringDB account credentials.

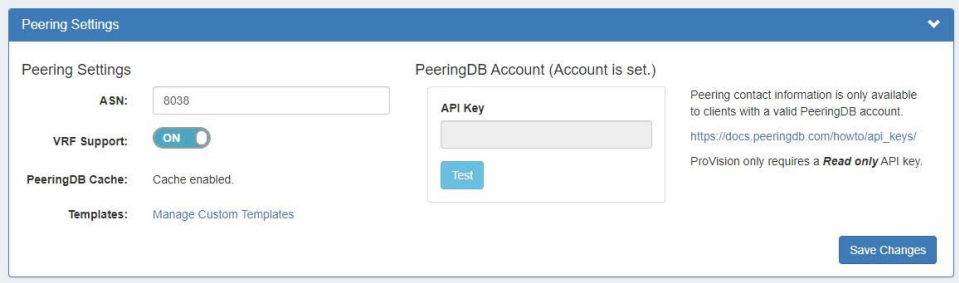
Add ASN(s) to ProVision

Add at least one ASN to ProVision from either the **Admin** **Admin Preferences** **Peering** page, or via the **Peering** Tab -> Exchange Settings.

- Click one of the options below for details:

  From the **Admin Settings** page, go to Peering -> **Peering Settings**.

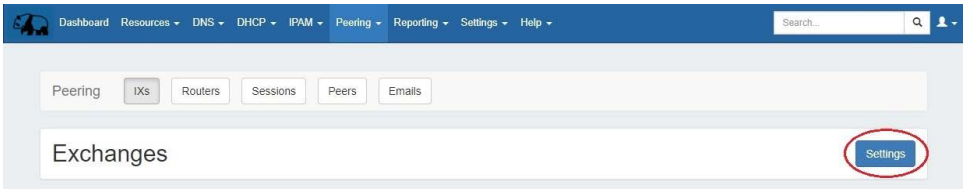
  Next to "ASN", enter the ASN(s) you want to track in ProVision.



  For multiple ASNs, separate each ASN with a comma (e.g. "1234, 5678").

  When done, click "Save Changes" to save your changes.

  From the **Peering** Tab, go to the **IX's** subtab and then click "Settings".



  Peering Settings will display.

  Under the "Config" section, you'll see a field to add an ASN - fill in the desired ASN(s), and click "Add".

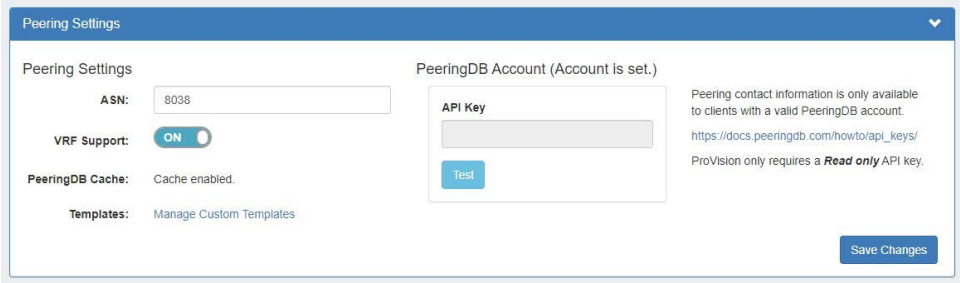
Add PeeringDB Credentials

Both Cloud customers and local installations may set the PeeringDB credentials in the ProVision **Admin** **Admin Preferences -> Peering** page, or via the **Peering** Tab -> Exchange Settings.

- Click one of the options below for details:

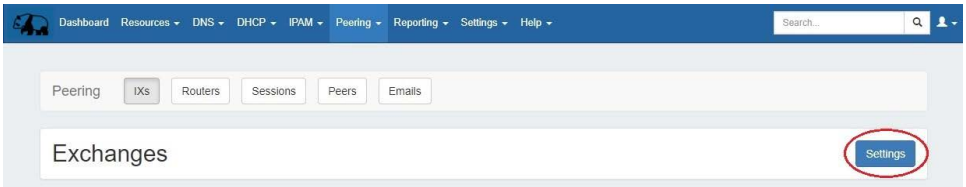
  From the **Admin Settings** page, go to Peering -> **Peering Settings**.

  The current PeeringDB Account status will display next to "Peering DB Account".



To set or change the account, enter the PeeringDB API Key, then hit "Test" - the connection will be tested. If successful, you can then save the credentials. When you are done, click "Save Changes".

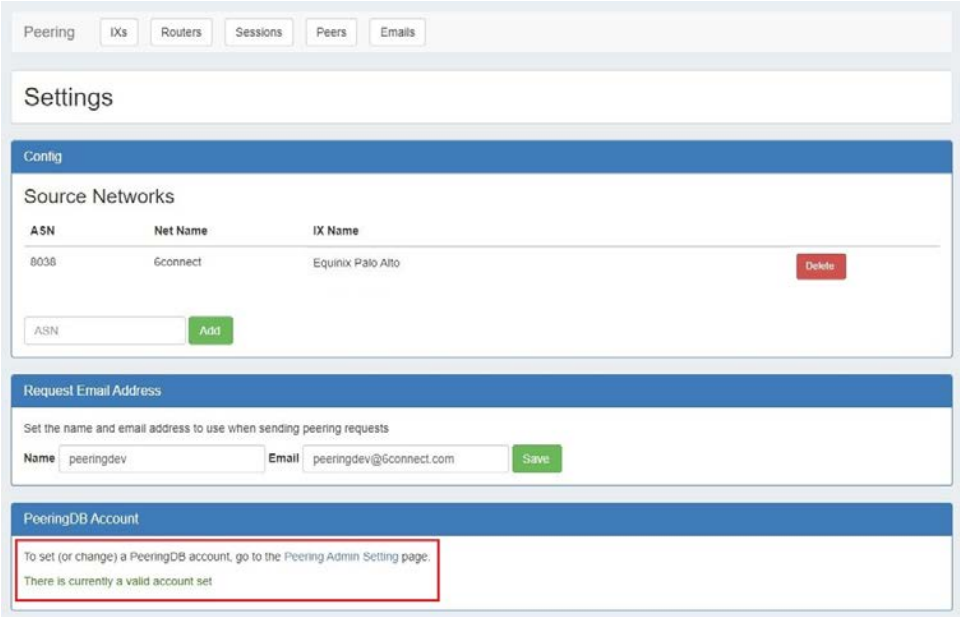
From the **Peering** Tab, go to the **IX's** subtab and then click "Settings".



Peering Settings will display.

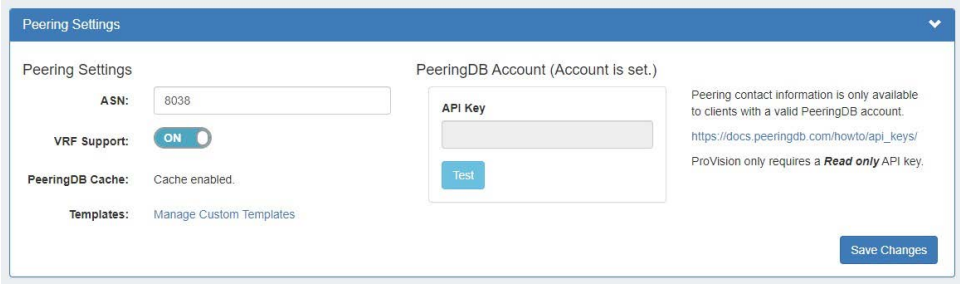
Under the "PeeringDB Account" section, you will see account status instructions to set or change the Peering DB Account.

Click on the "Peering Admin Settings" link to go to the **PeeringDB API Connection** page to test and set the account.



This opens the **PeeringDB API Connection** page.

Enter the PeeringDB account API Key, then hit "Test" - the connection will be tested. If successful, you can then save the credentials.



Additional Options for Local Installations

Local Installations have an additional option of hard-coding the credentials in ProVision's globals.php file.

Additional Peering constants may be added into globals.php to change the PeeringDB URL between the main and beta site (some users may find the beta site to have faster response times), and to adjust the PeeringDB cache TTL.

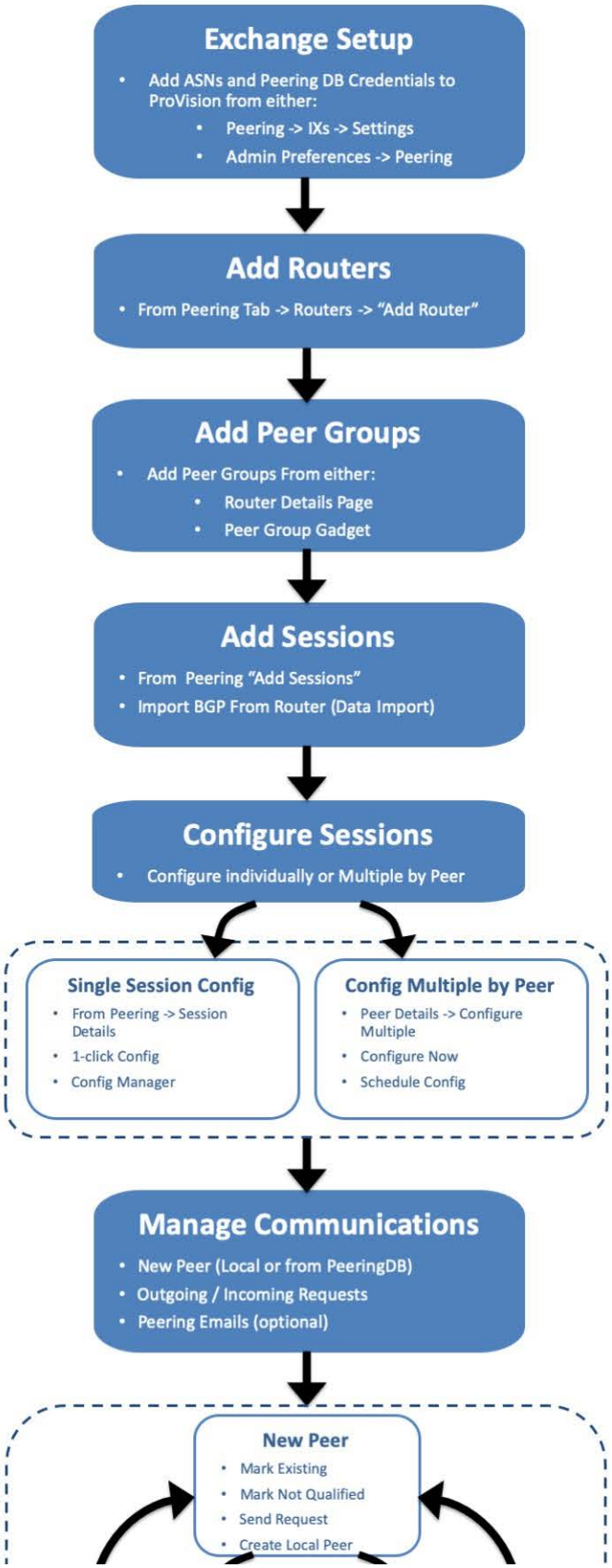
For real-time updates, TTL may be set to 0. However, some users may experience severe lag with a TTL = 0; we recommend using a 10 to 15 minute or greater TTL if this occurs.

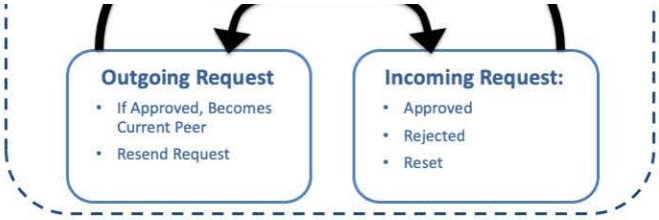
For details on adding / editing these peering constants, see Local Installations: Peering Setup.

Peering Workflow

After the initial Peering setup is complete (Adding ASNs and a Peering DB account), you can begin to work with the rest of the Peering tabs, including routers, peer groups, sessions, managing peers, and communications.

PEERING WORKFLOW





Peering Workflow Steps

Below is an outline of the steps needed for a basic workflow process.

- Peering Overview
- Set up ProVision Peering
  - Add ASN(s) to ProVision
  - Add PeeringDB Credentials
  - Additional Options for Local Installations
- Peering Workflow
  - Peering Workflow Steps
    - 1) Add Router(s)
    - 2) Add Peer Groups
      - From Peering "Router Details" Page:
      - From the Peer Group Gadget:
    - 3) Add Session(s)
    - 4) Configure Sessions
      - Configure Sessions Individually by Exchange / Session:
      - Configure Sessions by Peers:
    - 5) Manage Communications
      - New Peer:
      - Outgoing Peer Request:
      - Incoming Peer Request:
    - 6) Repeat for new Routers, Sessions, and Peers.
- Additional Information

1) Add Router(s)

Adding a router is the fundamental base and first step of working with peering in ProVision. Routers may be added through the "Add Router" button in the **Peering** Tab.

For a detailed breakdown of this task, see Peering Routers.

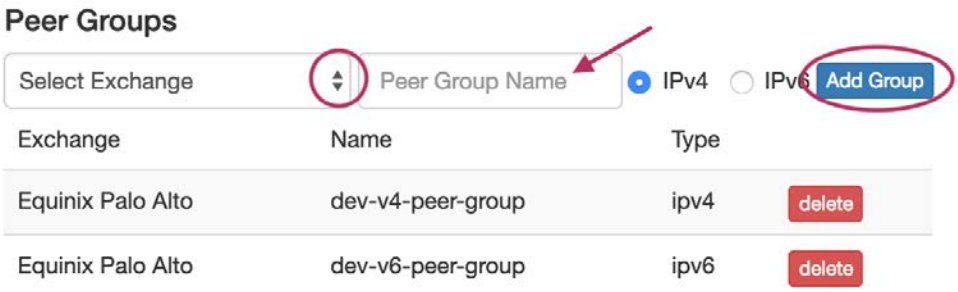
2) Add Peer Groups

Associating the router with a peer group is necessary to link the router to a particular exchange. You may add the Peer Group information either in the "Router Details" page in Peering, or in the Peer Group Gadget prior to adding sessions.

From Peering "Router Details" Page:

Go to **Peering** Tab Routers. Click on the desired router to view the **Router Details** page. (See Peering Routers)

Here, you may add and delete and Peer Groups associated with the router - select the Exchange, Add the Peer Group Name, select the IP type, and click "Add Group".

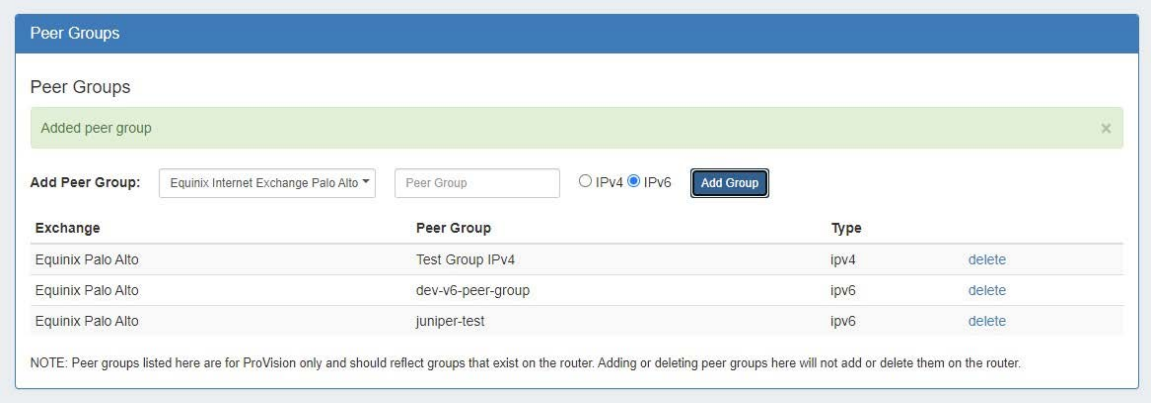


From the Peer Group Gadget:

If you need to add a Peer Group to an existing router, you may use the Peer Group gadget.

The Peer Group Gadget allows you to add peer groups for IPv4 and IPv6 for a selected exchange from a router's Resource Entry page.

To do this, simply select the exchange, type in a Peer Group name in the text box, select IPv4 or IPv6, the click "Add Group".



Peer Groups added from this gadget will be then be available to select in the "Add Session" dialog box in the **Peering** tab.

3) Add Session(s)

After Routers and Peer Groups have been set up, the next step is Adding Sessions to ProVision.

You may add a new session through the "Add Session" button in the **Peering** tab, or you may Import Peering Sessions from an existing router.

Importing sessions requires Admin level permissions, and is accessed through the **Data Import** Tab in the Admin section of ProVision.

4) Configure Sessions

Once a session has been added, you will see it in the session list. For a newly added session, the status will show as "Not Configured". There are a few options to configure sessions:

Configure Sessions Individually by Exchange / Session:

You may configure the session through 1 click config or the Config Manager, accessed by clicking session and opening the Session Details page. 1 click config uses the default config settings, while the Config Manager allows you to manually create one time use unique settings.

Configure Sessions by Peers:

From the **Peer Details** Page, you can choose to create or configure multiple sessions.

With this option, you can view and configure all sessions for that Peer from one menu (as opposed to the Sessions list configure option, which configures individual sessions by Exchange).

Clicking on "Configure Multiple Sessions" button opens a page showing the available exchanges with routers and options to change the router, peer group, and Peer type.

Select the checkmarks for the desired sessions to configure. As a shortcut, you may also check the "Exchanges" option to select all sessions under all exchanges, or, check "Select all networks" next to the exchange header to select all sessions in that exchange. From there, deselect items as needed.

When your selections have been made, click "Create Sessions" to immediately configure all selected sessions.

5) Manage Communications

Once a session has been added with a peer, you will see the peer listed Peer List under the **Peers** tab.

You'll also be able to manage communications from Exchange Communications.

You will see the list of Peers, their ASNs, Name, Request Status, Notes (log), and the Action Menu (wrench icon).

From here, you may send peer requests, mark peer status, and view notes on previous actions. The available options and flow depends on the Peer Status and whether a request is Outgoing or Incoming.

New Peer:

For an existing peer that was just added, you can mark the peer as:

a) Mark Existing Peer, or,

b) Mark Not Qualified

You may also choose to send an outgoing peer request.

Outgoing Peer Request:

To send out a peer request, select "Send Request" from the Action Menu (wrench icon) . This sends an initial peering request email to the peering coordinator for that peer. The email template pre-populates data based on peeringdb data (To address, Subject line and Peering exchange information). You have the chance to edit the email prior to sending. If Peering Emails are set up in ProVision with the same email address, a copy of the request will be saved to the Sent box.

Once a Request has been sent out, it can proceed two ways:

a) The request is accepted and Peering is established (becomes current peer)

b) The request is not accepted / responded to, and the "Resend Request" option becomes available, allowing you to repeat the request.

Incoming Peer Request:

If a request is received, you have a few options from which you may mark the peer from the Action Menu:

a) If you accept the request, you may "Mark Approved" and Peering is established (becomes current peer).

b) You may "Mark Rejected", in which case a peer status is marked rejected.

c) "Reset Status" is available at various points in the communications process, if you want to reset the peer back to the beginning state and re-establish a different status condition. This reopens the initial options from which you may select a different peer mark.

d) "Resend Request" may be available to resend a request

If Peering Emails are set up in ProVision, and the message was sent to the account as set there, the incoming request will be recieved to the ProVision inbox.

6) Repeat for new Routers, Sessions, and Peers.

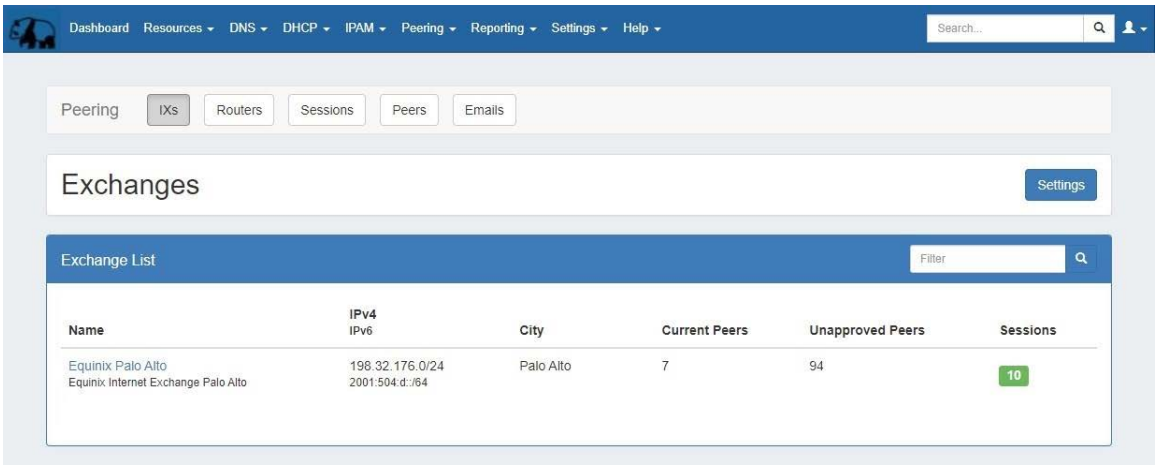
To add additional Routers, Sessions, and Peers repeat steps 1, 2, or 3, and manage your newly added sessions and peer communications similarly with steps 4 and 5.

Additional Information

- Peering Exchanges
- Peering Routers
- Peering Sessions
- Managing Peers
- Peering Emails

Peering Exchanges

Working with Peering Exchanges

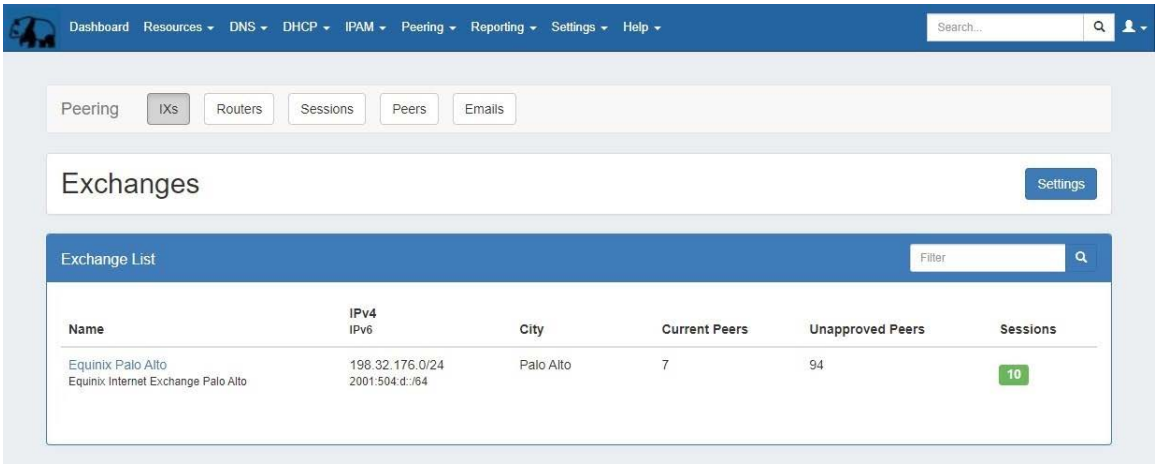


From this tab, you can access exchange settings to set ASN / Peering DB info, view the current exchange list and peer status, and view details for each exchange.

- Working with Peering Exchanges
- IXs Overview
  - Exchange Settings
    - ASNs
    - Request Email Address
    - PeeringDB Account
  - Exchange Details
    - Exchange Details Tab:
    - Exchange Sessions Tab:
    - Communications Tab:
      - Menu Actions
    - Peering Maintenance Email
  - Additional Information

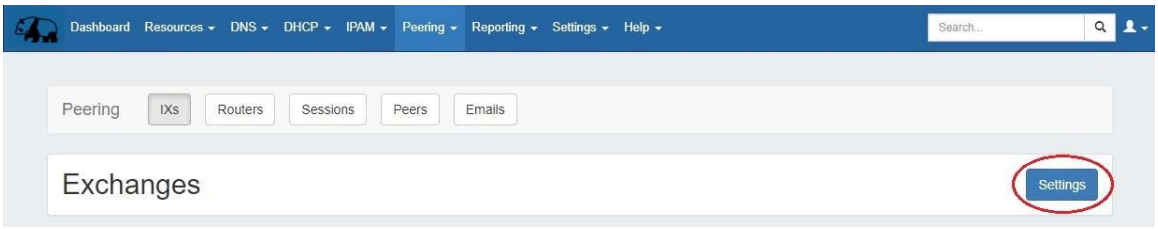
IXs Overview

The Exchanges subtab features the list of exchanges currently set in ProVision, with IP type, city, peers, and active session counts.

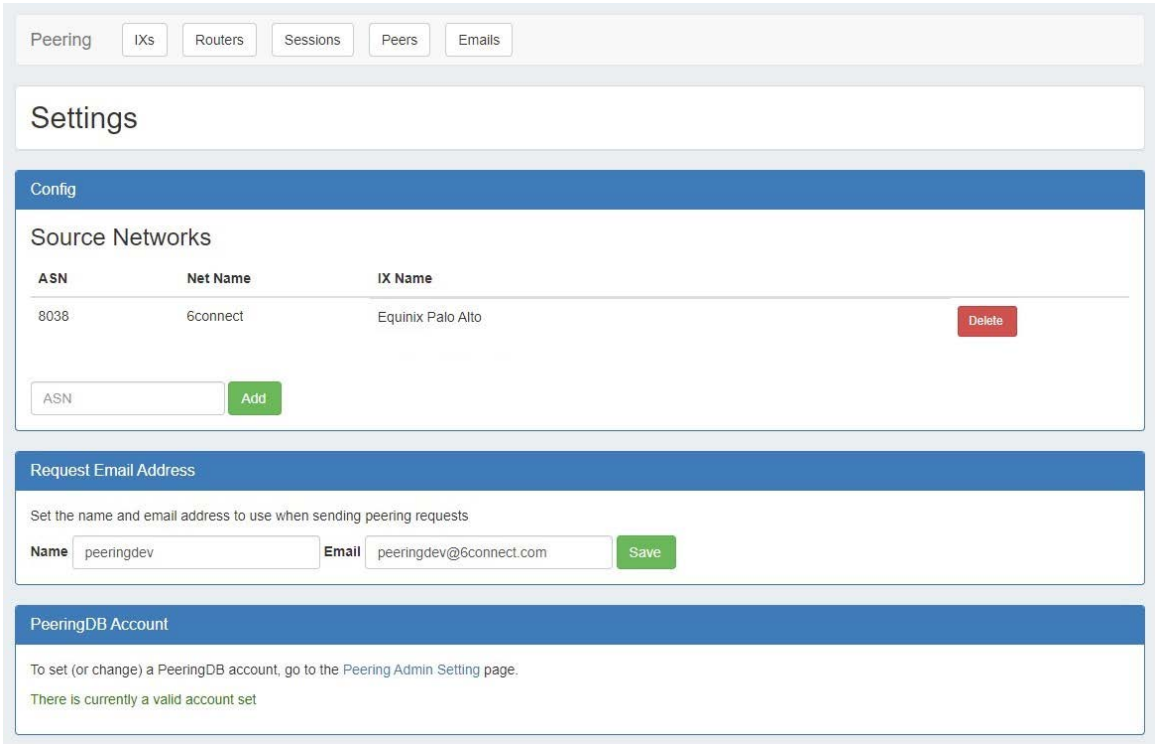


Exchange Settings

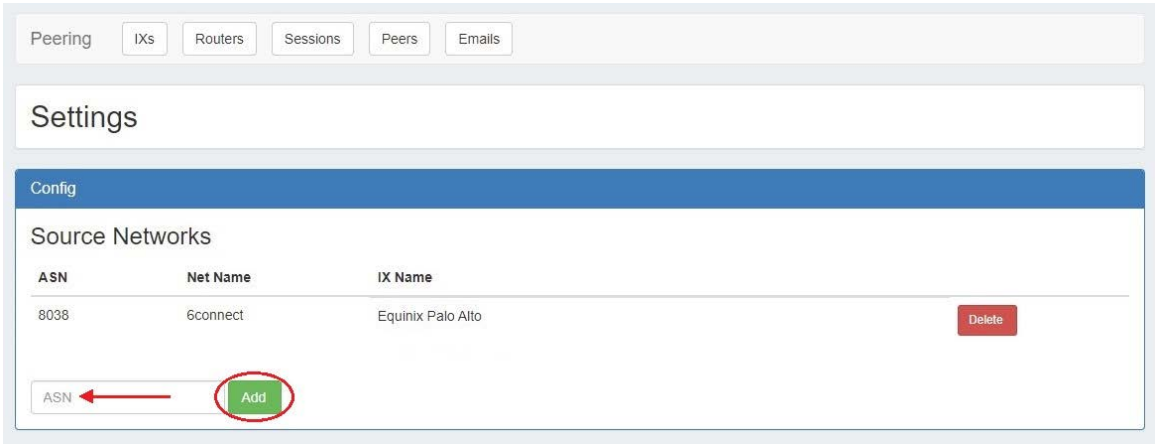
Clicking the "Settings" Button opens the Exchange Settings page.



Here, you can add or remove ASNs, add or edit PeeringDB account settings:



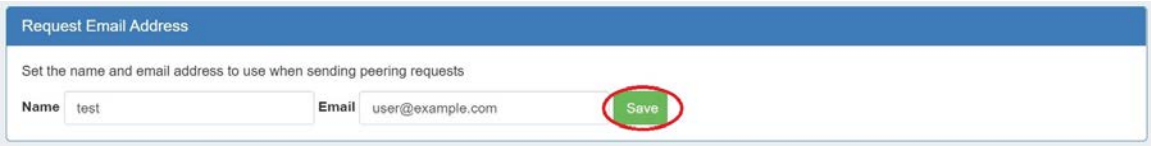
ASNs



- Add an ASN by typing a valid ASN into the Config - ASN box, and then click "Add".
- Delete an ASN by clicking the red "Delete" icon for the row under Source Networks.

Request Email Address

To add a name and email address for Peering Request emails enter the information and click save.

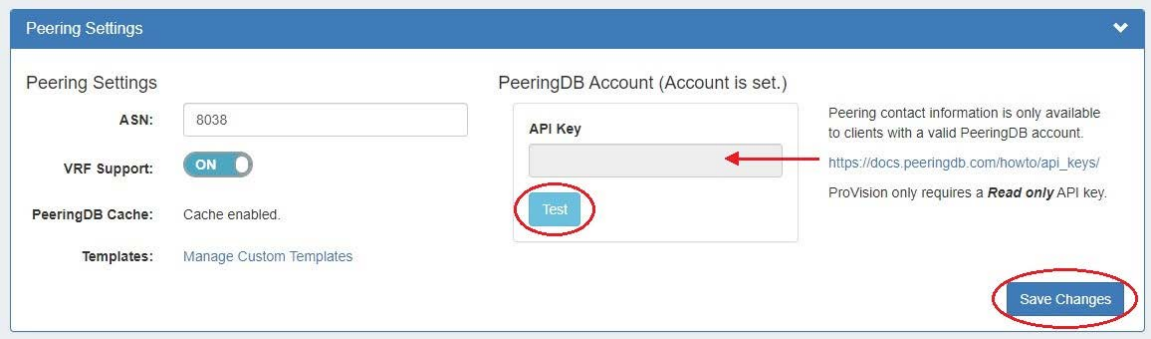


PeeringDB Account

If a valid PeeringDB account is already set, a message will display confirming the valid account.



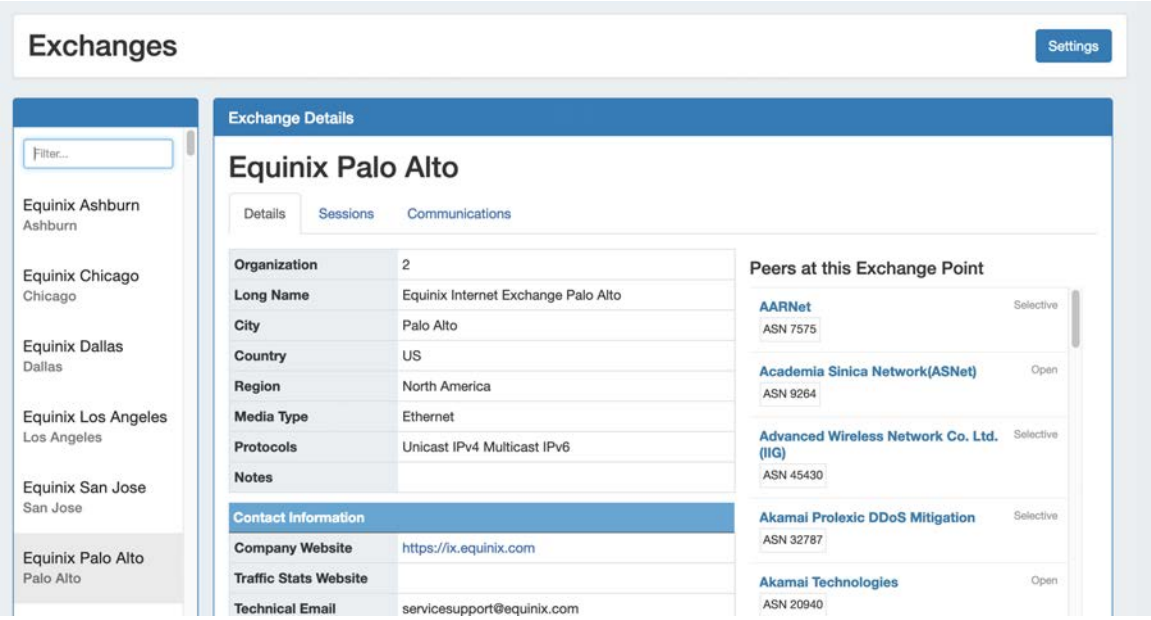
If no account is set, or the current account is invalid, follow the link to the **Peering Admin Settings** page to test and add a PeeringDB account.



Enter the PeeringDB credentials and click "Test". Remember to save your changes.

Exchange Details

Clicking on an exchange in the exchange list will bring up an exchange details page, where Exchange Details, Session Details, and Exchange Communications may be viewed and managed.



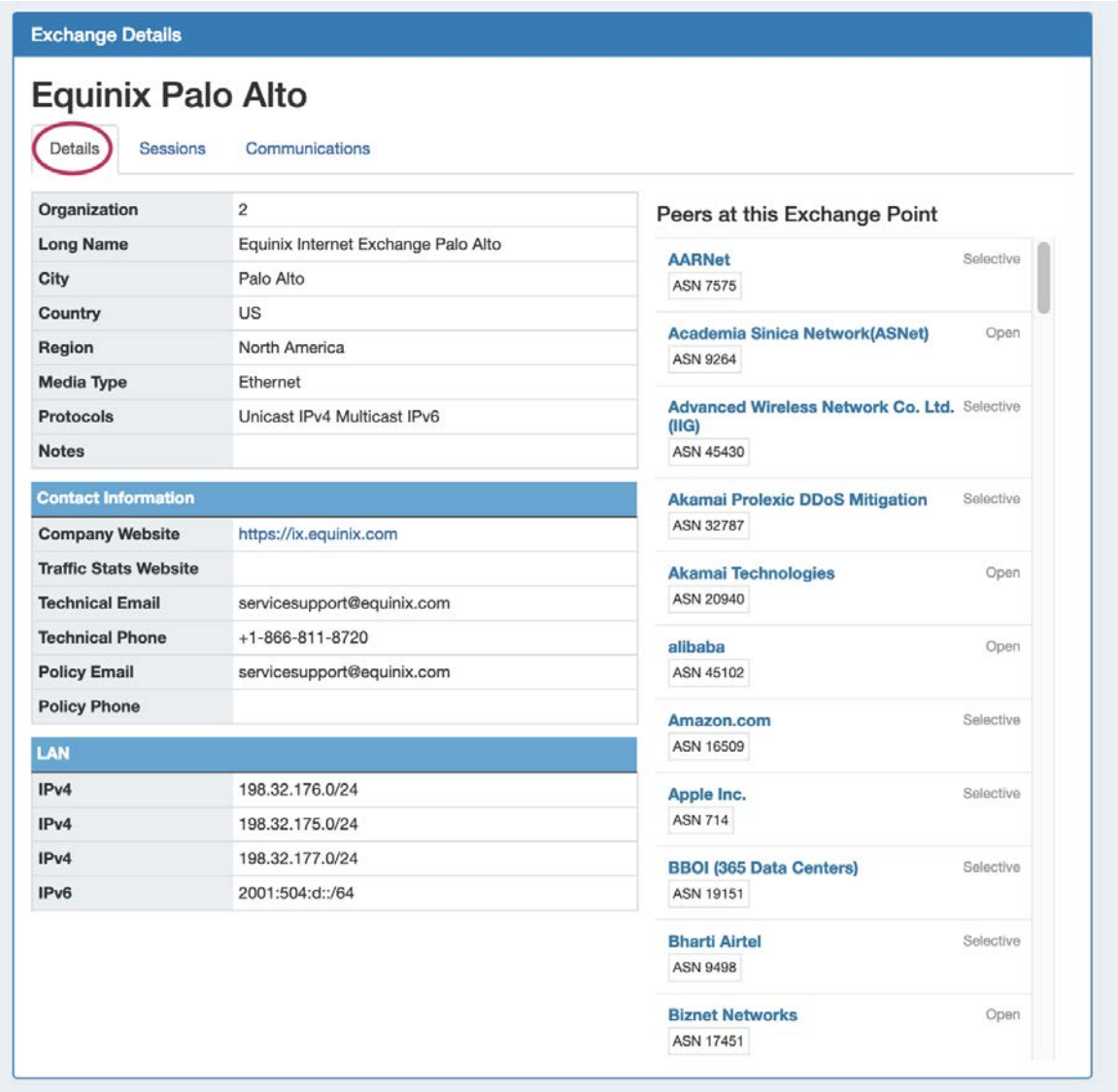
The "Settings" button takes you back to the **Exchange Settings** page.

The left side of the page displays a filterable list of all exchanges currently added to ProVision - to narrow the list down, simply type the first few letters of the exchange name into the "Filter" box, and click on your desired exchange to view its details.

Exchange Details Tab:

The exchange details tab provides general information about the exchange, obtained from PeeringDB.

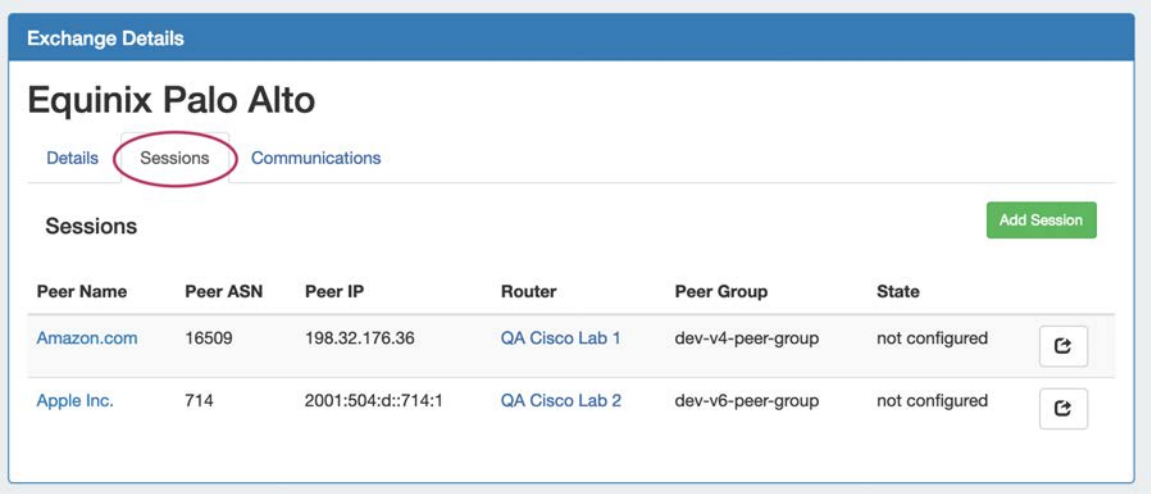
It includes organization information, contact information, LAN, and a list of Peers at the exchange point.



Clicking on the name of any peer in the under the "Peers at this Exchange Point" list will open the **Peer Details** page.

Exchange Sessions Tab:

The sessions tab lists ProVision sessions associated with the exchange, detailing the ASN, IP, Router, Peer Group, and session state.

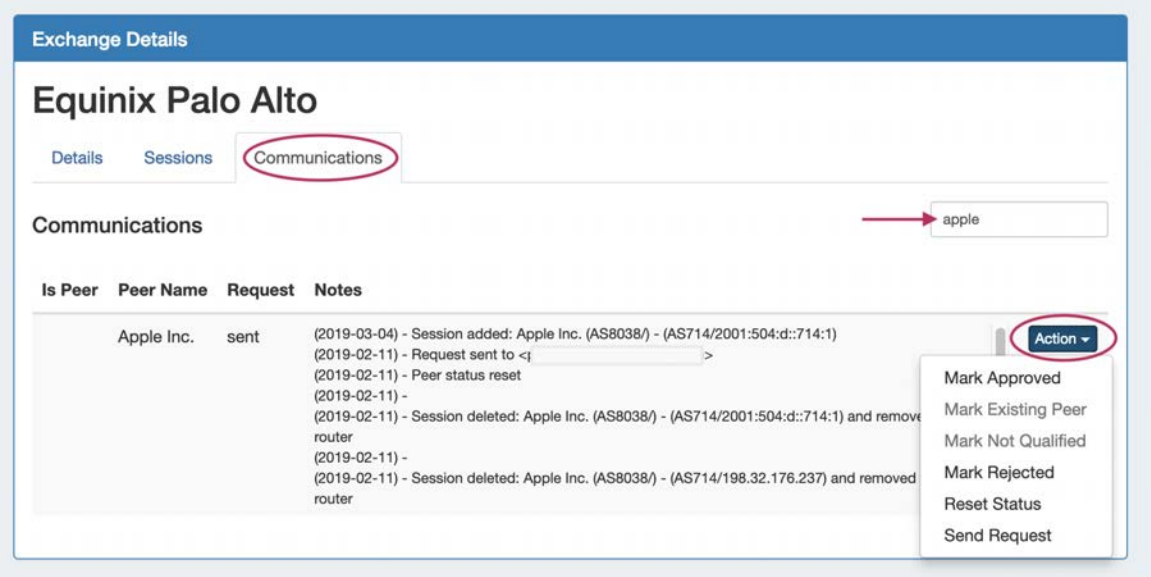


From here, you may:

- Add sessions to this exchange by clicking "Add Session".
- Click on the Peer Name to go to the **Peer Details** page for that Peer.
- Click on the Router Name to view **Router Details**.
- Manage the session by clicking on the "GoTo" Arrow button at the right side of the list to open the **Session Details**.

Communications Tab:

The Communications tab is where you can manage communications actions and mark status of peers.



Filter the Communications list by typing the peer name into the filter box at the top left.

Available communication and status options are available in the Action Menu - available actions are dependent on current status, so not all actions are available at all times.

Menu Actions

Mark Approved: Marks the peer as approved. Available after receiving a request response.

Mark Existing Peer: Marks a peer as an existing one and removes the email request options.

Mark Not Qualified Peer: Marks a peer as "not qualified" and removes the email request options.

Mark Rejected: Marks the peer as rejected. Available after receiving a request response.

Reset Status: Resets the status of the peer, opening up the options to mark peer as existing, not qualified, or to send email requests.

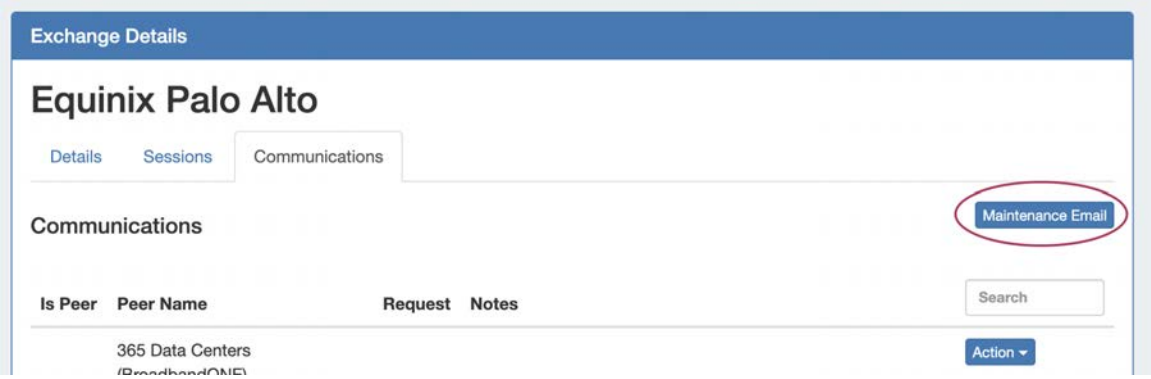
Resend Request: Resends the peering request.

Send Request: Sends an initial peering request email to the peering coordinator. The email template pre-populates data based on peeringdb data (To address, Subject line and Peering exchange information). You have the chance to edit the email prior to sending.

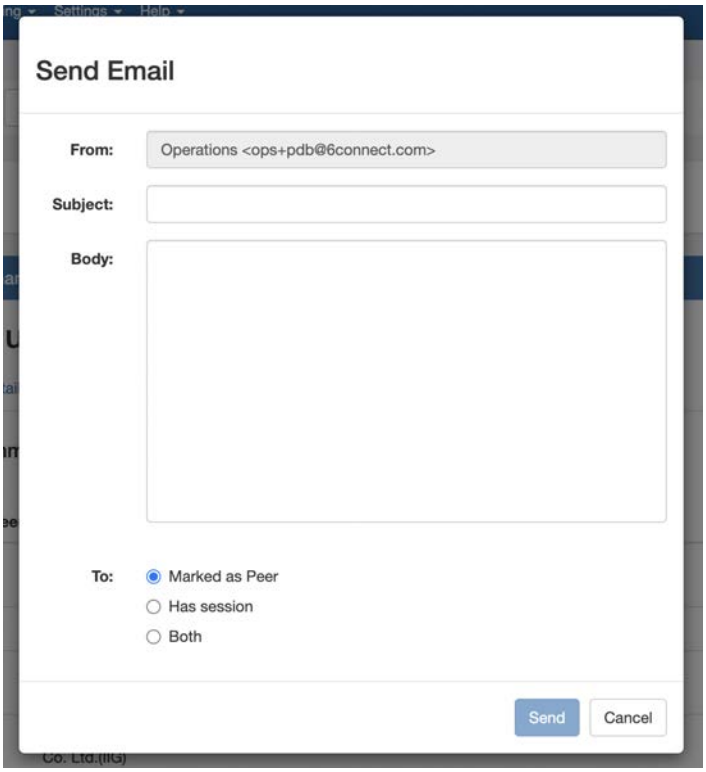
Actions taken from this menu will be logged and display in the "Notes" field of the Communications list. If a Peering Email account is set up in ProVision and used to send Peering Requests from this menu, the emails will be accessible in ProVision in the Peering Emails Tab Sent Folder. See Peering Emails for additional information.

Peering Maintenance Email

To send a maintenance email out to all Peers, Go to the Peering Tab Selected Exchange Communications, and then click the "Maintenance Email" button.



Add a subject line and message body, and select whether to send the email to all "Marked as Peer", those with sessions, or both.



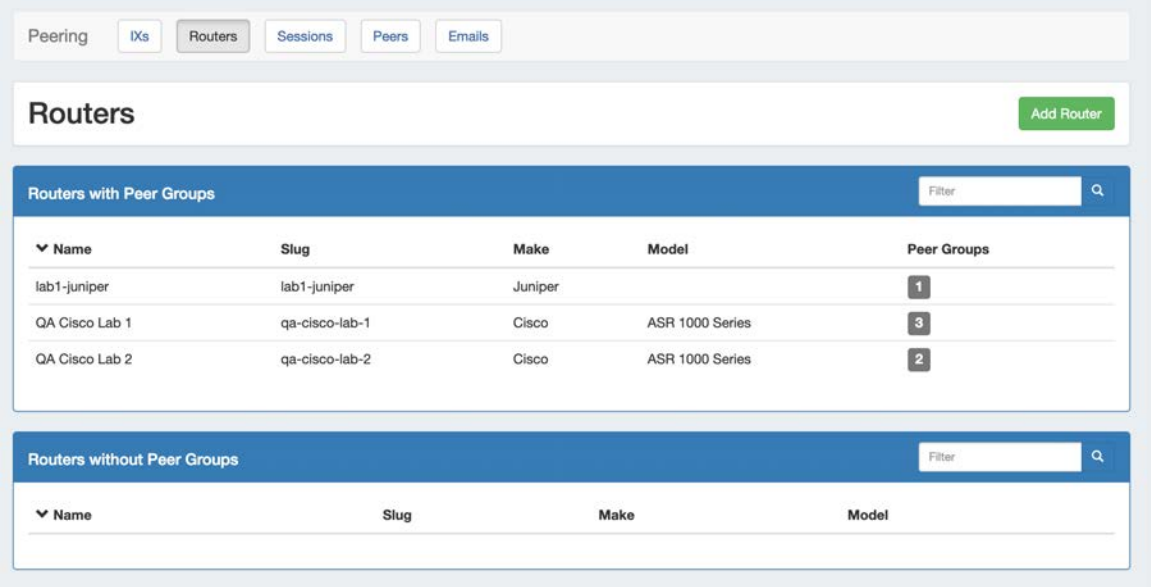
When done, click "Send".

Additional Information

- Peering
- Peering Routers
- Peering Sessions
- Managing Peers
- Peering Emails

Peering Routers

Peering Routers



The **Routers** subtab is where routers may be added and managed. Routers are divided into two lists - those with Peer Groups, and those without.

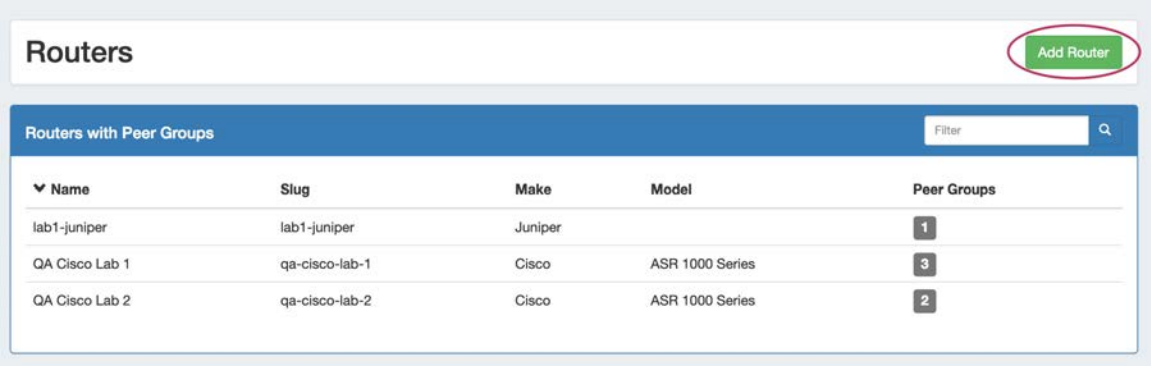
From here, you can filter the router list, click on any router name to go to the **Router Details** page, or "Add Router" to add a new router.

- Peering Routers
- Working with Peering Routers
  - Add a Router
    - Router Details Page
      - Edit Router
      - Edit Peer Groups
      - Router Sessions
  - Additional Information

Working with Peering Routers

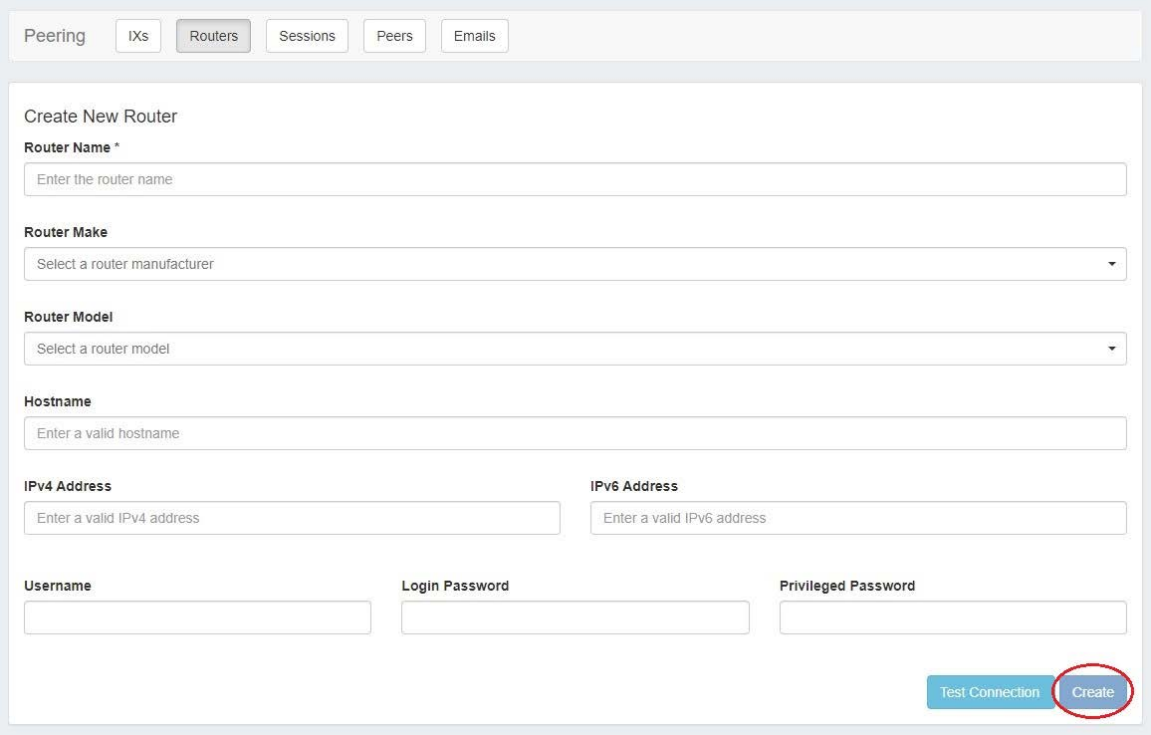
Add a Router

Add a new router by clicking the "Add Router" button, which will direct to a page to input the router details.



Enter in router details: Name, Make, Model, Hostname, IP address(es), and credentials. If desired, you can confirm the connection by clicking "Test Connection".

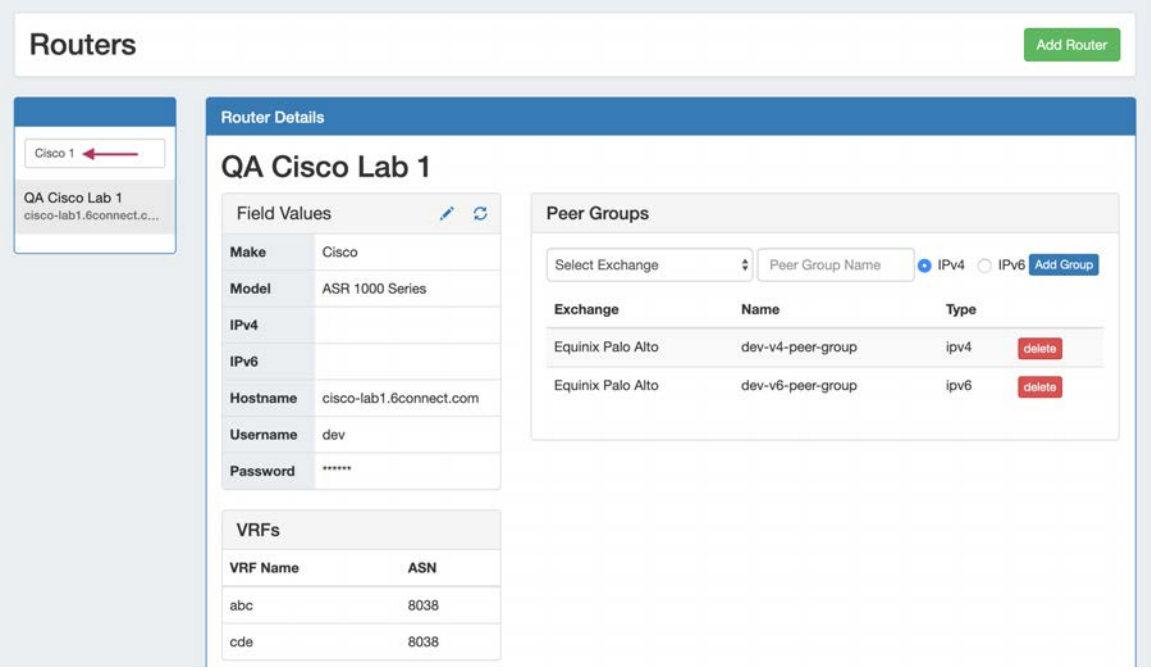
When done, click "Create".



The Router will be added to the Router list, and can be managed from the router details page.

Router Details Page

Clicking on a router entry in the router list will open the router details page.



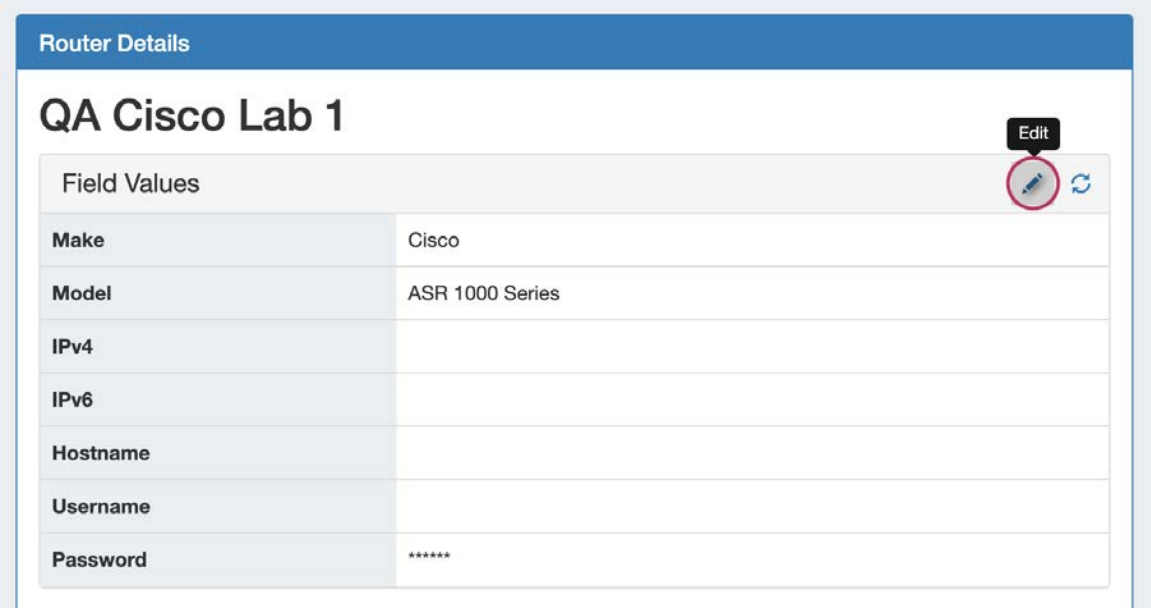
From here, routers may be added as well, or you can use the filterable list in the left sidebar to select a router to view.

The router details area gives the basic router information.

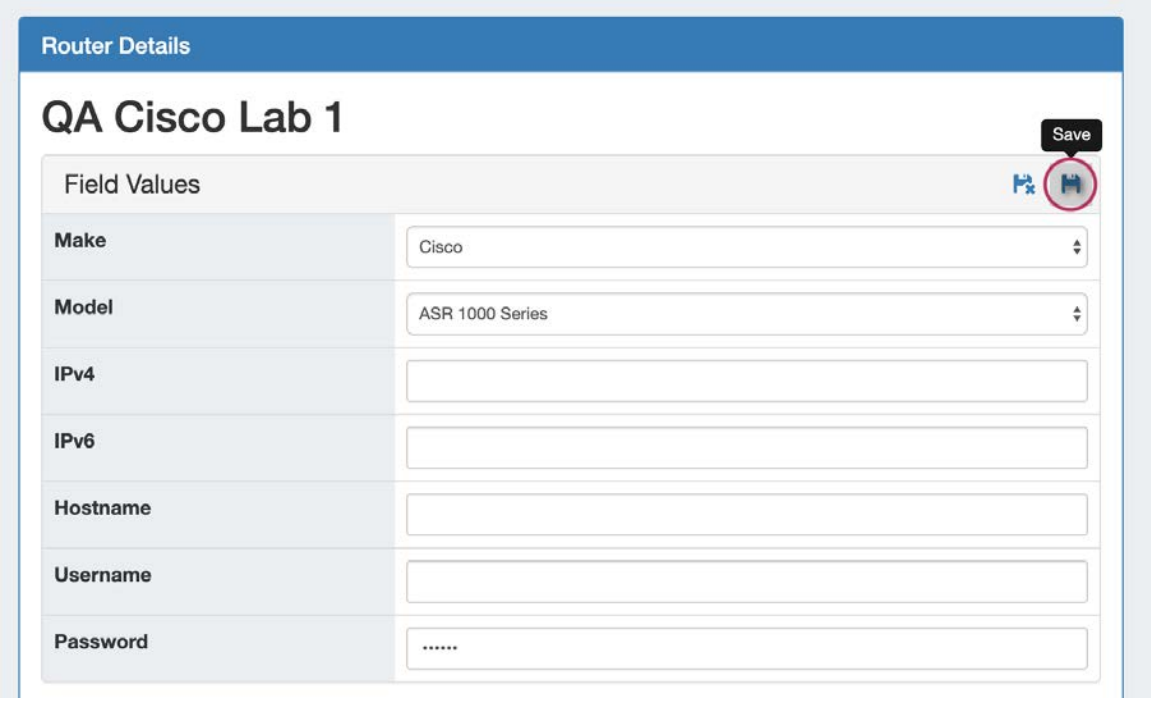
Edit Router

A Router's Make, Model, IP address, Hostname, Username, and Password may be edited from the Peering Router Details page.

To edit a router field, click the "Edit" icon (pencil), and input the desired change.



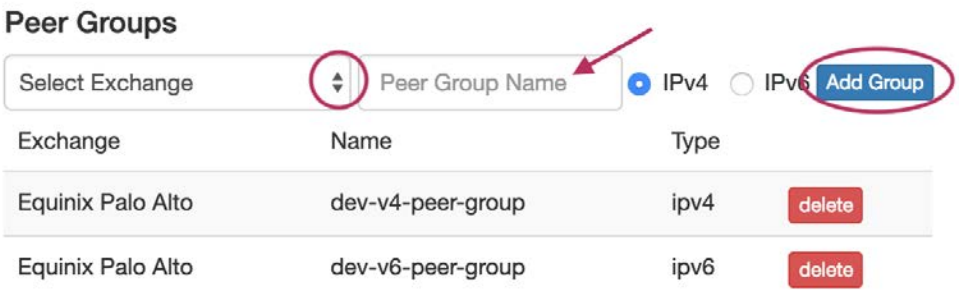
When complete, click the "Save" icon. You may cancel the edit by clicking the "Cancel" icon to the left of "Save".



Router information may also be edited from the Router's Resource Entry page and /or Field Gadget. By default, not all router fields may be visible or editable - this is to prevent editing critical router identification elements while sessions may exist for those routers.

Edit Peer Groups

You may also add and delete and Peer Groups associated with the router - select the Exchange, Add the Peer Group Name, select the IP type, and click "Add Group".

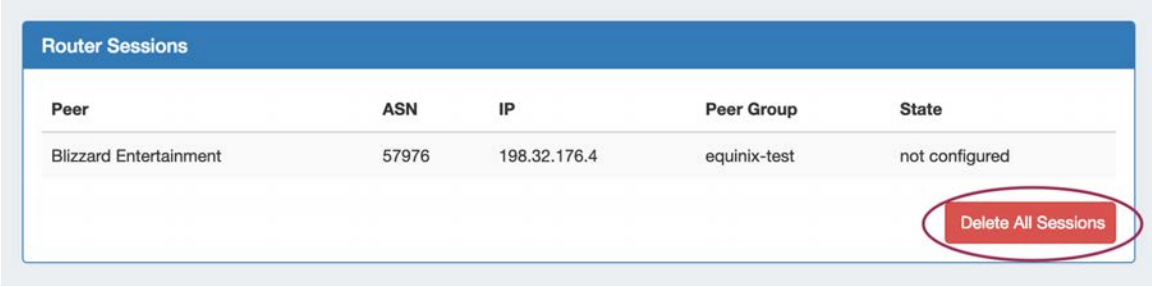


To delete Peer Groups, click "Delete" for the peer group to remove. Peer Groups may also be edited via the Peer Group gadget.

Note: Adding / Deleting Peer Groups only affects ProVision, it does not add or remove from from the router itself.

Router Sessions

View all ProVision sessions associated with a router by going to that router's detail page and scrolling down to the "Router Sessions" section. Clicking on any session will open up the Session Details for that session.



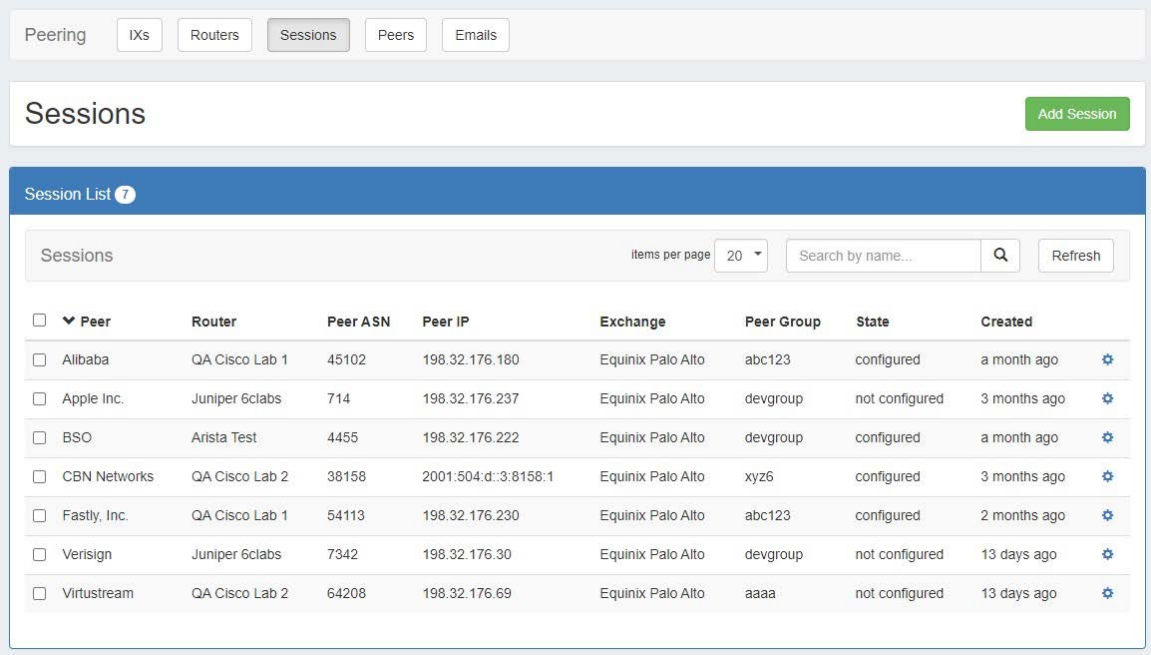
Delete all sessions in ProVision for the router by clicking "Delete All Sessions" under Router Sessions.

Additional Information

- Peering
- Peering Exchanges
- Peering Sessions
- Managing Peers
- Peering Emails

Peering Sessions

Peering Sessions



The **Sessions** subtab is where current sessions may be added, managed, and updated.

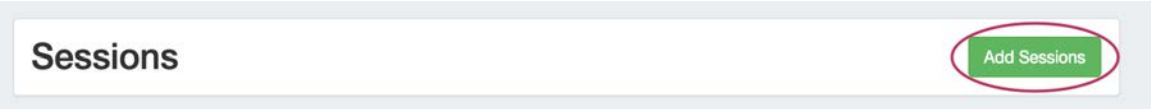
The **Session List** shows all current sessions in ProVision, and their current information and session state. Update the session states for all sessions by clicking the "Refresh" button, or manage individual sessions by clicking on the row for the desired session.

- Peering Sessions
- Working with Peering Sessions
  - Add a Session
    - Add Session Information
    - Select or Add Destination
  - Manage a Session (The Session Details Page)
    - Session Details Actions
  - Session List Action Menu
  - Additional Information

Working with Peering Sessions

Add a Session

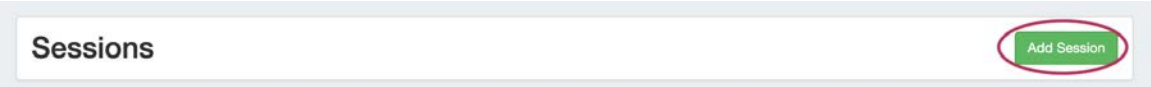
Add a new session by clicking the "Add Session" button.

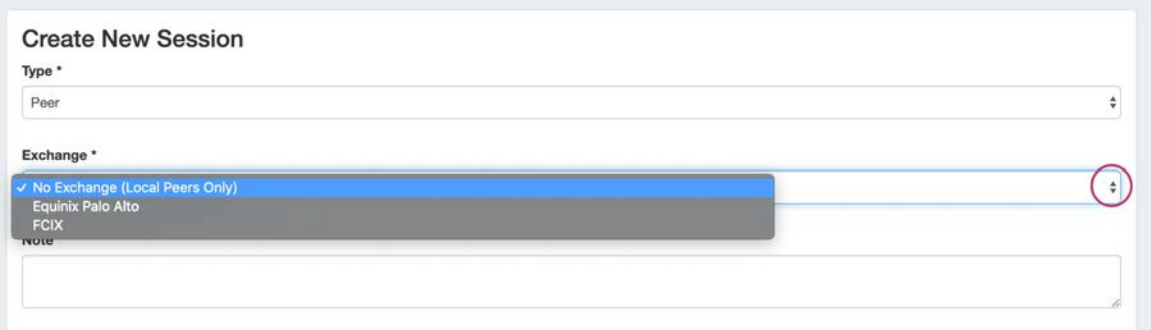


Add Session Information

Click "Add Session" from the Peering Sessions sub-tab.

In the Create New Session Form, type the session information, selecting the appropriate exchange type for the planned Peer. If using a Local Peer, "No Exchange" is an available option.

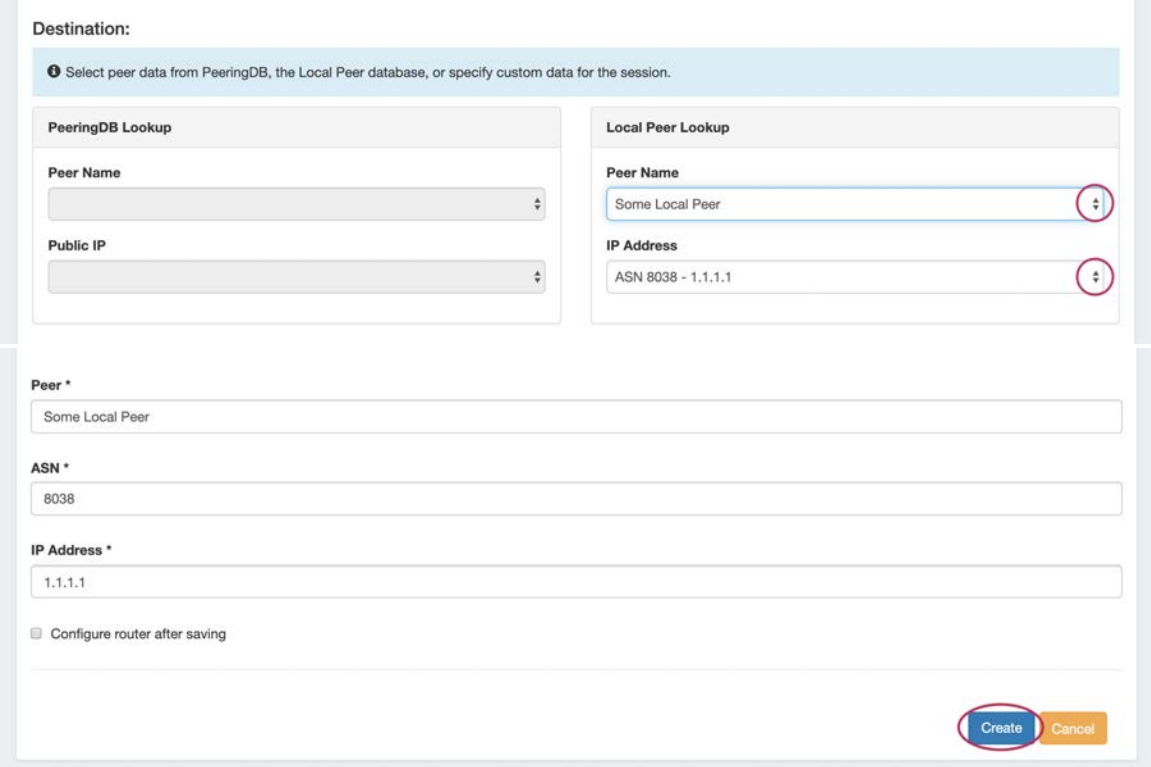




Select or Add Destination

Under the **Destination** section, select or type in information for a peer. You may add Peer information from any of the three available methods:

- Use PeeringDB Lookup to select a PeeringDB Peer (the destination fields will be automatically populated).
- Look up an existing Local Peer under "Local Peer Lookup" by selecting the peer name and IP address (the destination fields will be automatically populated).
- Manually add a new Local or Custom Peer, by directly typing the Peer Name, ASN, and IP in the Destination fields.

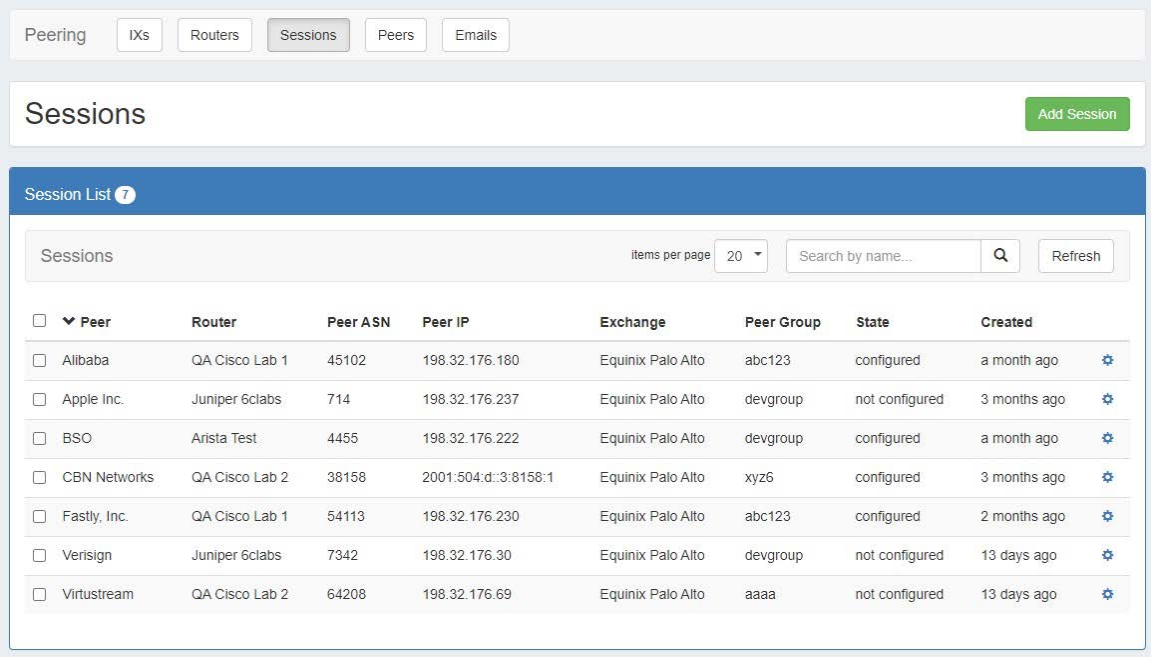


After selecting the Peer Destination information, you have the option of configuring the router immediately after saving. When done, click the "Create" button.

If "Configure router after saving" is selected, the router will configure immediately after session creation and automatically load the session page when done.

While Configuring, you may either wait for the configure to complete and automatically load the session details page, or immediately view the details by clicking "View Session" while the configure continues in the background.

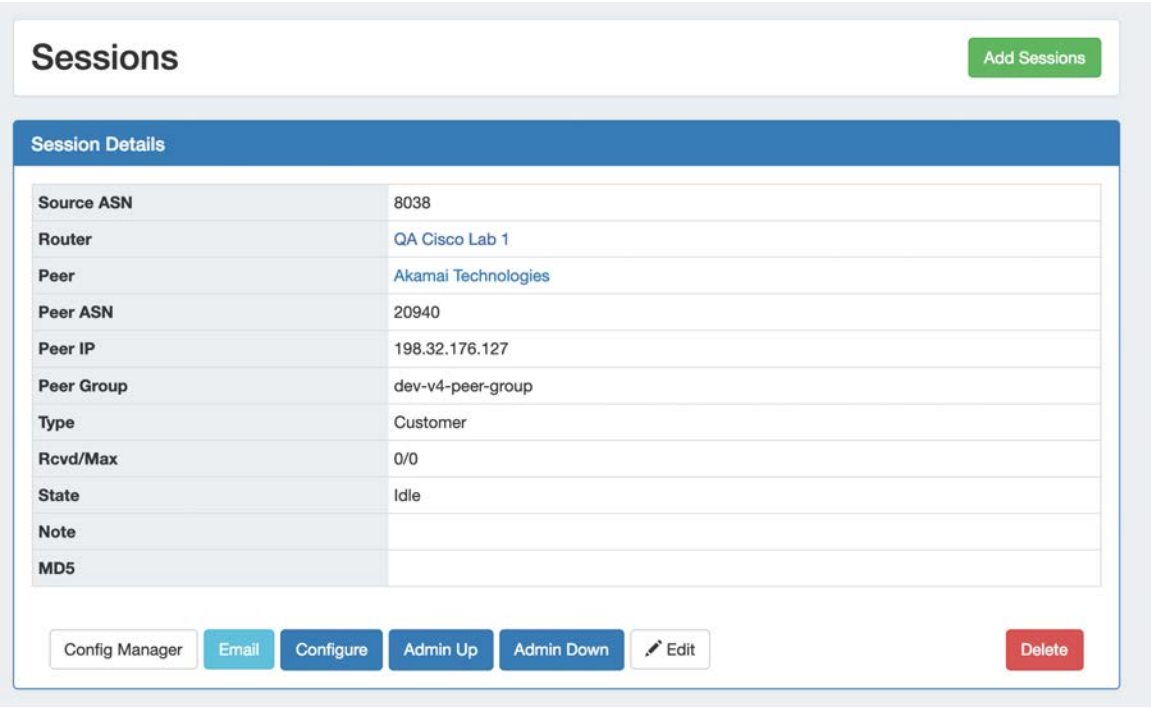
The new Session will be added to the Session List.



Manage a Session (The Session Details Page)

Clicking on a Session entry from any Session List, or clicking "View Session" after creating a session, will open the Session details page.

From here, new session may be created by clicking "Add Sessions" if desired, but it is primarily for session management. You may also click on the Router link to view the Router Details page, or the Peer Name for Peer Details.



The Session may be manually configured via "Config Manager", or automatically via "Configure".

"Email" opens an Email communications form, with data automatically generated from PeeringDB. Other available tasks include Admin Up/Down, Edit, and Delete session.

Session Details Actions

Edit: Edit session information such as Type, Prefixes, Notes or MD5.

Configure: 1-click configure which uses default router configuration, username, and password settings.

Config Manager: The Config Manager allows for custom configuration commands and user-level username/ password to be entered prior to pushing the config. This is a one time use configuration.

Email: Brings up the NOC (Network Operations Center), Policy, Technical, or other preset email template. The email template pre-populates data based on peeringdb data (To address, Subject line and Peering exchange information). You have the chance to edit the email prior to sending.

Admin Up: Ups a bgp session without removing it or adding it to the config.

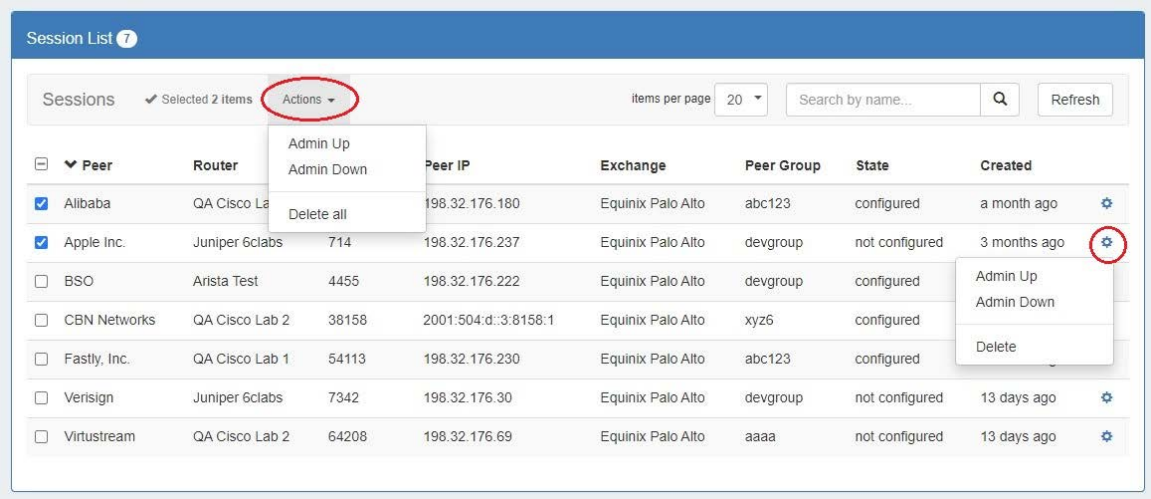
Admin Down: Downs a bgp session without removing it or adding it to the config. On Cisco, Admin Down moves the session to Idle (Admin) state, on Juniper it deactivates the session.

Delete: Sessions of type "Peer" are removed from the router when deleted in ProVision. Other sessions will only be removed from the sessions list in ProVision.

Session List Action Menu

Several actions are available from the Session List for single or multi-session use.

Select the session(s) and choose the desired action from the right-click menu or "Actions" dropdown menu at top. Options include Admin Up, Admin Down, and Delete.

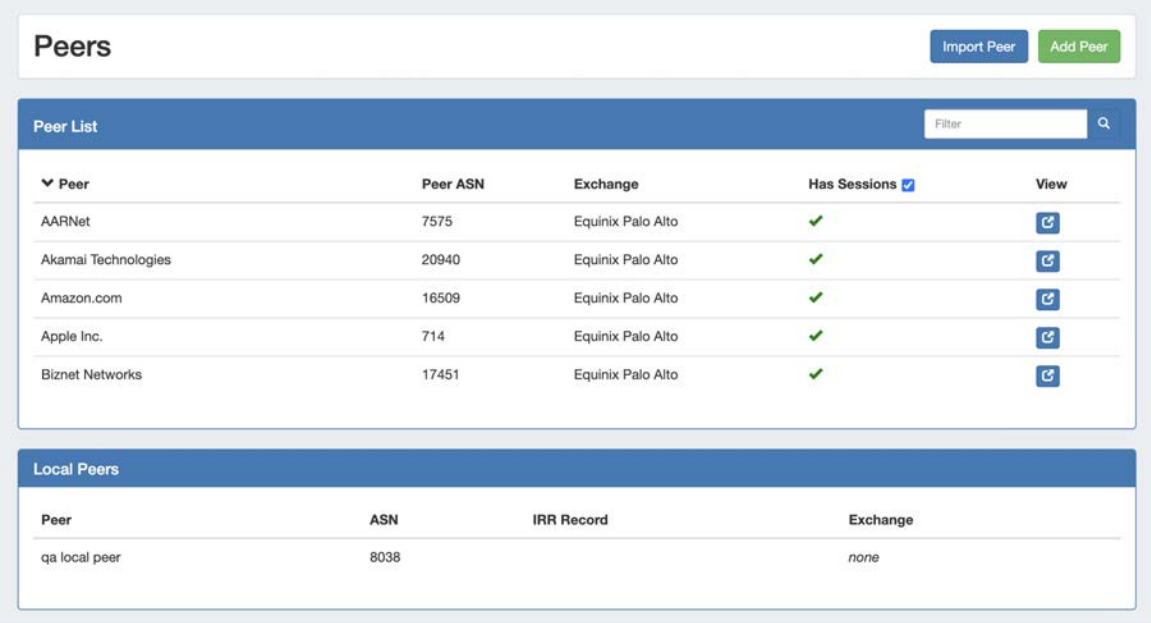


Additional Information

- Peering
- Peering Exchanges
- Peering Routers
- Managing Peers
- Peering Emails

Managing Peers

Peers



The **Peers** subtab lists existing peers in ProVision. Here, you can add new peers and view peer details. ProVision supports Peer lookup from PeeringDB, as well as creation of "Local Peers". Local or custom Peers that are 'private' or not registered with PeeringDB may also be used for session creation.

- Peers
- Working with Peers
  - Peer List
  - Add Peers
    - Add PeeringDB Peer (Import Lookup)
    - Add Peer via Configure / Configure Multiple Sessions
    - Add a Local Peer
    - Add Peer via Session
      - Add Session Information
      - Select or Add Destination
  - Peer Details Page
  - Additional Information

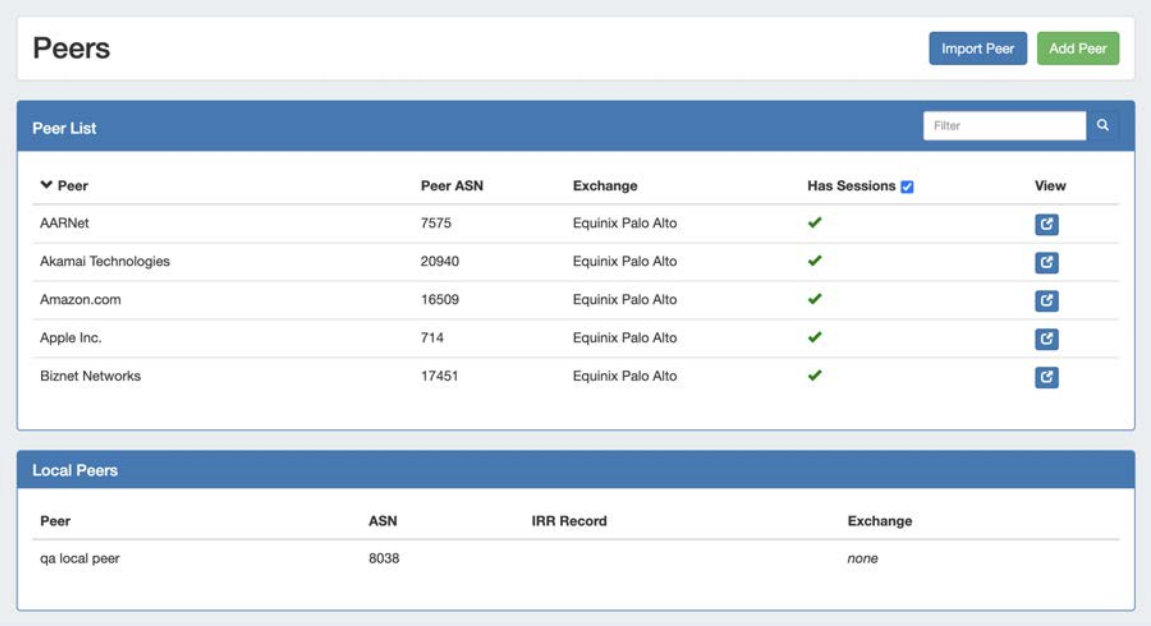
Working with Peers

Peer List

The Peer list shows peers currently in ProVision, their ASN, associated exchange, and whether session exist.

Filter the peer list by typing all or part of a peer name into the "Filter" text box in the right side of the list header, and the list will narrow down to matching Peers.

You may also sort by any field by clicking on the column name in the header. To view a Peer, you may click anywhere in the row for the peer, or click the "View" button.



Organizations will show as Peers in this list if:

- There is an existing session in Provision with the organization set as the destination - applies to both "Add Session" and "Add Peer" Configure Sessions
- The organization is marked "Existing Peer" in Exchange communications

Manually added Local Peers will show in the Local Peer list, below the standard Peer List.

Add Peers

Adding a Peer can be done via many methods in ProVision, depending on whether the peer is from PeeringDB, Local, and what the peer/session status is.

In general, Peers will added from either:

- PeeringDB through "Import Peer", session creation, or exchange communications
- Local / Custom creation through "Add Peer" or session creation

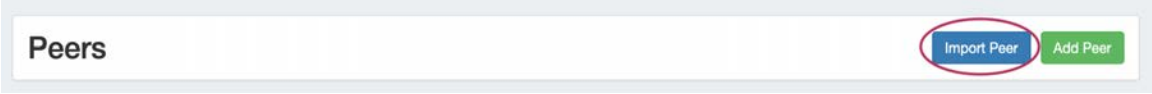
The following approaches will result in a Peer being added into ProVision:

- Create a session for a peer, selecting the Peer from PeeringDB options available under the Session tab "Add Session" form.
- Create a session for a local or custom peer, selecting an existing local peer or manually entering a custom destination in the Session tab "Add Session" form.
- Manually create a Local Peer, from "Add Peer".
- Import/search for a Peer from PeeringDB, then add the peer by configuring multiple sessions.
- Add a peer without creating sessions by marking the peer as "existing" under ExchangeCommunications. The Peer will show in the Peer List, but no sessions will exist for the peer until they are created in ProVision.

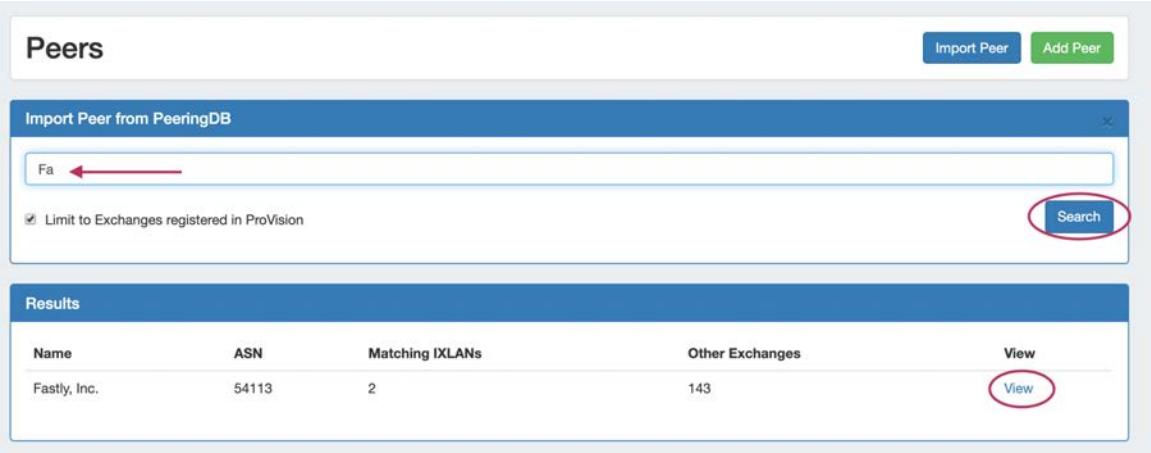
Add PeeringDB Peer (Import Lookup)

Peers may be added via finding a peer from PeeringDB to import,

You can search for Peers by clicking "Import Peer" on the **Peers** or **Peer Details** pages.



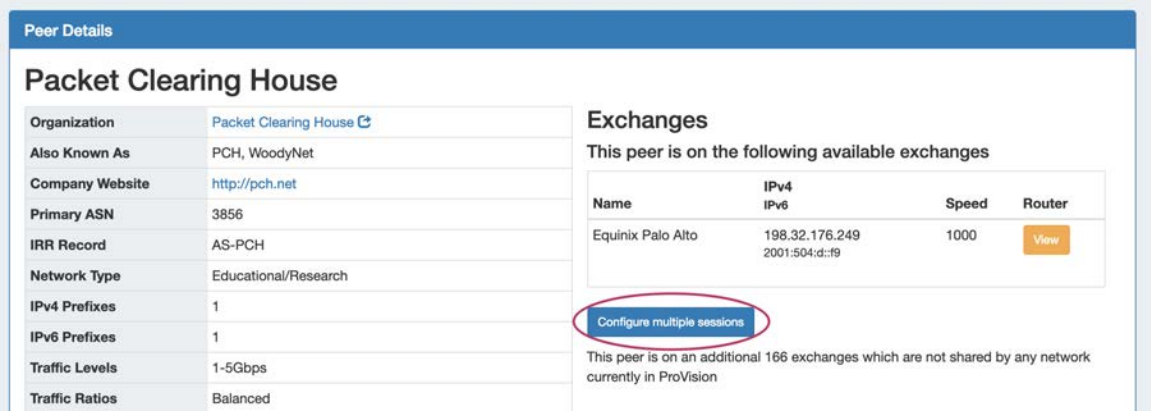
The "Import Peer from PeeringDB" search module will open. Enter all or part of the peer name, then click "Search". The results will show in a list below.



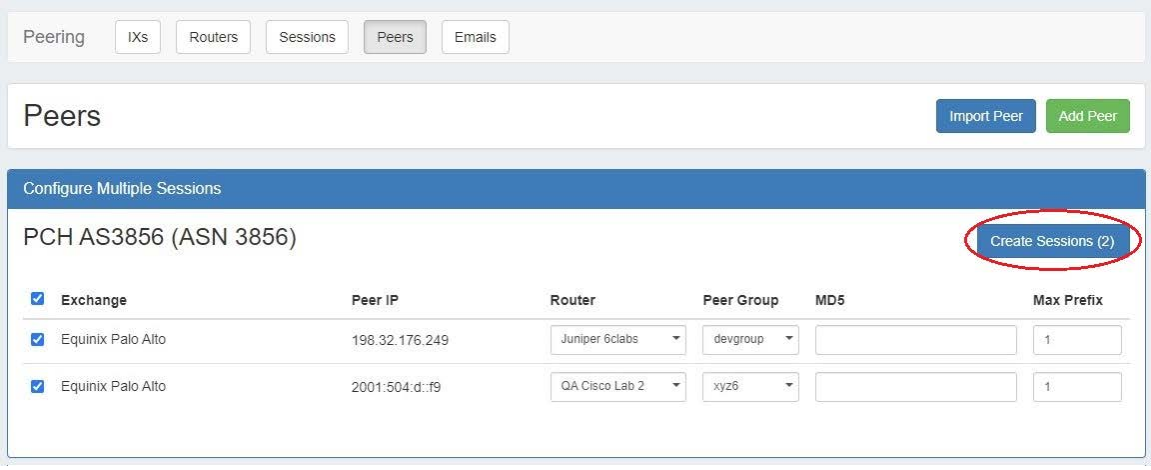
From the results list, click "View" - this will open the **Peer Details** page for the Peer, where you can view the peer's information, available exchanges, existing sessions, or add the peer via configuring multiple sessions.

Add Peer via Configure / Configure Multiple Sessions

From the **Peer Details page**, click "Configure Multiple Sessions".



Clicking the configure multiple buttons opens a page where you may select and set up multiple sessions for that peer.

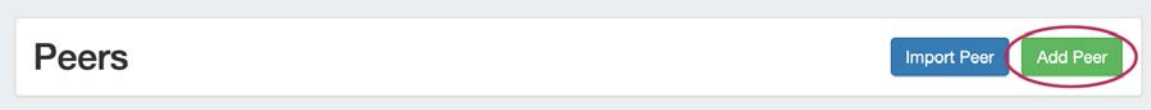


Select the desired exchanges, router, peer group, and type, and then choose "Create Sessions." If a similar session already exists, a visual indicator will alert the user.

Configuring sessions here will create new sessions, and add the peer used to the Peer List.

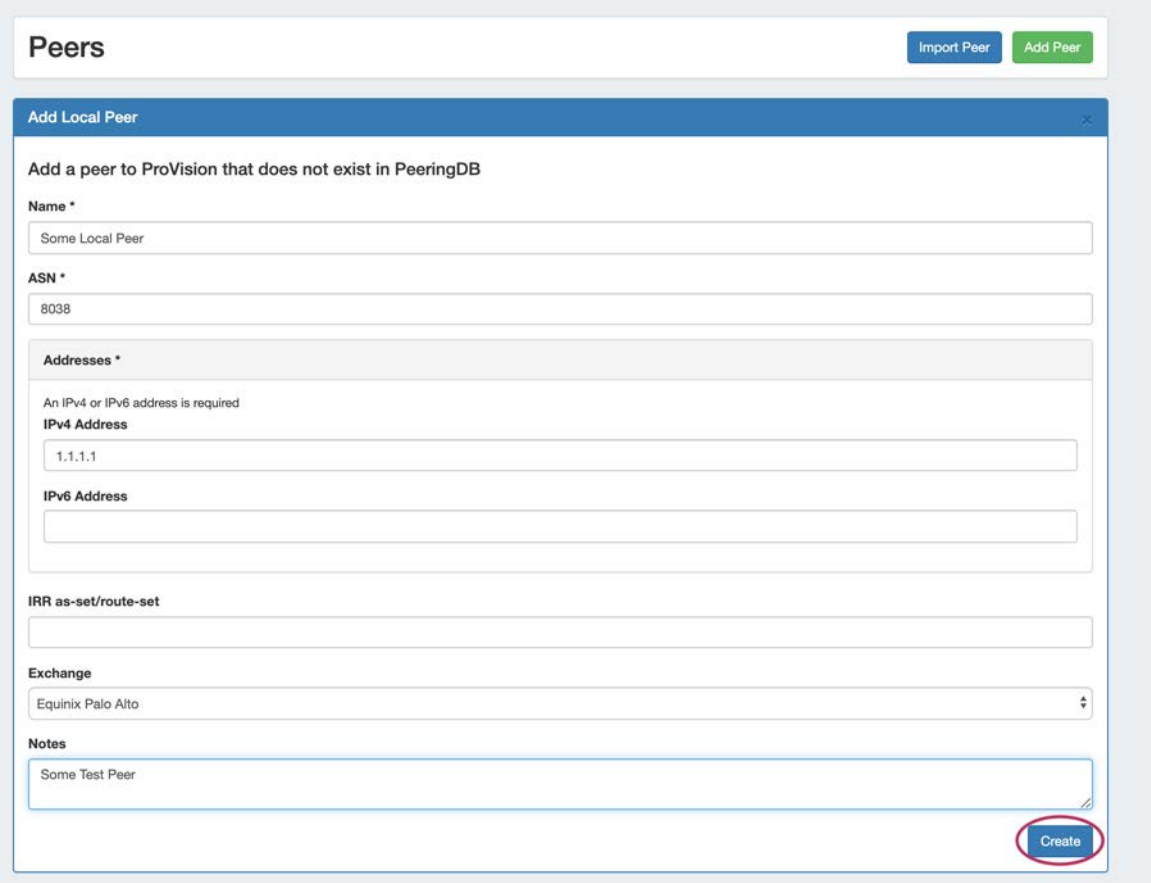
Add a Local Peer

Add a new local peer by going to the **Peering** Tab Peers subtab, and clicking "Add Peer".



In the "Add Local Peer" form, enter the Peer details including Name, ASN, IPv4 or IPv6 Address, Route-Set, select an Exchange Option, and add notes if desired.

When finished, click "Create".



The Peer will be added to the "Local Peers" list, and be available to select while creating a session.



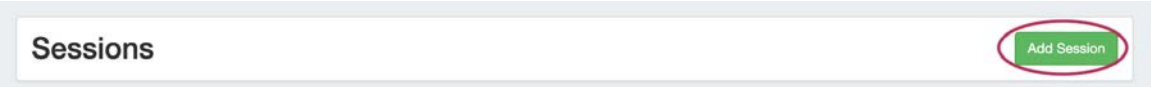
Add Peer via Session

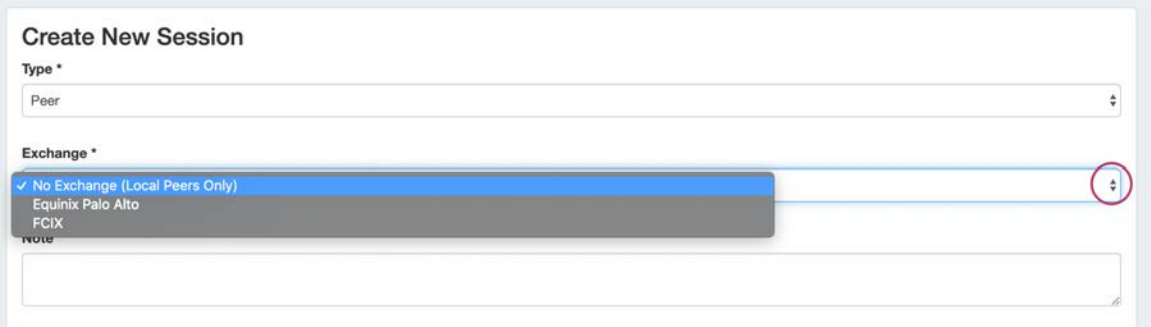
New Peers are added when creating a session with that Peer. While creating a new Session, you may select a PeeringDB Peer, an existing Local Peer, or create a new custom Peer.

Add Session Information

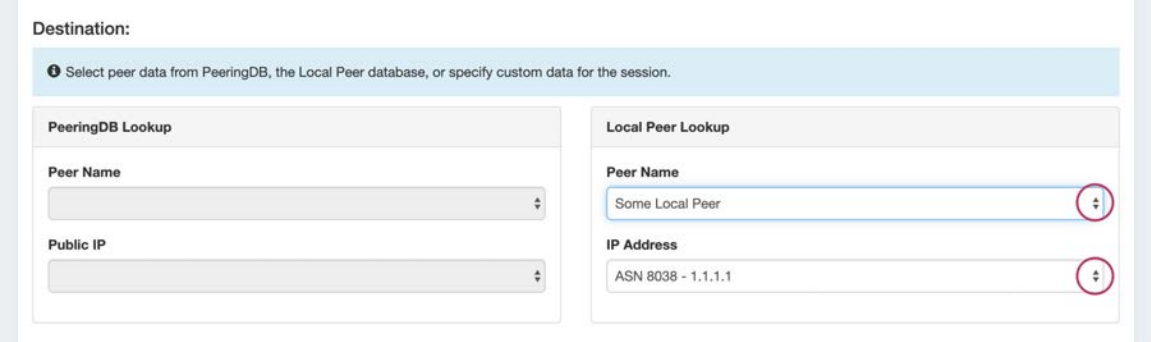
Click "Add Session" from the Peering Sessions sub-tab.

In the Create New Session Form, type the session information, selecting the appropriate exchange type for the planned Peer. If using a Local Peer, "No Exchange" is an available option.



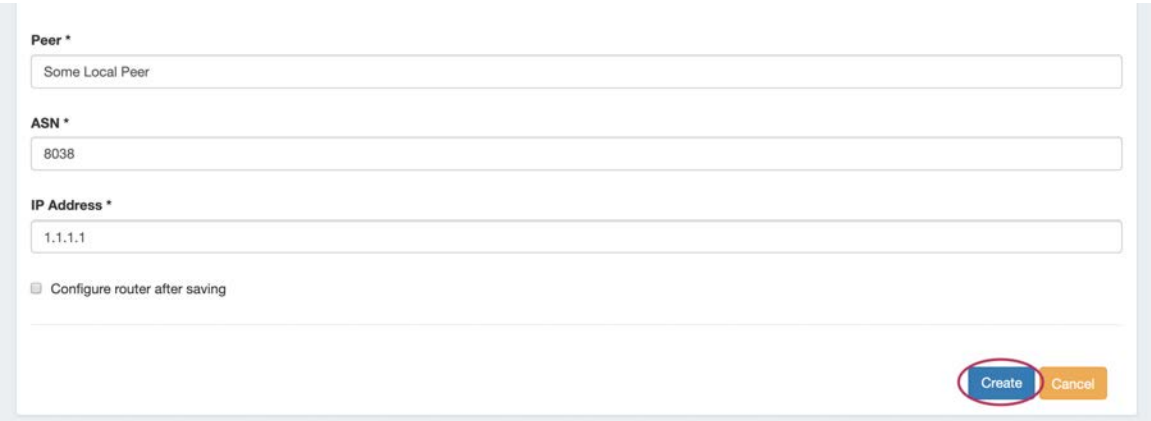


Select or Add Destination



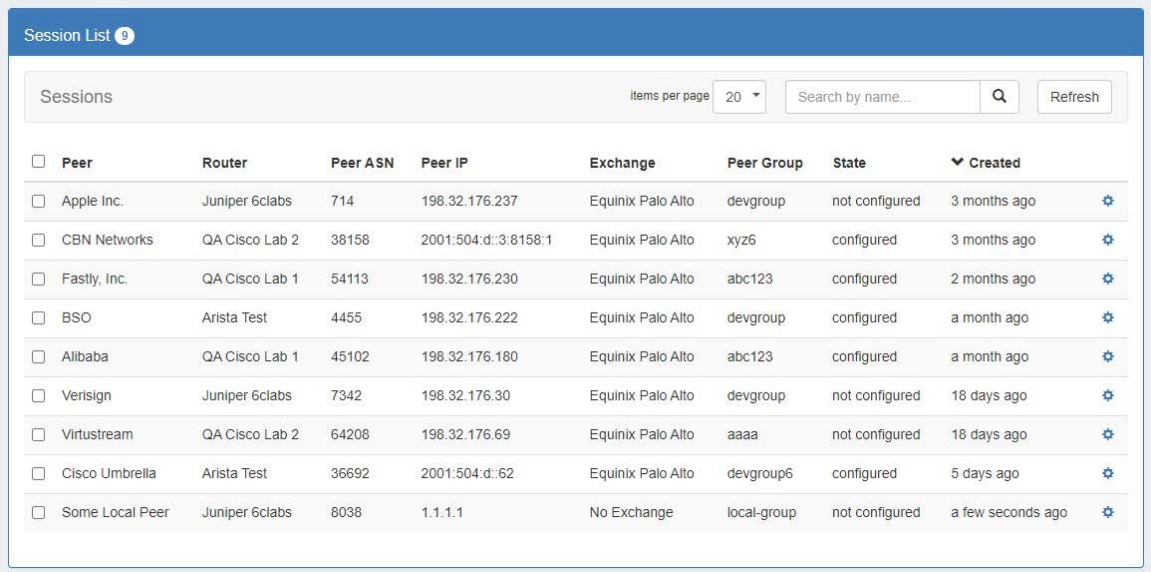
Under the **Destination** section, select or type in information for a peer. You may add Peer information from any of the three available methods:

- Use PeeringDB Lookup to select a PeeringDB Peer (the destination fields will be automatically populated).
- Look up an existing Local Peer under "Local Peer Lookup" by selecting the peer name and IP address (the destination fields will be automatically populated).
- Manually add a new Local or Custom Peer, by directly typing the Peer Name, ASN, and IP in the Destination fields.



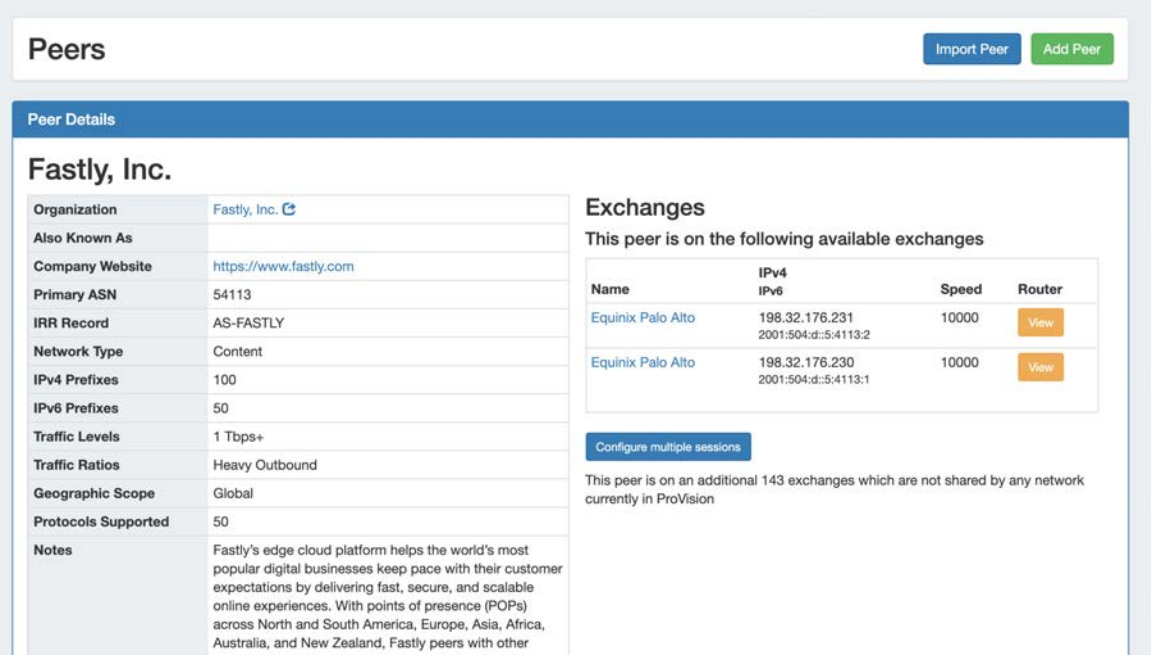
When complete, click "Create".

The new Session will be added to the Session List.



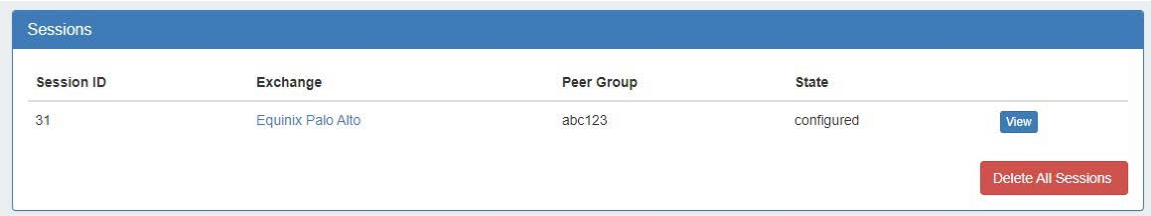
Peer Details Page

Clicking on a peer in the list will open the Peer Details page.



From here, you can view details for the existing peer, including available exchanges and what routers you have available on that exchange. Additional, the peer may be added by configuring new sessions via Configure Multiple Sessions.

Existing sessions for the Peer may be viewed, managed and deleted under "Sessions".



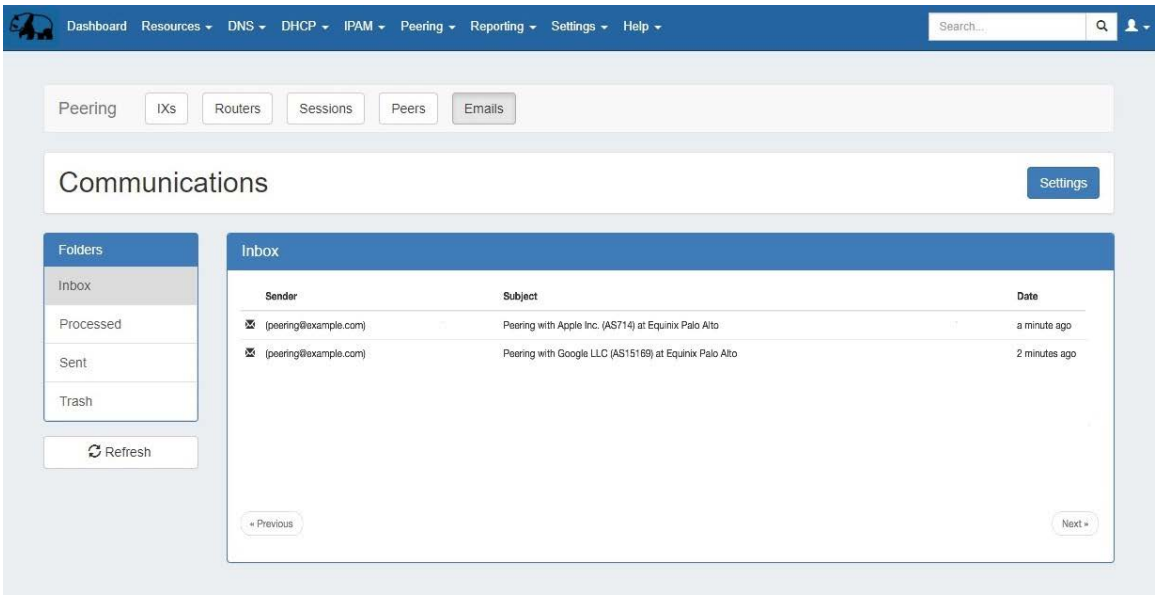
To edit, manage, or delete a single session, click on the session listing to open the Session detail page. All sessions under the Peer may be deleted by clicking "Delete All Sessions".

Additional Information

- Peering
- Peering Exchanges
- Peering Routers
- Peering Sessions
- Peering Emails

Peering Emails

Peering Emails



The Peering **Email** subtab is an Admin-only page from which a company peering account can view and manage recent emails.

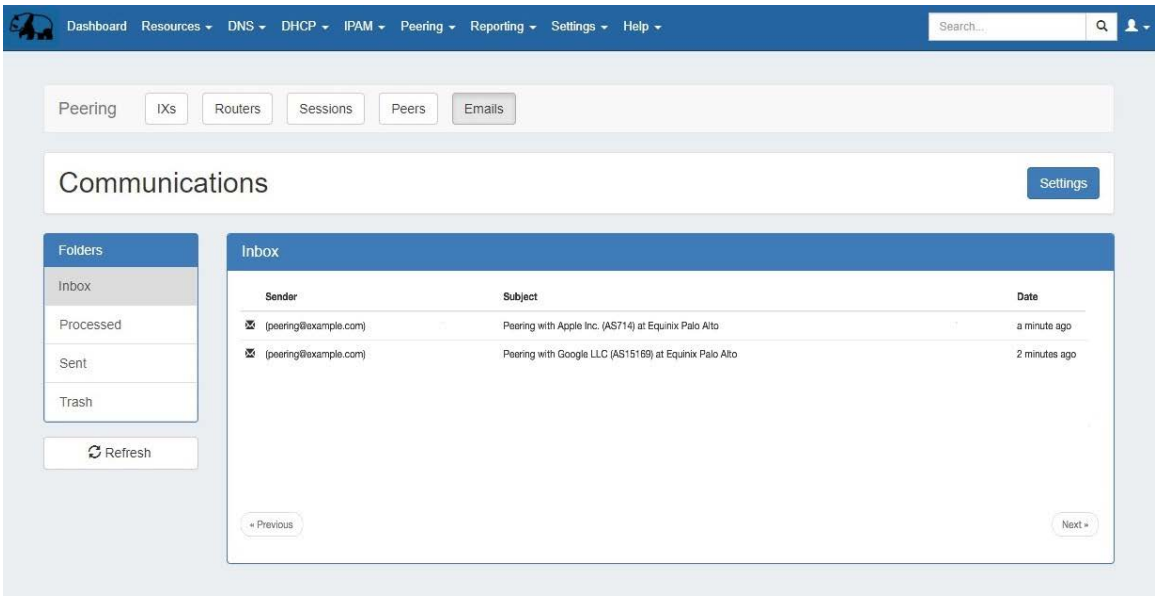
> The Peering Emails page is only accessible to Administrative users in the primary "Global Admins" User Group.
>
> Ensure that Peering Administrators using ProVision's Peering Emails area are included as members of that group for full access.

- Peering Emails
- Communications Page Overview
- Messages
  - Process a Message
  - Reply to a Message
  - Delete a Message
- Communications Settings
  - Add an Account
  - Edit or Delete an Existing Account
  - Additional Information

Communications Page Overview

The Peering **Emails** subtab associates a single company peering email account (such as peering@company.com) with your ProVision instance, creating a 'shortcut' email system to keep on top of the most recent peering requests while in ProVision.

Here, you can load, view, and reply to emails received at that address, view requests sent from ProVision's Exchange Communications page, and process emails to associate the message with ProVision Peers.



Four folders are available to view, displayed on the left sidebar:

Inbox: Displays emails received at that address, barring any messages deleted from ProVision

Processed: Emails which have been associated ("Processed") with a ProVision Peer.

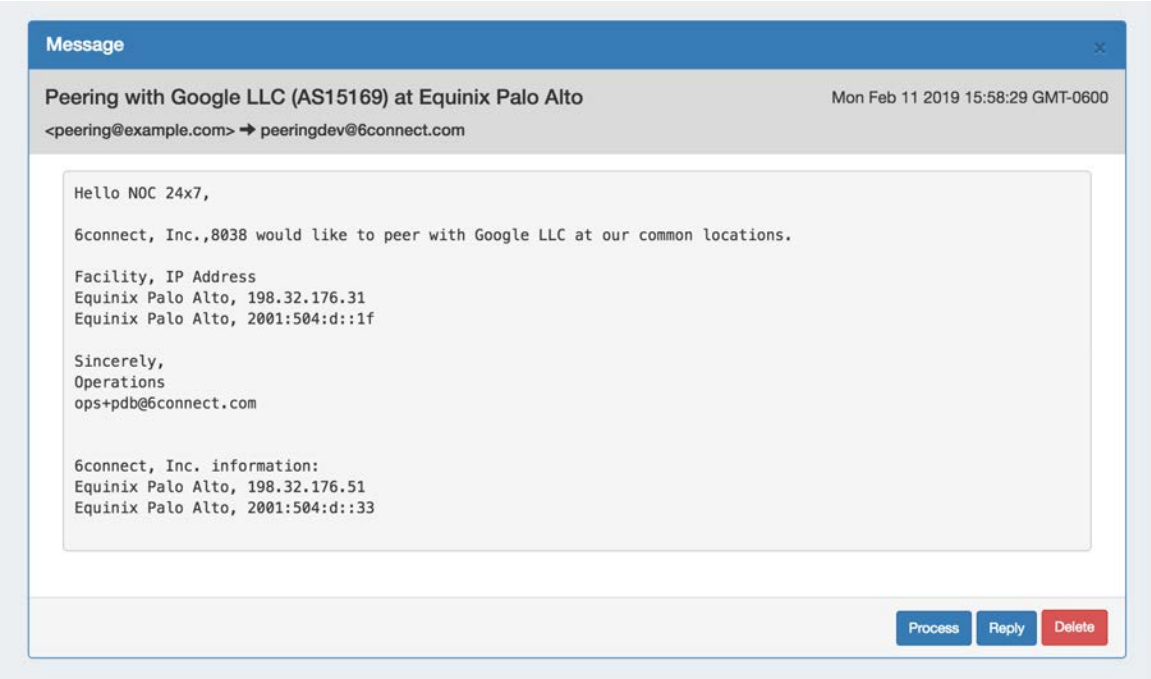
Sent: Emails sent from the set address from ProVision, either via "Reply" or from sending a peering request under "Exchange Details" Communications

Trash: Emails removed from ProVision folders - 'deleting' ProVision emails only affects what messages are loaded into the ProVision instance - your original messages remain intact on your original email server. So feel free to only keep only the emails relevant to peeringTo-Do list!

Messages are automatically checked for after 10 minutes, and refreshed when loading the page. When staying on the page for a period of time, you can manually check for and load new messages by clicking the "Refresh" button under the folder list.

Messages

From any message folder, click on the message to view message details.



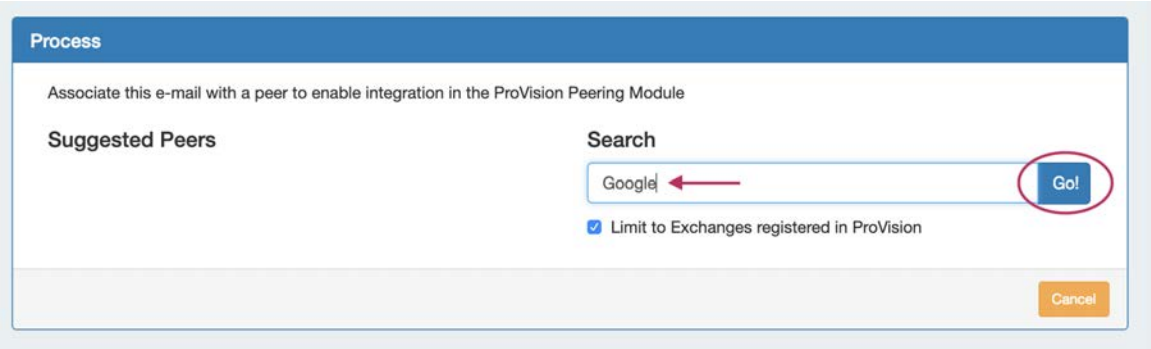
Three actions can be performed on messages: Process, Reply, or Delete.

Process a Message

"Processing" a message in ProVision associates that message with a Peer, and moves it into the "Processed" message box. To do so, click "Process" on the message.

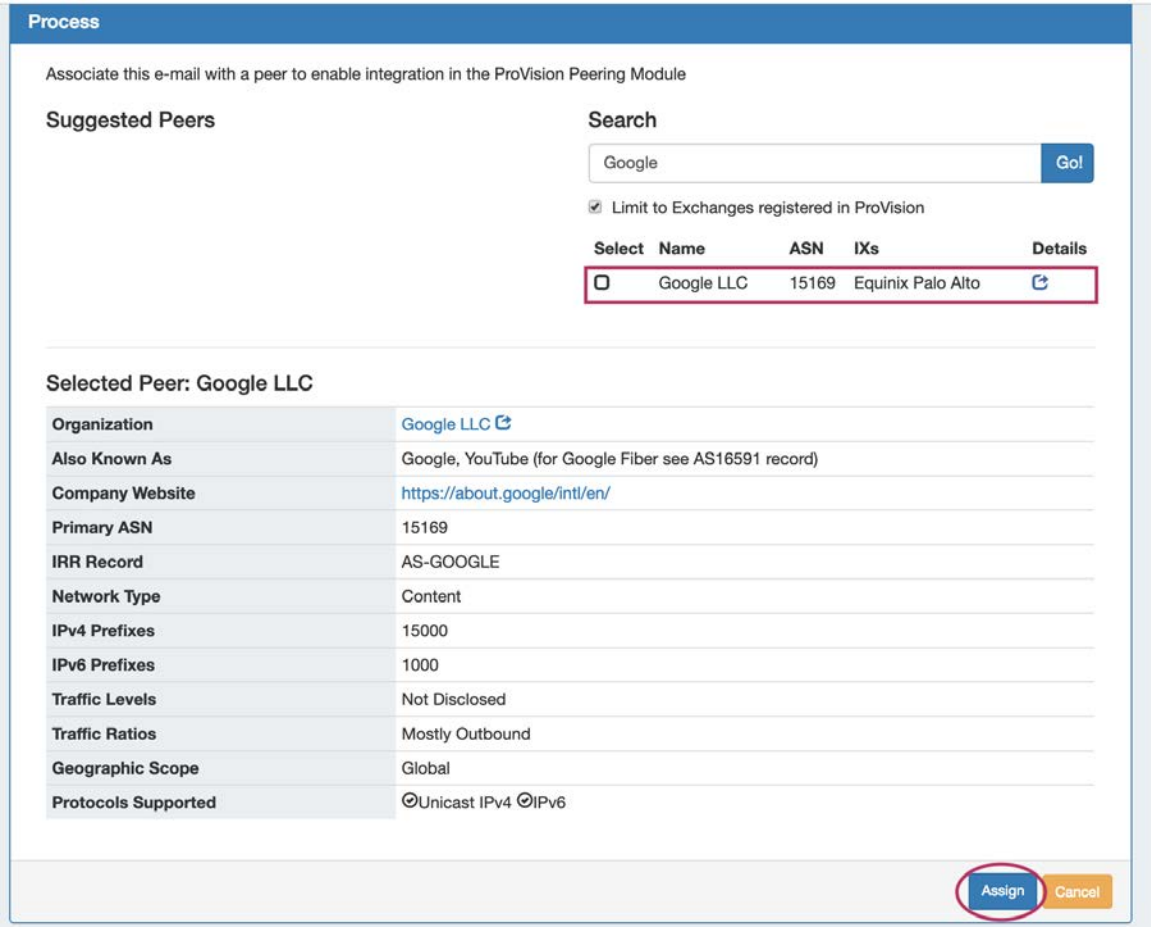


The "Process" email module open with a search field to select the Peer. Type in all or part of the peer name, then click "Go", or click "Cancel" if you want to skip the Processing and go back to the message.

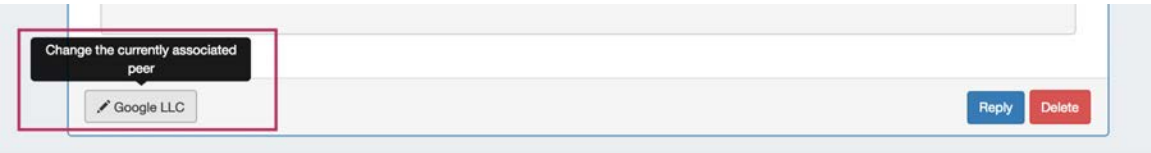


The search results for the peer will display under the search box.

Click on the Peer result that you wish to assign from the search results, then review the peer details to verify it is the correct Peer. When done, click "Assign".



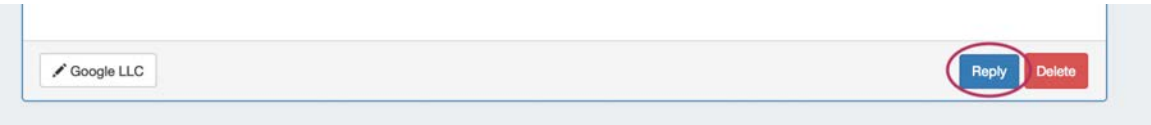
The Peer's name will be tagged to the bottom of the email message. If you need to change the associated Peer, you can click the tagged Peer to repeat the process and select a new Peer.



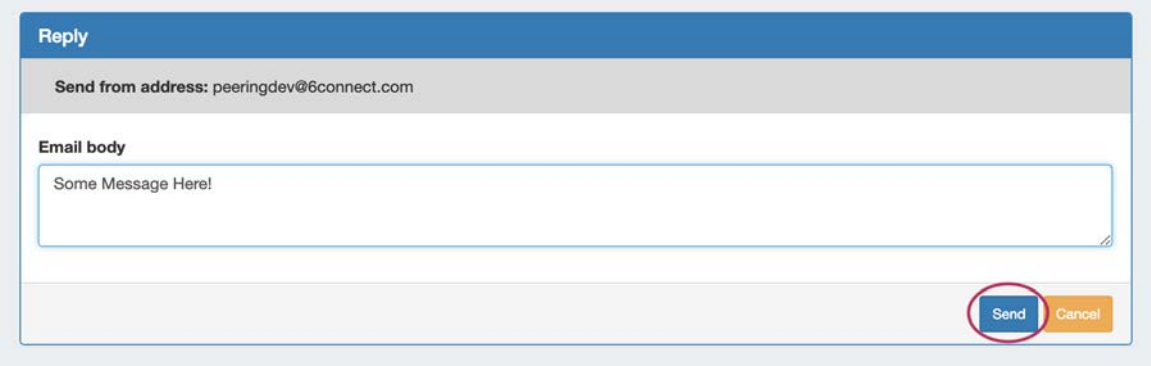
When done, the email will be move to the "processed" message box, to denote the message is associated with a peer.

Reply to a Message

To reply to a message, from the message details click the "Reply" button at the bottom of the message.



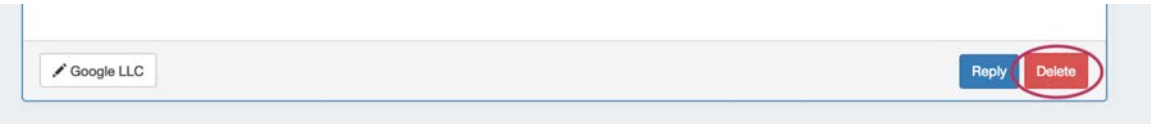
Type in your desired message reply, and click "Send".



The message reply will be sent to the original sender, and a copy will be saved in the "Sent" folder.

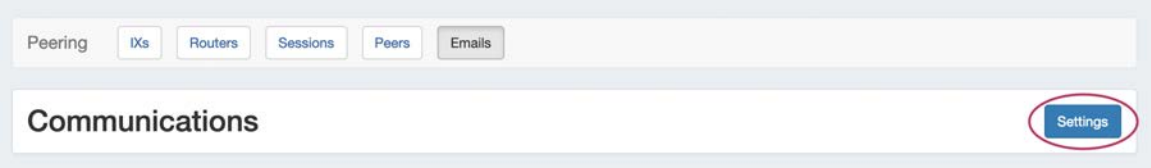
Delete a Message

To delete a message from ProVision, click the "Delete" button at the bottom of the message. The message will be removed from the Provision inbox and placed in the "Trash" folder, but remains intact on the original email server.



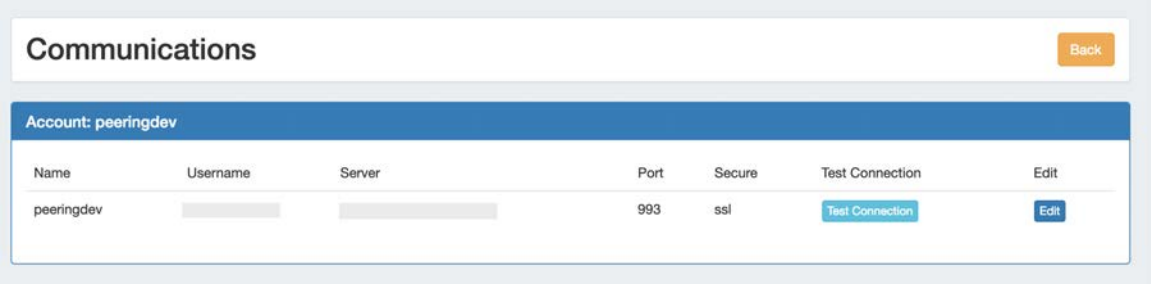
Communications Settings

The "Settings" page allows you to set, edit, or delete the email account associated with ProVision. From the Email Tab, click "Settings".



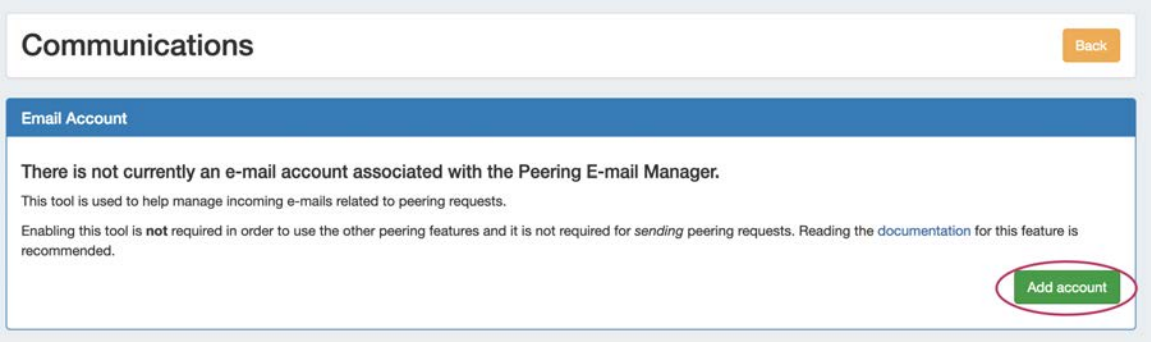
If no account is active, the option to add a new email account will be available.

Otherwise, if an account has already been set, details for the account will be visible as well as options to test or edit the account.

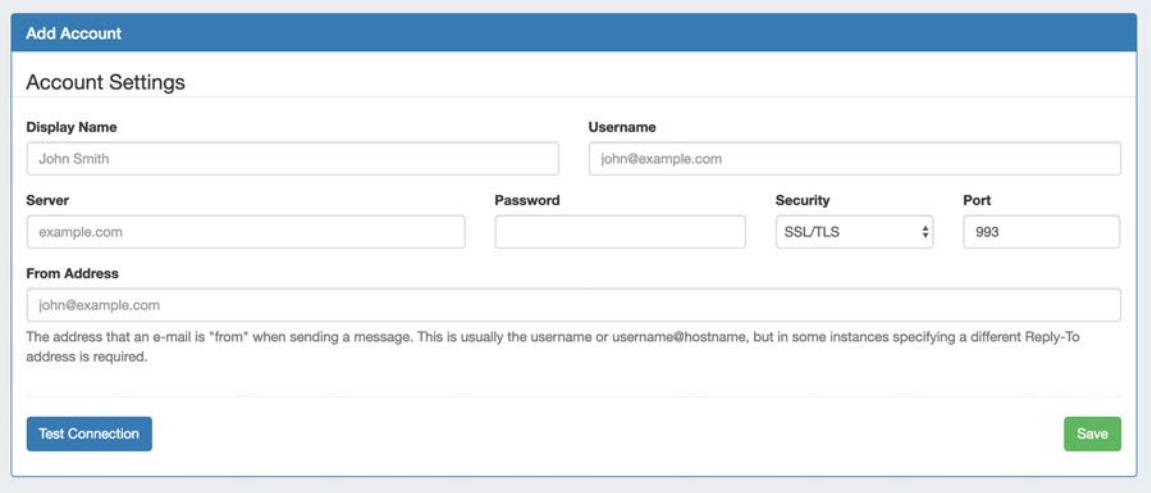


Add an Account

If an account is not currently set, status information and and the option to add a new email account will be available. Click "Add Account".

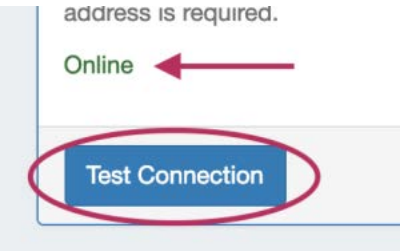


On the "Add Account" page, enter the account display name, email username/address, server, email password, and change the security and port settings if needed.



"From Address" is a field used if the email reply address is different than the username@serverhostname - in most cases, it will not be necessary.

When done, you can verify the information is correct by clicking "Test Connection" - if the account is valid and a connection succeeds, you will see a "Online" response.



When done, click "Save", and the account information will display under "Settings" and the email folder will be available.

A Note on Yahoo and Gmail

When working with Yahoo or Gmail email addresses specific settings are necessary:

Yahoo How To:

- Use Yahoo IMAP settings for the server - see: https://help.yahoo.com/kb/sln4075.html

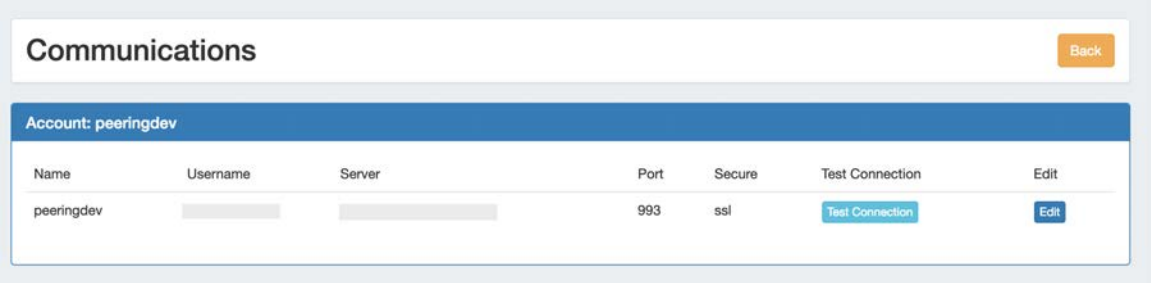
- Use / create a 3rd party Yahoo app password for the password field - see: https://help.yahoo.com/kb/generate-manage-third-party-passwords-sln15241.html
- For the Username field, input the Yahoo username instead of the email address (user, instead of user@yahoo.com)

Gmail How To:

- Use Gmail IMAP settings - see: https://support.google.com/mail/answer/7126229
- Turn on access for less secure apps
- Use a 3rd party app password for the password field (This requires setup of 2 step verification for Gmail sign in). Info on this process is here: https://support.google.com/accounts/answer/3466521?hl=en
- For the Username field, input the Gmail username instead of the email address (user, instead of user@gmail.com)

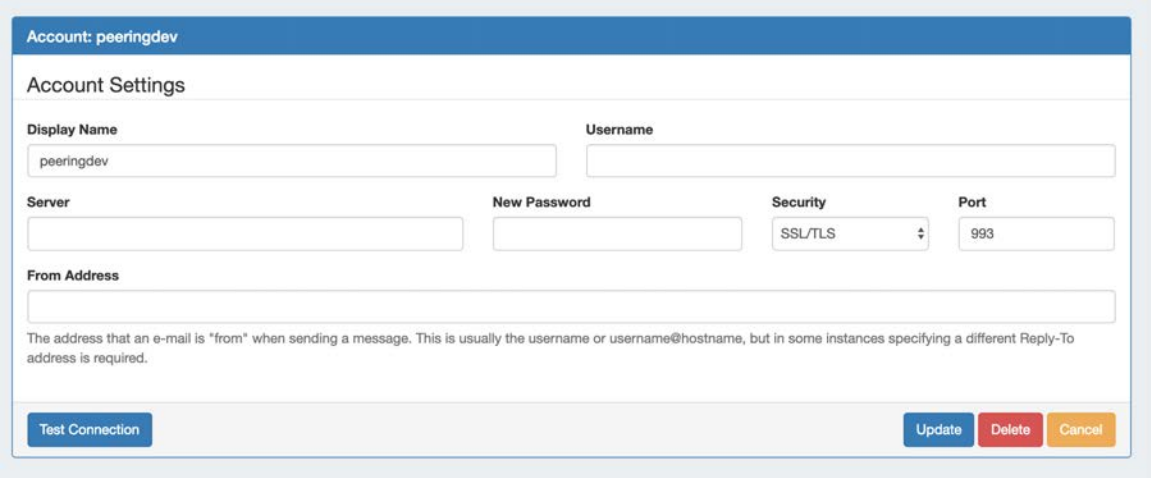
If you have additional questions on additions to Peering email addresses, contact support@6connect.com.

Edit or Delete an Existing Account



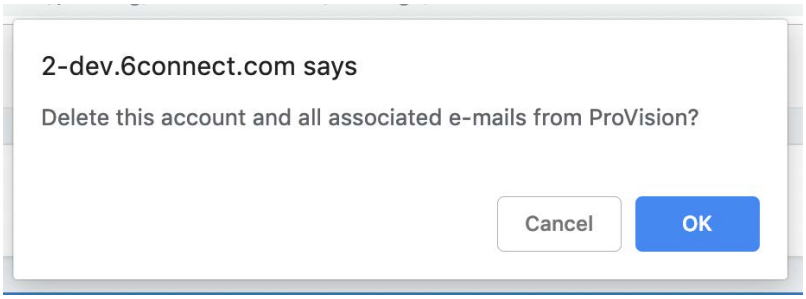
An existing account may have the connection tested by clicking "Test Connection" in Account Information. Additional Actions, such as editing account details or deleting the account from ProVision may be done by clicking "Edit" for the Account.

Click "Edit" to open the



Edit the account settings as needed, test the connection if desired, and click "Update".

Delete the account by clicking "Delete" - a confirmation message will appear confirming that the account will be deleted and all emails removed from the ProVision infterface - don't worry, the original emails stay fully intact on the email server.



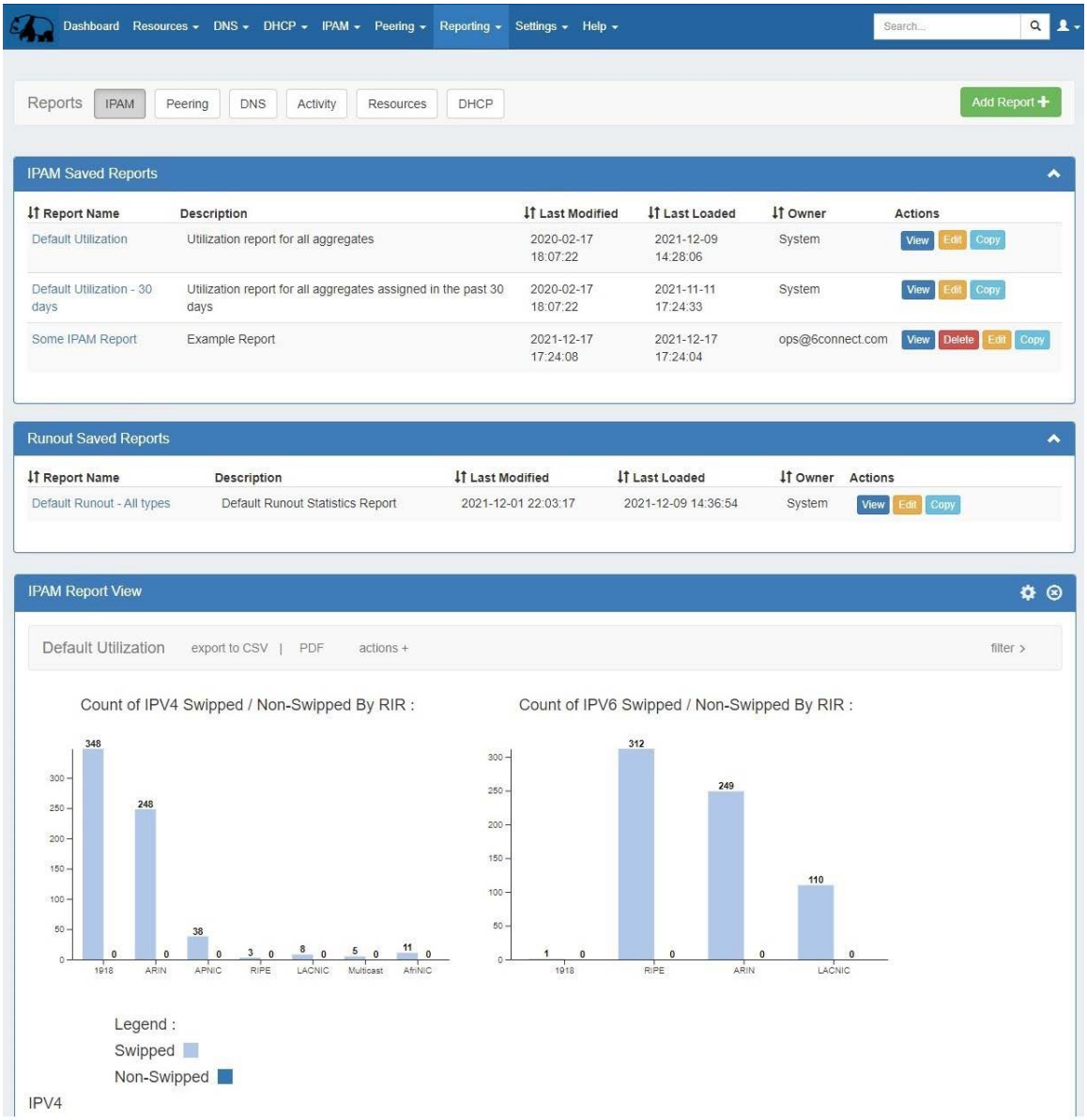
Additional Information

- Peering
- Peering Exchanges
- Peering Routers
- Peering Sessions
- Managing Peers

Reporting

Reporting

The ProVision **Reporting** tab provides reports for IPAM, Peering, DNS, Activity, Resources, and DHCP.



To view reports for ProVision modules (IPAM, Peering, DNS, Activity, and Resources), click on the applicable sub-tab button at the top of the page, or select it from the **Reporting** Tab dropdown menu.

- Reporting Overview
- Report Ownership, Permissions, and Coordination
  - Report Ownership
  - Report Permissions
  - Global Admin Permissions Override
  - Coordination & Best Practices
- Available Reports
  - IPAM Utilization Reports
  - IPAM Runout Report
  - Peering Reports
  - DNS Reports

    - Activity Reports
    - Resource Reports
    - DHCP Server Report
    - DHCP Pools Report
- Additional Information

Reporting Overview

The **Reporting** tab contains reports for five ProVision modules - IPAM, Peering, DNS, Activity, Resources, and DHCP.

Default reports are available for each module sub-tab, and users may create their own customized report from the existing templates. Once created, reports may be exported on-demand, or have exports scheduled to be sent to a user at regular intervals.

Reporting Features

- Fifteen default system reports for IPAM, Peering, DNS, Activity, Resources, and DHCP
- Customizable user-created reports
- IPAM Utilization, Runout, and Peering Status charts
- Export reports to .csv and/or pdf
- Schedule reports to be emailed at selected intervals
- Safely view existing reports and apply filters without overwriting saved report settings, or chose to permanently save changes.
- Copy existing reports to use as editable templates
- IPAM reports include integration with IPAM metacolumn data and IPAM Column settings

Report Ownership, Permissions, and Coordination

Reports and User Permissions

Admin level users ("Admin" permissions on TLR) may view all data in all reports, as well as perform report actions such as creating, editing, copying, and deleting reports if the "Reporting Permissions Override" setting is selected in Admin Preferences.

Non-admin / Limited permission users may view reports, but will only be shown the reports and data/modules for which they have permissions to view.

Non-Admin users may not create new reports, or edit, copy, or delete system reports or reports created by other users.

Report Ownership

Default reports will display with "System" as the owner, and may be viewed and copied by all users with access to the report, but are not deletable. Admin level users may edit default reports.

User-created reports will display with the creator's username in the owner field, and are able viewed and copied by anyone who has view permissions for that report, but only the report owner (and global admins) may edit / delete user created reports.

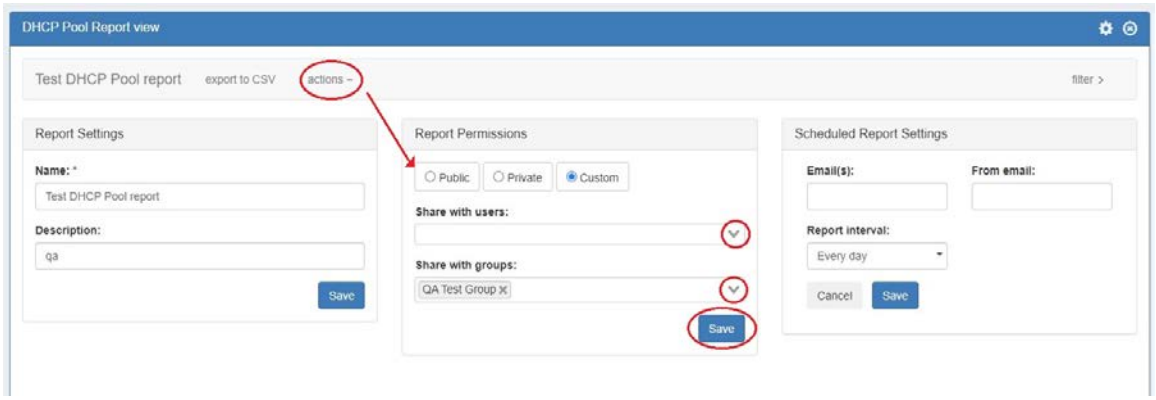
Reports may be hidden to other users by setting the report permissions to "private" or "custom", with the caveat that global admin users may override set permissions on reports.

Report Permissions

A Report Permissions module is available under report actions, allowing the user to set view permissions to one of the following:

- Public: Any user may view the report
- Private: Only the report owner can view the report
- Custom:
    - Share with Users: Only the specified users may view the report.
    - Share with Groups (Admin only): Only the users in the selected group(s) may view the report.

To set custom permissions, select the radio button for "Custom" and select either user(s) or group(s) to share with via the dropdowns. Be sure to click "Save" before exiting.



The Report Permissions module only affects report view permissions. It does not give access to edit / delete actions beyond what the user's permissions typically allow (non-admin level users will not gain "Edit" access, for example).

In addition to the selected Report Permissions settings, viewable report data is also subject to the permissions level of the User Group of the current user, and any admin-level viewing restrictions for specific data (such as log-based reports).

Reporting Permissions Hierarchy:

TLR Global Admins, with enabled Permissions Override:

- May create new reports.
- System reports may be viewed, copied, and edited.
- Can view, edit, copy, and delete all user reports, regardless of report permission settings.

TLR Global Admins, without Permissions Override (Includes "Read-Only" TLR Admins):

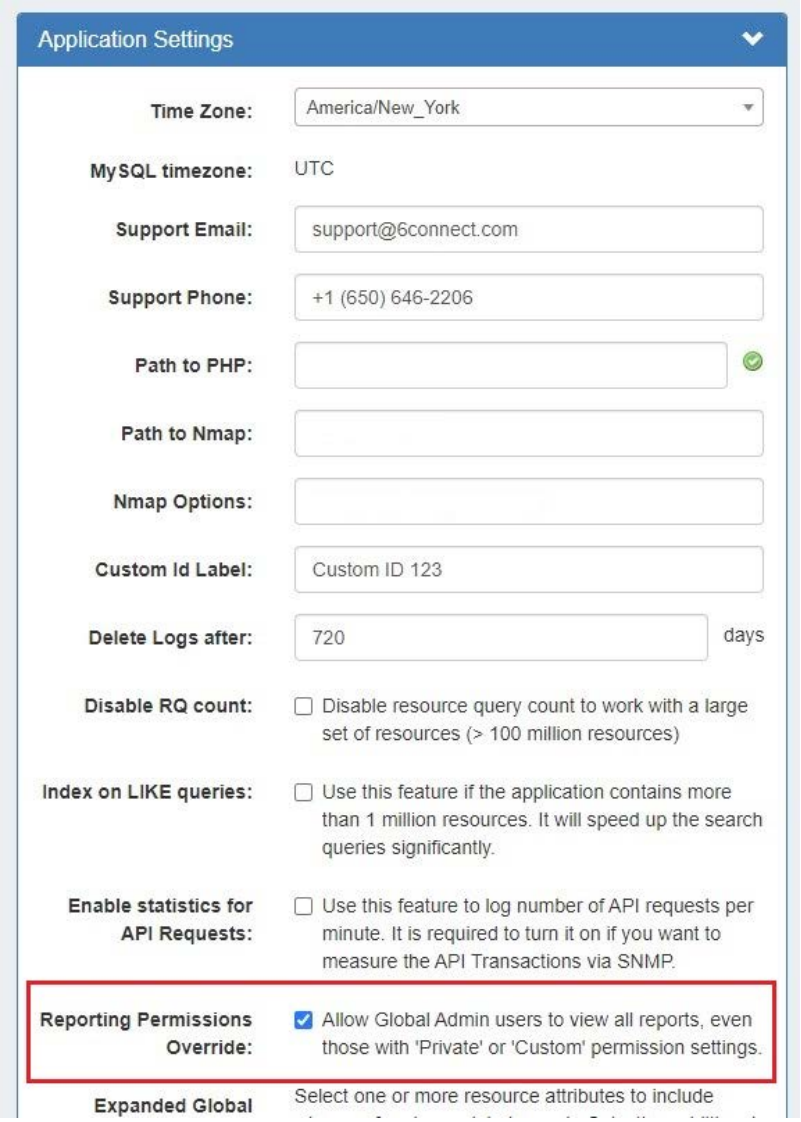
- May create new reports.
- System reports may be viewed, copied, and edited.
- Can view, edit, copy, and delete any user reports which they have permission to access (reports set to "Public, or the admin is included under "Custom" permissions).

Non-Admins (including TLR level non-admin, or users in groups with only resource-level permissions):

- May not create new reports.
- May not view Activity reports.
- May view or copy existing reports which they have permission to access.
- Can view, edit, copy, and delete reports which they own.

Global Admin Permissions Override

Global Admins may view all reports, even those with Private or Custom settings, by enabling the "Reporting Permissions Override" in the Admin section Application Settings module.



Coordination & Best Practices

Although it is possible for global admin users to edit and save default reports as well as those created by other users, it is recommended to either coordinate the changes with the report's owner, or to create a new copy of the existing report to use for modifications.

Report Editing Etiquette

You may view existing reports at any time, including freely adjusting and applying filters on a temporary basis (by selecting filters clicking Apply) as well as immediately export those results, without overwriting the existing report filter settings.

However, *saving* new filter settings to an existing report (by applying the new filters -> Gear Icon Save) **permanently** overwrites the report's default filter settings.

Before saving changes to an existing report, it is recommended to perform some basic due diligence:

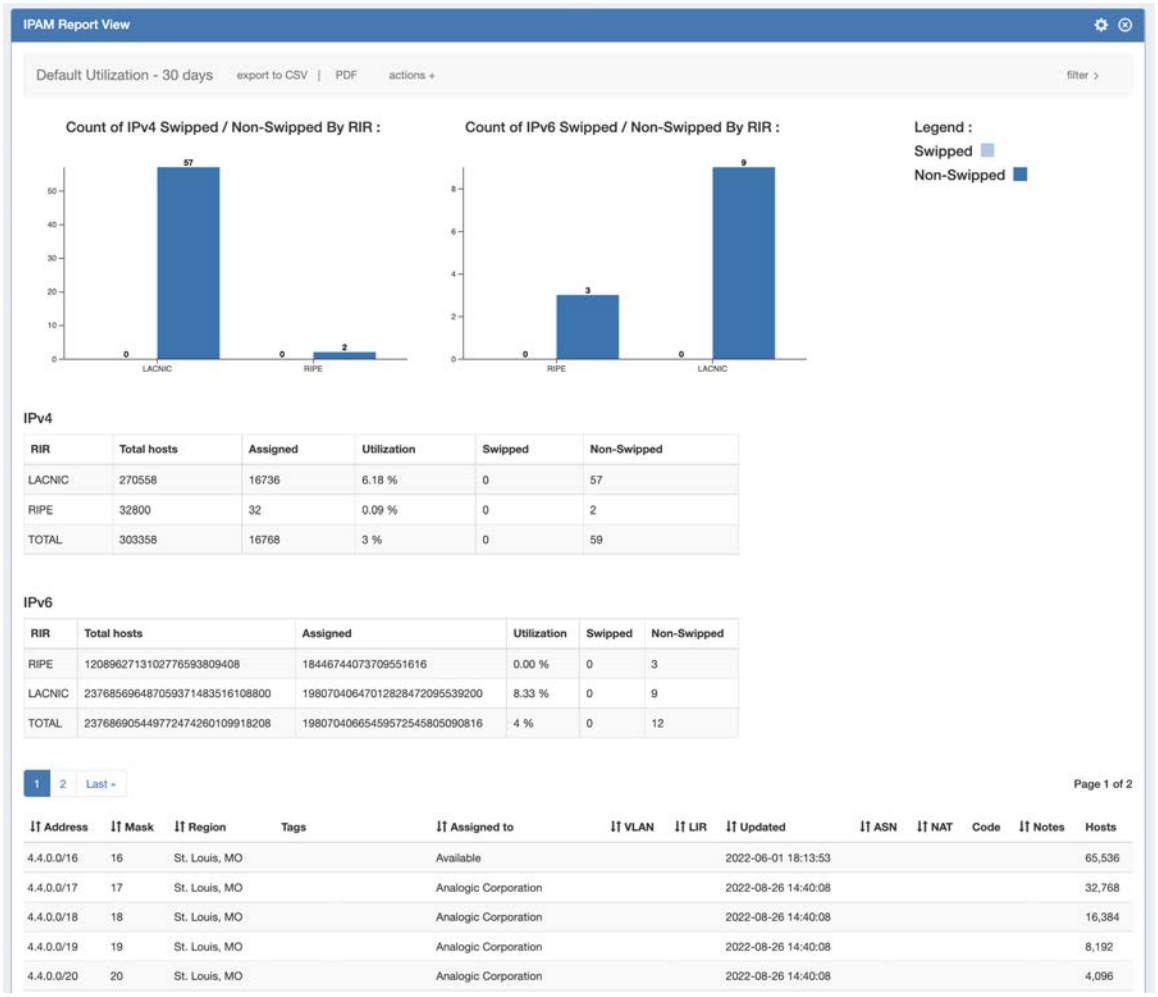
- If you are not the report's owner, confirm the report edit with the report owner prior to saving
- If there is a user listed as receiving scheduled exports of that report under Schedule Report Settings, verify that the report change will not negatively impact the planned use of the scheduled report(s).

Best Practices:

- Use the report Copy function whenever you are unsure of ownership or scheduled report repercussions
- If you only need a one-time export, temporarily adjust the filters on a default or existing report, and use the "Export to .csv/pdf" button
- Use the report's description field to communicate details, status, and restrictions to other users (such as "Do not edit - Report used for monthly status comparisons by Bob")

Available Reports

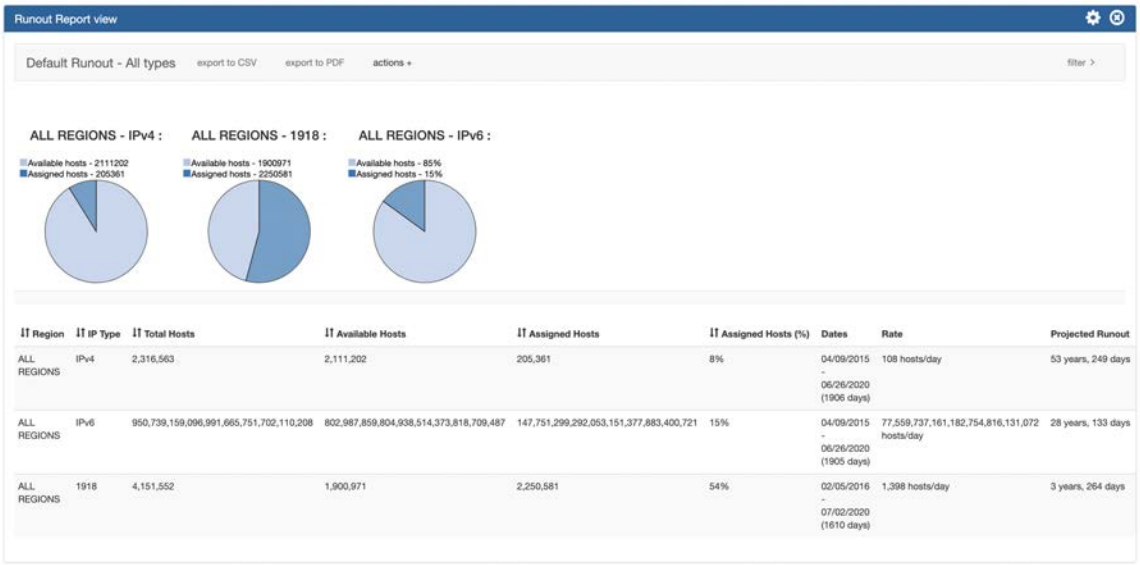
IPAM Utilization Reports



IPAM Utilization reports display IPv4/IPv4 utilization charts organized by RIR and SWIP status, and provide a listing of ProVision blocks meeting the applied filter criteria. The report view includes the block data for all applied IPAM Columns, in the order set under IPAM Admin IPAM Columns . IPAM Reports may be exported to .csv (limit: 100,000 records; no chart provided) or PDF (limit: 1000 records; chart included). Default reports include:

- Default Utilization: IPAM utilization report for all aggregates
- Default Utilization - 30 days: IPAM utilization report for all aggregates assigned in the past 30 days

IPAM Runout Report

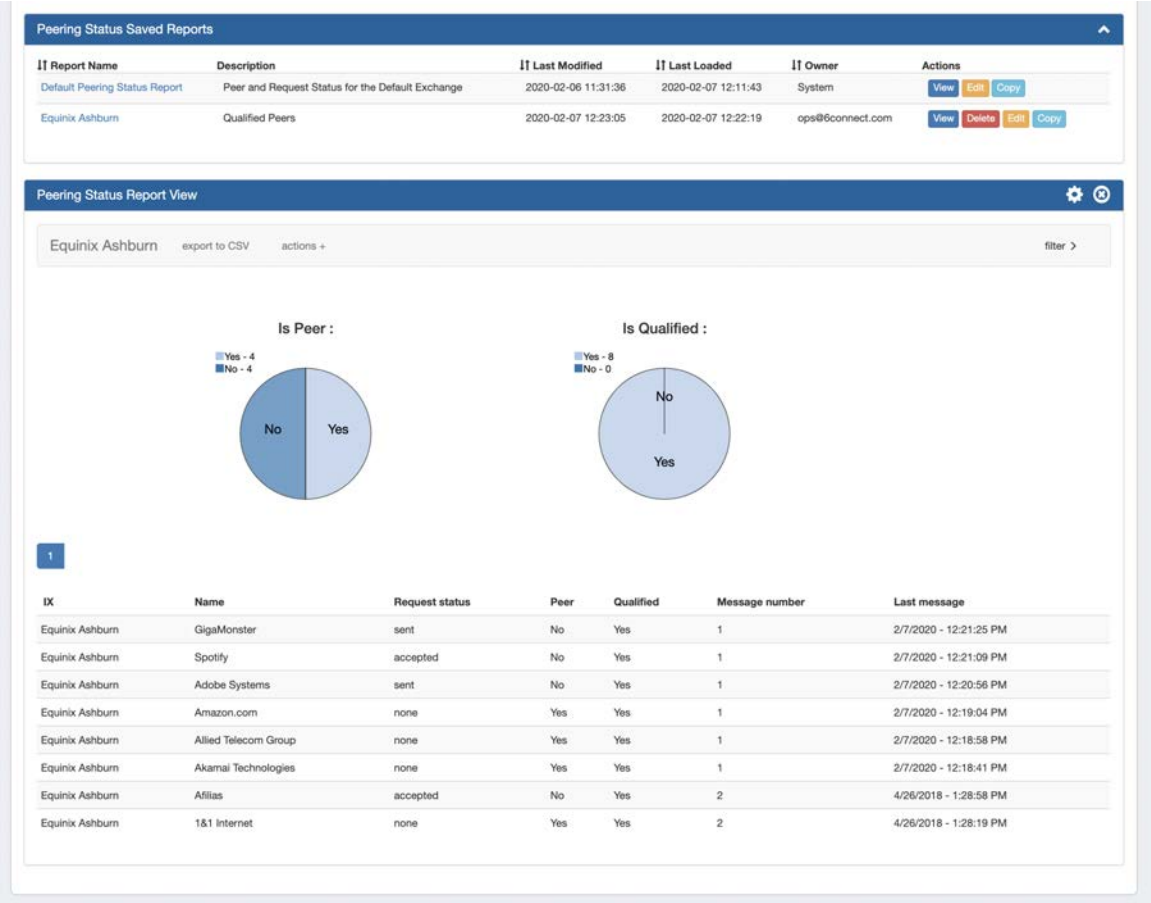


The IPAM Runout Report displays IPv4/IPv6/1918 assigned/allocation pie charts, and lists available/assigned host statistics and projected runout for the selected block type(s) and region(s).

The Default report include:

- Default Runout - All Types: IPAM Runout report for all block types and regions.

Peering Reports



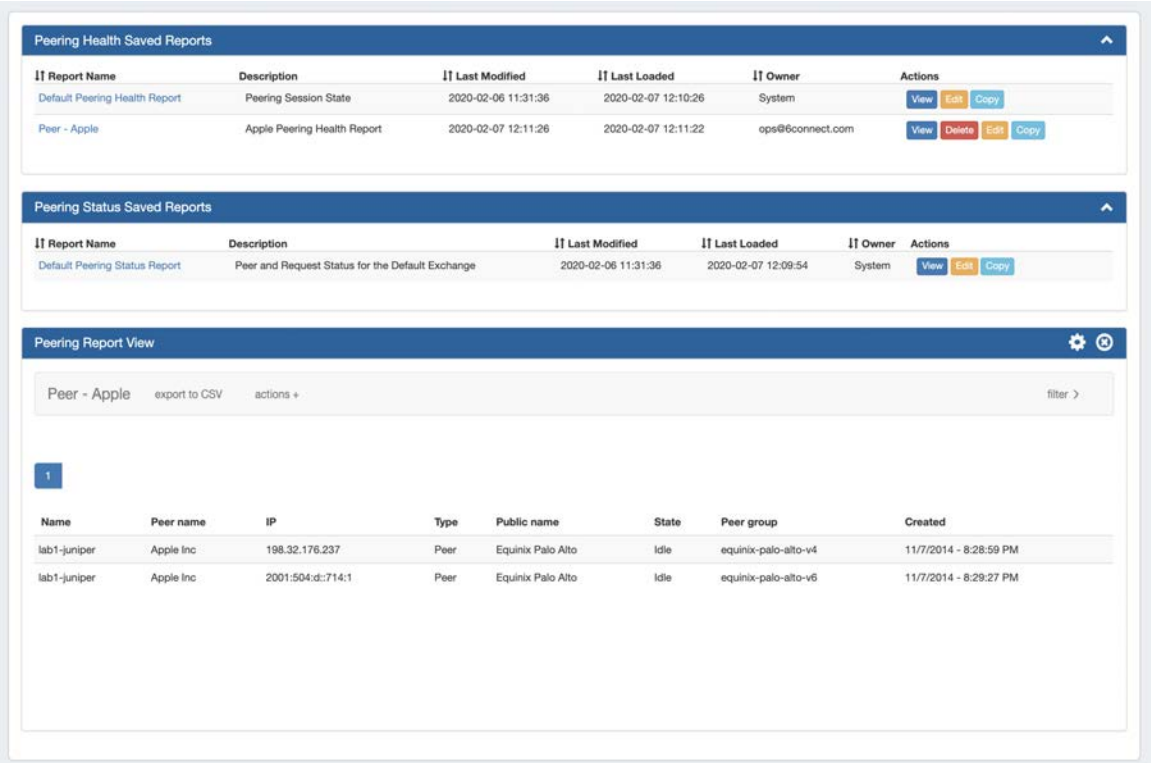
Two peering report types are available - Peering Health and Peering Status.

Peering Health reports display the sessions existing in ProVision, with the associated fields of Router Name, Peer Name, IP, Session Type, Session State, Peer Group, ASN, and session Created Date.

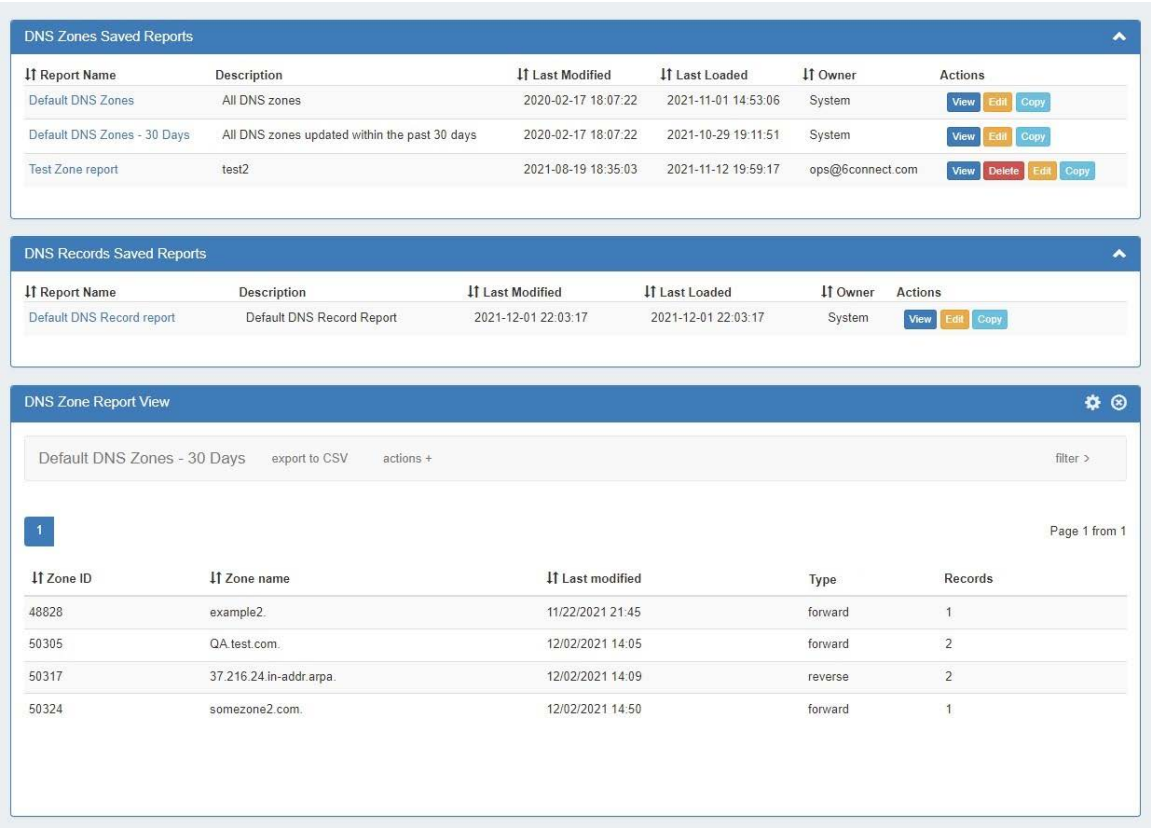
Peering Status reports are set per-exchange, and display pie charts for Peer Status/Qualification Status, as well as a data table of the Peer Name, Request Status, Peer Status, Qualification Status, Message Count, and Last Message Time.

All Peering Reports may be exported to .csv (limit: 100,000 records; no chart provided). Default reports include:

- Default Peering Health Report: Displays the peering session state for all currently existing sessions in ProVision
- Default Peering Status: Displays Peer, Request, and Qualified status for the default (first available) exchange in ProVision



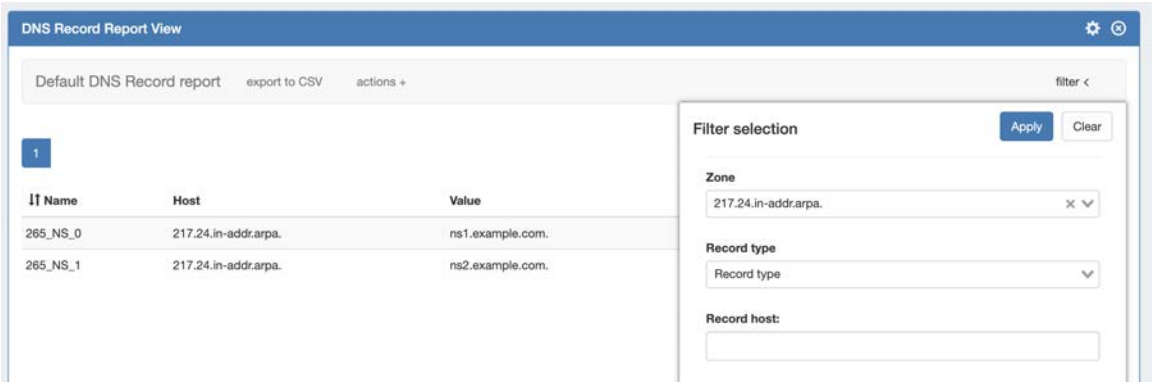
DNS Reports



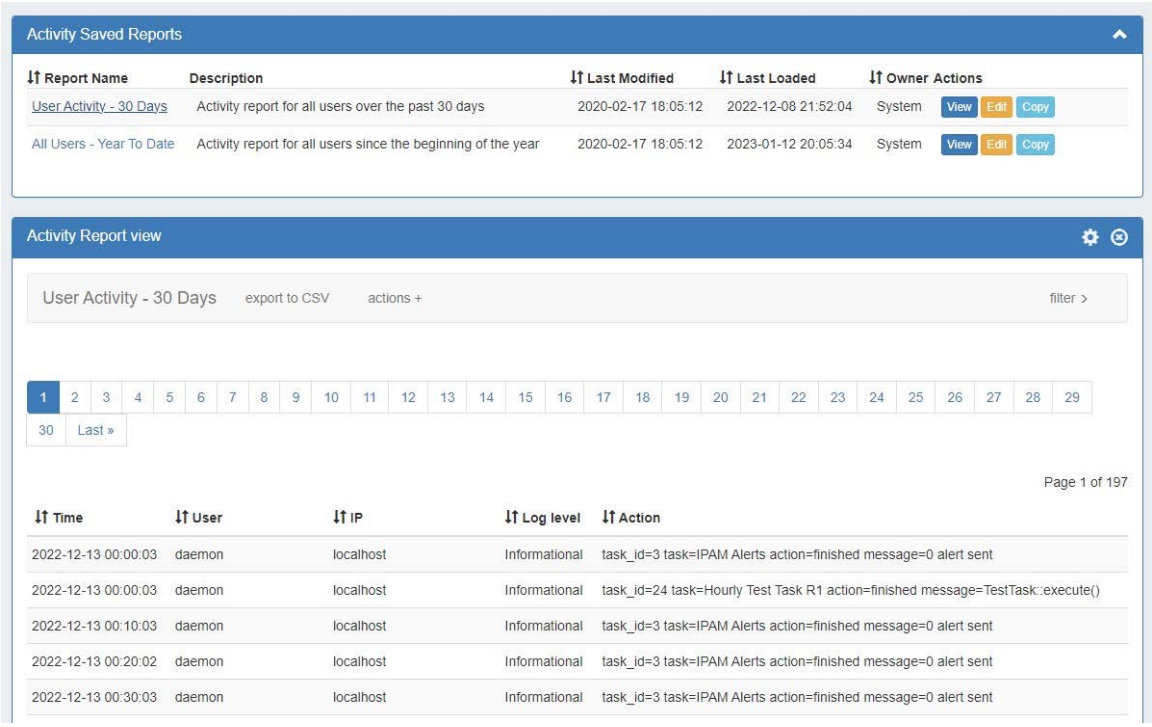
DNS Zone reports provide a list of zones existing in ProVision, along with the fields of Zone ID, Name, Last Modified Date, Forward/Reverse Type, and Record Count information. DNS Zone Reports may be exported to .csv (limit: 100,000 records). Default reports include:

- Default DNS Zones: All DNS zones in ProVision
- Default DNS Zones - 30 days: All DNS zones in ProVision modified within the past 30 days
- Default DNS Records: All DNS records in ProVision

DNS Record reports provide a list of records which exist under the selected zone, including Name, Host, Value, Type, TTL, and Last Modified.



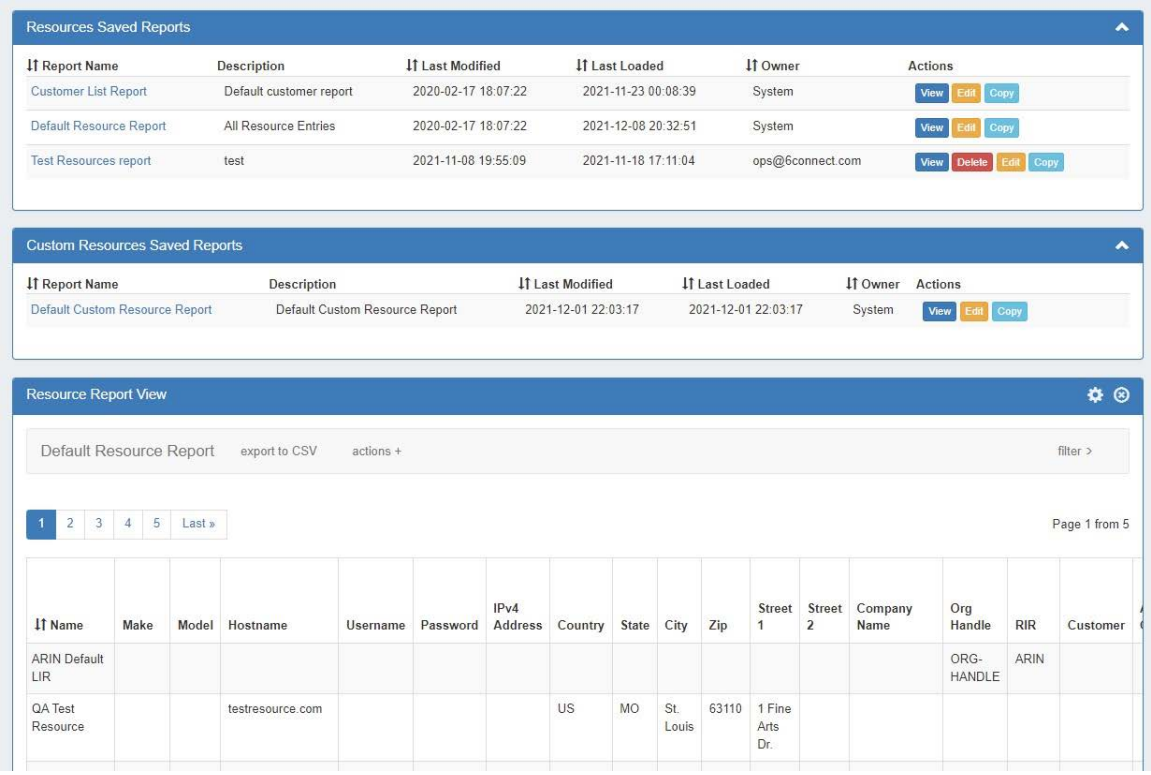
Activity Reports



Activity reports provide a listing of ProVision log events. Provided fields include the Timestamp, User, IP, Log Level, and the Action, and the report may be filtered to include one or more users / user groups, as well as basic data filters. Activity Reports may be exported to .csv (limit: 100,000 records). Default reports include:

- Default User Activity - 30 days: All ProVision user activity within the past 30 days
- Default User Activity - Year to date: All ProVision user activity for the current calendar year (ISO Standard/Gregorian calendar)

Resource Reports



Resource reports provide a list of all (non-DNS) ProVision resources, and field data from the Contact, Billing, Tech Info, and Resource Field Gadget(s) associated with the resource. The report may be filtered to include one or more Sections or Categories, as well filtered by resource name. Additional attributes may be selected to display from the filter options, as well as whether or not to include resource children.

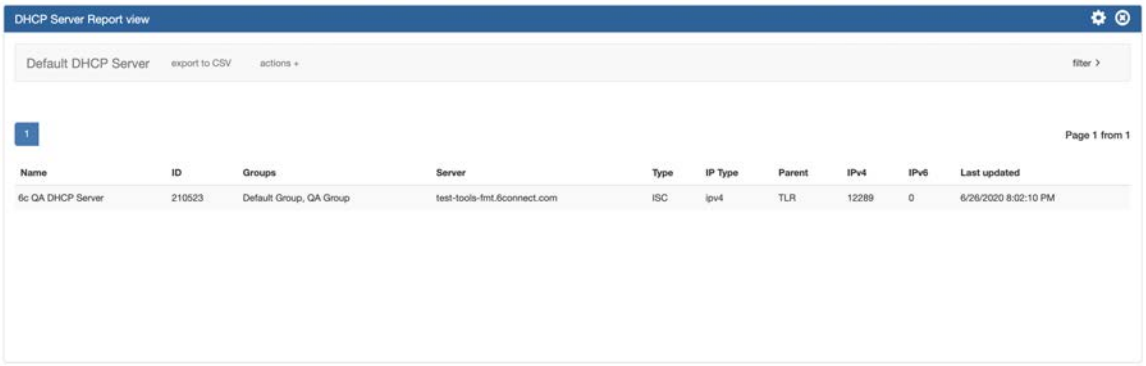
Custom Resource Reports allow for custom-filtered list of resources by Section or Category. Additional report columns may be displayed by selecting the desired attributes from the "attributes" selector from the report filter.

Resource Reports may be exported to .csv (limit: 100,000 records). Default reports include:

- Customer List Report: ProVision resources which are of the "Resource Holder" Section and "Customer" Category.=
- Default Resource Report: All ProVision resource entries - matching resources listed in the Resource Tab -> Entries page list, and all applicable resource fields
    - TIP: Due to the large scope of the ProVision resource system and its fields, we strongly recommend using the Default Resource Report as starting template from which to further define more specific resource reports. Simply "Copy" the Default Resource Report, apply your desired Section/Category filter combination(s), and click the Gear Icon Save to create a more manageable data set.
- Default Custom Resource Report: ProVision resources which are of the "Resource Holder" Section, with no attributes selected.

Note: The number of entries able to be exported limited to 100,000 rows for .csvs, and 1000 rows for IPAM pdfs. If more rows are needed, the ProVision API may be used to retrieve larger datasets.

DHCP Server Report

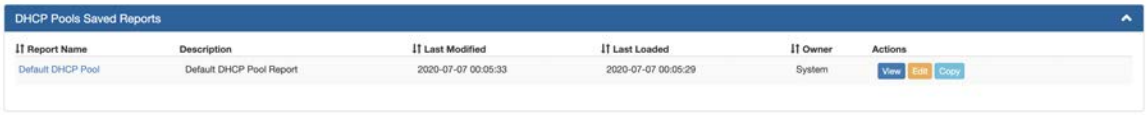


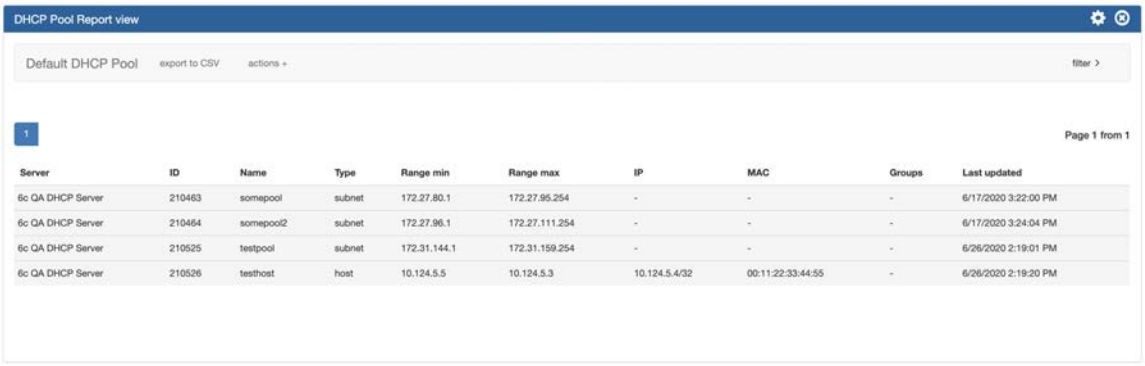
The DHCP Servers Report displays existing DHCP servers in ProVision, associated statistics, and last updated time. The DHCP Servers report can be filtered by Name, Server/Hostname, or by last modified date.

Default reports include:

- Default DHCP Server Report: All ProVision DHCP Servers, with no additional filters applied.

DHCP Pools Report





The DHCP Pools Report displays existing DHCP Pools in ProVision, type, ranges, IP/MAC, associated groups, and last updated time.

The DHCP Pools Report can be filtered by DHCP Server(s), name, type, or by last modified date.

Default reports include:

- Default DHCP Pool Report: ProVision DHCP Pools for the default server(s), both subnet and hosts, with no additional filters applied.

Additional Information

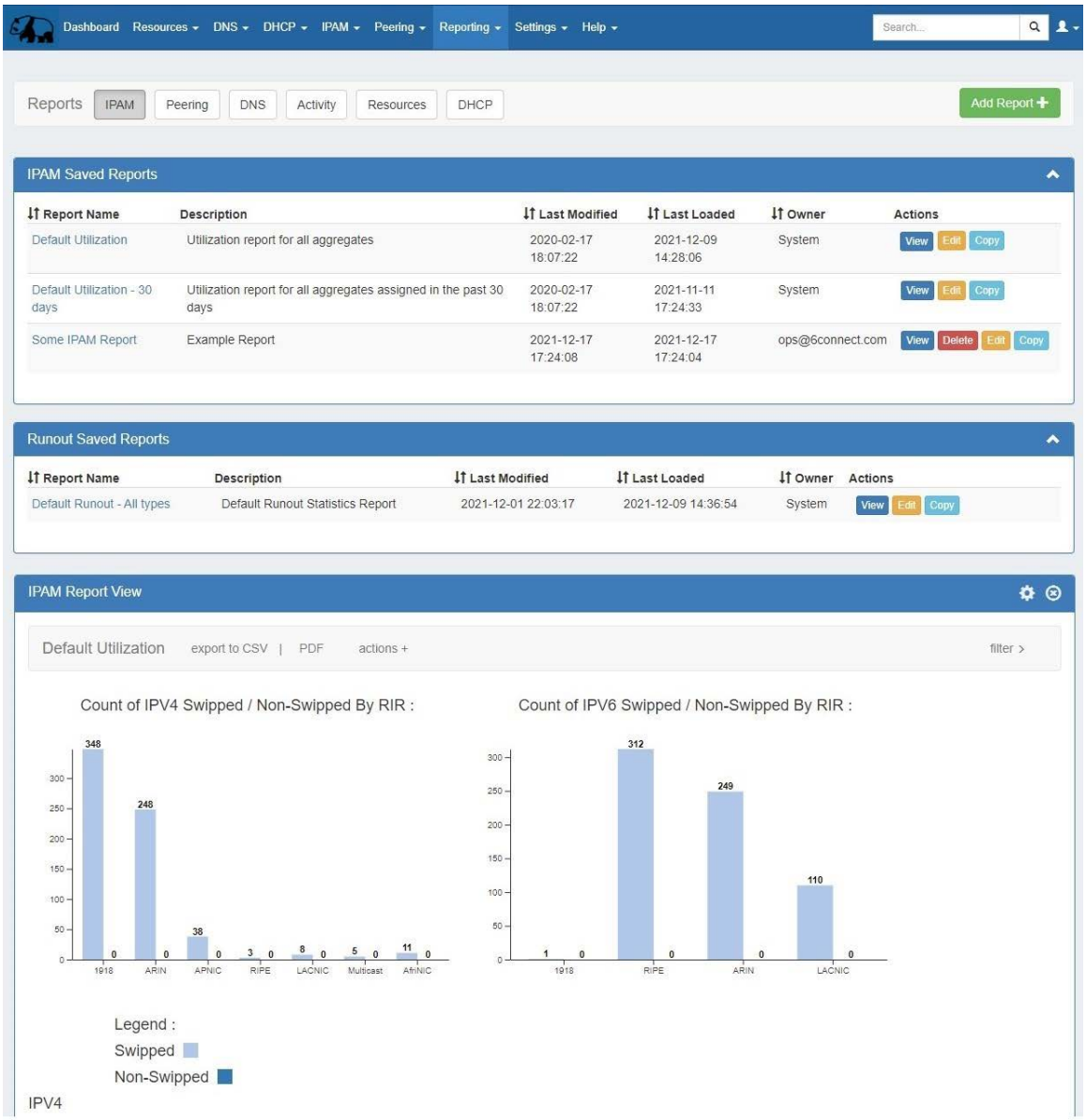
For more information on performing specific tasks in reporting, see:

- Working with Reports

Working with Reports

Working with Reports

The ProVision **Reporting** tab provides reports for IPAM, Peering, DNS, Activity, Resources, and DHCP.



To view reports for ProVision modules (IPAM, Peering, DNS, Activity, and Resources), click on the applicable sub-tab button at the top of the page, or select it from the **Reporting** Tab dropdown menu.

Default reports are available for each module sub-tab, and users may create their own customized report based from the existing templates.

- Working with Reports
  - Working with Reports - Overview
  - The Saved Reports List
  - Report View
    - Report View Filters
  - View Report
  - Create New Report
    - Step 1 - Add Report
    - Step 2 - Customize Filters
    - Step 3 - Save Report

    - Export / Schedule Report
        - Export Current View
        - Schedule Report
    - Edit Report
        - Edit Report Settings
        - Edit Report Permissions
        - Edit Scheduled Report Settings
    - Copy Report
    - Delete Report
- Additional Information

Working with Reports - Overview

Reporting v2, accessible to admin users from the **Reporting** tab, contains reports for six ProVision modules - IPAM, Peering, DNS, Activity, Resources, and DHCP. Default reports are available for each module sub-tab, and users may create their own customized report from the existing templates. Once created, reports may be exported on-demand, or have exports scheduled to be sent to a user at regular intervals.

Admin users may perform the following reporting actions:

- View reports
- Create new reports
- Edit reports
- Copy reports
- Delete user-created reports
- Export and/or schedule export of a report

For each ProVision module, these actions are accessed in two general areas - the Saved Reports list, which shows the reports existing for each report type, and Report View, which displays the data for the selected report, and where report edits, exports, and filter updates may be performed.

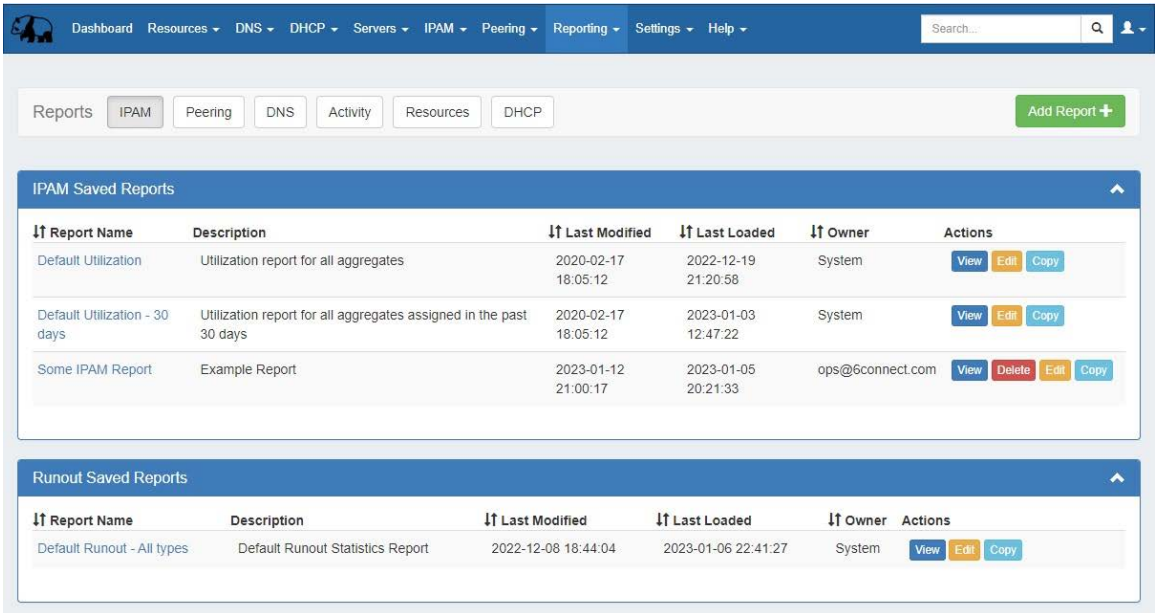
Reports and User Permissions

Admin level users ("Admin" permissions on TLR) may view all data in all reports, as well as perform report actions such as creating, editing, copying, and deleting reports if the "Reporting Permissions Override" setting is selected in Admin Preferences.

Non-admin / Limited permission users may view reports, but will only be shown the reports and data/modules for which they have permissions to view.

Non-Admin users may not create new reports, or edit, copy, or delete system reports or reports created by other users.

The Saved Reports List



The Saved Reports List shows the reports created for each module, including both default and user-created reports. Each report row displays the report name, description (optional), last modified date, last loaded date, the owner (creator), and provides action button options.

Available actions under the Saved Reports area:

- Expand and Collapse the Saved Reports List by clicking the caret ( ) in the blue bar
- Sort the list (toggle ascending / descending) for any field with an up/down arrow ( )by clicking on the column name
- Open a report by clicking on the report name link, or click View under Actions (opens Report View)
- Edit a report's name, description, or scheduled report settings by clicking Edit, under Actions. (opens Report View Actions)
- Duplicate a report, or use an existing report as a template, by clicking Copy

Report View

Report View displays the data for the selected report, using the filter options saved to the report. It it divided into three general areas - the header, graph display (if applicable), and data display.

The header area contains the following items:

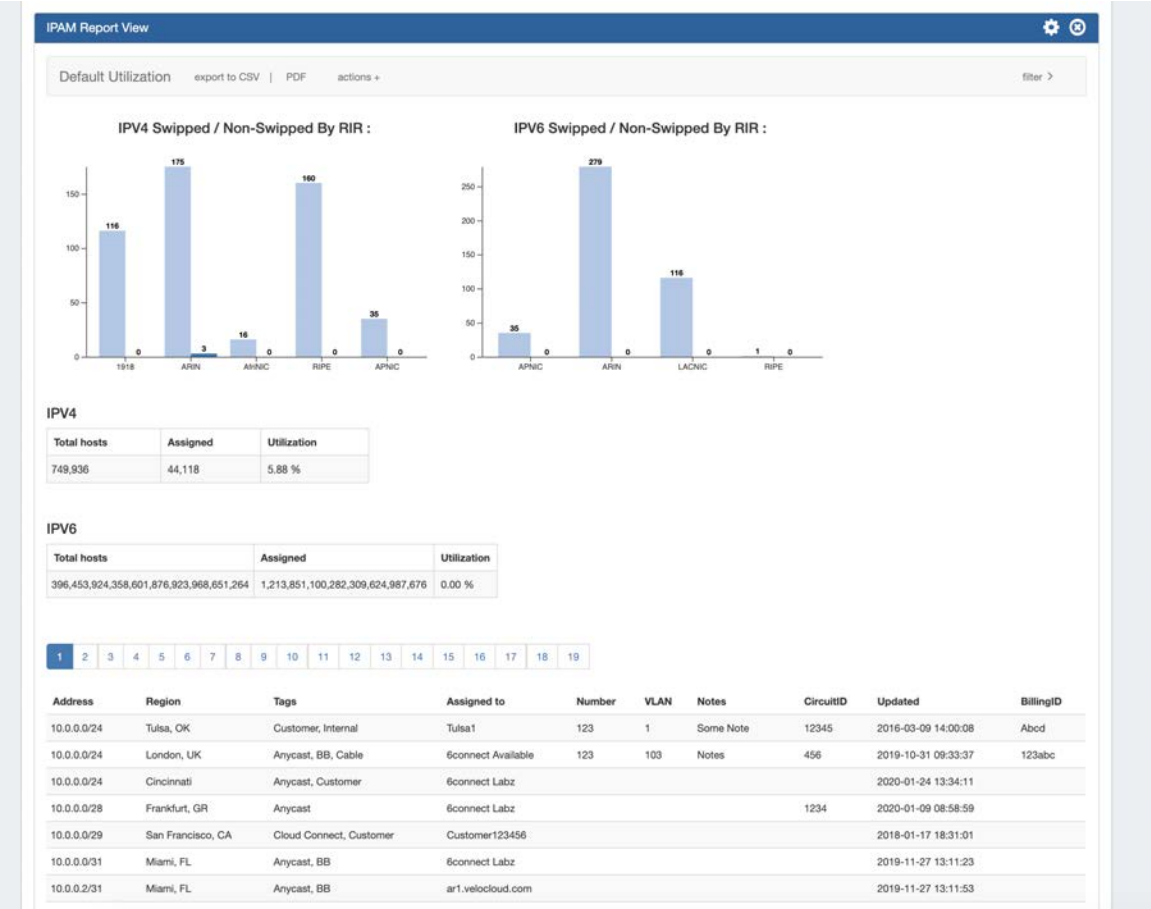
- Report view header (blue bar) which contains:
  - Report view menu (gear icon) with options to Edit, Copy, Save, Export to CSV, and Export to PDF (if available)
  - Close Report View ('X' icon)
- Selected report header (grey bar), which contains:
  - The name of the currently open report
  - Report export options (export to CSV or PDF)
  - Actions menu - click to toggle the edit report options open or closed)
  - Filter flyout - click to toggle open or closed, and apply different filters

The graph area displays for selected reports:

- IPAM Utilizations report - displays IPv4/IPv6 Swipped and Non-Swipped by RIR bar charts, with host utilization tables
- Peering Status - displays Peer Status and Qualification Status pie charts

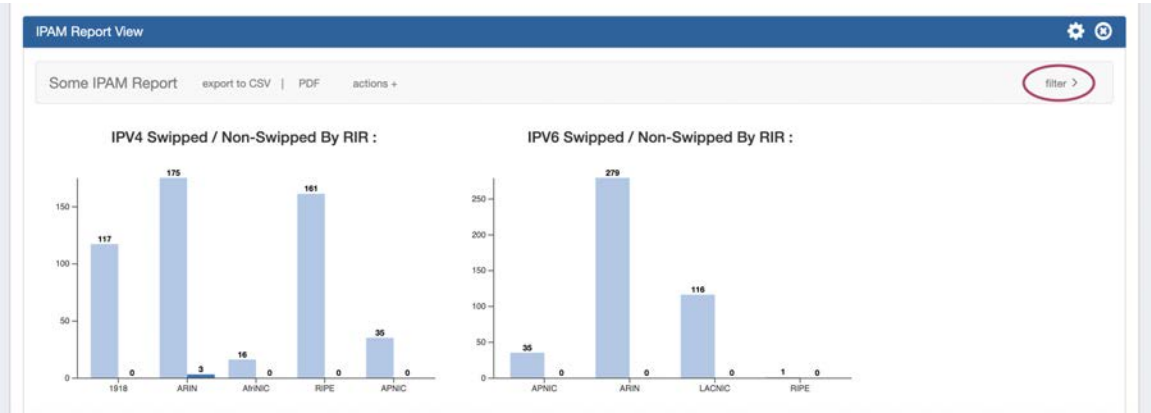
The data display area shows 50 rows per page of report information, including

- Report-specific field information, for fields that contain data
- Metadata columns, if enabled and containing data (for IPAM report types)



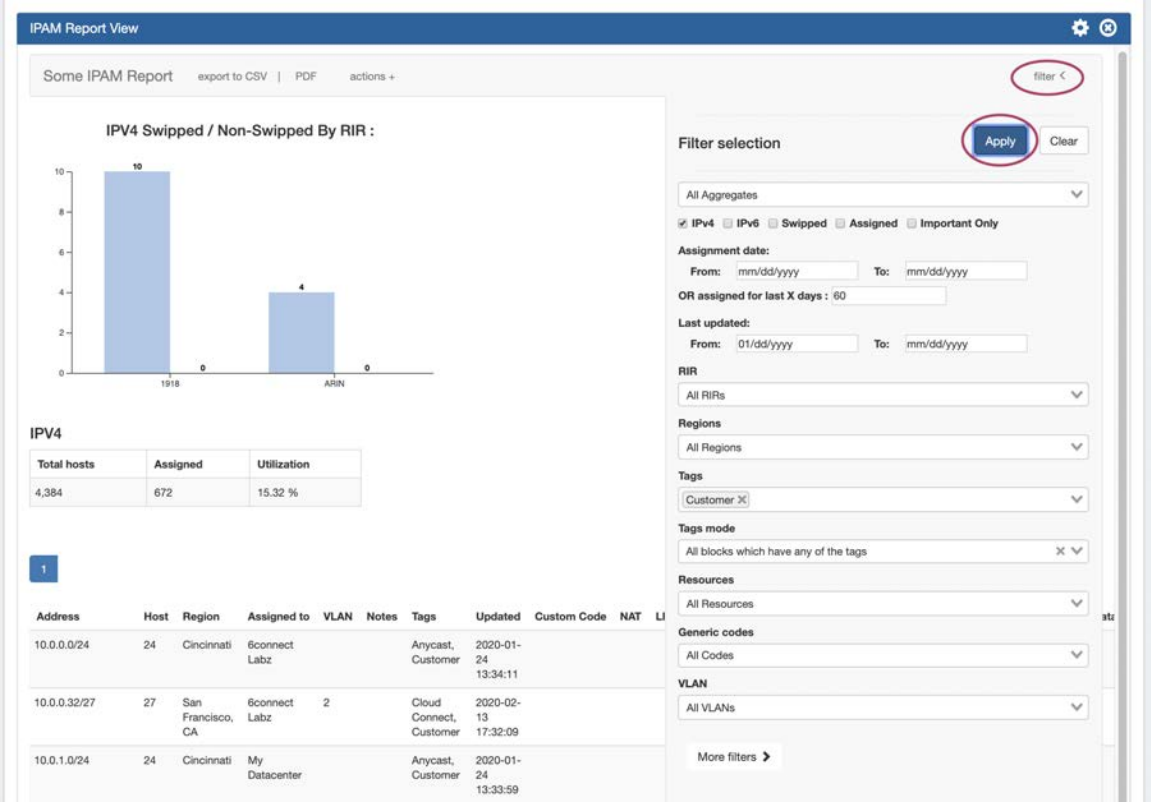
Report View Filters

While in Report View, you may view or edit the applied filters by clicking Filter in the report header.



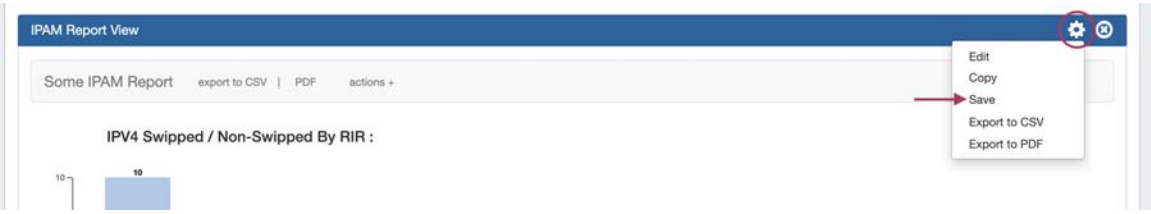
The filter flyout opens from the right side of the Report View, showing all fields available to filter by for that report type.

Select or enter values for the filter criteria that you wish to apply to the report, and click "Apply" when finished. Close the filter flyout by clicking Filter .



Applying updated report filters allows you to adjust the report output on a temporary basis - just until the page is reloaded. This is useful for quick look-ups, or to export a partial data set.

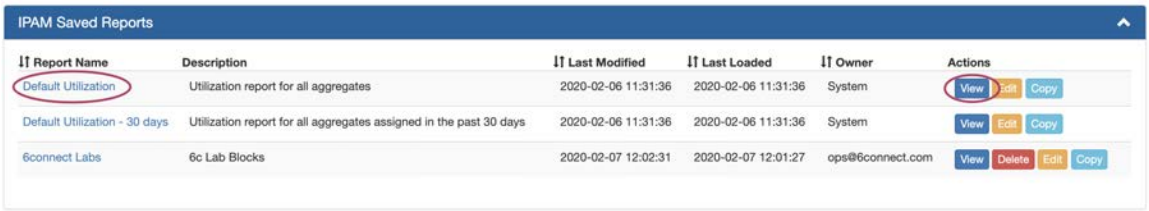
If you wish to permanently save the updated filters to the report, saving the current state as the report's default, click the Report View menu (gear icon), and select Save.



> Saving the report overwrites the previous filter set with the current filter set. This affects all users who view the report, as well as future exports and scheduled exports.
>
> If you only need a temporary view of certain report filters, Apply the filter changes without saving the report - the report will be reset to its saved configuration the next time it is loaded.

View Report

Open a report view by clicking on the report name in the Saved Reports list, or click "View" under report Actions.

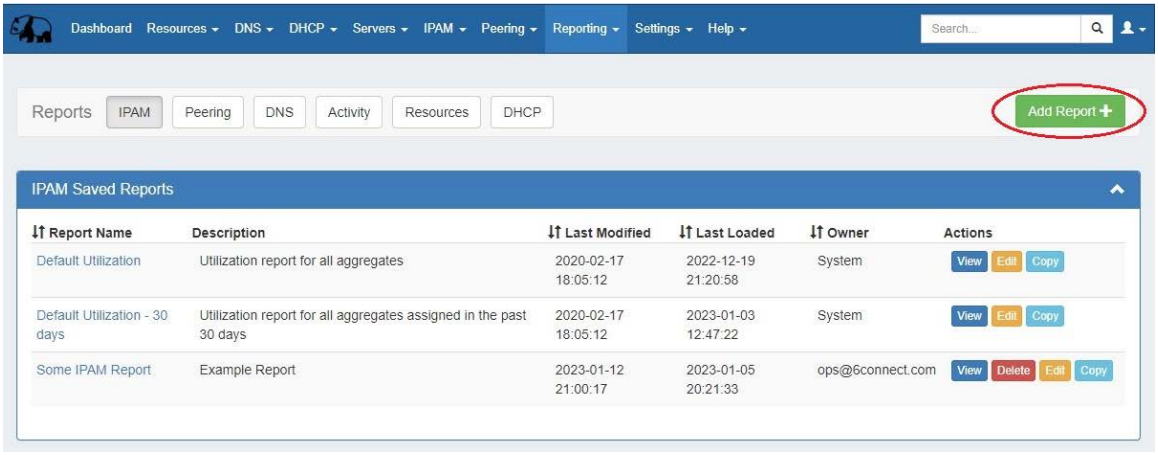


The Report View for the selected report will open, where you can edit, filter, and export the report.

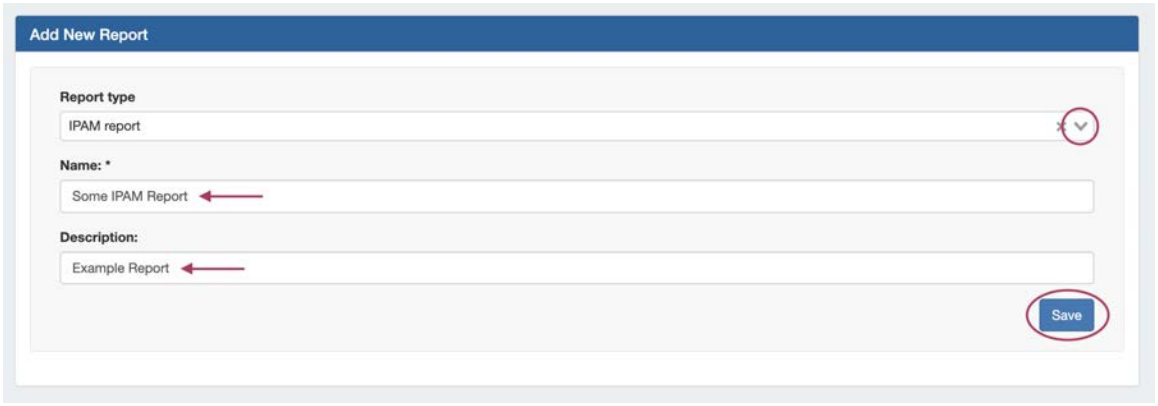
Create New Report

Step 1 - Add Report

To create a new report, click "Add Report" from any reports module page. This opens the Add Report page.



Under Add New Report, select the desired report type to add, enter the name of the report, and a description. Click "Save" when complete.

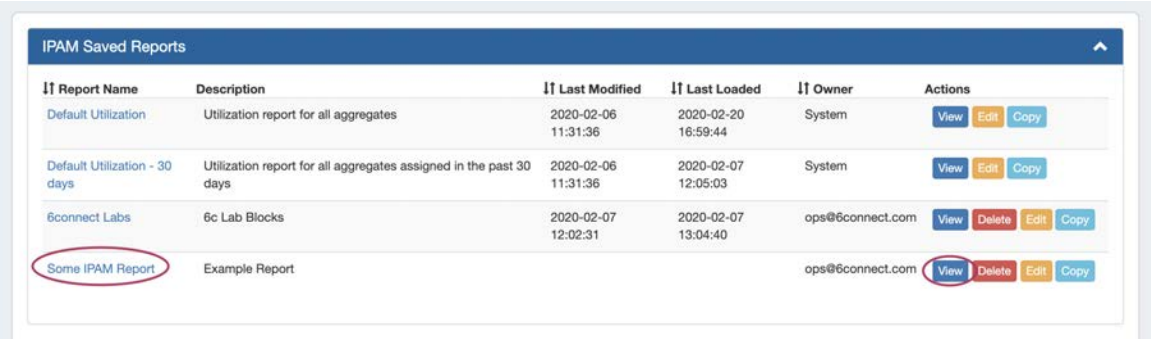


The Saved Reports list page for that report type will automatically load, showing the newly created report.

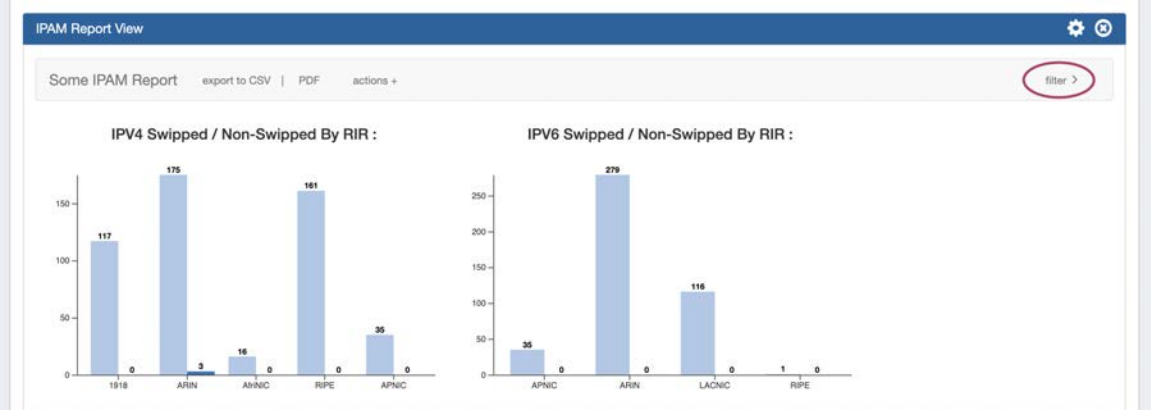
New reports are created without any filters applied, so the next step is to open the report and apply filter customizations and report settings to the report.

Step 2 - Customize Filters

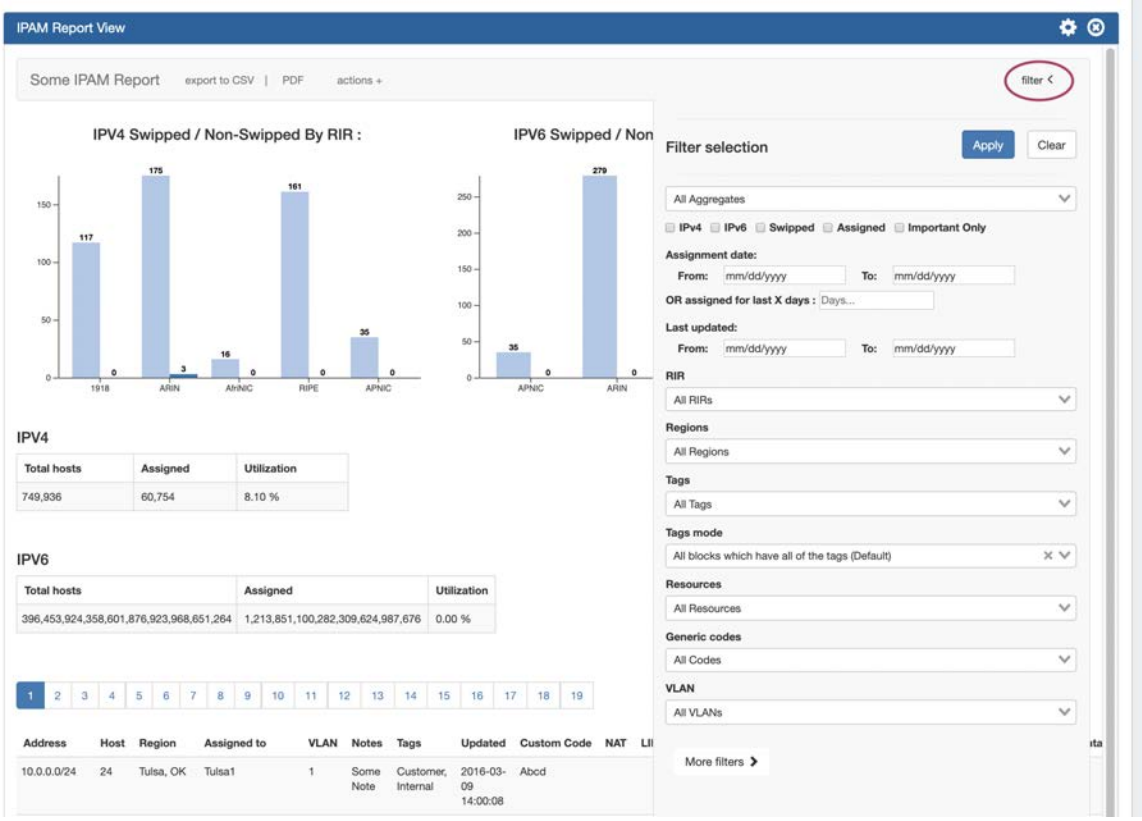
Open the report from the Saved Reports list by clicking either the report name, or the "View" button under Actions.



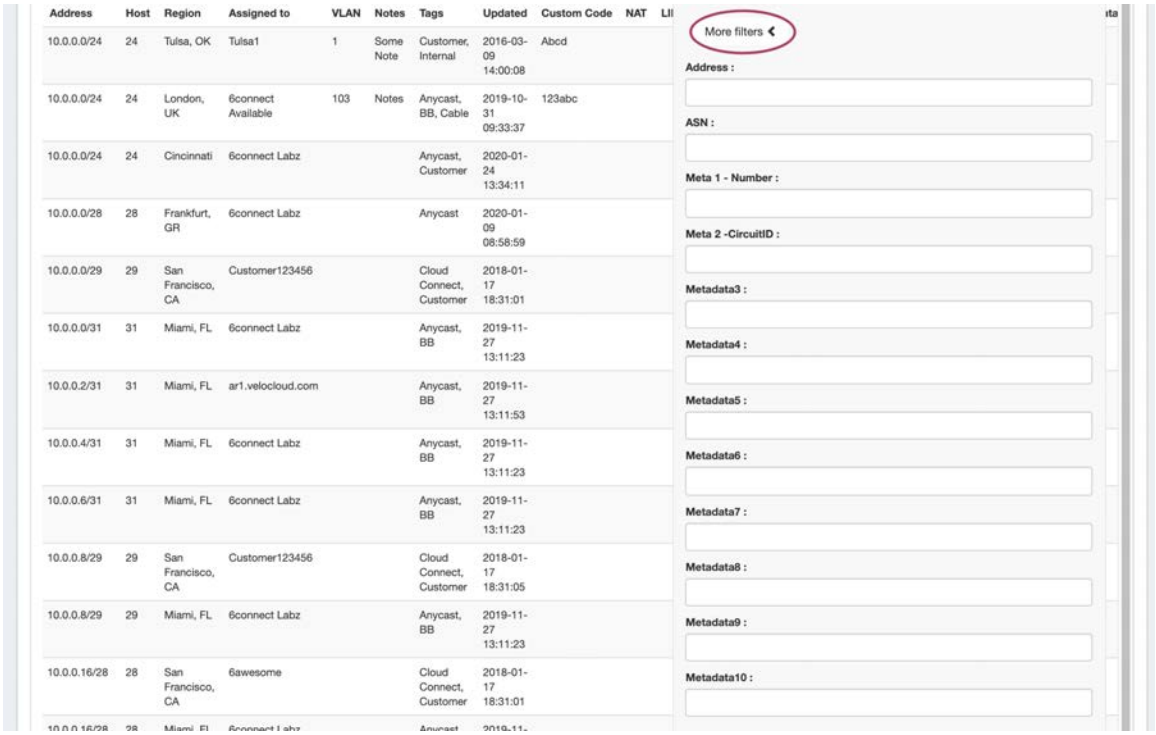
Report View opens for the report, showing the report with no filters applied. To view or edit the report filters, click filter to open the filter flyout.



The filter flyout opens from the right side of the Report View, showing all fields available to filter by for that report type.

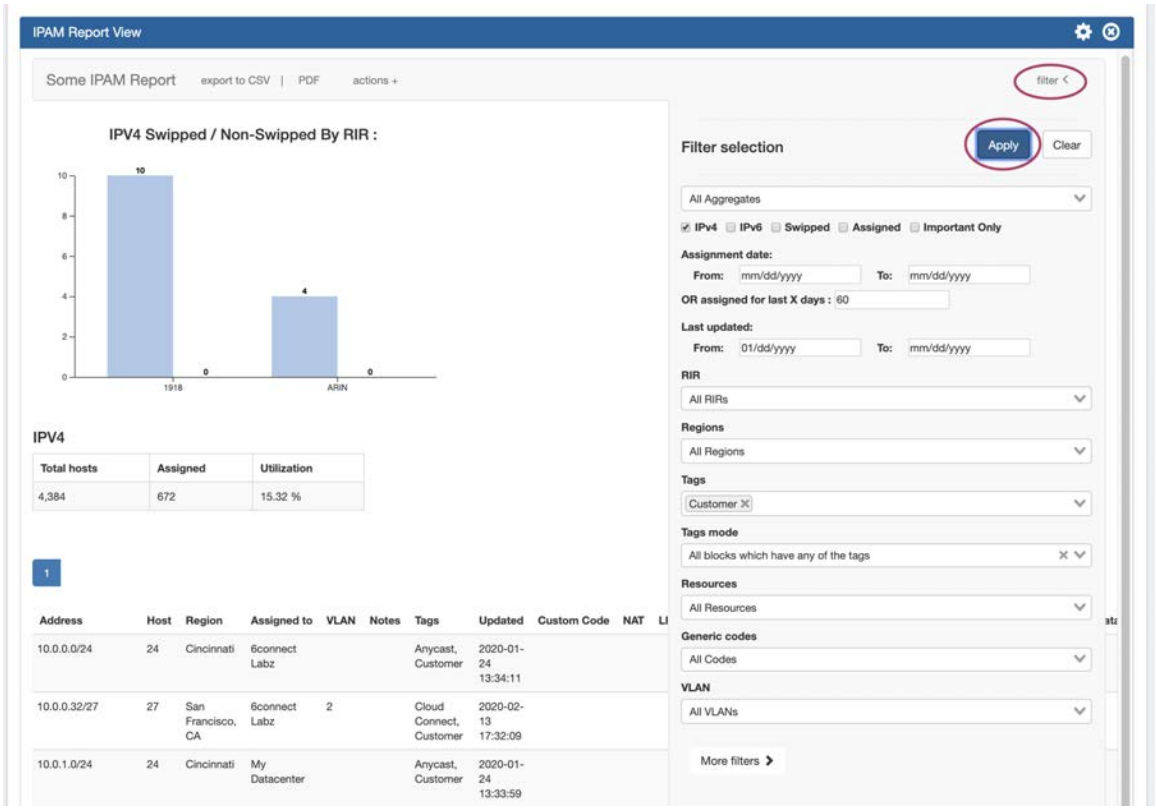


Some report types, such as IPAM Utilization, have additional secondary filters available for items such as metadata fields. To open or close these additional filters, click More Filters.



Select or enter values for the filter criteria that you wish to apply to the report.

For our example, "Some IPAM Report", we have selected IPv4 blocks assigned in the last 60 days, that have the "Customer" tag.

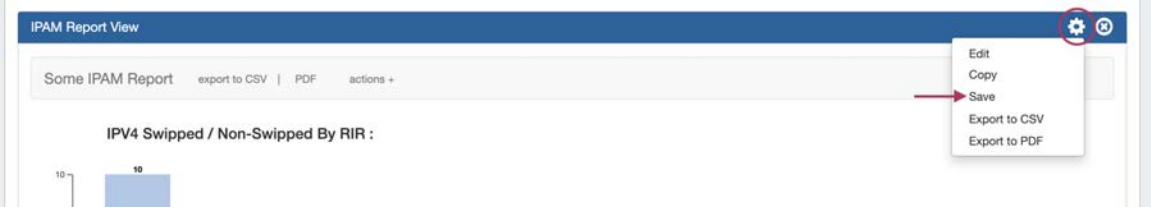


When done, click Apply, and then close the flyout by clicking Filter . This applies the filter conditions to the report in the current view, but does not permanently save them.

Step 3 - Save Report

After applying filters to the report, review the data to ensure the filter conditions result in the desired output.

To permanently save the applied filters and settings, click the Report View menu (gear icon), and select Save. This ensures that subsequent report views and exports use the same filter set.



Export / Schedule Report

Reports may be exported immediately, as they are currently displayed in the Report View, or exported on a regular basic automatically (Schedule Report). Note: Schedule Report requires ProVision's **Scheduler** Tab to be running.

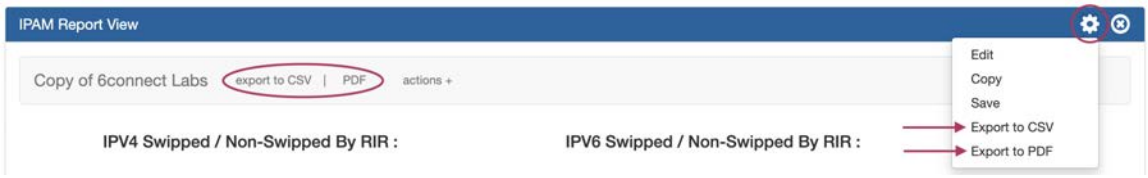
Export Size Limitations

Report exports have a maximum size limit of 100,000 rows for .csvs, and 1000 rows for pdfs. If your report data exceeds that amount, it is recommended to adjust the report filters to further reduce results, and/or split the report into multiple, smaller reports. The ProVision API may also be used to retrieve larger datasets.

If your company regularly requires exports larger than these limits, please contact support@6connect.com for assistance.

Export Current View

Export a report by opening Report View for the desired report, and then clicking Export as CSV or Export as PDF (if available). Export options are also available from the gear menu.



The applicable file type will download via your browser.

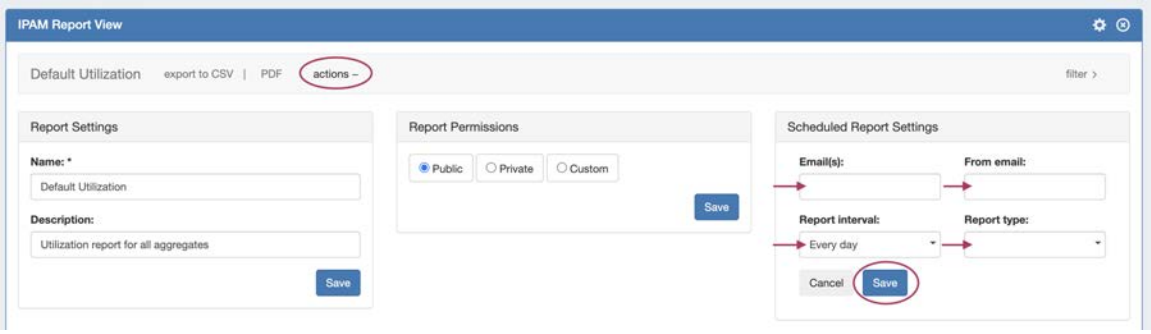
Schedule Report

Scheduling a report generates an export of the report at the set time interval, and emails the export file to the entered recipient(s).

Open the Scheduled Report Settings by clicking Edit for the report in the Saved Reports list, or by clicking the Actions panel in Report View.

To add Scheduled Report Settings, enter the email address(es) that the report should be sent to (Multiple addresses may be comma, semicolon, or space separated). You may specific a "From" addresses if desired.

Then, select an interval frequency for how often the report export should be emailed, and (if available) select the report export type to send. When done, click Save. To close the actions panel, click Actions .



Scheduled Reports

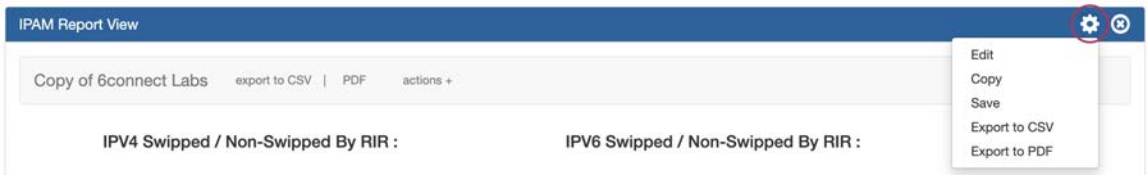
Once Schedule Report Settings have been saved for a report, ProVision automatically generates a Scheduler Tab task entry for that report with the entered information. Once created, the email address, report interval, and time to send the report may be also manually edited from the Scheduler Tab, and the history and log event for the scheduled report task may be reviewed.

Edit Report

Edit a report's name, description, permissions, or scheduled report settings by clicking Edit in the Saved Reports list. The report actions panel will open.

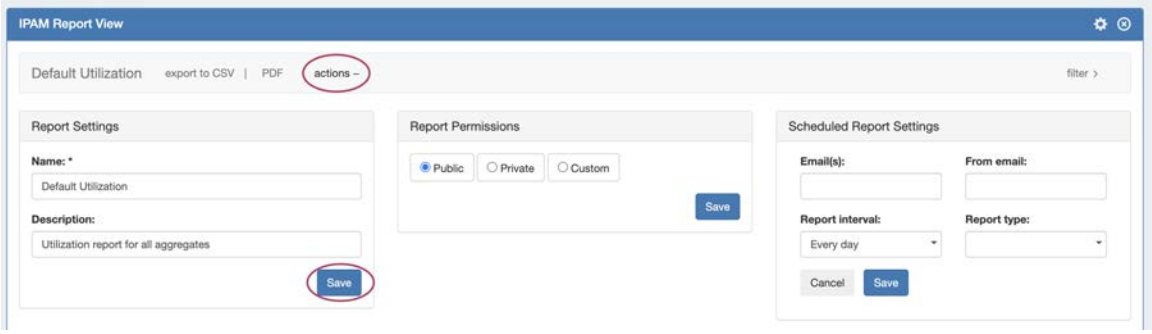


You may also open the report actions panel from Report View. Click the gear icon, then select Edit, or open the actions + panel.



Edit Report Settings

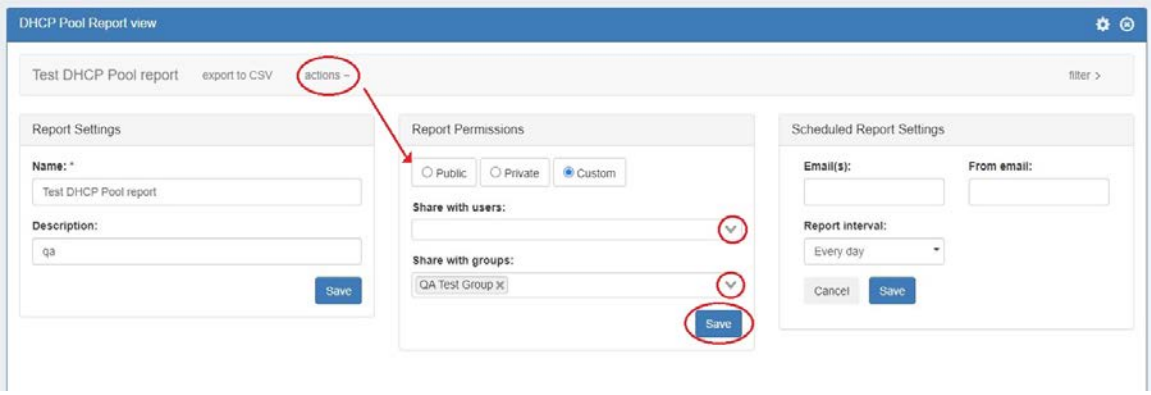
From the report actions panel, edit the report name and description under Report Settings, then click "Save".



Edit Report Permissions

The Report Permissions module allows the user to set view permissions to public, private, or custom. Custom allows the selection to allow access to only specific users or user groups.

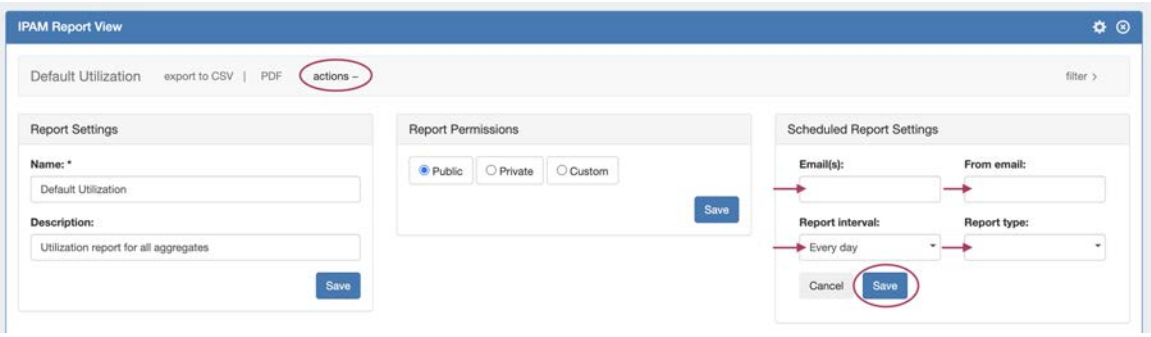
To set Custom permissions, select the radio button for "Custom" and select either User(s) or Group(s) to share with via the dropdowns. Be sure to click "Save" before exiting.



Global Admins may view all reports, even those with Private or Custom settings, by enabling the "Reporting Permissions Override" in the Admin section Application Settings module.

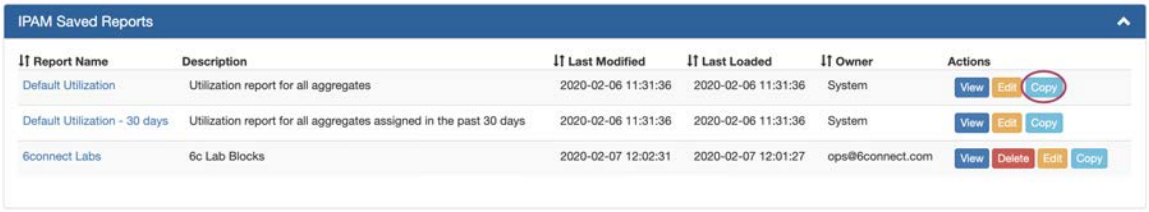
Edit Scheduled Report Settings

To edit Scheduled Report Settings, update or enter the desired field. Under "Email(s)", multiple email addresses may be comma, semicolon, or space separated. When done, click Save. To close the actions panel, click Actions .

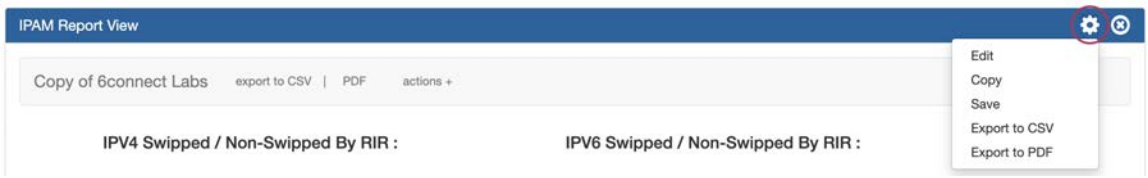


Copy Report

Copy a report by clicking "Copy" in the Saved Reports list for the report.

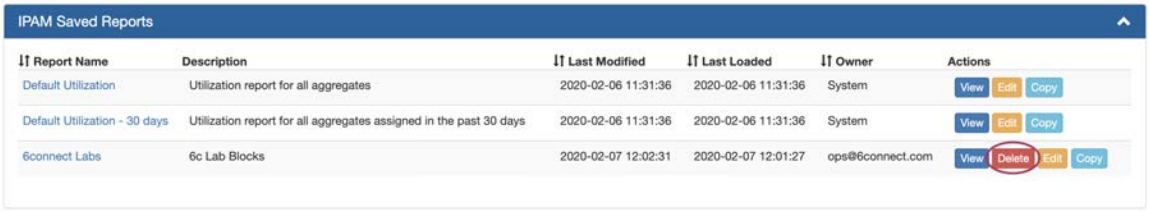


You may also copy a report from its Report View. Click the gear icon, then select Copy.



Delete Report

Delete a user-created report by clicking Delete in the Saved Reports list. Default reports (listed with "System" as the owner) may not be deleted.



> Before deleting reports (especially any created by a different user), verify that both the report and its scheduled exports are no longer needed.

Additional Information

For additional information on Reporting, see the following areas:

- Reporting
- Scheduler Tab (for editing or reviewing Scheduled Reports)

User Preferences

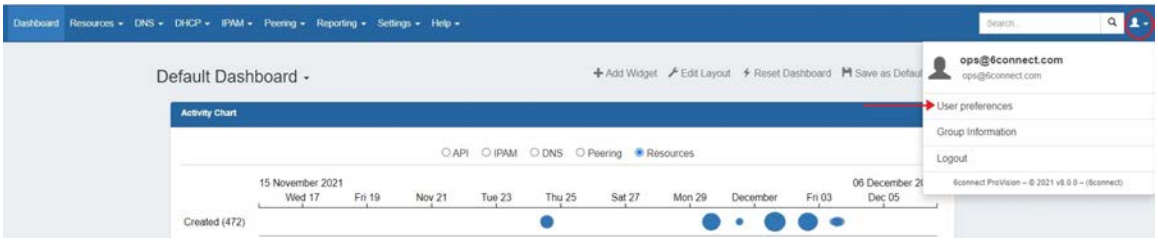
User Preferences

The User Preferences page allows the logged in user to reset their password as well as adjust per-user settings and themes.

- Accessing User Preferences
- Editing Preferences
- Theme Customization
    - Changing Themes

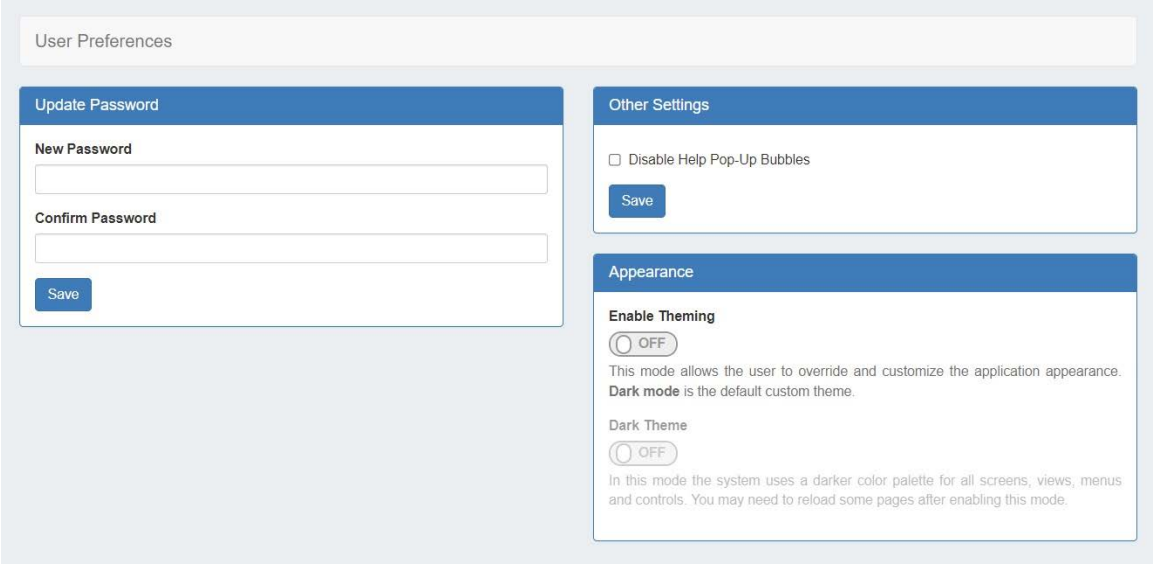
Accessing User Preferences

To access the User Preferences page, click the user icon in the right corner of the header from any page. From there, select "User Preferences". You will be redirected to the User Preferences page.



Editing Preferences

The User Preferences page includes sections for updating the user's ProVision password, Other Settings, and Appearance.



Update Password:

To update your password, type the new password in the "New Password" box, then retype under "Confirm Password" for verification. When complete, click the "Save" button. Passwords must be eight characters in length.

Other Settings:

Under "Other Settings", help pop-up bubbles may be enabled or disabled. Click the check box next to "Disable Help Pop-Up Bubbles" to disable, or leave unchecked to keep enabled. When complete, click the "Save" button.

Appearance:

Custom theming may be enabled or disabled in the "Appearance" section.

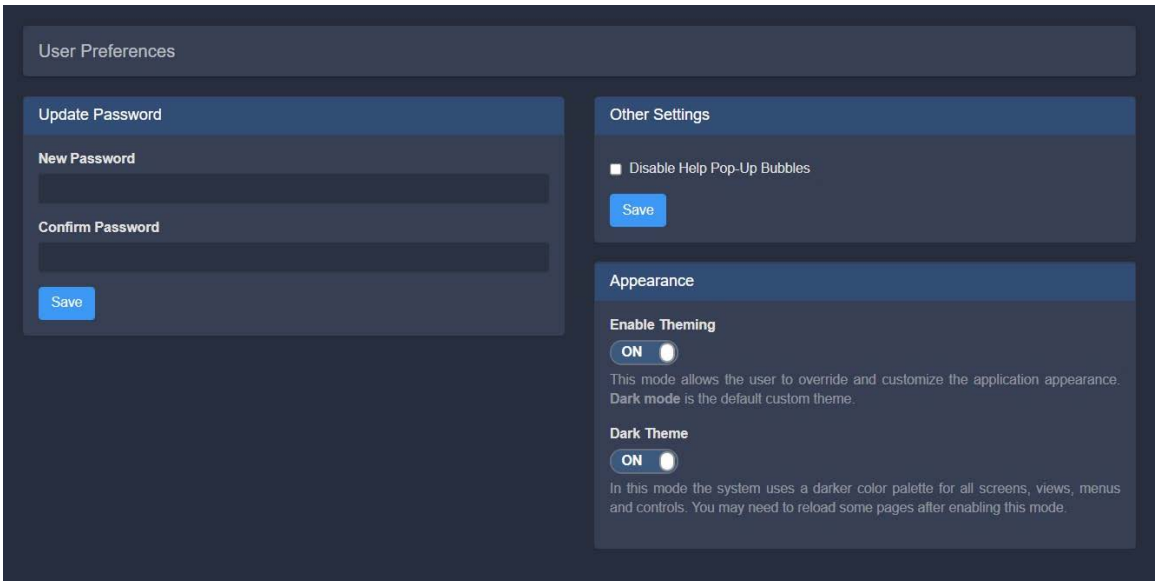
To leave the User Preferences page, click on any tab in the navigation bar.

Theme Customization

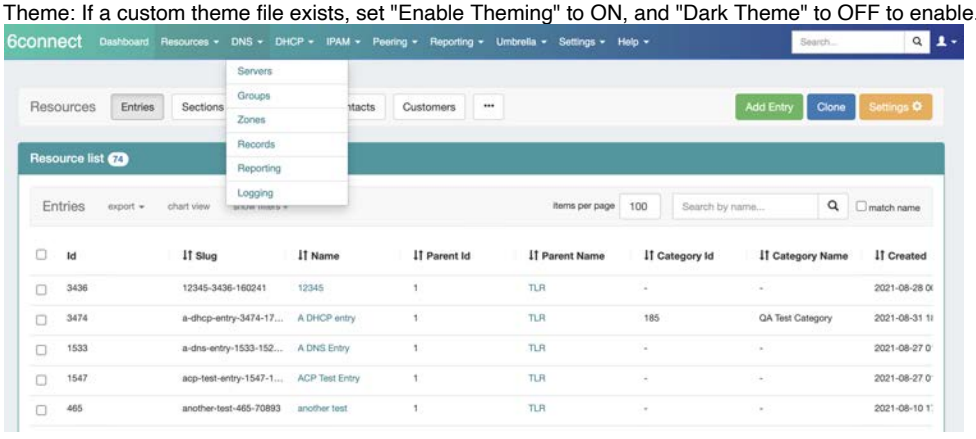
Two default ui themes are provided with ProVision - Light and Dark mode themes. Additional custom themes may be created and enabled to reflect company branding, if desired.

Themes are enabled on a per-user basis, by adjusting the Appearance settings available on the User Preferences page.

Changing Themes



Users may select the desired theme by navigating to the User Preferences page and adjusting the Theming settings under "Appearance" as follows:

- Light Mode Theme (default): Both "Enable Theming" and "Dark Theme" set to the OFF position
  - (Note: if no custom theme file exists, Light mode is also the fallback theme if "Enable Theming" is set to ON and "Dark Theme" is OFF)
- Dark Mode Theme: Both "Enable Theming" and "Dark Theme" toggles set to ON
- Custom Theme: If a custom theme file exists, set "Enable Theming" to ON, and "Dark Theme" to OFF to enable.
  - 

  - If no custom theme file exists, this combination will fall back to Light Mode.

For additional details on customizing themes in ProVision, see Developer Tools - Theming.

Admin Guide

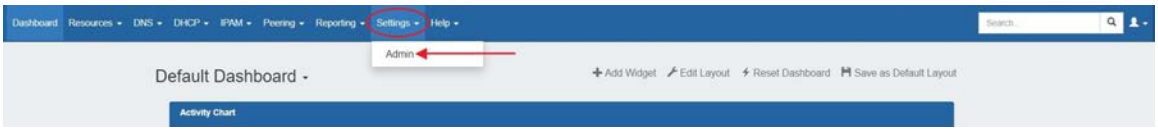
Admin Guide

The ProVision Admin Guide provides information on features accessible with Admin level permissions within ProVision. For more detailed information on features accessible in the standard user tabs , see the ProVision User Guide.

Accessing the ProVision Admin section

To access the Admin area, click the Settings tab of the header from any page.

From there, select "Admin". You will then have access the Admin section tabs of ProVision, and will see the Admin Settings page.



Leaving the ProVision Admin section

To leave the Admin area, simply click the "Exit Admin" link in the navigation bar. You will be redirected to the Dashboard.

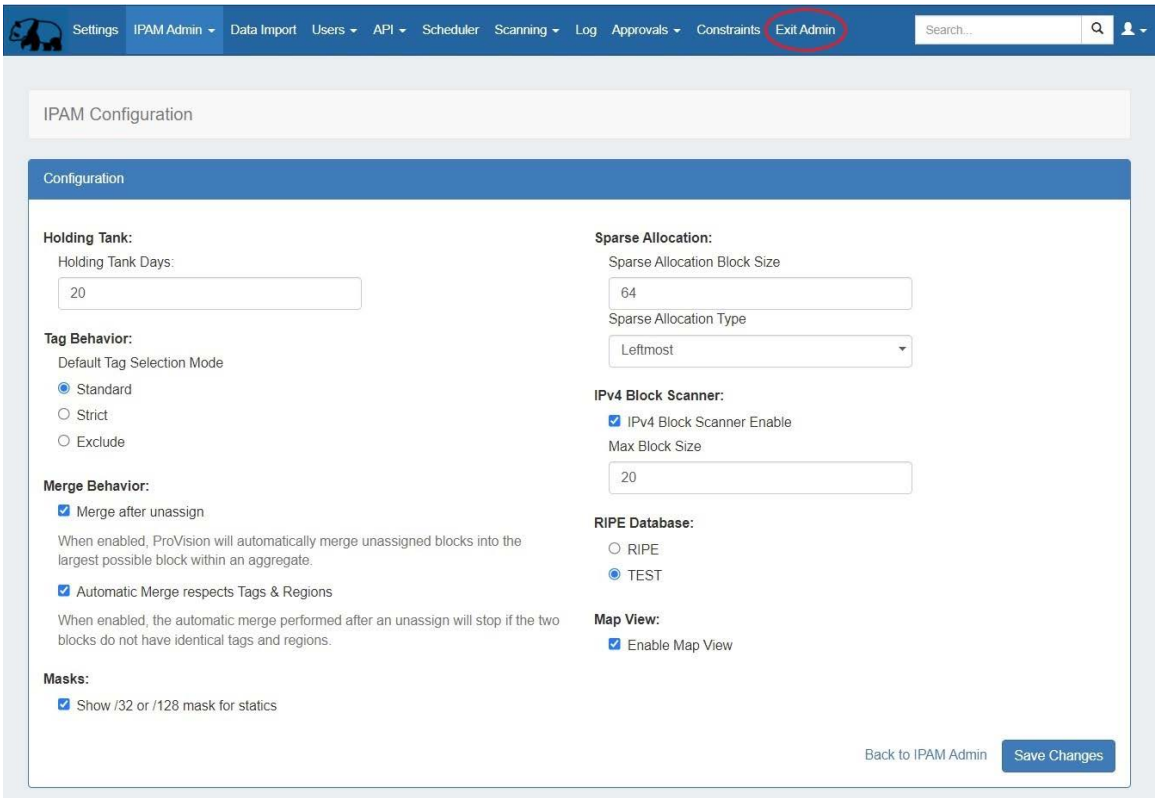


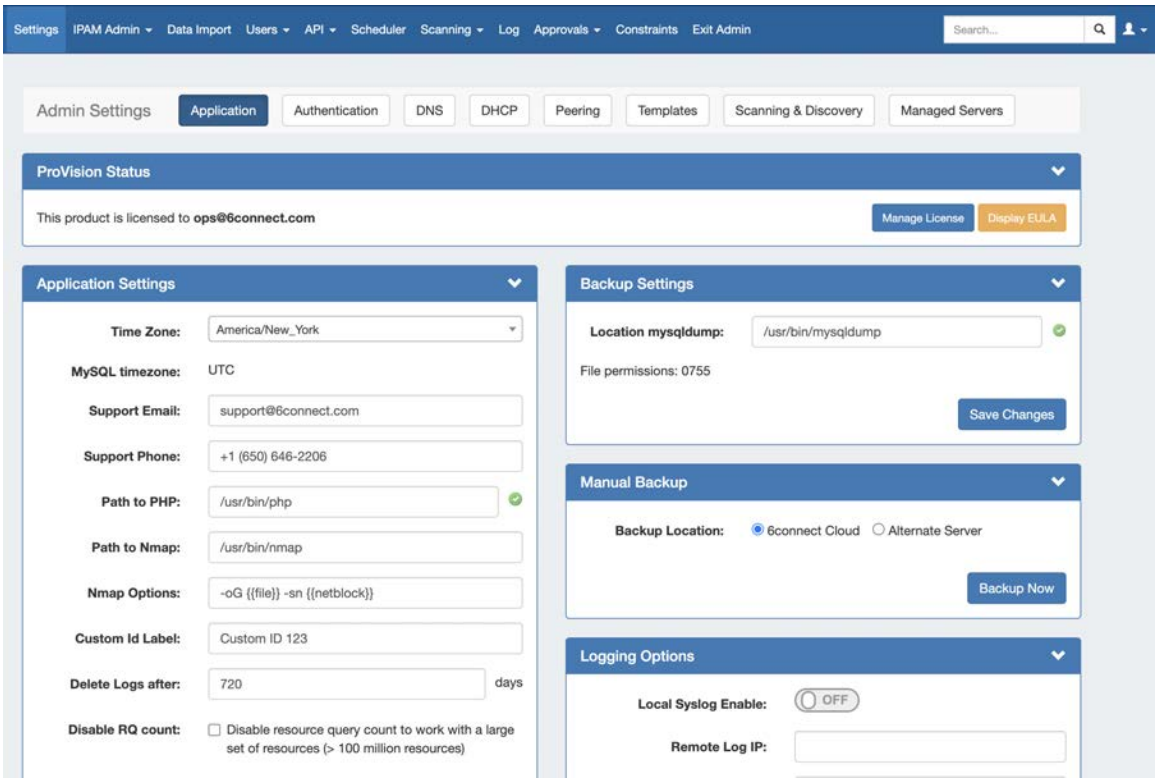
Table of Contents

- Admin Settings
- IPAM Administration
- DNS Administration
- DHCP Administration
- Importing Your Data
- Users and Permissions
- API Tab

- Scheduler Tab
- Log
- Approvals
- Constraints

Admin Settings

Overview



The Admin Settings page is the home page of the Admin section of ProVision where general platform preferences may be set.

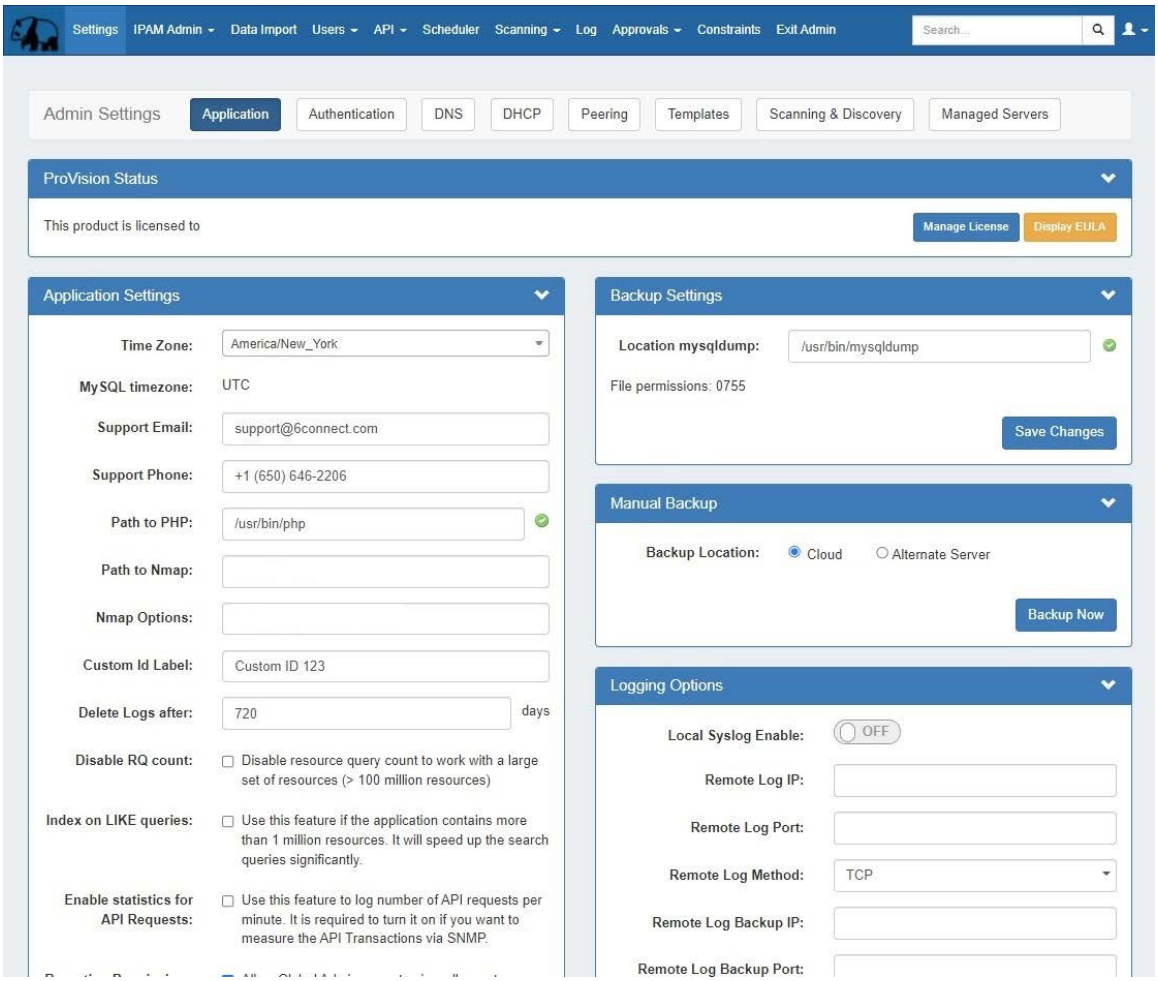
To access it, click the gear icon at the top right section of the header. From there, select "Admin". You will then have access the Admin section tabs of ProVision, and will see the Admin Settings page. Each module area can be accessed by its own sub-tab button, available at the top of the page.

For details on each Admin Settings sub-tab, see the following areas:

- Application Settings
- Authentication
  - RADIUS Authentication
  - LDAP Authentication
    - LDAP Authentication on Windows Server
  - SAML Authentication
  - DUO Authentication
- DNS Settings
- DHCP Settings
- Peering Settings
  - Peering Templates
- Template Settings
- Scanning and Discovery Settings
- Managed Servers Settings

Application Settings

Application Settings



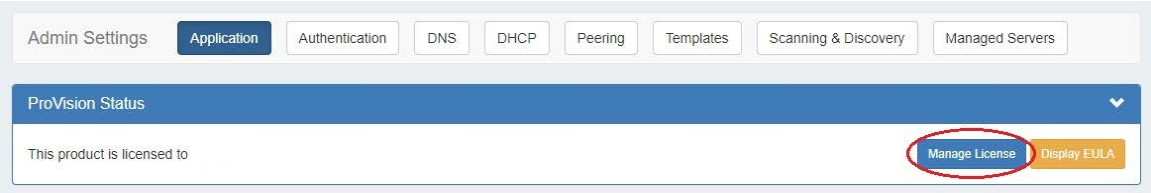
The Application Settings page is the home page of the Admin section of ProVision where general platform preferences may be set.

- ProVision Status / License Info
- Application Settings
- Backup Settings
  - Manual Backup - 6connect Cloud:
  - Manual Backup - Alternate Server:
  - Backup Settings - Local Installation
- ACP Settings
- Logging Options
- MySQL Replication

ProVision Status / License Info

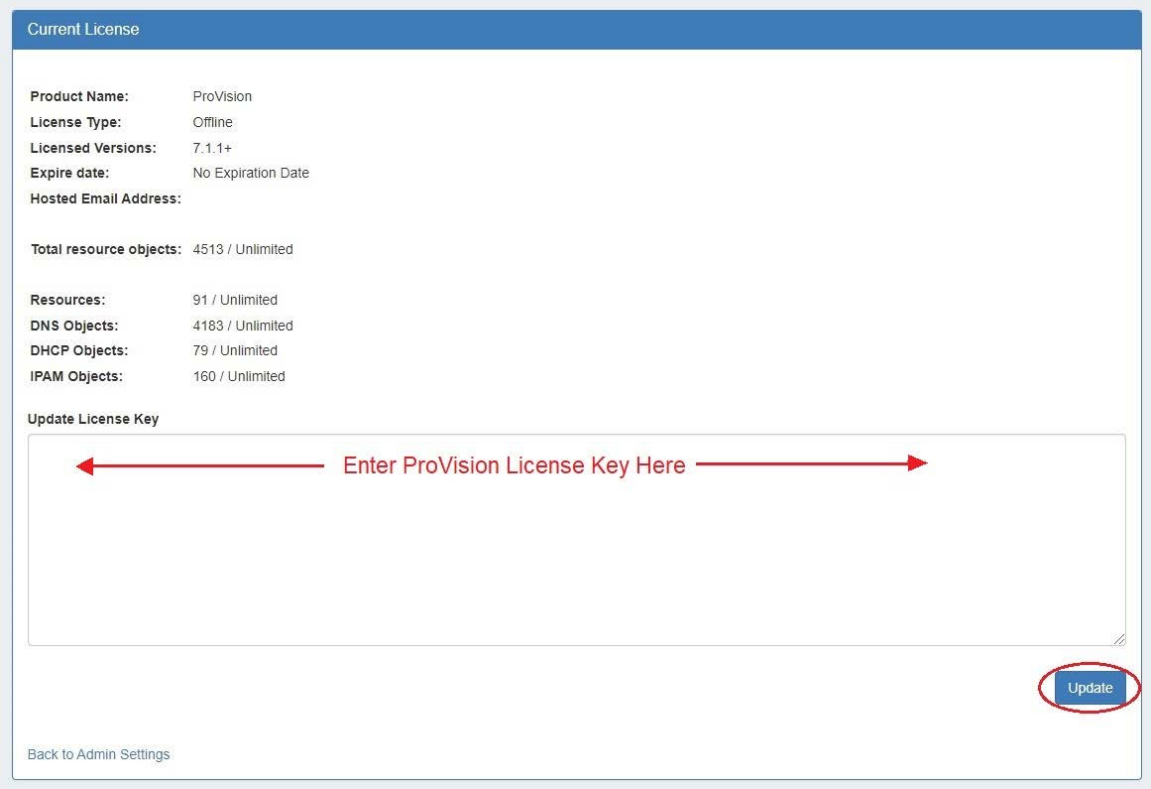
The License page displays current product license details such as Product, Type, Versions, Expiration, Email, and the option to add/update the 6connect License Key(s).

From the Admin Settings page, ensure the "Application" sub-tab is selected, then click "Manage License".



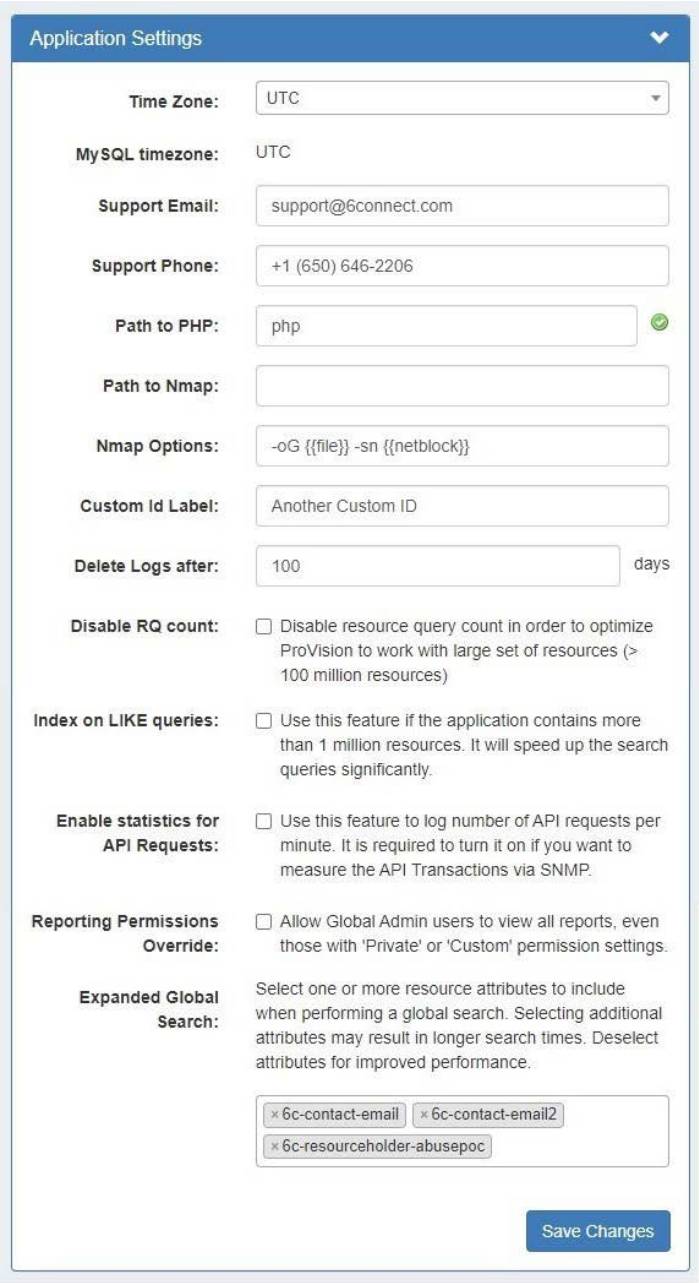
Current license details for ProVision, and other affiliated 6connect products will display.

To add/update a License Key, paste the key provided into the "Update License Key" box, and click "Update License".



Application Settings

Application Settings is where you provide company specific info that appears in the Dashboard, as well as general instance settings.



Time Zone: Supported Time zones are listed here: {EXT} http://www.php.net/manual/en/timezones.php. Default value is ('America /Los_Angeles') and can be modified at any time via the drop down menu

MySQL Timezone: The timezone set from the server's MySQL settings.

Support Email: Support Email address that displays on the Dashboard

Support Phone: Support phone number that displays on the Dashboard

Path to PHP (Local Installation): The directory path to php location

Path to Nmap (Local Installation): The directory path to nmap location

Nmap Options (Local Installation): Custom nmap options

Custom id Label: The display name for the customizable label field available when creating or editing a resource.

Delete Logs after: The number of days to retain logs.

Disable RQ Count: Disables resource query count, in order to optimize ProVision with large data sets.

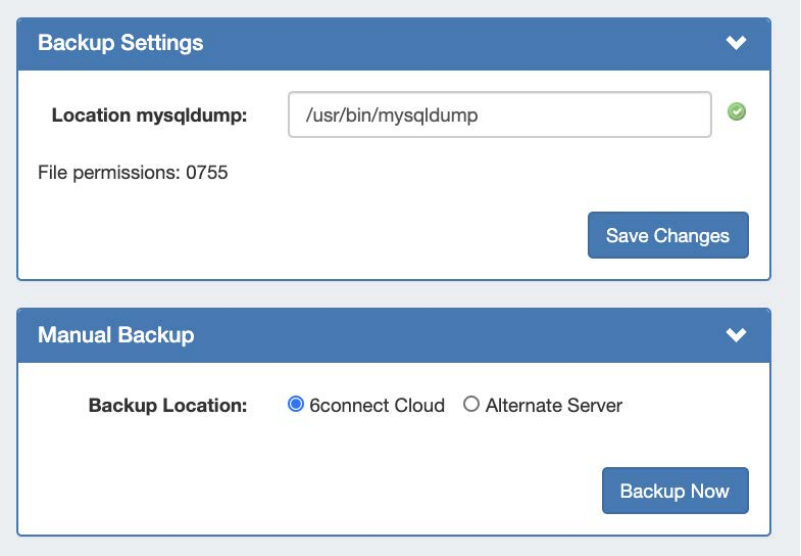
Index on LIKE queries: Speeds up search queries for cases of extremely large data sets.

Enable statistics for API Requests: Logs number of API requests per minute. Required to measure the API Transactions via SNMP.

Reporting Permissions Override: Allows Global Admin users to view all reports, even those with 'Private' or 'Custom' permission settings.

Expanded Global Search: Allows admins to customize which resource attributes are included in Global Search, and balance search scope vs performance.

Backup Settings



For cloud users, regular backups can be set up through the Scheduler. However, prior to imports or other large changes, you may wish to manually perform a backup.

Backup Location: The backups may be sent to the 6connect cloud, or to a specific server in the Resource system. Select the radio button for the desired location.

Manual Backup - 6connect Cloud:

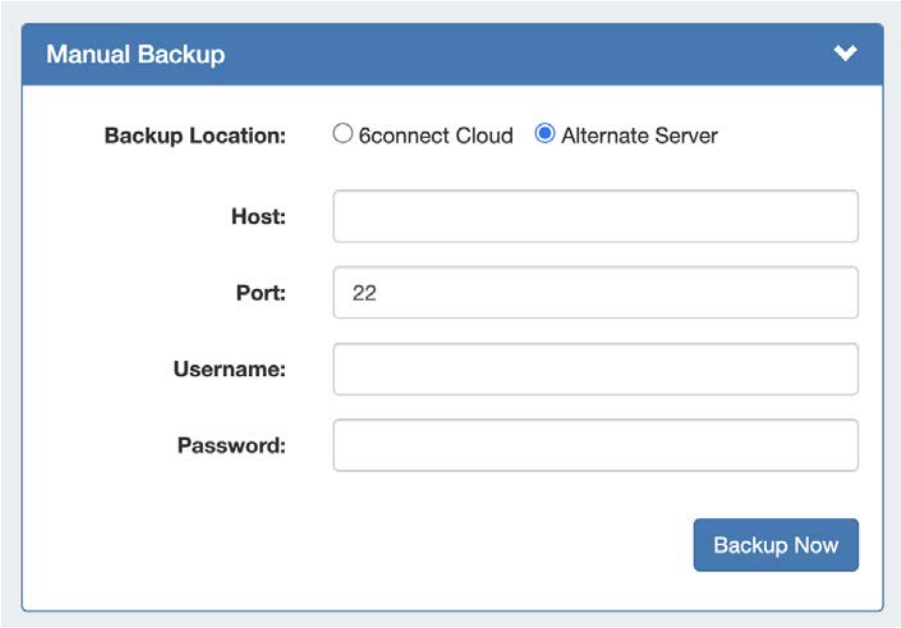
Select "6connect Cloud" as your backup location, then click on the "Backup Now" button. You will see a success message below the button if successful.

Manual Backup - Alternate Server:

Manual Backup: Alternate Server allows you to save a a backup to a server outside of ProVision.

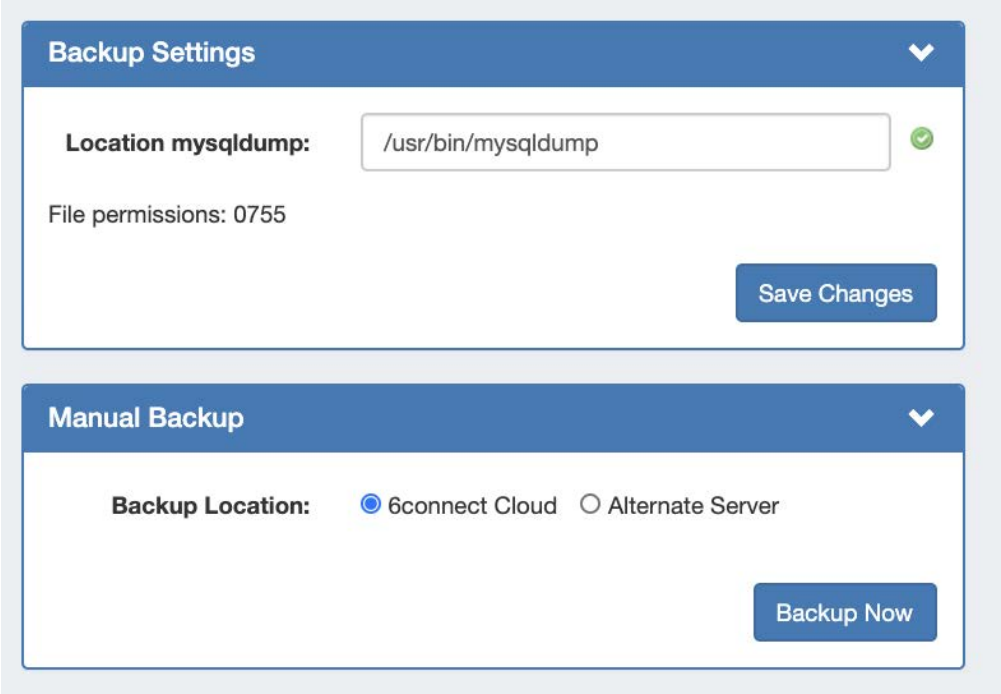
Select "Alternate Server", and then enter the following server information: Port, Hostname, Username, and Password.

Once complete, click "Backup Now" to connect to the server and send the backup file.



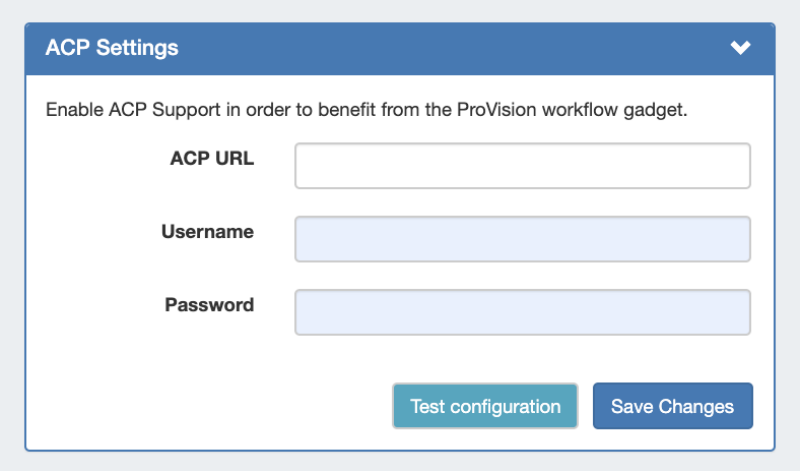
Backup Settings - Local Installation

Additional settings are available for local installations:



Location of mysqldump (Local Installation): This is the location of the mysqldump directory.

ACP Settings

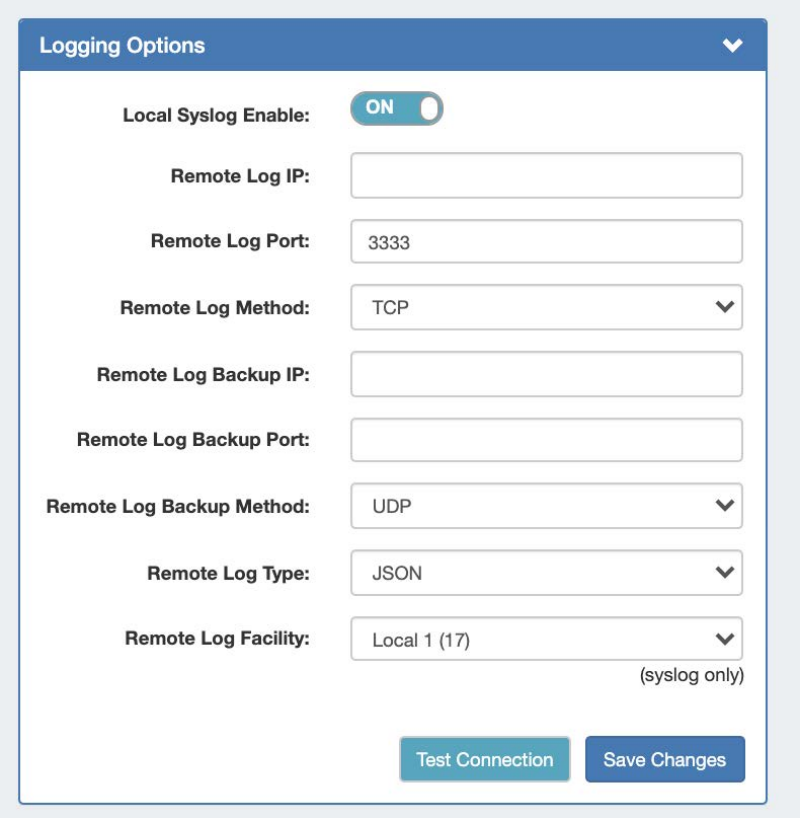


The ACP Settings area links an ACP instance and login credentials to the ProVision instance, and allows the ACP Workflow Gadget to execute Workflows as the provided user.

Enter the ACP URL for a licensed ACP instance, then provide the ACP Username and Password for the user that should be used to execute Workflows. To verify the account, click "Test Configuration" - you will be notified whether the account is valid.

When done, click "Test configuration" to verify the connection and then "Save Changes". Afterwards, you may proceed to configure the ACP Workflows Gadget to specify Workflows to execute in ProVision.

Logging Options



Remote Log IP: Target IP address that we will send log information to

Remote Log Port: Port number for the syslog server you will send log information to

Remote Log Method: Select TCP, UDP, SSL from the dropdown for the log delivery method

Remote Log Backup IP: Target IP address for the Backup syslog server you will send log information to

Remote Log Backup Port: Port number for the Backup syslog server you will send log information to

Remote Log Backup Method: Select TCP, UDP, SSL from the dropdown for the log delivery method

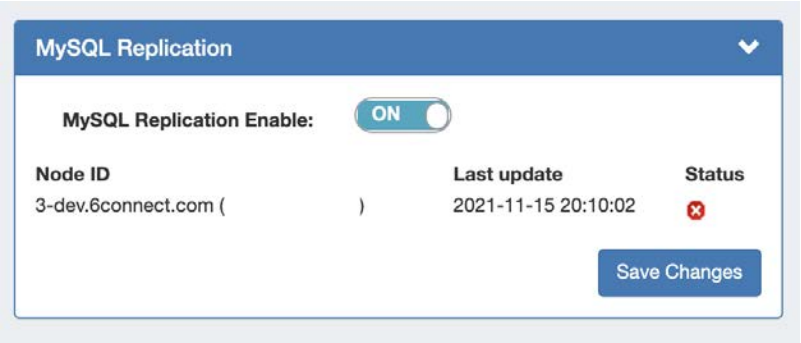
Remote Log Type: Select SysLog format or JSON output

Remote Log Facility: Select the Facility - applies to syslog only

If desired, you may select "Test Connection" to verify the connection before clicking "Save Changes".

MySQL Replication

MySQL Replication Monitor displays the enabled/disabled status of replication, and periodically checks the replication state and displays the result in Admin Settings.
To enable / disable MySQL Replication, turn the toggle to the ON/OFF position, respectively. Click "Save Changes" when done.

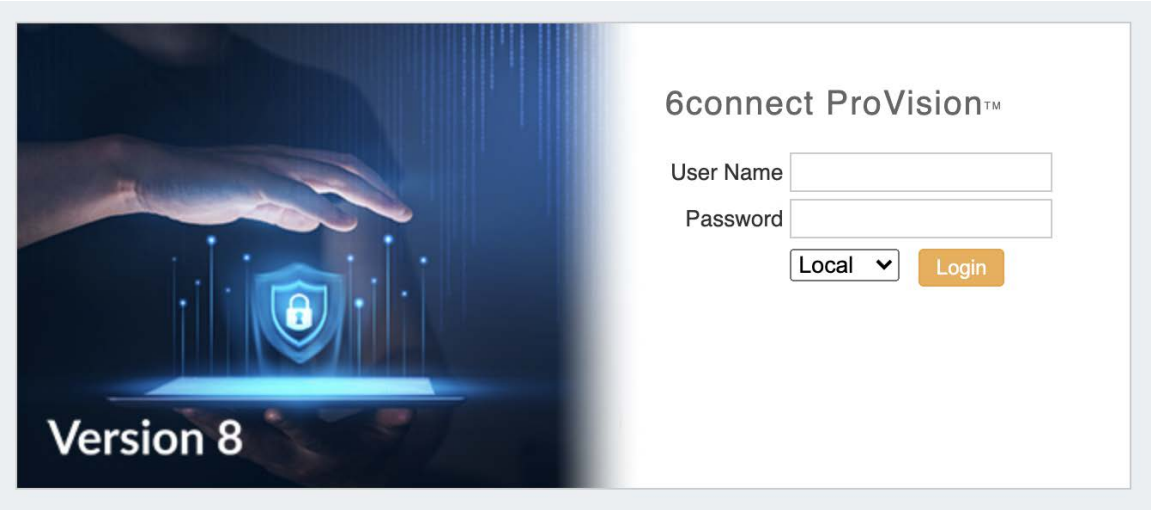


Once saved, the associated "MySQL Replication Monitor" Scheduler task is automatically created to gather data for the monitor.

To deactivate the MySQL Replication Monitor, turn the toggle to the "Off" position, and click save changes. The associated scheduler task will be automatically deleted.

Authentication Options

Authentication



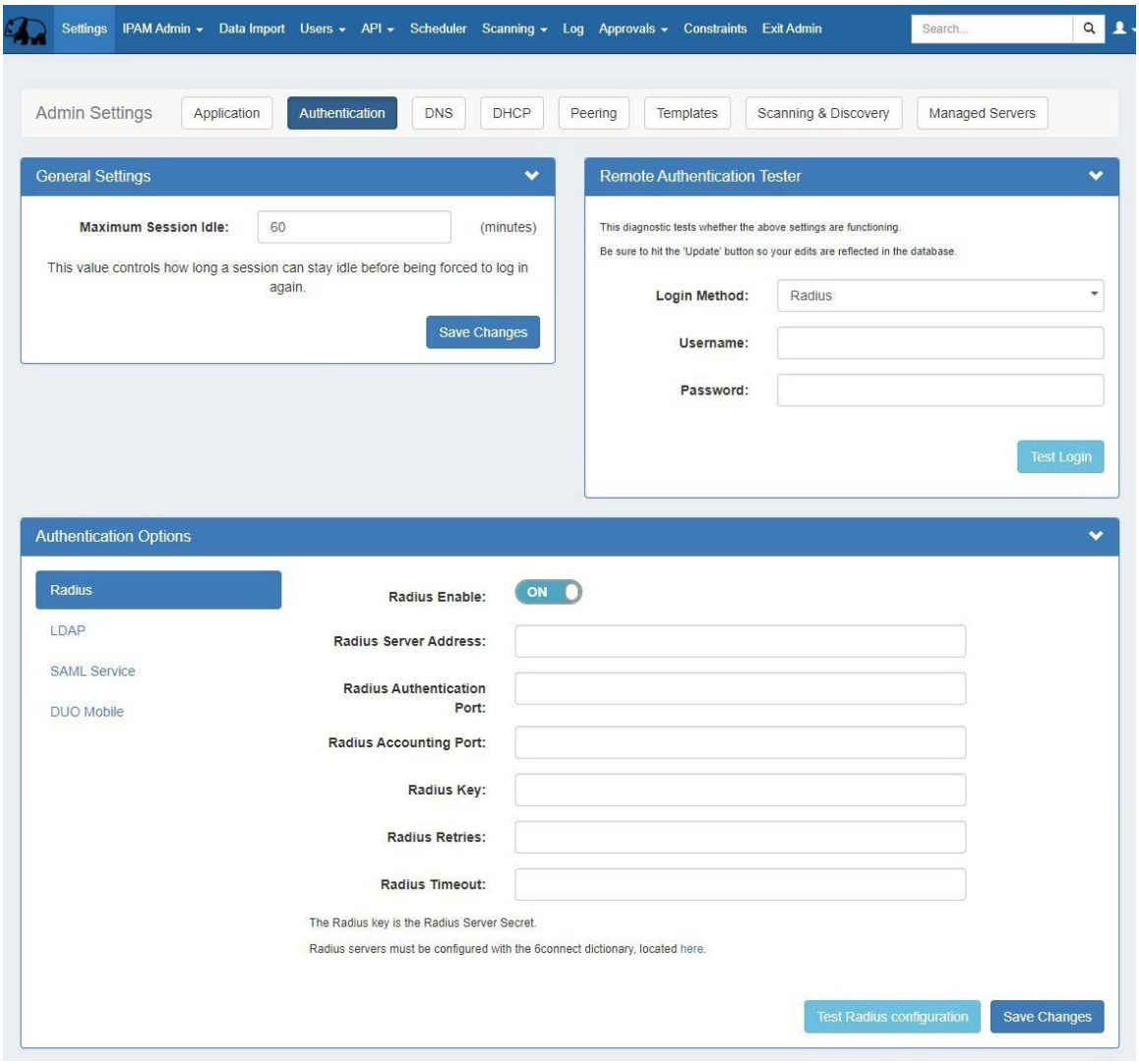
By default, credentials are managed via the local authentication mechanism provided by 6connect.

Depending on the authentication method chosen by your organization, there may be a separate authentication to login or logout of the application via the drop down menu.

Four non-local authentication types are available for ProVision: Radius, LDAP, SAML, and DUO Mobile. Settings for these authentication types may be entered from the "Authentication" sub-tab at the top of the Admin Settings page.

- Authentication Settings
  - General Settings
  - Remote Authentication Tester
  - Authentication Options
- Login
- Additional Information

Authentication Settings



Authentication settings are accessed by clicking the "Authentication" sub-tab at the top of the Admin Settings page.

In this area, you may set the max session idle time, as well as setup additional authentication options. Four non-local authentication types are available for ProVision: Radius, LDAP, SAML, and DUO Mobile.

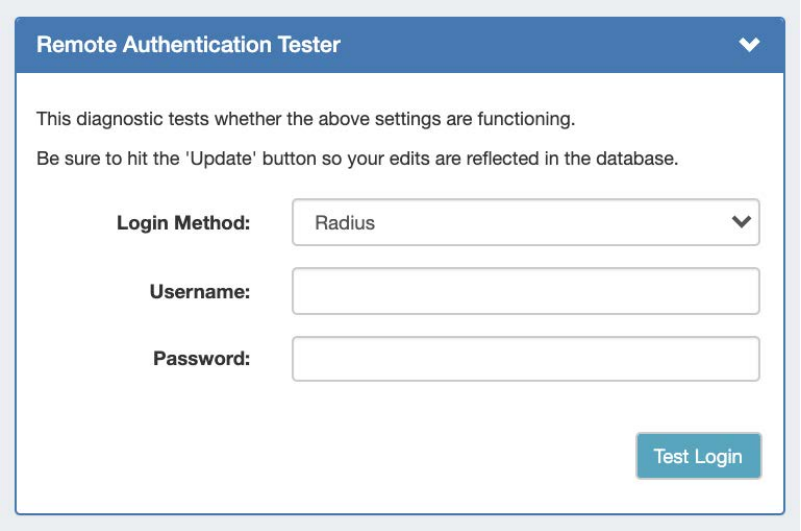
For general authentication settings and options, see the settings below.

General Settings



Maximum Session Idle: This setting (minutes) controls how long a session can stay idle before being forced to log in again.

Remote Authentication Tester



The Remote Authentication Tester checks Radius / LDAP settings for a user.

Select the Login Method (Radius or LDAP), enter the Username and Password for the user, and then click "Test Login".

Login Method: Select Radius or LDAP, according to your authentication settings.

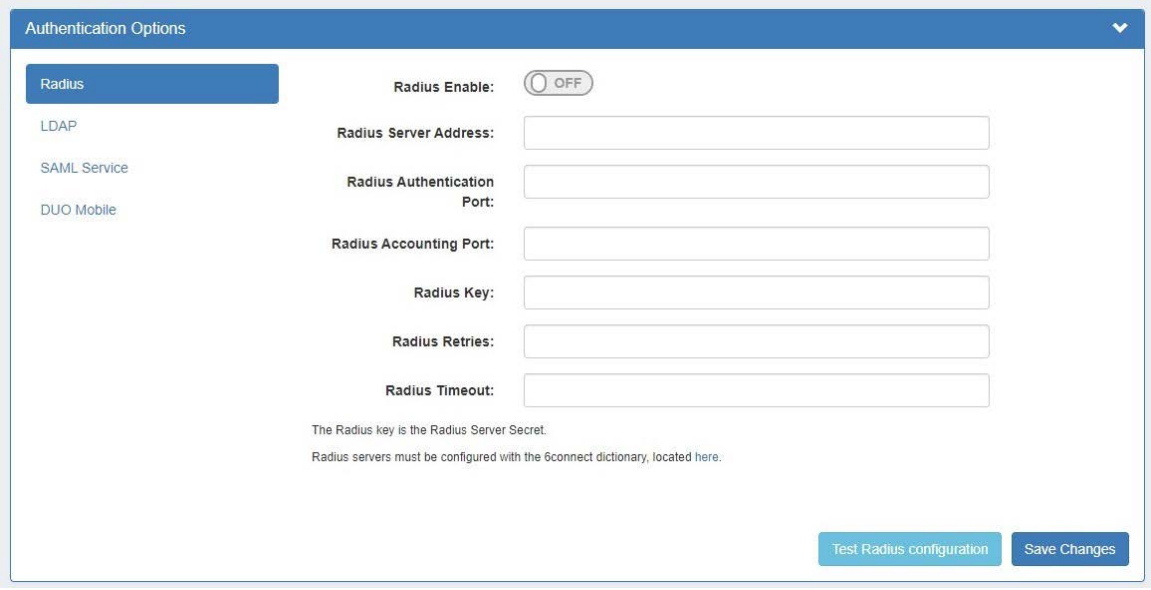
Username: The username for the user you are testing.

Password: Password for the user you are testing.

Authentication Options

Four authentication types are available for ProVision: Radius, LDAP, SAML, and DUO Mobile.

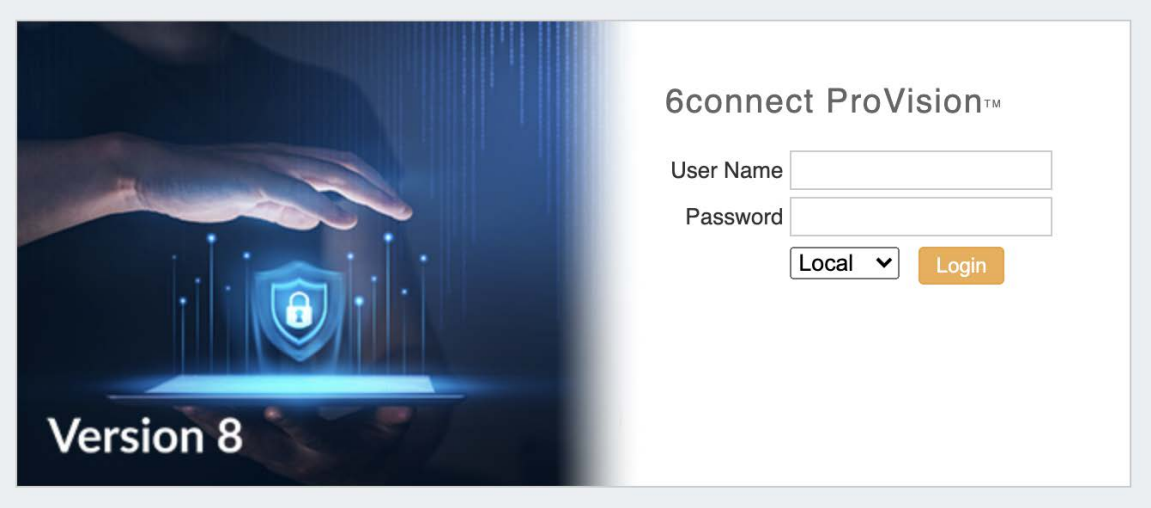
To view settings for each, select the authentication type from the list at the left of the module.



For details on each authentication type, see the following pages:

- RADIUS Authentication
- LDAP Authentication
- SAML Authentication
- DUO Authentication

Login



To login, go to your instance's url and select the authentication type (the default is 'Local'), and enter in the user credentials.

Depending on the authentication method chosen by your organization, there may be a separate authentication to login or logout of the application via the drop down menu.

Change Order of Login Menu Dropdown

The drop down menu defaults to "local" - if you are using another authentication method, you can use the following to change the default ordering and improve usability.

In the file data/globals.php, add a line:

```
define('DEFAULT_LOGIN_TYPE', 'ldap');
```

Acceptable values instead of 'ldap' are 'local', 'radius' and 'saml'.

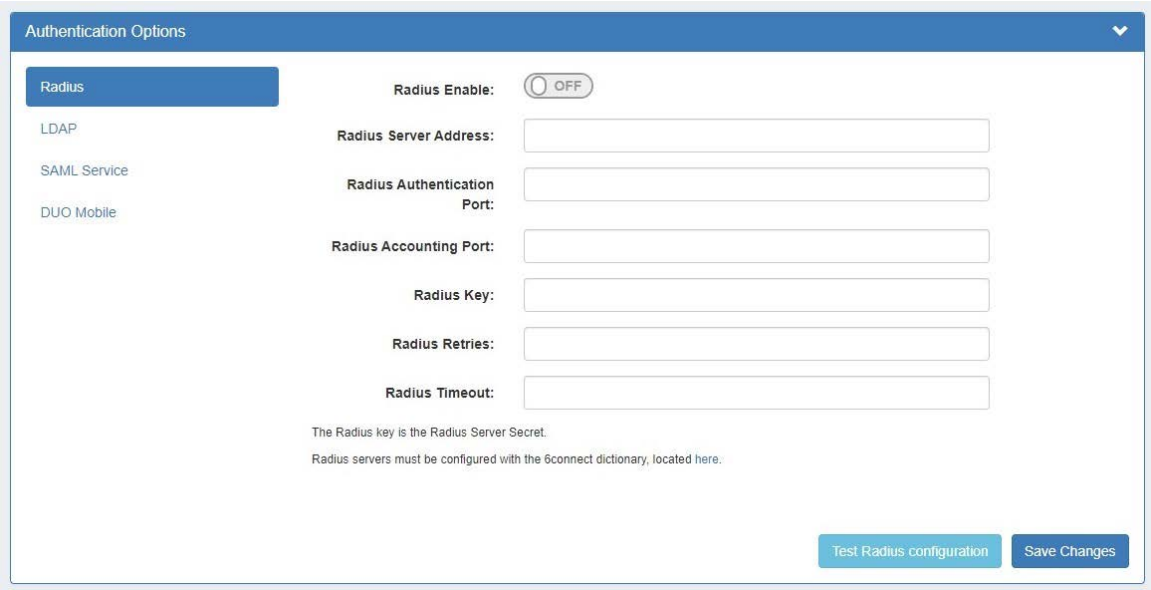
Additional Information

Detailed information on specific authentication types is available on the following pages:

- RADIUS Authentication
- LDAP Authentication
- SAML Authentication
- DUO Authentication

RADIUS Authentication

RADIUS Authentication



ProVision supports 6connect vendor-specific attributes (VSAs) for use with RADIUS authentication.

To use these attributes, you must perform the following procedures:

- Setting Up Radius Authentication
  - Add the 6connect VSA to the Radius Installation
  - Configure Radius Accounts
  - Test Radius Accounts
  - Configure ProVision for Radius Authentication
- Add or Update Radius Authentication Settings (Local Install Only)

Setting Up Radius Authentication

Add the 6connect VSA to the Radius Installation

To use the 6connect VSA, the attributes must be defined on the RADIUS server. Add the following RADIUS dictionary file to your RADIUS server and name it dictionary.6connect:

ProVision 4.0 and greater:

```
VENDOR 6connect 36009

BEGIN-VENDOR 6connect

ATTRIBUTE 6connect_user_group 10 string
#A 6connect User Group to which this user belongs.

END-VENDOR 6connect
```

Make sure to add the following to the primary dictionary file: $INCLUDE dictionary.6connect

Configure Radius Accounts

On the Radius server, configure the user accounts that will have access to the ProVision system.

An example of a ProVision account configuration for the user file on a Freeradius system for ProVision 4.0 and greater:

Example: To add a new radius user, edit the 'users' file found at /etc/raddb/users and add a block like:

Setting up a RADIUS account

```
bobber Cleartext-Password := "hello"
6connect_user_group = "Global Admins,Group 2,Group 1,Group Nonexistant"
```

The Radius server must be restarted every time you add, remove, or modify users. To restart the Radius server, use this command:

```
/etc/init.d/radiusd restart
```

Note on RADIUS attributes

There are many Radius attributes, but '6connect_user_group' is the one used by 6connect ProVision. It is a comma-separated list of all the group names that the user belongs to.

Test Radius Accounts

For ProVision 4.0 and higher, test and response should look like the following:

To query a radius server, use the following command format:

```
radtest [USERNAME] [USERPASSWORD] [SERVER] 0 [SECRET]
```

Example:

```
radtest bobber hello 208.39.140.106 0 6connect
```

A successful response will look like this:

```
Sending Access-Request of id 198 to 208.39.140.106 port 1812
User-Name = "bobber"
User-Password = "hello"
NAS-IP-Address = 67.221.240.229
NAS-Port = 0
Message-Authenticator = 0x00000000000000000000000000000000
rad_recv: Access-Accept packet from host 208.39.104.106 port 1812, id=198, length=69
Attr-10 = 0x476c6f62616c2041646d696e732c47726f757020322c47726f757020312c47726f7570204e6f6e6578697374616e74
```

A rejected response may look like this:

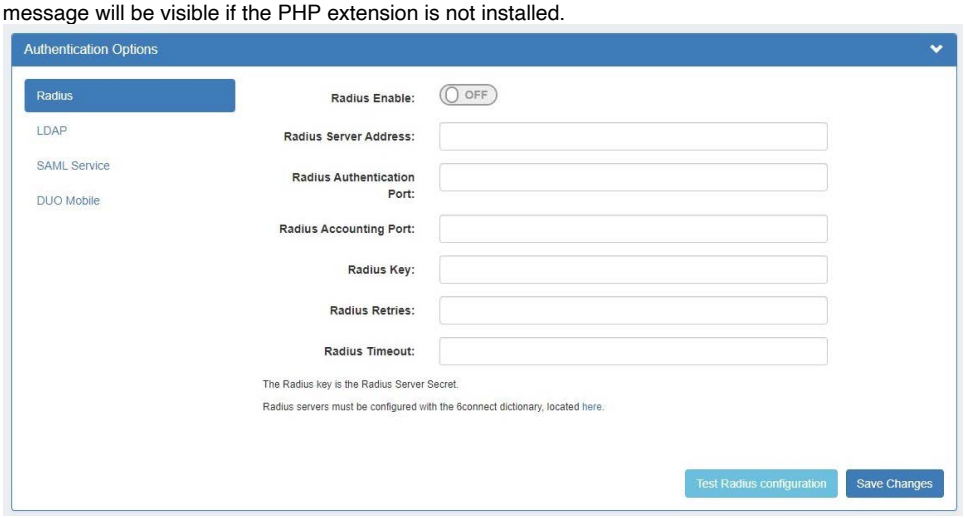
```
Sending Access-Request of id 68 to 208.39.140.106 port 1812
User-Name = "bobberbro"
User-Password = "hello"
NAS-IP-Address = 67.221.240.229
NAS-Port = 0
Message-Authenticator = 0x00000000000000000000000000000000
rad_recv: Access-Reject packet from host 208.39.104.106 port 1812, id=68, length=20
```

Configure ProVision for Radius Authentication

To configure the use of Radius authentication with ProVision, follow the steps below:

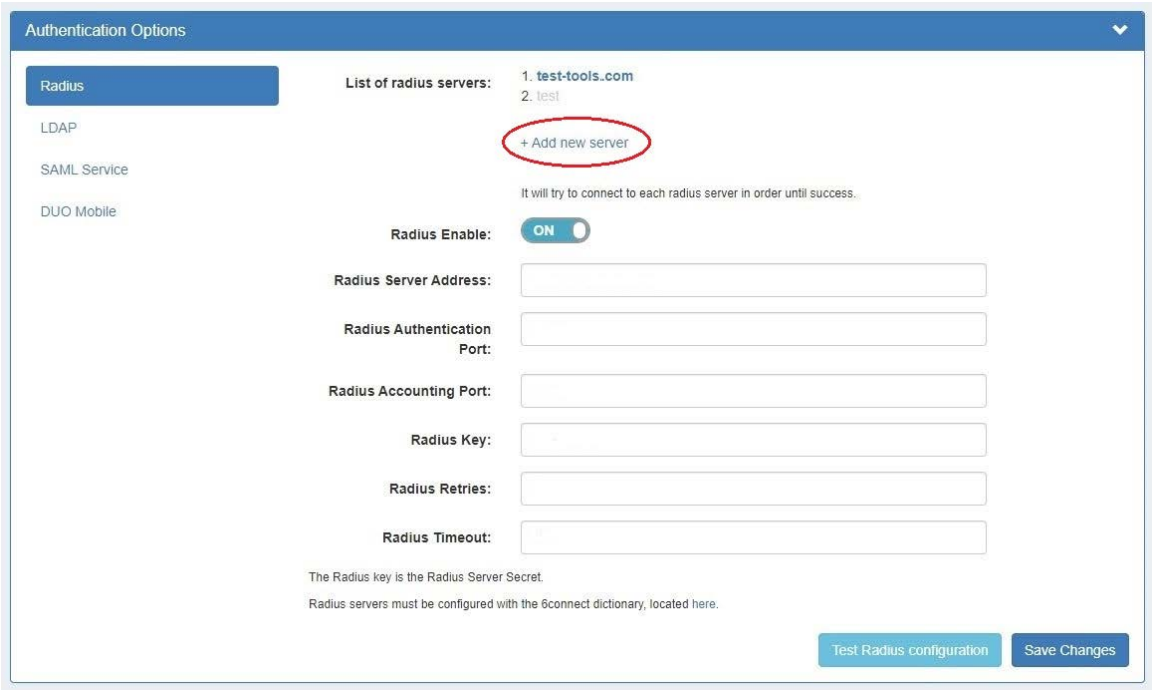
1. Log into 6connect ProVision
2. Go to Settings Admin -> Authentication
3. Select the "Radius" tab under "Authentication Options"
4. Ensure that Radius functions are available. Radius functions are always available on 6connect cloud instances. Note: Radius functions are available on VM Images and Local Installations only if the relevant PHP Pear Radius Libraries have been installed. An error

message will be visible if the PHP extension is not installed.



5. Move the Radius Enable selector to the "ON" position.
6. Fill in the hostname or ip address, authentication ports, accounting port, and shared Radius key as specified.

Once at least one Radius server has been added, a list will appear at the top of the Radius module. Add an additional Radius server by clicking "Add new server".



ProVision will try to connect to each radius server listed in the order listed, until a success is returned. Disabled servers will display in grey, and the currently selected server will display in bold.

Setting default login authentication options

In the login screen, you would select the authentication method from the dropdown. If you like, you can set the default login option in the following way:

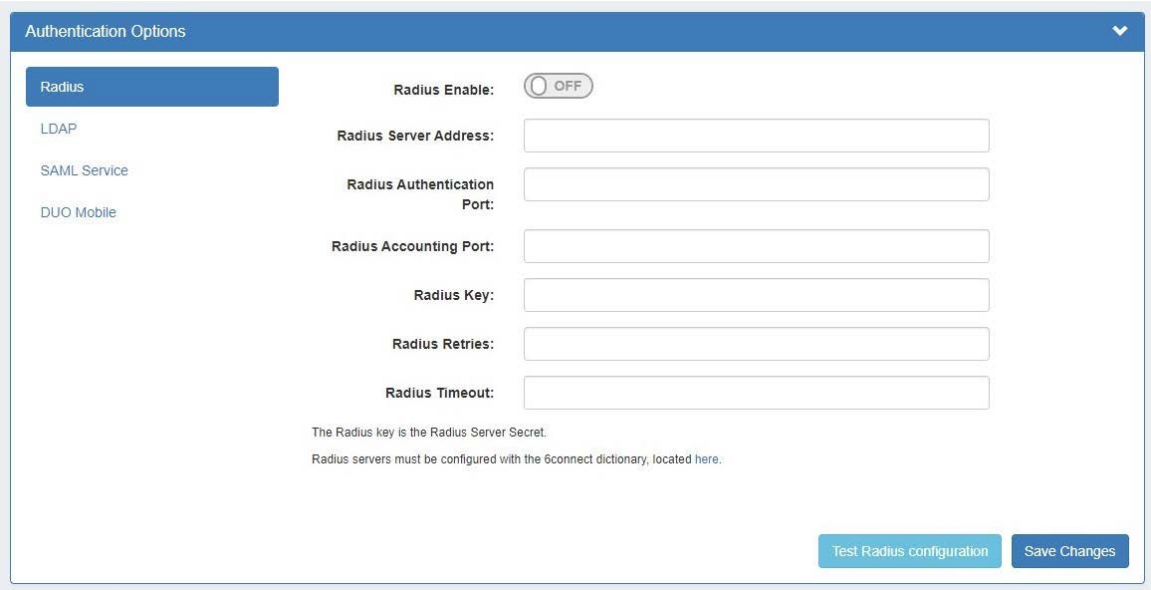
Go to the /data/globals.php and open in vi (or other editor). Add in the following text as the last line of the file (before the closing ?>)

define('DEFAULT_LOGIN_TYPE', 'radius');

Acceptable values are "local", "radius", "ldap" and "saml". If this line is not present in globals.php, the default option is "local".

Add or Update Radius Authentication Settings (Local Install Only)

Authentication options are accessed by clicking the "Authentication" sub-tab at the top of the Admin Settings page.



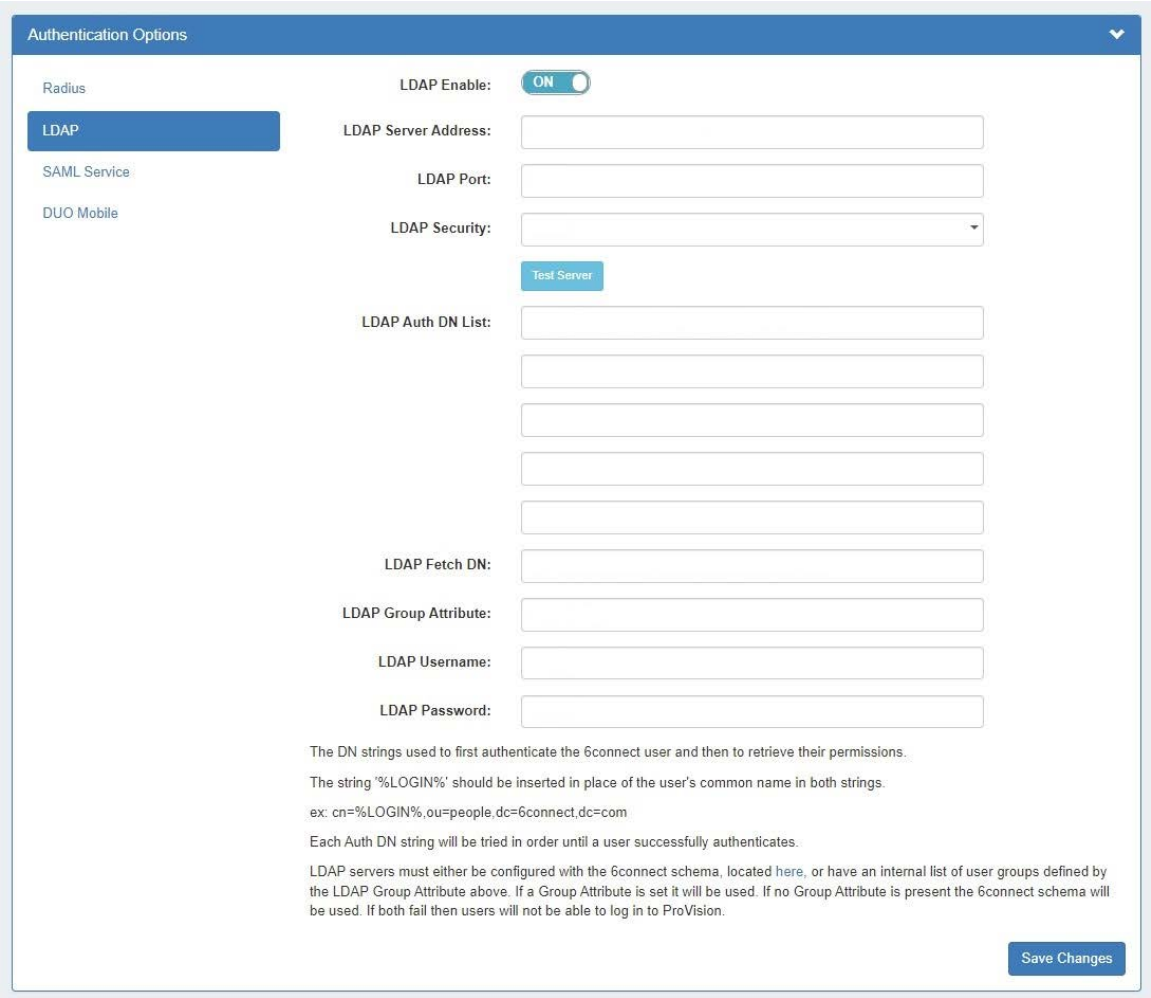
- **Radius Enable:** Move this selector to enable RADIUS functionality.
- **Radius Server Address:** Set to the IP address of your radius server. If this is specified, it will force authentication over radius.
- **Radius Authentication Port:** Set to the port for authentication. Default port is 1812
- **Radius Accounting Port:** Set to the port for radius accounting. Default port is 1813
- **Radius Key:** Set to the shared key of your radius server

Enter or update the desired settings.

To verify the settings connect, click "Test Radius Configuration". When done, click "Save Changes".

LDAP Authentication

LDAP Authentication



LDAP authentication options are accessed by clicking the "Authentication" sub-tab at the top of the Admin Settings page, then selecting "LDAP" from the "Authentication Options" module.

ProVision authenticates against an LDAP server by using the following three steps:

1. Attempts to do an LDAP query for the user based on the Auth DN provided
2. Pulls the user's own object from the LDAP server
3. Attempts to match group names in the "LDAP Group Attribute" against existing groups in ProVision.

Before you enter LDAP settings, ensure that you have the LDAP server set up and configured for ProVision.

- Set up an LDAP Server for Authentication
  - Configure the LDAP Server:
    - LDAP Schema - Example
  - Creating a LDAP User:
    - Test the LDAP Server with LDAP Search
  - Configure ProVision for LDAP Authentication
- Add or Update LDAP Settings
- LDAP Authentication on a Windows Server

Set up an LDAP Server for Authentication

To setup an LDAP server for this authentication, you must perform the following three procedures:

1. Configure the LDAP server using the 6connect LDAP Schema
2. Create the LDAP user(s) in a 'LDIF' file (testing the query using LDAP Search, if desired)
3. Configure ProVision with the LDAP authentication settings by enabling LDAP then entering (at minimum) the following information:
    a. LDAP Server Address
    b. Port
    c. LDAP Auth DN List
    d. LDAP Fetch DN
    e. LDAP Group Attribute

Configure the LDAP Server:

Configuring the LDAP server involves adding the schema and adding LDAP users / groups to the server:

LDAP Schema - Example

```
attributetype (1.3.6.1.4.1.5023215.2.3.21 NAME 'sixConnGroup' SYNTAX 1.3.6.1.4.1.1466.115.121.1.15 )
objectclass ( 1.3.6.1.4.1.5023215.2.4.2 NAME 'sixConnectPermissionsV2' DESC '6Connect Permissions Object v2'
SUP top AUXILIARY MUST ( sixConnGroup ) )
```

Creating a LDAP User:

SSH into your openLDAP server and create a new 'LDIF' file. Example:

```
dn: cn=JoeSmith,ou=people,dc=6connect,dc=com
cn: JoeSmith
sn: JoeSmith
objectclass: top
objectclass: person
objectclass: sixConnectPermissionsV2
sixConnGroup: "Global Admins"
sixConnGroup: "IT Engineering"
sixConnGroup: "Sales"
sixConnGroup: "Customer Admin"
userPassword: testpass
```

To create a new user, make a new LDIF file and change all instances of "JoeSmith" to whatever username you wish to create and update the password. Keep all of the object class definitions as listed above. Add a sixConnGroup declaration for each ProVision user group a user is in.

After the file is created, run the following command to add the new user to LDAP server in the following format:

```
ldapadd -h [SERVER] -x -f [LDIF FILE] -D [ROOTDN] -w [ROOT PW] -v
```

Example:

```
ldapadd -h localhost -x -f 6connect.ldif -D "cn=JoeSmith,dc=6connect,dc=com" -w secret -v
```

The user will now be active in openLDAP and can be used to login to ProVision.

Test the LDAP Server with LDAP Search

The best method to confirm the LDAP server settings is to perform an LDAP search.

To query the LDAP server, run the following command while SSH'ed into your LDAP Server, replacing the placeholders (in brackets) with your specific LDAP information:

```
ldapsearch -b [BASE] -h [IPADDRESS] -D [DOMAIN] -w [PASSWORD] [USER]
```

Note: We have not been able to use a v6 address at with this tool, even though multiple sources say it should work.

At the end of the command where [USER] is specified, user or groups can be used (in LDAP format) to query.

Example with User:

```
ldapsearch -b "dc=6connect,dc=com" -h sometestserver.lab.com -D "cn=JoeSmith,ou=people,dc=6connect,dc=com" -
w testpass "cn=JoeSmith"
```

Example with Group:

```
ldapsearch -b "dc=6connect,dc=com" -h sometestserver.lab.com -D "cn=JoeSmith,ou=people,dc=6connect,dc=com" -
w testpass "cn=JoeSmith" memberOf
```

The LDAP search should return the extended LDIF information similar to the following:

```
# extended LDIF
#
# LDAPv3
# base <dc=6connect,dc=com> with scope subtree
# filter: cn=JoeSmith
# requesting: memberOf
#

# JoeSmith, 6connect.com
dn: cn=JoeSmith,dc=6connect,dc=com
memberOf: cn=Global Admins,ou=groups,dc=6connect,dc=com

# search result
search: 2
result: 0 Success

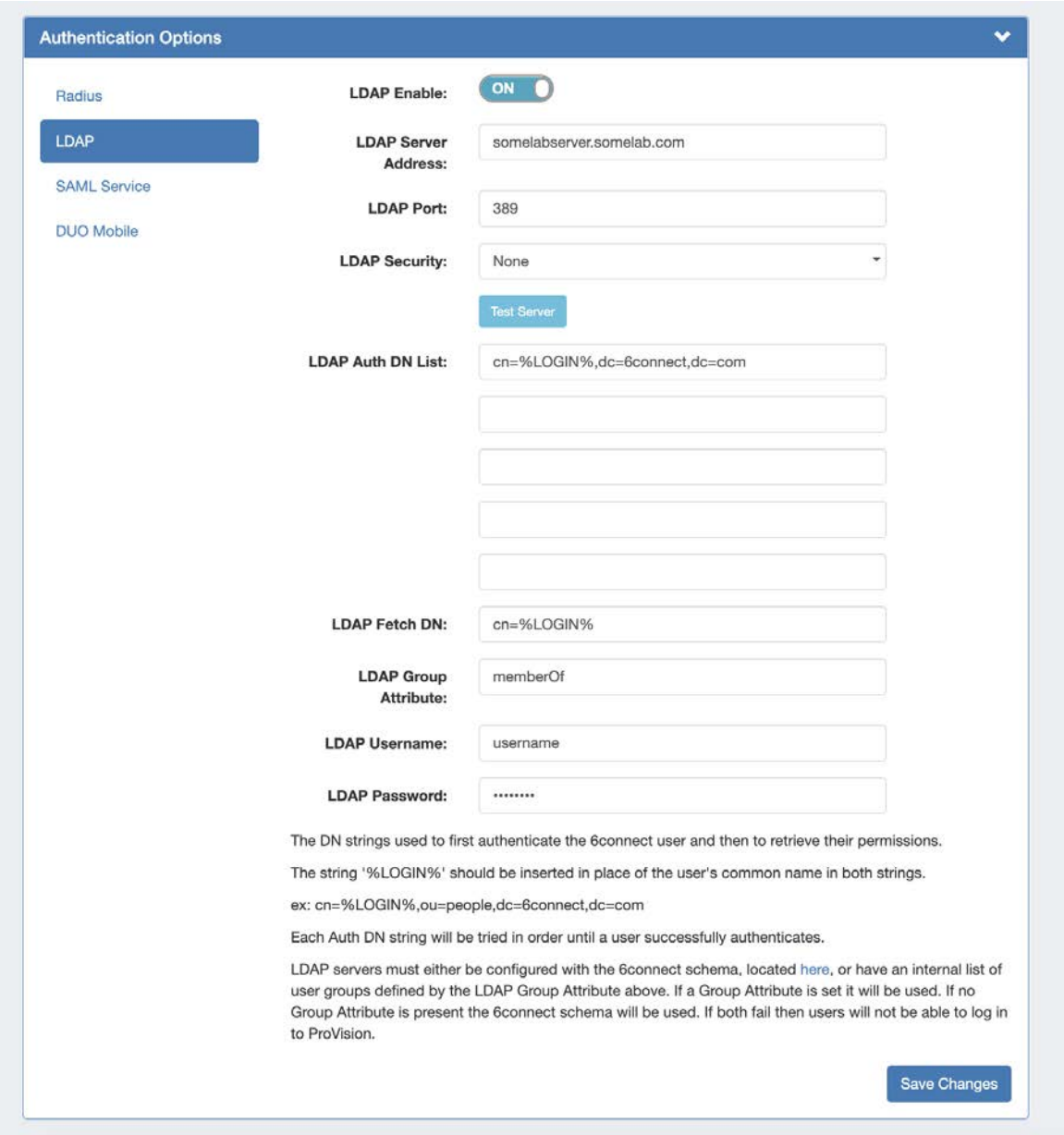
# numResponses: 2
# numEntries: 1
```

The Auth DN is used to derive the ldapsearch base and domain, then uses the Fetch DN to pull the user, and the Group Attribute to filter on the list of groups the user is a part of. The end result is this list of user groups:

memberOf: cn=Global Admins,ou=groups,dc=6connect,dc=com

Authentication from ProVision checks to see

Configure ProVision for LDAP Authentication



To configure the use of LDAP authentication with ProVision:

1. Log into 6connect ProVision
2. Go to Settings Tab Admin Settings -> Authentication
3. Select "LDAP" under "Authentication Options"
4. Move the LDAP Enable selector to the "ON" position.
5. Fill in the hostname or ip address, authentication port, LDAP Security, Auth DN List, and Fetch DN, and LDAP Group Attribute.
    a. Example values in this case would be:
        - LDAP Enable: (Checked)
        - LDAP Server Address: IP or Domain, such as 1.2.3.4 or somelabserver.lab.com
        - LDAP Port: 389 (or SSL/TLS port is 636)
        - LDAP Security: None
        - LDAP Auth DN: cn=%LOGIN%,dc=6connect,dc=com
        - LDAP Fetch DN: cn=%LOGIN%
        - LDAP Group Attribute: memberOf
        - LDAP Username / LDAP Password: Optionally, you may enter LDAP admin credentials to allow ProVision to import and sync LDAP contacts. See Contact Manager for details on LDAP contacts.
6. Click "Test Server" to verify the connection.
    a. NOTE: If you experience authentication errors at this step, confirm the LDAP settings using an LDAP Search, as described in the previous section.

Setting default login authentication options

In the login screen, you would select the authentication method from the dropdown. If you like, you can set the default login option in the following way:

Go to the /data/globals.php and open in vi (or other editor). Add in the following text as the last line of the file (before the closing ?>)

define('DEFAULT_LOGIN_TYPE', 'ldap');

Acceptable values are "local", "radius", "ldap" and "saml". If this line is not present in globals.php, the default option is "local".

Using SSL encryption

To use SSL encryption with LDAP, the ldap.conf file must be correctly configured on the ProVision server.

Typically, the LDAP configuration file is kept at "/etc/ldap/ldap.conf". Make sure the following line is present:

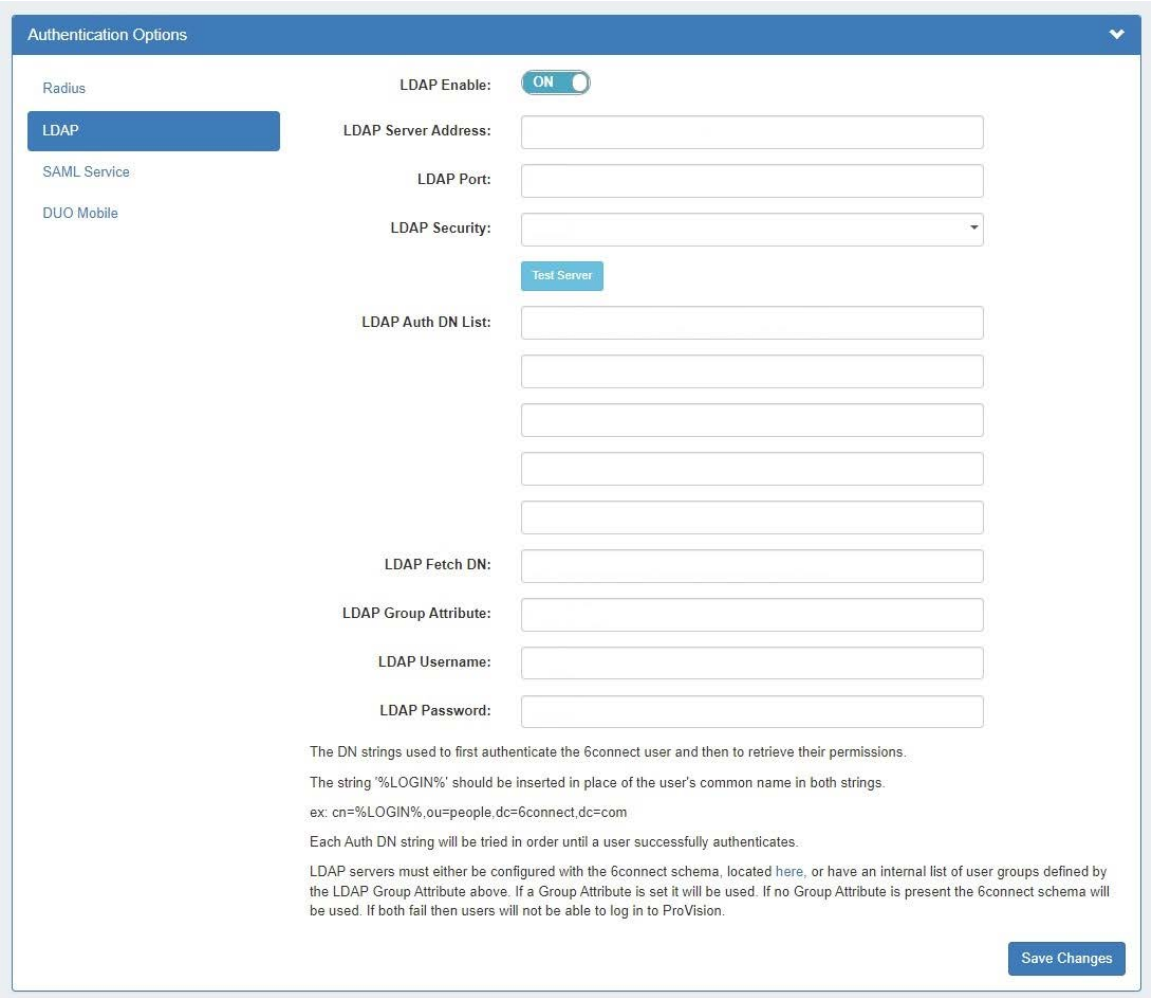
TLS_REQCERT allow

and restart the webserver.

Add or Update LDAP Settings

To view, add, or update LDAP settings, go to the Settings Tab Admin to enter the Admin area of ProVision.

Then, click the "Authentication" sub-tab at the top of the Admin Settings page, and select "LDAP" from the "Authentication Options" module.



The following settings are available to add or update:

- **LDAP Enable:** Check the box to enable LDAP functionality.
- **LDAP Server Address:** The IP address or domain of your LDAP server.
- **LDAP Port:** 389 (or SSL/TLS port is 636)
- **LDAP Security:** Select the security method of your LDAP server - SSL, TLS or None
- **Test Server:** Click to test the connection to the LDAP server.
- **LDAP Auth DN List:** A query string that will be used to authenticate the user against the LDAP server. %LOGIN% is a variable string that will be replaced with the user name. This may be in list format, and the auth system will try each to authenticate the user. (ex: cn=%LOGIN%,ou=people,dc=6connect,dc=com)
- **LDAP Fetch DN:** The LDAP query that will be used to pull the user object
- **LDAP Group Attribute:** The LDAP attribute that will hold the LDAP-GNI group links. If using an internal list of user groups instead of 6connect groups, enter the attribute name for the LDAP groups here. If a Group Attribute is set, it will be used first, otherwise the 6connect schema will be used.
- **LDAP Username / LDAP Password:** Optionally, you may enter LDAP admin credentials to allow ProVision to import and sync LDAP contacts. See Contact Manager for details on LDAP contacts.

- **NOTE: Mapping Permissions to 6connect schema:** To integrate 6connect permissions with your existing directory structure then you will need the 6connect schema. It should snap in with any existing LDAP structure and allow you to assign 6connect permissions to your existing users. You can download a copy of the schema.

When done, you may optionally click "Test Server" to verify the connection to the LDAP server with the entered settings, then "Save Changes".

LDAP Authentication on a Windows Server

For information on settings up LDAP for a Windows server, see the following section:

- LDAP Authentication on Windows Server

LDAP Authentication on Windows Server

LDAP Authentication on Windows Server

Starting in 3.6, ProVision supports LDAP authentication (including Windows Server!). To setup an LDAP server for authentication, you must perform the following procedures:

- Configuring the LDAP functions on your Windows Server
  - LDAP Schema - Example
  - LDAP User Example
- Test the LDAP Server
- Configure ProVision for LDAP Authentication
- Add or Update LDAP Settings

Configuring the LDAP functions on your Windows Server

You should confirm these steps with your LDAP admin - the purpose of this walkthrough is to provide some level of detail on how to extend LDAP functionality to support integration with an application like ProVision.

Step 1: Prepare to extend the Schema (http://technet.microsoft.com/en-us/library/cc961754.aspx)

This is not a minor operation and requires interaction with various control modification areas of Windows Server:

- If you have not modified the schema before, you will need to use the Active Directory Schema console on a DC (Domain Controller) to permit write access to the DC schema.
- Since the schema object has dedicated permissions, admins must be a member of the Schema Administrator group (Schema Admins).
- Note that the DC that is holding the Schema Master Role is the only one allowed to write to it.

Step 2: Decide on method for Installing/executing Schema Extensions (http://technet.microsoft.com/en-us/library/cc961742.aspx)

If you have already used other AD integrations, this should be straightforward. We recommend using the LDIF script method

Step 3: Add and Modify a Schema Object (http://technet.microsoft.com/en-us/library/cc961575.aspx)

To add a new attribute to the schema, you first have to create a attribute object. The you will need to complete the following steps:

- Select a name for the attribute (ProVision assumes that the name will be '**sixConnGroup**')
- Get a valid Object Identifier (OID) from an issuing authority (http://msdn.microsoft.com/en-us/library/ms677620.aspx)

> **Generate an Object Identifier**
>
> Microsoft has released a script that can generate an Object Identifier (OID): https://gallery.technet.microsoft.com/scriptcenter/56b78004-40d0-41cf-b95e-6e795b2e8a06

- Document the attribute syntax
- Confirm that the attribute should be single-value
- Confirm the attribute indexing behavior
- Decide if the attribute needs to be distributed to the Global Catalog

LDAP Schema - Example

```
attributetype (1.3.6.1.4.1.5023215.2.3.21 NAME 'sixConnGroup' SYNTAX 1.3.6.1.4.1.1466.115.121.1.15 )
objectclass ( 1.3.6.1.4.1.5023215.2.4.2 NAME 'sixConnectPermissionsV2' DESC '6Connect Permissions Object v2'
SUP top AUXILIARY MUST ( sixConnGroup ) )
```

LDAP User Example

SSH into your openLDAP server and create a new 'ldif' file. Example:

```
dn: cn=JoeSmith,ou=people,dc=6connect,dc=com
cn: JoeSmith
sn: JoeSmith
objectclass: top
objectclass: person
```

```
objectclass: sixConnectPermissionsV2
sixConnGroup: "Global Admins"
sixConnGroup: "IT Engineering"
sixConnGroup: "Sales"
sixConnGroup: "Customer Admin"
userPassword: testpass
```

To create a new user, make a new ldif file and change all instances of "JoeSmith" to whatever username you wish to create and update the password. Keep all of the object class definitions as listed above. Add a sixConnGroup declaration for each ProVision user group a user is in.

After the file is created, run the following command to add the new user to LDAP server:

```
ldapadd -h [SERVER] -x -f [LDIF FILE] -D [ROOTDN] -w [ROOT PW] -v
```

Example:

```
ldapadd -h localhost -x -f 6connect.ldif -D "cn=Manager,dc=6connect,dc=com" -w secret -v
```

The user will now be active in openLDAP and can be used to login to ProVision.

Test the LDAP Server

To query the LDAP server, run the following command on any server which has openLDAP enabled:

```
ldapsearch -b [BASE] -h [IPADDRESS] -D [DOMAIN] -w [PASSWORD] [USER]
```

Note: We have not been able to use a v6 address at with this tool, even though multiple sources say it should work.

At the end of the command where [USER] is specified, user or groups can be used (in LDAP format) to query.

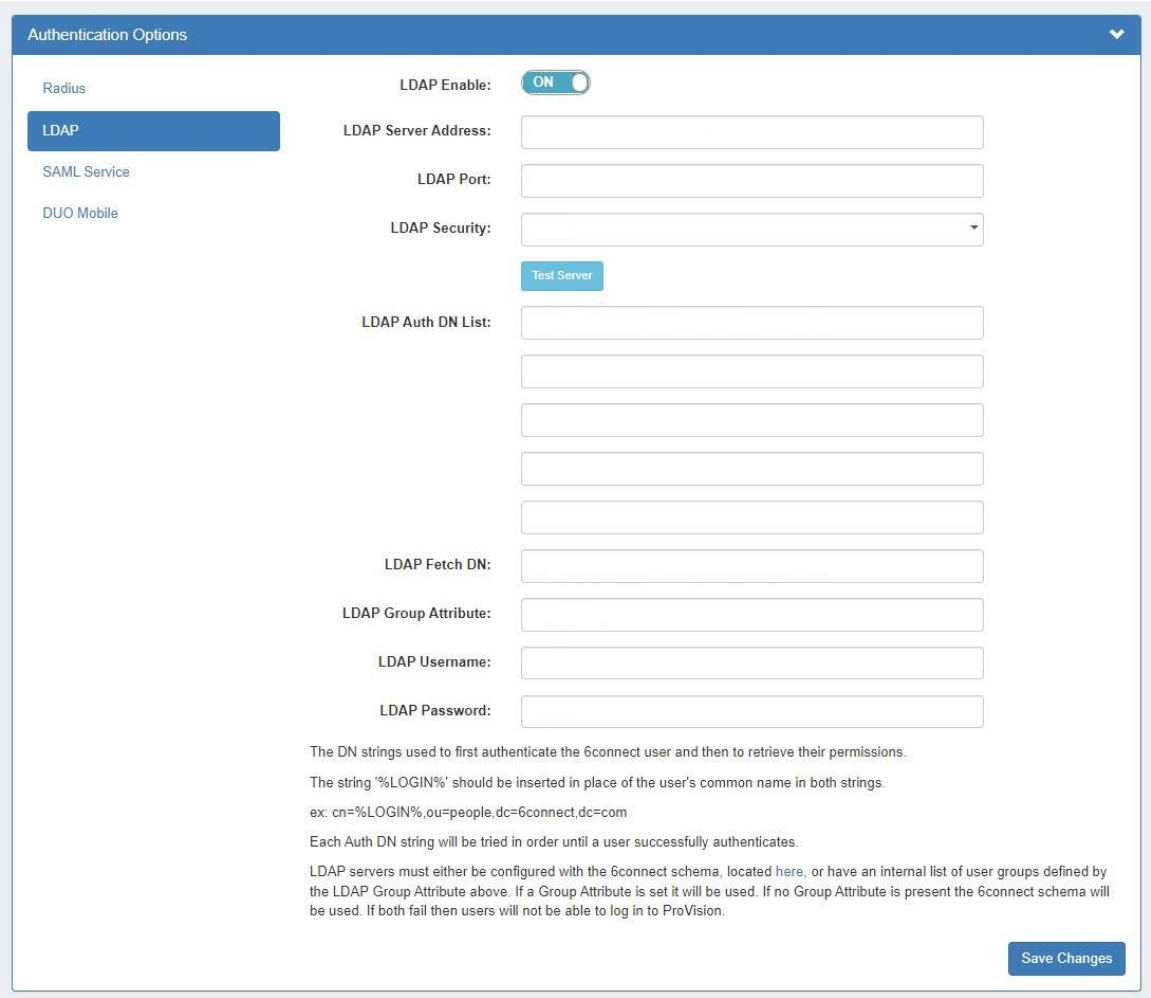
Example:

```
ldapsearch -b "dc=6connect,dc=com" -h 50.240.195.129 -D "cn=Mayor,ou=people,dc=6connect,dc=com" -w testpass
"cn=MajorMiner"
```

Configure ProVision for LDAP Authentication

To configure the use of LDAP authentication with ProVision, follow the steps below.

1. Log into 6connect ProVision
2. Go to Settings Tab Admin Settings -> Authentication
3. Select "LDAP" under "Authentication Options"
4. Move the LDAP Enable selector to the "ON" position.
5. Fill in the hostname or ip address, authentication port, LDAP Security, Auth DN, and Fetch DN.
    a. Optionally, enter the LDAP Username and Password in order to allow ProVision to import LDAP Contacts and sync LDAP contact information (see: Contact Manager)
6. Click "Test Server" to verify the connection.



Example values in this case would be:

- LDAP Enable: (Checked)
- LDAP Server Address: 52.240.195.12
- LDAP Port: 389 (or SSL/TLS port is 636)
- LDAP Security: None
- LDAP Auth DN: cn=%LOGIN%,ou=people,dc=6connect,dc=com
- LDAP Fetch DN: cn=%LOGIN%

Setting default login authentication options

In the login screen, you would select the authentication method from the dropdown. If you like, you can set the default login option in the following way:

Go to the /data/globals.php and open in vi (or other editor). Add in the following text as the last line of the file (before the closing ?>)

define('DEFAULT_LOGIN_TYPE', 'radius');

Acceptable values are "local", "radius" and "ldap". If this line is not present in globals.php, the default option is "local".

Using SSL encryption

To use SSL encryption with LDAP, the ldap.conf file must be correctly configured on the ProVision server.

Typically, the LDAP configuration file is kept at "/etc/ldap/ldap.conf". Make sure the following line is present:

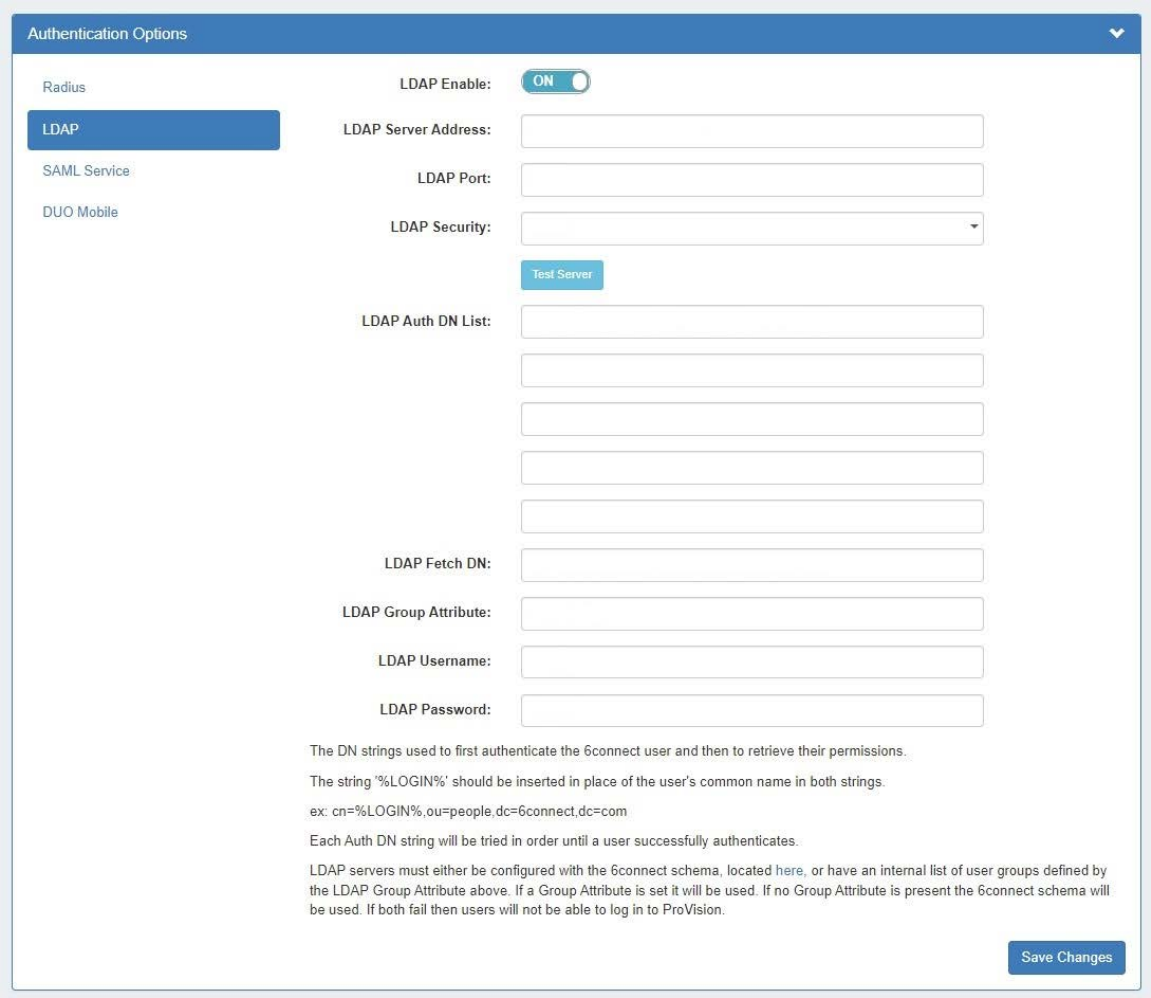
TLS_REQCERT allow

and restart the webserver.

Add or Update LDAP Settings

To add or update LDAP settings, go to the Settings Tab Admin to enter the Admin area of ProVision.

Then, click the "Authentication" sub-tab at the top of the Admin Settings page, and select "LDAP" from the "Authentication Options" module.



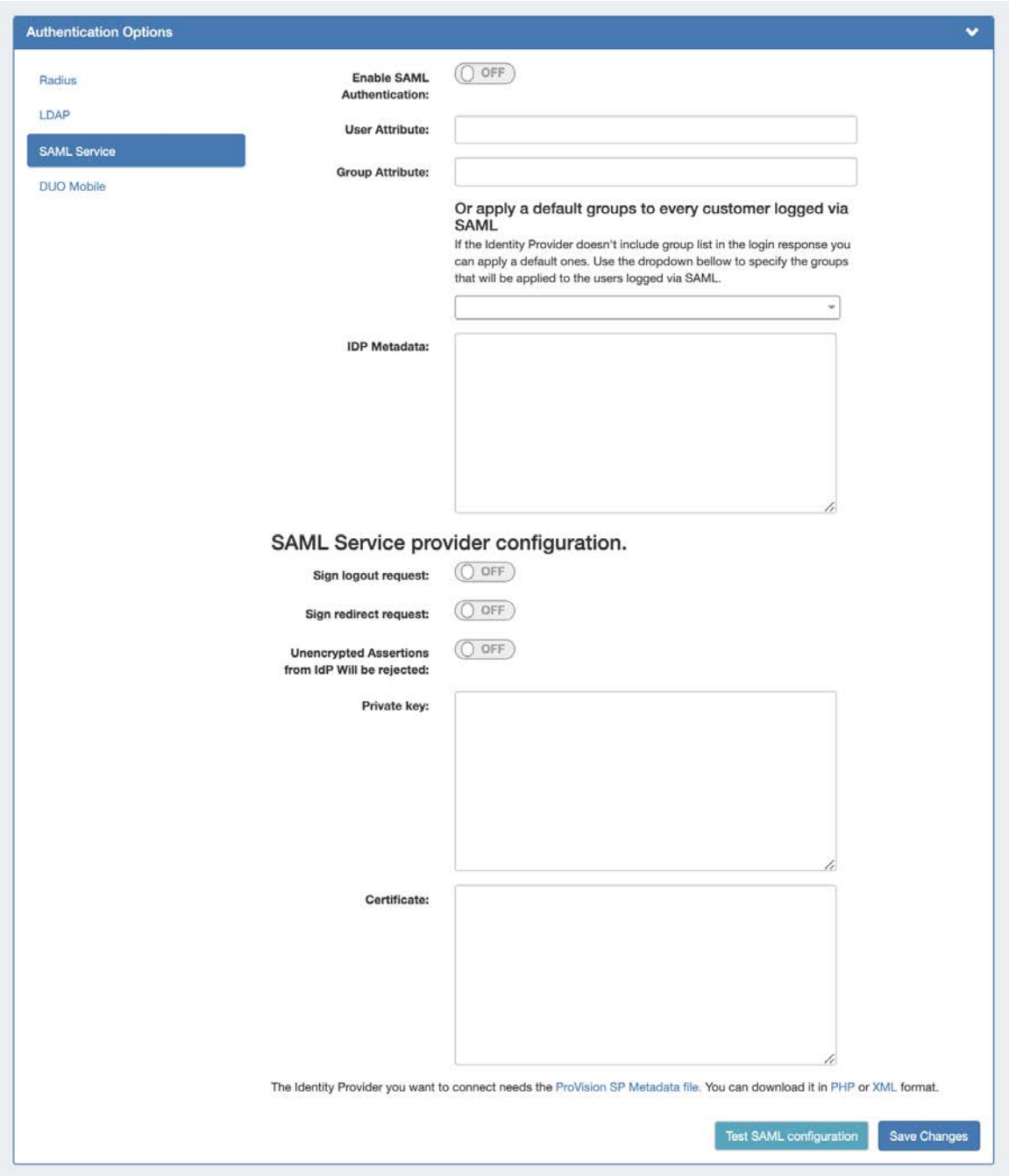
Enter or update the following settings:

- **LDAP Enable:** check the box to enable LDAP functionality.
- **LDAP Server Address:** Set the IP address of your LDAP server.
- **LDAP Port:** Set the port for your LDAP server
- **LDAP Security:** Select the security method of your LDAP server - SSL, TLS or None
- **Test Server:** Click to test the connection to the LDAP server.
- **LDAP Auth DN/Fetch DN:** These strings are used to first authentication the 6connect user and then to retrieve their permissions. The string '%LOGIN%' should be inserted in place of the user's common name both strings. (ex: cn=%LOGIN%,ou=people,dc=6connect, dc=com)
- **LDAP Group Attribute:** If using an internal list of user groups instead of 6connect groups, enter the attribute name for the LDAP groups here. If a Group Attribute is set, it will be used first, otherwise the 6connect schema will be used.
- **LDAP Username / LDAP Password:** Optionally, you may enter LDAP admin credentials to allow ProVision to import and sync LDAP contacts. See Contact Manager for details on LDAP contacts.
- **Mapping Permissions to 6connect schema:** To integrate 6connect permissions with your existing directory structure then you will need the 6connect schema. It should snap in with any existing LDAP structure and allow you to assign 6connect permissions to your existing users. You can download a copy of the schema from this section.

When done, you may optionally click "Test Server" to verify the connection to the LDAP server with the entered settings, then "Save Changes".

SAML Authentication

SAML Authentication



SAML is a Single Sign On (SSO) authentication method that uses an external identity provider to authenticate a user at their first login, saving a token to the user's browser that is then used for subsequent logins, so that the user does not need to re-submit credentials.

SAML Authentication options are accessed by clicking the "Authentication" sub-tab at the top of the Admin Settings page, then selecting "SAML Service" under the "Authentication Options" module.

- SAML Setup
  - Set up the IdP
  - Users and Permissions:
  - Configure SAML in ProVision
- SAML Login

- Initial Login:
- Subsequent Logins:

SAML Setup

Before configuring SAML in ProVision, you must have an account set up with an Identity Provider (IdP) and ProVision users / groups set up in the IdP:

Set up the IdP

To use SAML authentication, you will need SAML set up for your instance with an Identity Provider (IdP), such as *Microsoft ADFS, OneLogin, Elastic SSO,* or others. You can view a list of available SAML IdPs at Wikipedia's SAML based products page.

> **Note**
>
> Some identity providers (such as Workspace One) have additional public/private key authentication requirements in excess of what is required in ProVision.
>
> If you receive a SAML configuration error of "Unable to load private key" or similar, please check your IdP requirements and documentation.

Users and Permissions:

User credentials will need to be created and associated with ProVision permission group names via the IdP. All user creation, management and permissions handling occurs via the IdP, externally from ProVision.

Configure SAML in ProVision

ProVision setup for SAML is located in **Admin** **Admin Settings** Authentication Options.

Under **SAML Configuration**:

Enable SAML authentication by clicking the checkbox next to "Enable".

The following fields are required and will need to be obtained from the IdP:

- **User Attribute(Required):**
- **Group Attribute(Required):**
- **IdP Metadata(Required):**

Under **SAML Service Provider Configuration:**

- **Sign logout request:**
- **Sign redirect request:**
- **Unencrypted Assertions from IdP Will be rejected:**
- **Private Key:**
- **Certificate (Required):**

Links are provided below the configuration settings for the ProVision SP Metadata file in php and xml format, which will be needed to provide to the IdP.

You can test the configuration by clicking the "Test SAML Configuration" button, a new page will open giving health check information for your provided attributes.

SAML Login

Once the correct configuration has been established and users set up for SAML in the IdP, users will be able to use SAML logins.

> Documentation Note: Depending on the IdP used, some screens may appear different from what is shown here.

Initial Login:

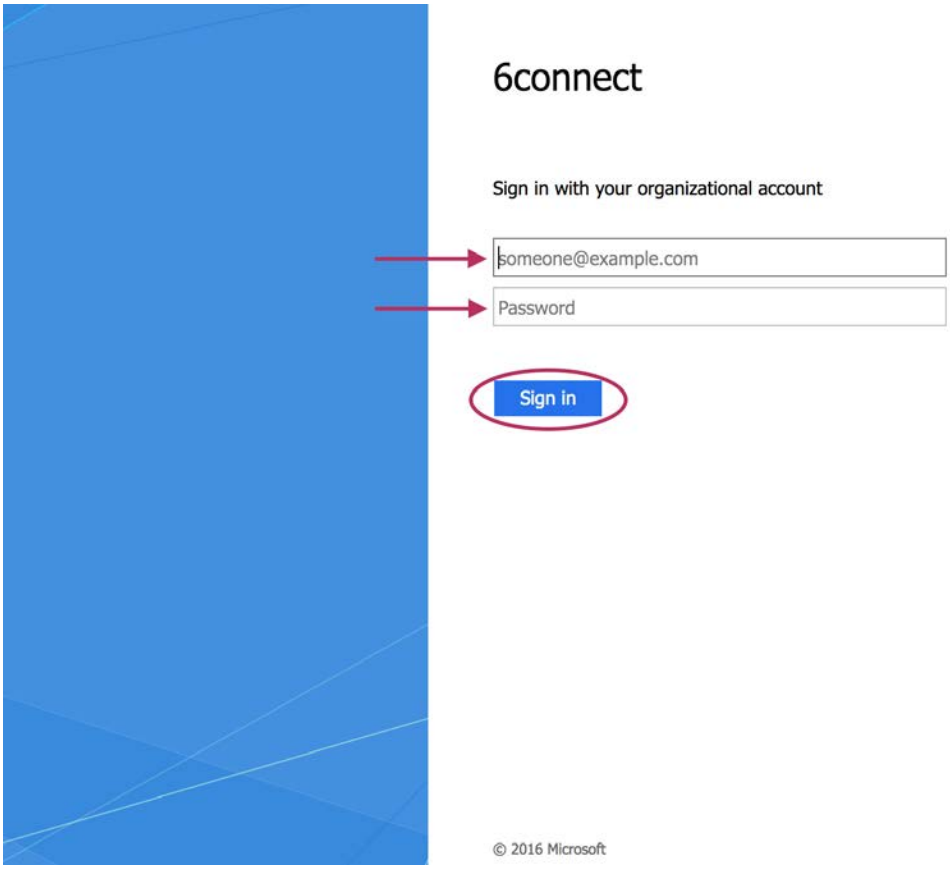
The initial login process occurs for the first time a user logs in, and anytime afterwards if the browser token is not present (e.g., cookies are cleared from the browser, the browser closed, or a new browser is used).

From the ProVision login page, select SAML from the authentication options dropdown - you do not need to enter Username or Password.



You will be redirected to the IdP site as set up in the Admin Configuration - here, we are using Microsoft ADFS (Active Directory Federation Services).

Log into the IdP site using your SAML credentials, and click "Sign In".



If the sign in is successful, you will be logged into the ProVision home page.

Subsequent Logins:

After the initial login via the IdP (as long as the auth token is present) users will be able to login to ProVision simply by selecting the "SAML" options from the ProVision login page without entering credentials.



The auth token may be destroyed or not available if browser cookies have been cleared, a different browser used, or the browser fully closed, depending on security settings. In these cases, the user will need to sign in again via the IdP.

Setting default login authentication options

In the login screen, you would select the authentication method from the dropdown. If you like, you can set the default login option in the following way:

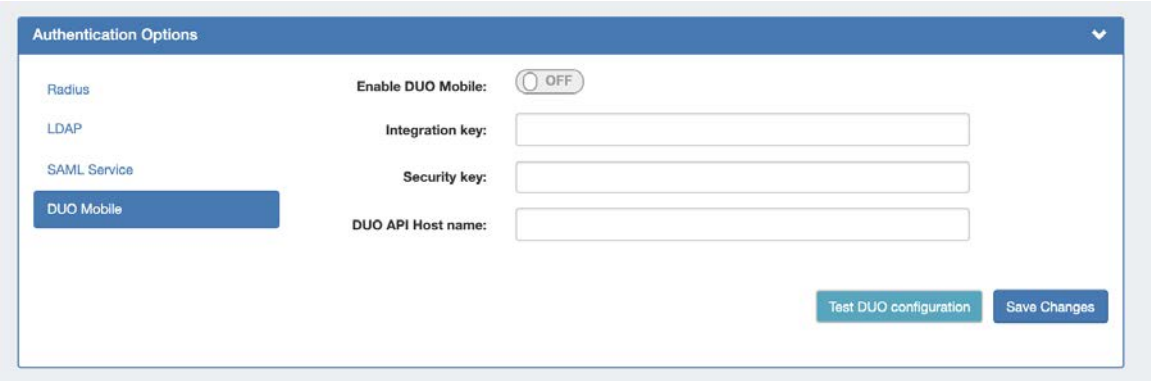
Go to the /data/globals.php and open in vi (or other editor). Add in the following text as the last line of the file (before the closing ?>)

define('DEFAULT_LOGIN_TYPE', 'saml');

Acceptable values are "local", "radius", "ldap" and "saml". If this line is not present in globals.php, the default option is "local".

DUO Authentication

DUO Mobile Authentication

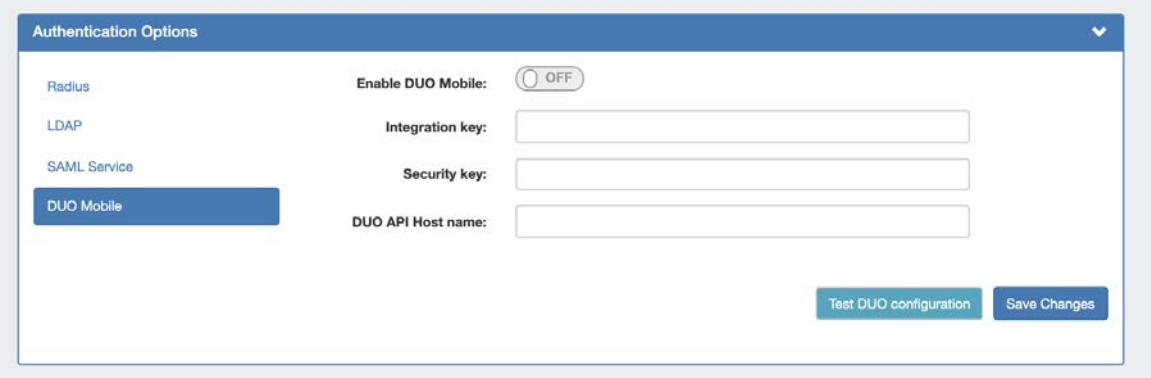


DUO Mobile may be used with ProVision to use two factor authentication with mobile devices. To use DUO Mobile in ProVision, you must first have a DUO account.

Once you have an account, settings may be accessed from the "Authentication" sub-tab at the top of the Admin Settings page, by clicking "DUO Mobile" under "Authentication Options".

- DUO Mobile Settings
- Disable DUO Mobile

DUO Mobile Settings



To use DUO Authentication, an account must first be set up with DUO.

Once an account is set up, obtain the following information:

- **Integration Key,**
- **Security Key, and**
- **DUO API Host name**

Enter those items into **Admin** **Authentication Options** DUO Mobile Configuration, and click "Save Changes" to save your changes.

You may also test the current configuration by clicking "Test DUO Configuration".

Disable DUO Mobile

DUO Mobile may be disabled from the GUI by turning the "Enable Duo Mobile" toggle to "OFF".

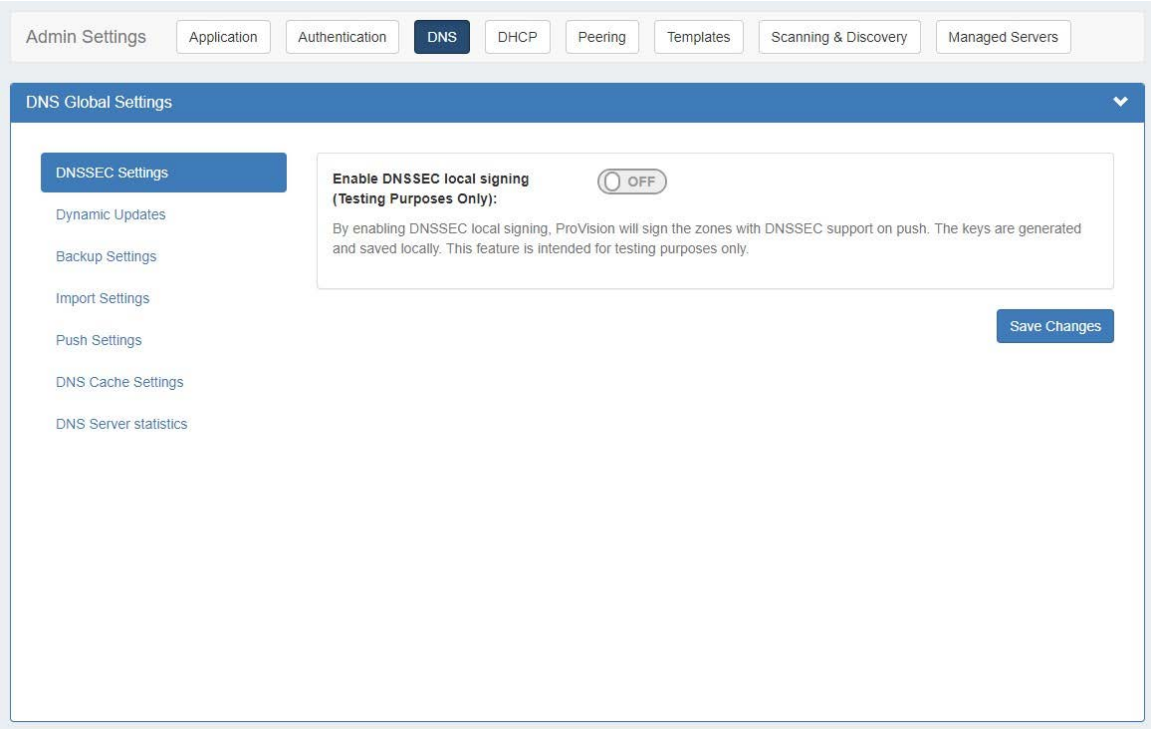
If you need to disable DUO Mobile authentication from ProVision from outside of the GUI (such as in an accidental enable), a command-line disable tool is available.

Run:

```
php tools/disable_duo.php
```

DNS Settings

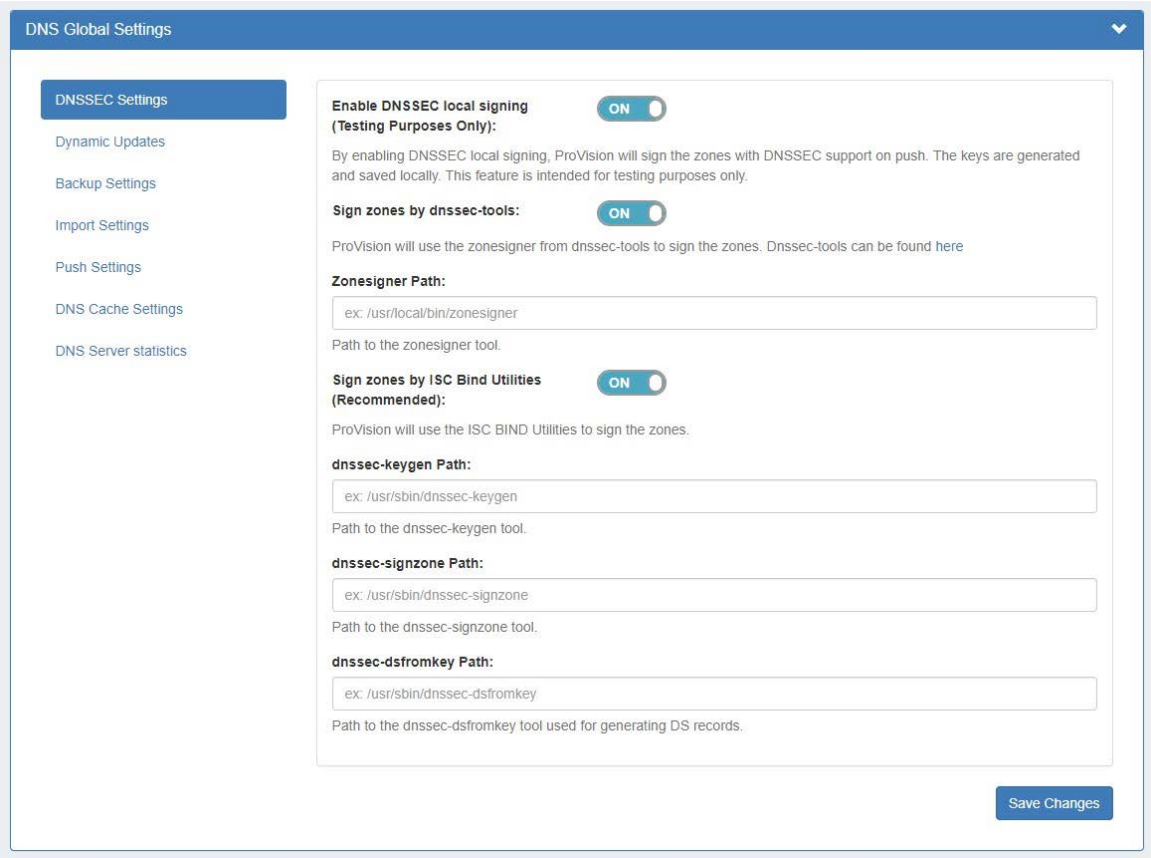
DNS Settings



DNS Settings are accessed by clicking the "DNS" sub-tab at the top of the Admin Settings page. DNS Settings are used to support various DNS functions, including DNSSEC, Dynamic updates, backup settings, push settings, DNS cache settings, and DNS server statistics.

- DNSSEC Settings
- DNS Dynamic Update Settings
- DNS Backup Settings
- DNS Import Settings
- DNS Push Settings
- DNS Cache Settings
- DNS Server statistics
- Additional Details:

DNSSEC Settings



If using DNSSEC, select whether to enabled DNSSEC local signing, or sign zones by dnssec-tools, then enter the following information:

zonesigner path : Enter the zonesigner path that will be used for DNS. Zonesigner is required if dnssec-keygen and dnssec-signzone are not set.

Sign zones by ISC BIND Utilities: Select whether to use ISC BIND utilities to sign zones.

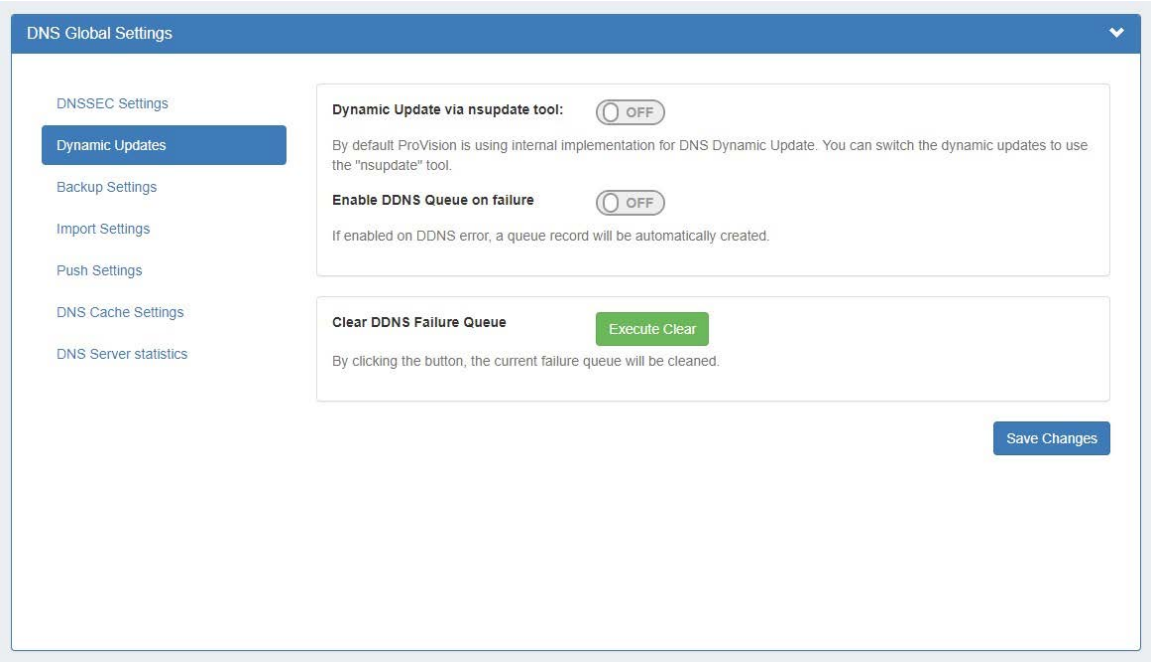
dnssec-dsfromkey path : Enter the dnssec-dsfromkey path that will be used for DNS. Required in all cases.

Additional Entropy

If delays occur due to lack of available entropy on servers, see the following article on how to set up additional entropy using haveged here:

https://www.digitalocean.com/community/tutorials/how-to-setup-additional-entropy-for-cloud-servers-using-haveged

DNS Dynamic Update Settings

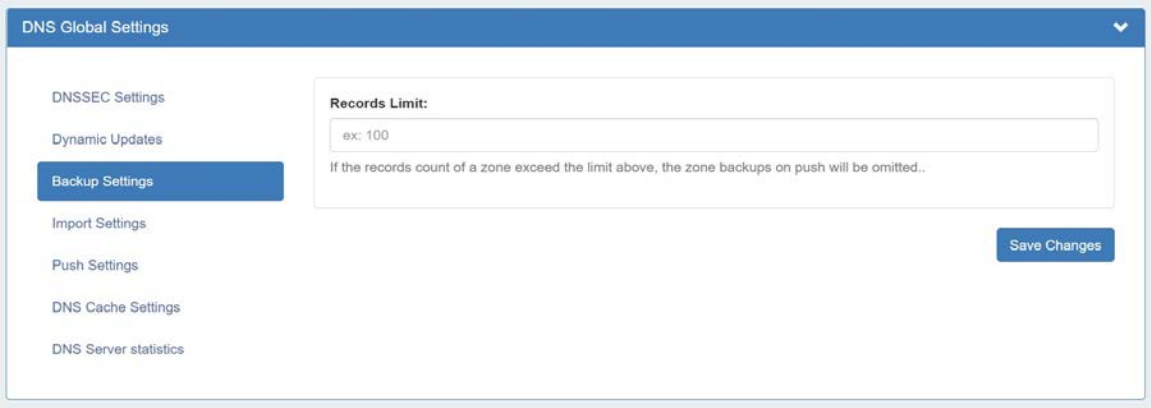


Dynamic Update via nsupdate: Toggle to "On" if you wish to use Dynamic Updates via nsupdate, instead of ProVision's internal implementation.

Enable DDNS Queue on failure: Toggle to "On" if you wish to enable the automatic creation of a queue record on DDNS error.

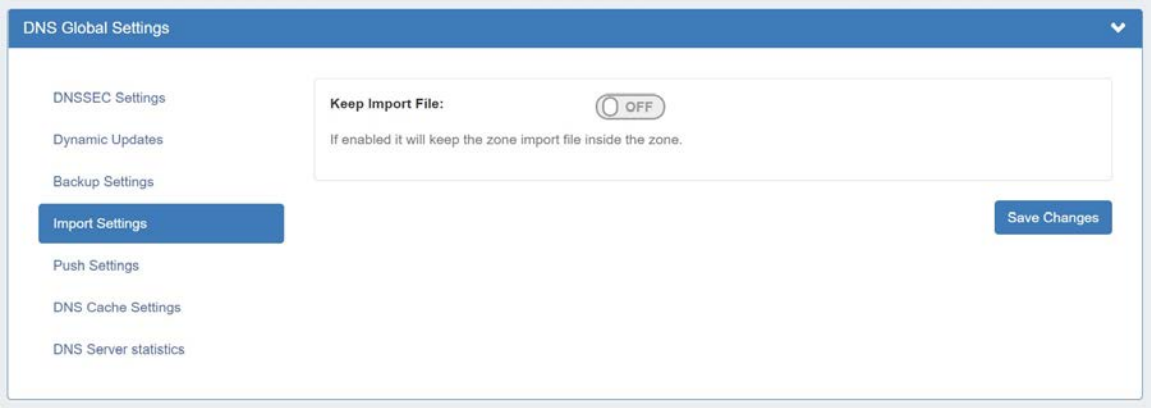
Clear DDNS Failure Queue: Clears the current DDNS failure queue.

DNS Backup Settings



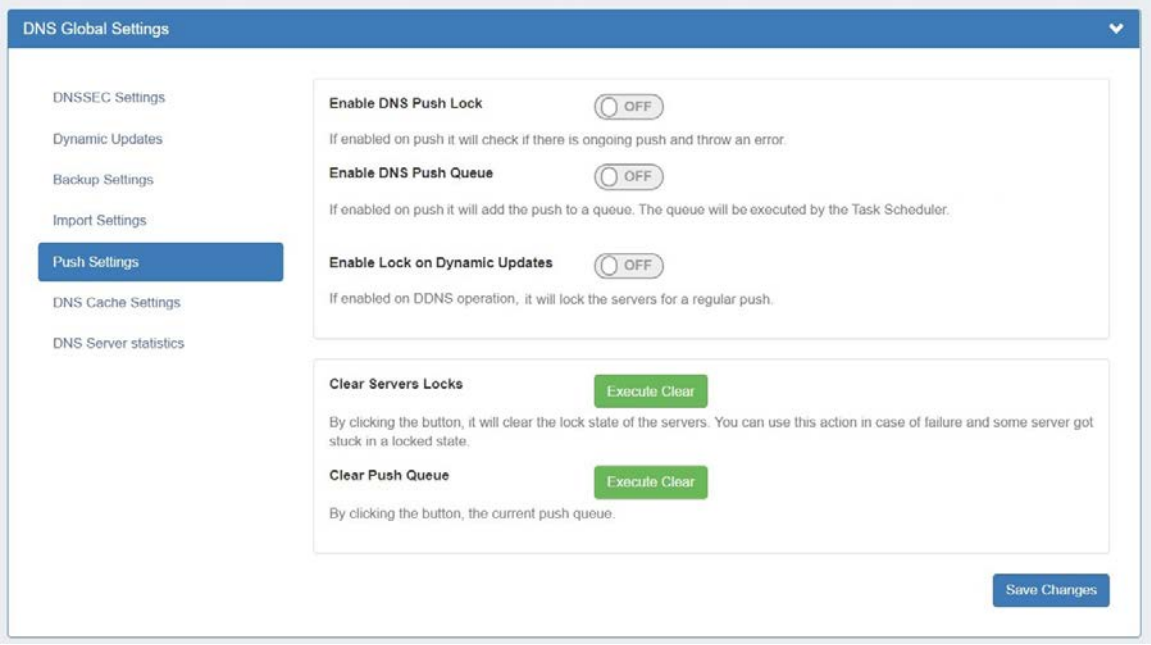
Records Limit : The limit for the number of records a zone may have for a zone to process a backup. If the records count exceed this number, zone backups will be omitted at zone push.

DNS Import Settings



Keep Import File: Toggle to "on" if you wish to retain the zone import file inside the zone.

DNS Push Settings



Enable DNS Push Lock: If enabled on push, ProVision will check if there is ongoing push and throw an error.

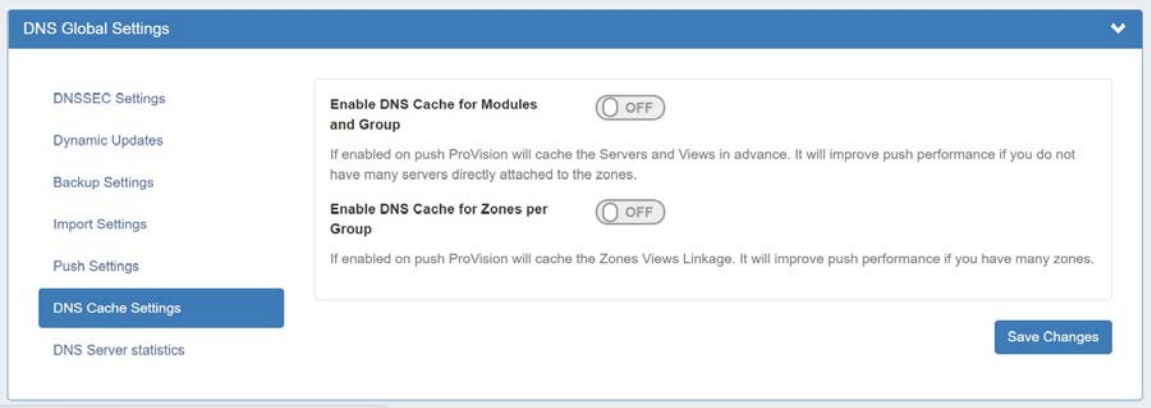
Enable DNS Push Queue: If enabled on push, ProVision won't throw an error, but will add the push to a queue. The queue will be executed by the Task Scheduler.

Enable Lock on Dynamic Updates: If enabled on DDNS operation, ProVision will lock the servers for a regular push.

Clear Servers Locks: Clears the lock state of the servers.

Clear Push Queue: Clears the current push queue.

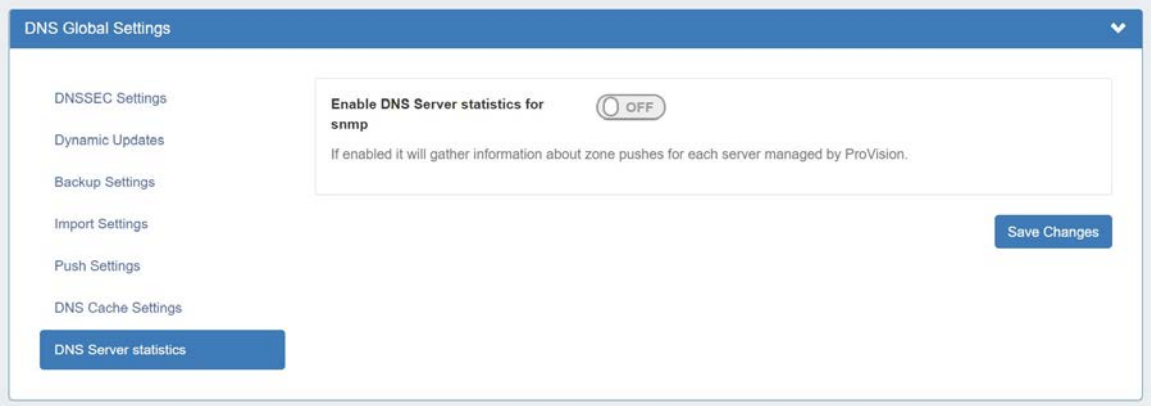
DNS Cache Settings



Enable DNS Cache for Modules and Group: Toggle to "on" prior to push if you wish to cache the servers and views in advance.

Enable DNS Cache for Zones per Group: Toggle to "on" prior to push if you wish to cache the Zones Views Linkage.

DNS Server statistics



Enable DNS Server statistics for snmp: Toggle to "on" and it will gather information about zone pushes for each server.

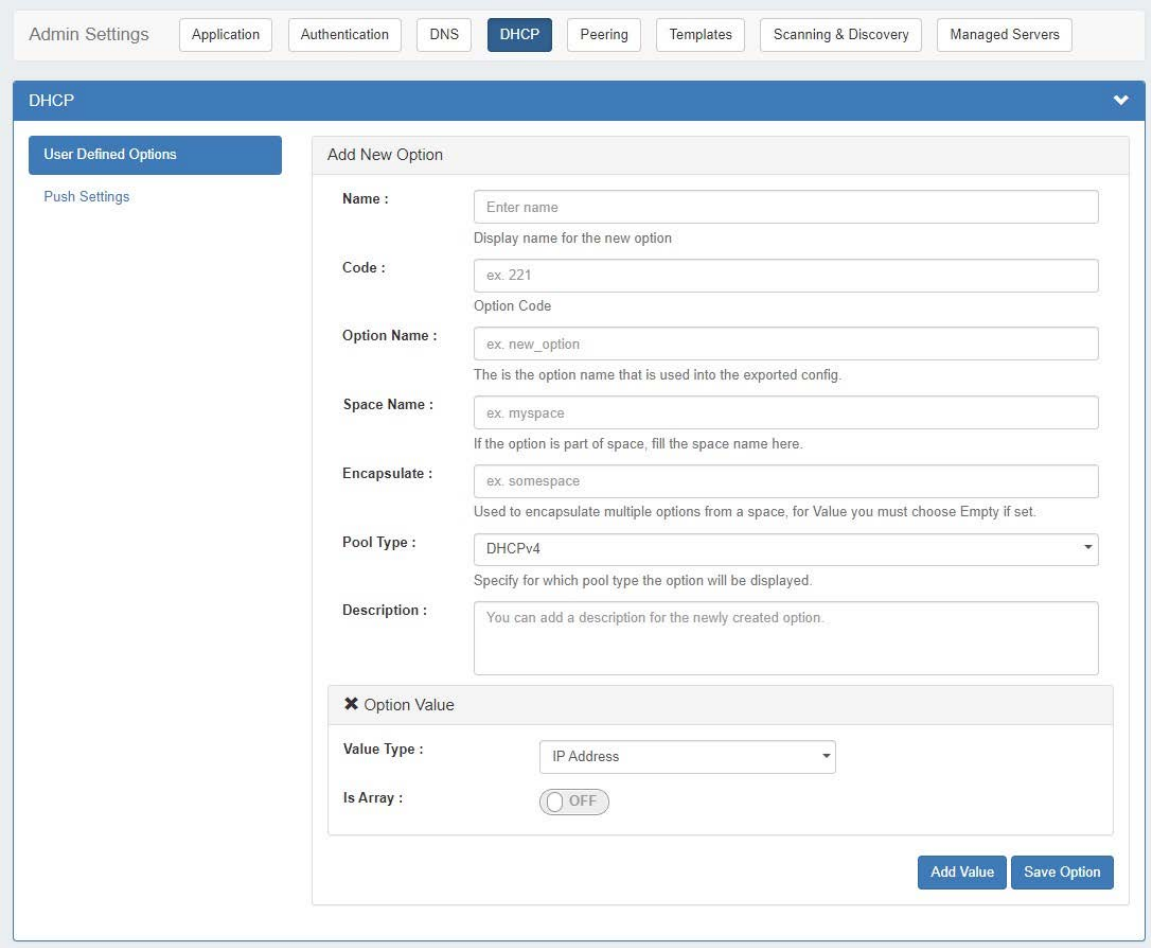
Additional Details:

For details on working with DNS, see the following areas:

- DNS Tab
- DNS Administration

DHCP Settings

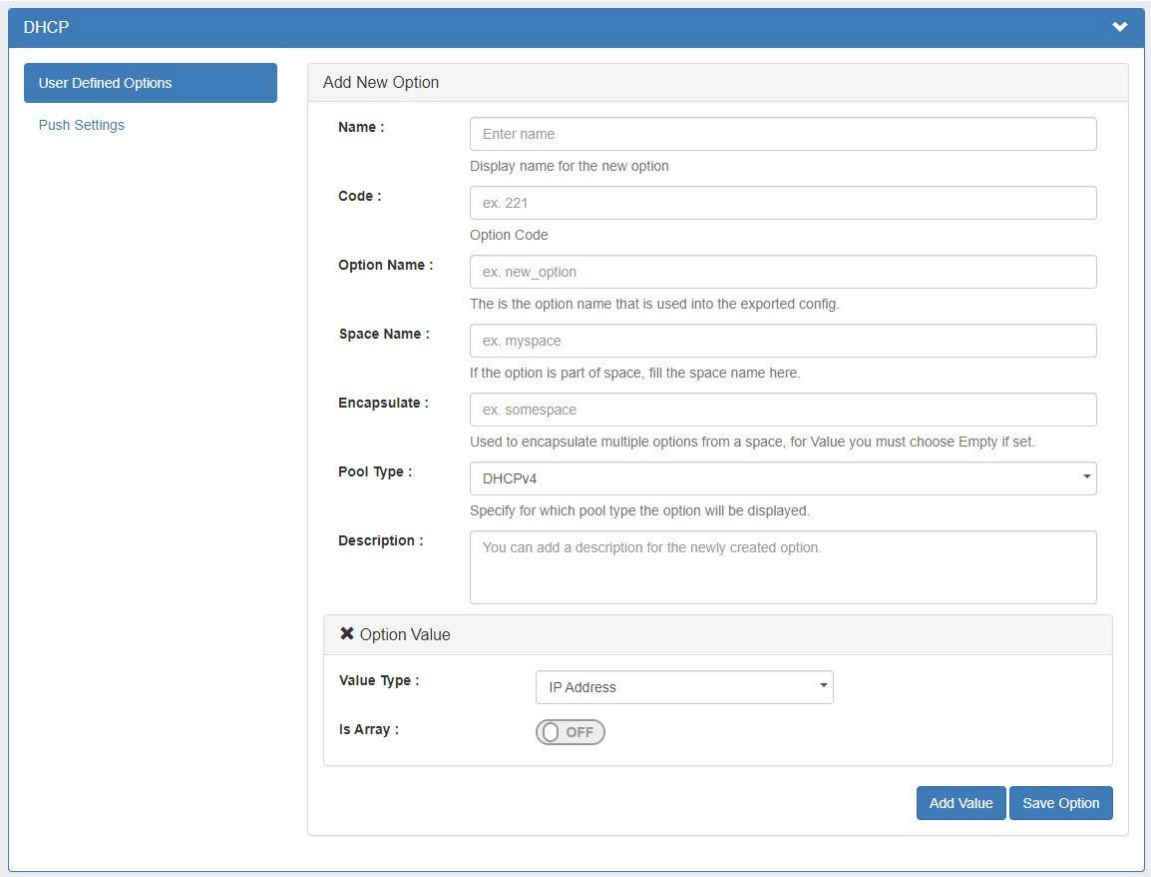
DHCP Settings



DHCP Settings are accessed by clicking the "DHCP" sub-tab at the top of the Admin Settings page. DHCP Settings are used to support various DHCP functions, including User Defined Options and Push Settings.

- DHCP User Defined Options
- DHCP Push Settings
- Additional Details

DHCP User Defined Options



Add New Option: Users can configure their own custom DHCP Options.

DHCP Push Settings



Maximum timeout for Pre/Post command execution in seconds: Set the maximum timeout for Pre/Post command execution.

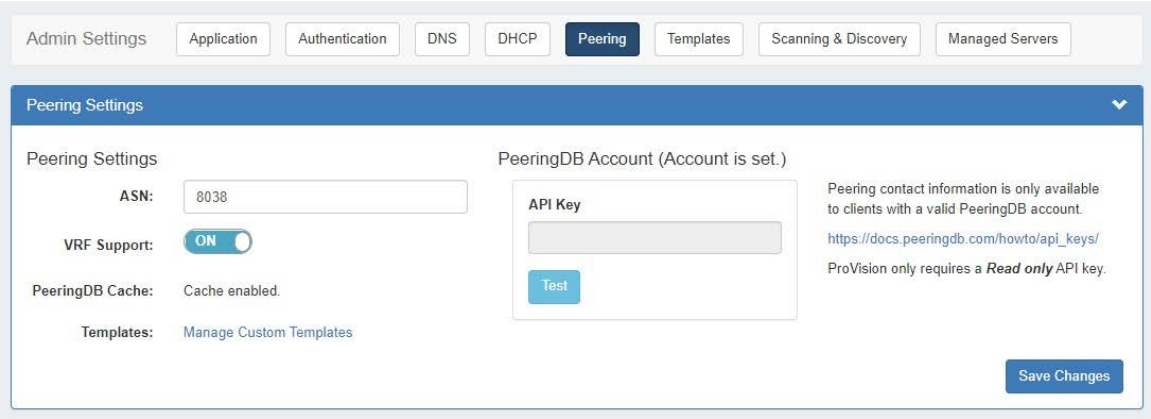
Additional Details

For details on working with DHCP, see the following areas:

- DHCP Tab
- DHCP Administration

Peering Settings

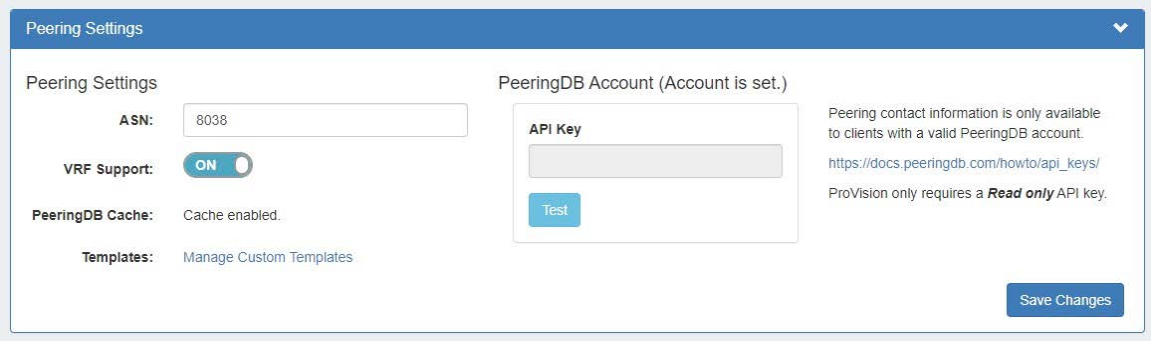
Peering Settings



Peering Settings are accessed by clicking the "Peering" sub-tab at the top of the Admin Settings page.

- Peering Settings
- Additional Information

Peering Settings



ASN : Enter the ASN(s) that will be used for Peering, or may leave blank. Separate multiple ASNs with a comma.

VRF Support: Check to enable adding the VRF gadget to the router Section. Currently, only supports Cisco routers.

PeeringDB Cache: Displays a status notification to show whether Peering DB cache is enabled or disabled.

Templates: Create or manage custom Peering Templates.

PeeringDB Account: PeeringDB account information is required to retrieve and update peering information. Enter a valid PeeringDB API Key. When done, click the "Test" button to verify the account, and save.

> ProVision only requires a ***Read Only*** API Key. For information on PeeringDB API keys, please refer to: https://docs.peeringdb.com/howto/api_keys/

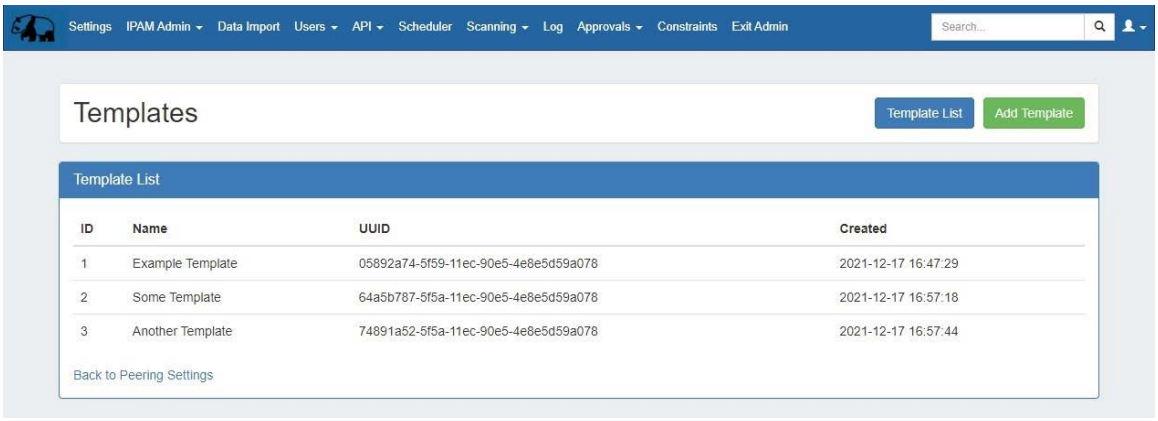
Additional Information

For additional information on working in Peering, see the following pages:

- Peering
- Peering Templates

Peering Templates

Peering Templates



Peering Templates allow users to create their own reusable session configuration files. When the default ProVision session configuration template doesn't do everything required for your specific use case, you can create your own template that does. Revisions to Peering Templates are tracked, and a template may be reverted to a previous version at any time.

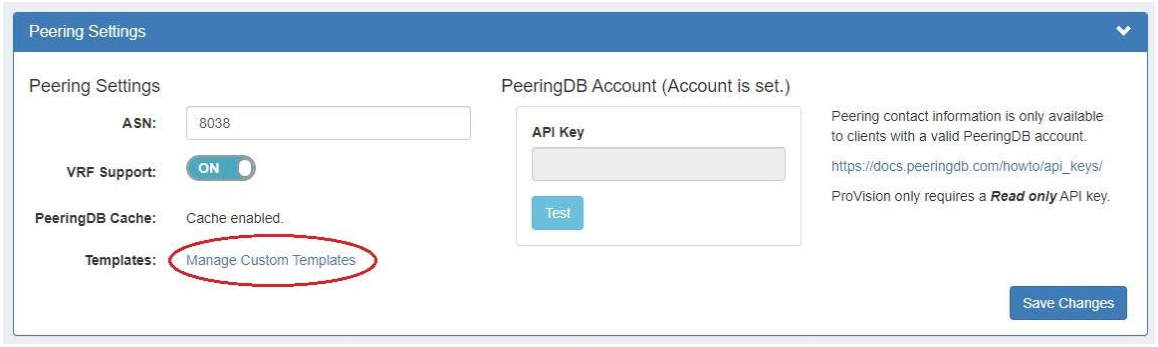
Peering Templates are accessible to Admin users from the **Admin Settings Peering** page, under Peering Settings.

- Viewing Templates
- Add a Template
- Delete a Template
- Edit a Template
    - Syntax
- Preview Template
- Template Revisions
- Additional Information:

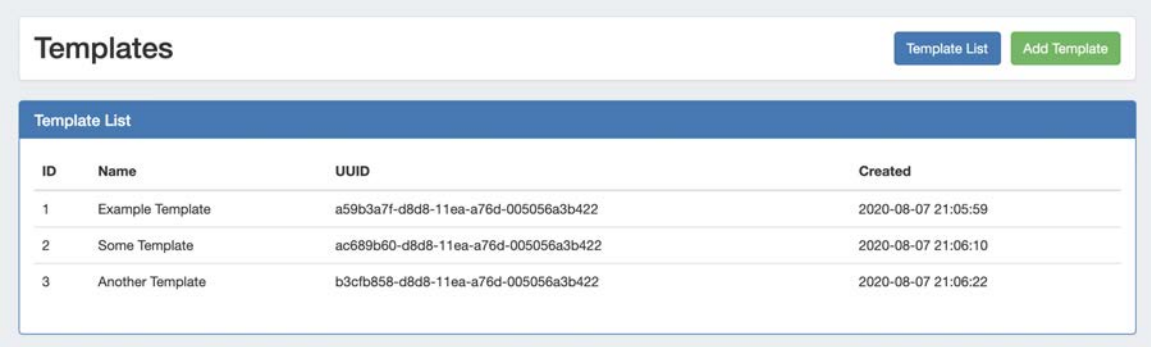
Viewing Templates

View the Template List by navigating to the **Admin Settings** page, in the Admin area of ProVision. From there, click the "Peering" sub-tab button at top to view Peering Settings.

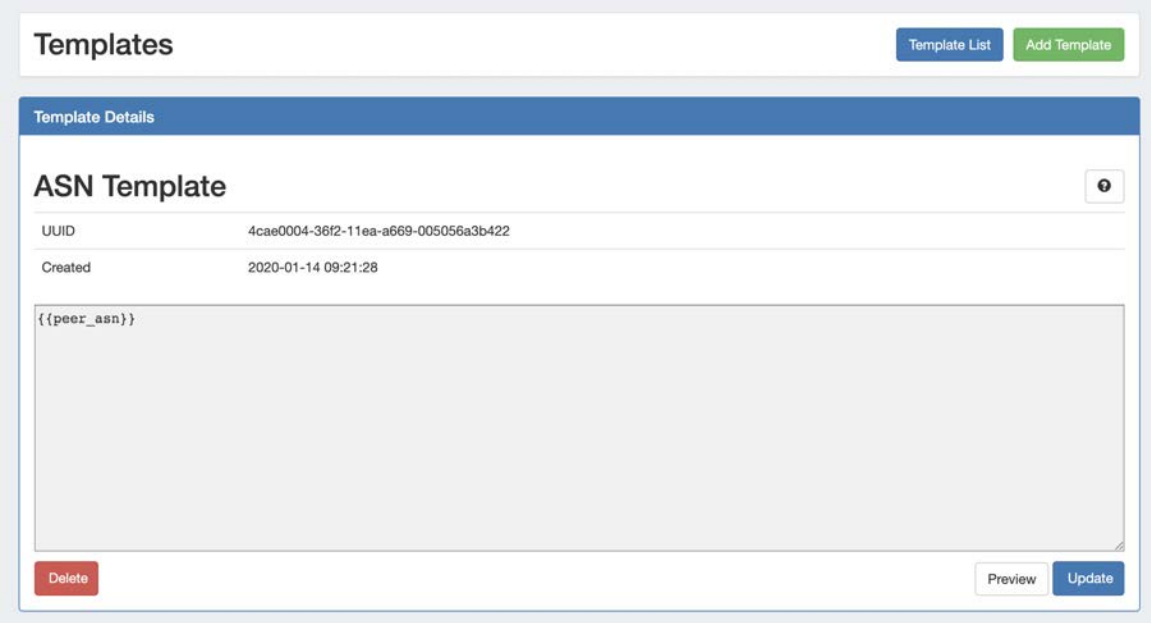
Next to "Templates", click "Manage Custom Templates".



The Template List will open, displaying all existing Peering Templates.



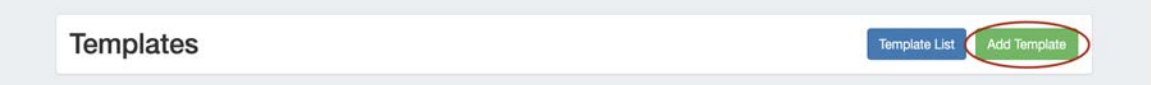
Click on any template to open Template Details, where you can edit, delete, or preview the template.



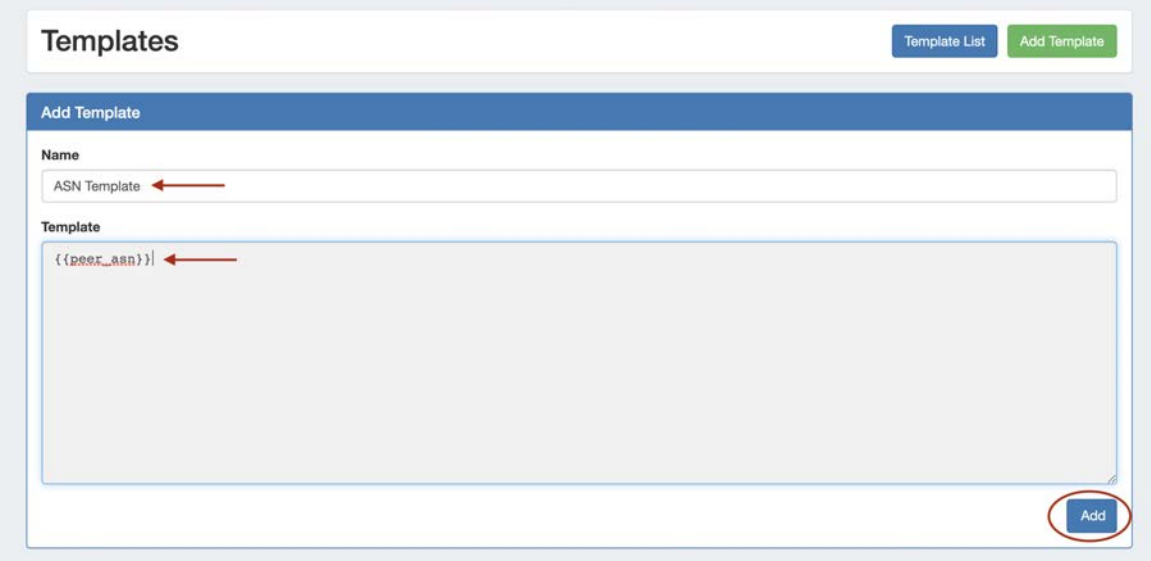
To return to the Template List, click the "Template List" button at the top right of the page.

Add a Template

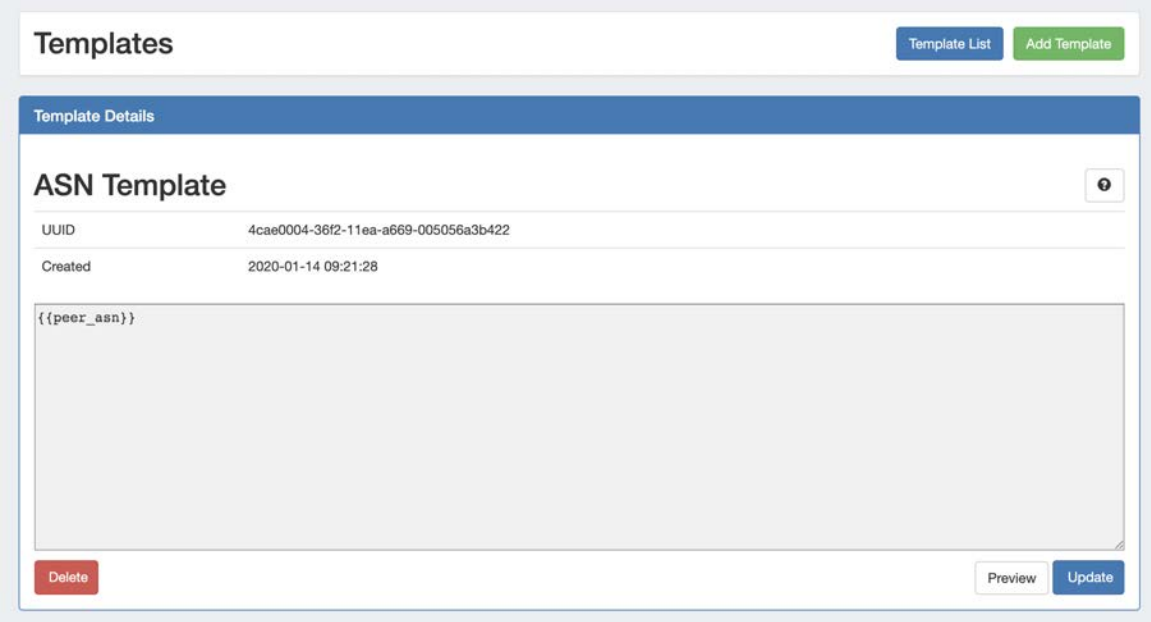
From any page in the Peering Templates area, click the "Add Template" button on the right side of the page header to start a new template.



In the Add Template form, enter a name for the template and the template body. When complete, click "Add".



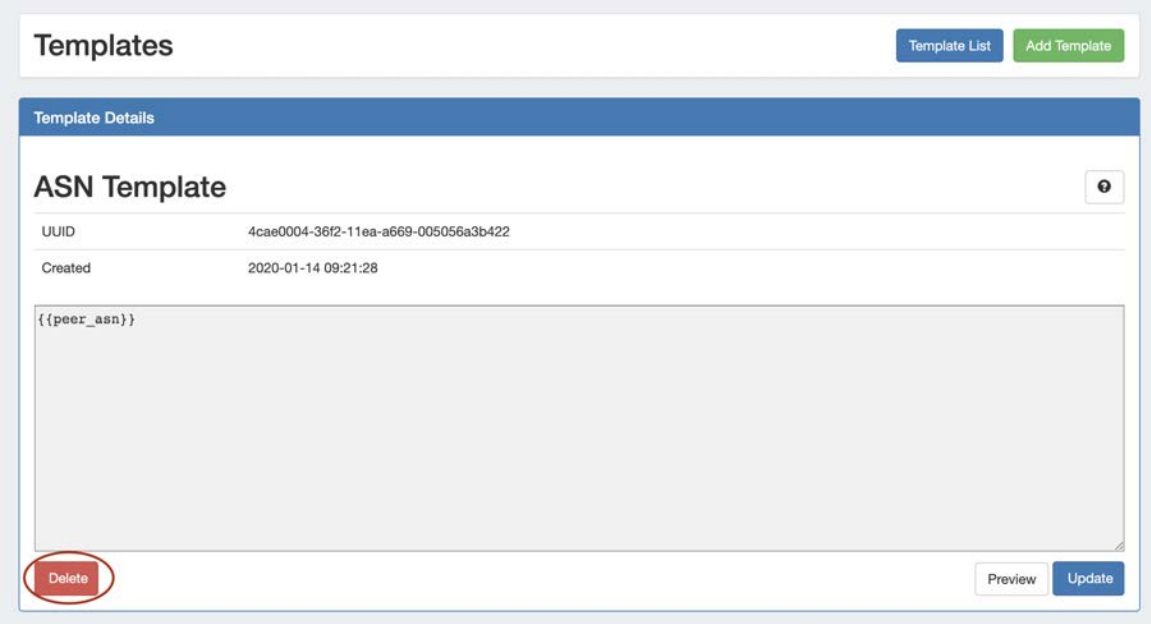
The "Template Details" view displays for the newly created template, here you can update, preview, or delete the template.



The "Revision History" section is available at the bottom of the page in this view, but will only display data if previous updates have been made to the template.

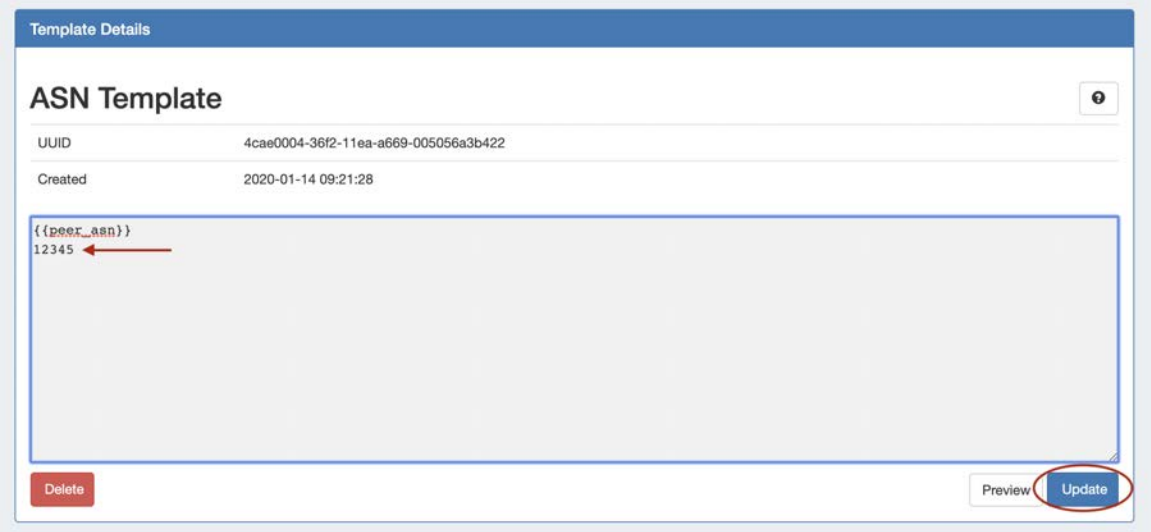
Delete a Template

From the Template Details view for the desired template, click the "Delete Button". Note: The deletion is immediate and permanent - use with care!



Edit a Template

From the Template Details view, edit the template by clicking inside the template body and typing the desired changes - if you need a reminder as to syntax or variables, click the help icon (Question Mark button) at top right to open the template editing guide.



Click "Update" when done.

Syntax

Templates use the Mustache format https://mustache.github.io/mustache.5.html

Template Syntax

Basic Variables

Values on the session object are inserted when referenced by double curly braces {{ }}

```
The router name is {{router_name}}
```

When given a session object with `{router_name:'TheName'}` the line becomes

```
The router name is TheName
```

If / If-Not statements

To only include a block (or part of a line) if a variable exists, enclose that part of the template starting with `{{#variable}}` and ending with `{{/variable}}`

```
{{#color}}The color is {{color}}.{{/color}}
{{#city}}
The city is {{city}}.
{{/city}}
```

When given `{color:'blue'}` the output will be

```
The color is blue.
```

To only include a block if a variable does *not* exist, start with `{{^variable}}` and end with `{{/variable}}`

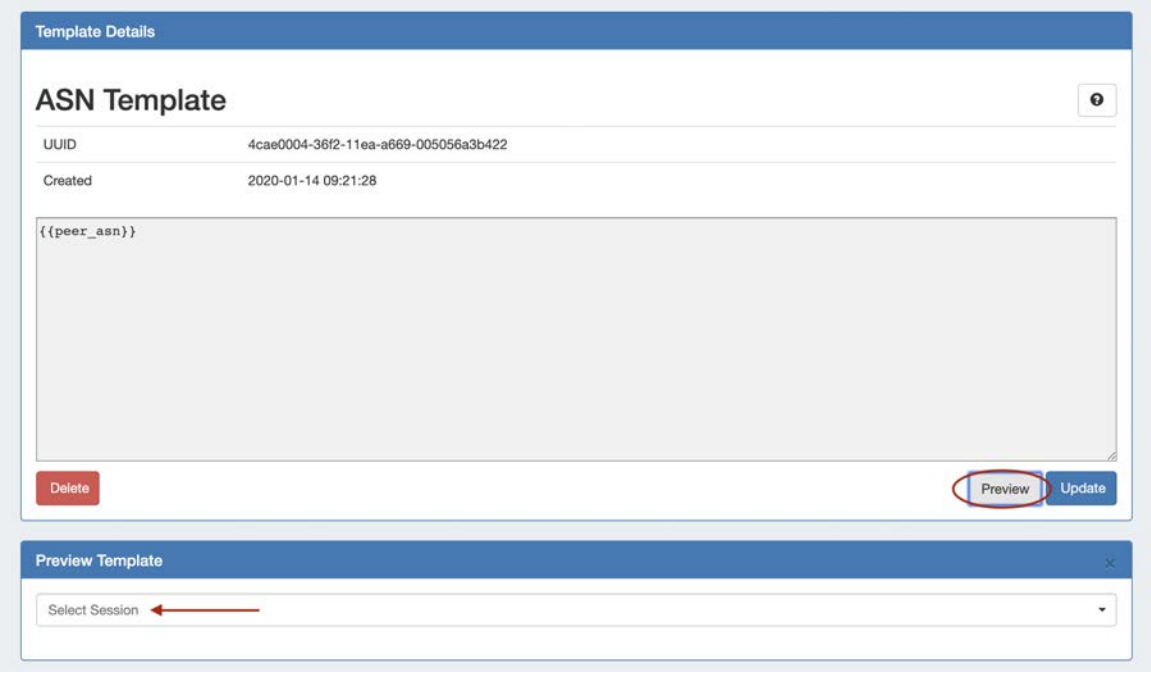
Common Variables

- source_asn
- vrf
- type_ipv6
- peer_ipaddr
- peer_asn

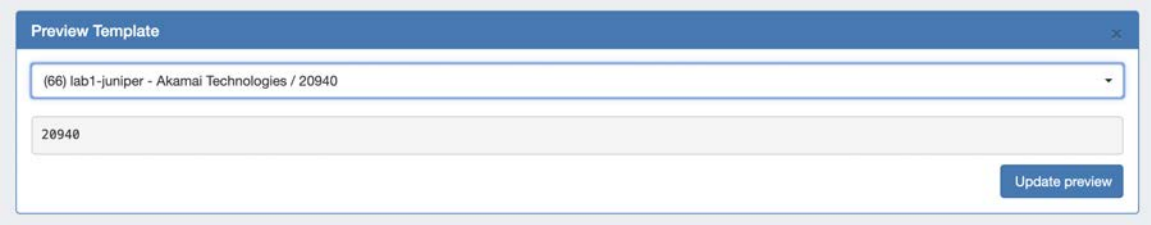
- peer_group
- peer_name
- ttl
- prfx_max
- prfx_alert_threshold

Preview Template

While editing or viewing a template, you may preview the template's output against a specific session by clicking the "Preview" button. A "Preview Template" section appears.

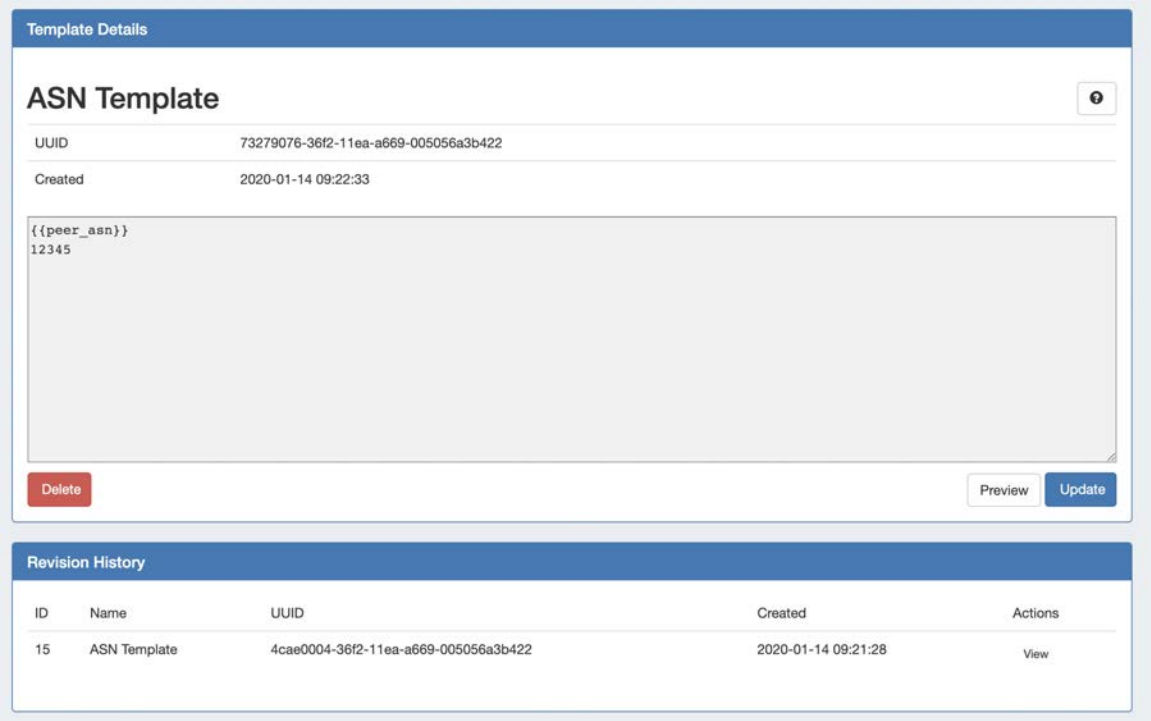


Select an existing Router/Session from the dropdown list to use to generate the preview. Once selected, the template output will display directly underneath the selected session.



Template Revisions

The Revision History area will display on the Template Details page after an update has been made to the template, with each update displaying as a separate revision item.



Click "View" under the "Actions" columns for a revision to see the template contents at that revision snapshot.



To restore the template back to that revision number, click the "Restore" button for the revision preview.

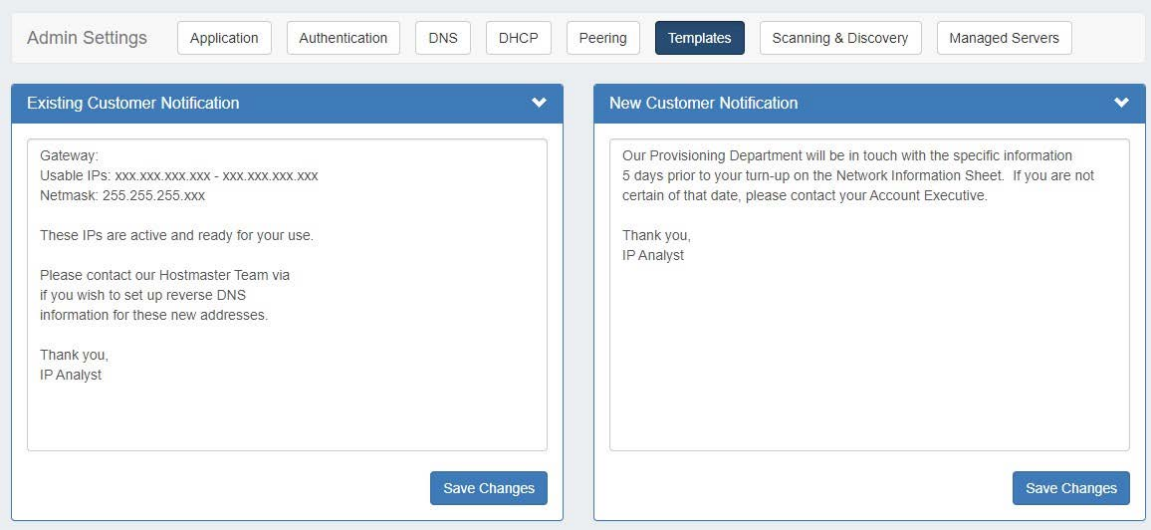
Additional Information:

For additional information on Peering, see the following areas:

- Peering Exchanges
- Peering Routers
- Peering Sessions
- Managing Peers
- Peering Emails

Template Settings

Email Templates



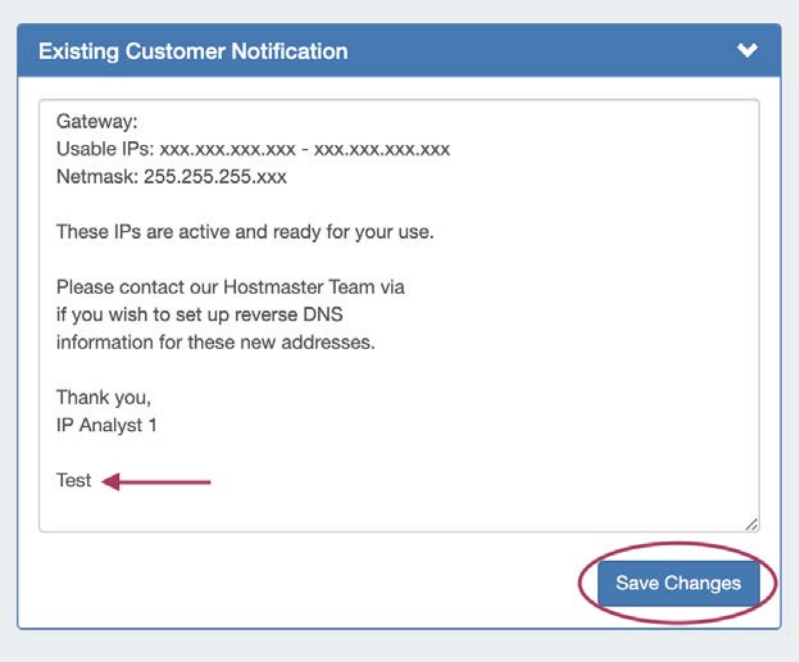
Email Templates are accessed by clicking the "Templates" sub-tab at the top of the Admin Settings page, and is where you can edit outgoing email templates for IP block assignments.

Two templates are available: An "Existing Customer Notification", and a "New Customer Notification".

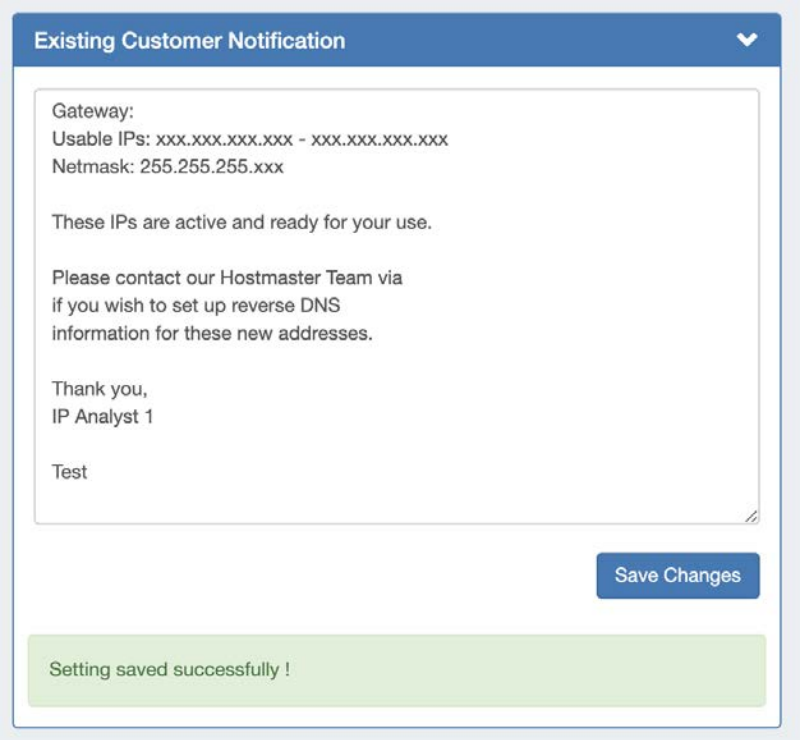
- Email Templates
  - Edit a Template
  - Use a Template

Edit a Template

To edit a template, click inside the text area box, make the desired changes, then click the "Save Changes" button.



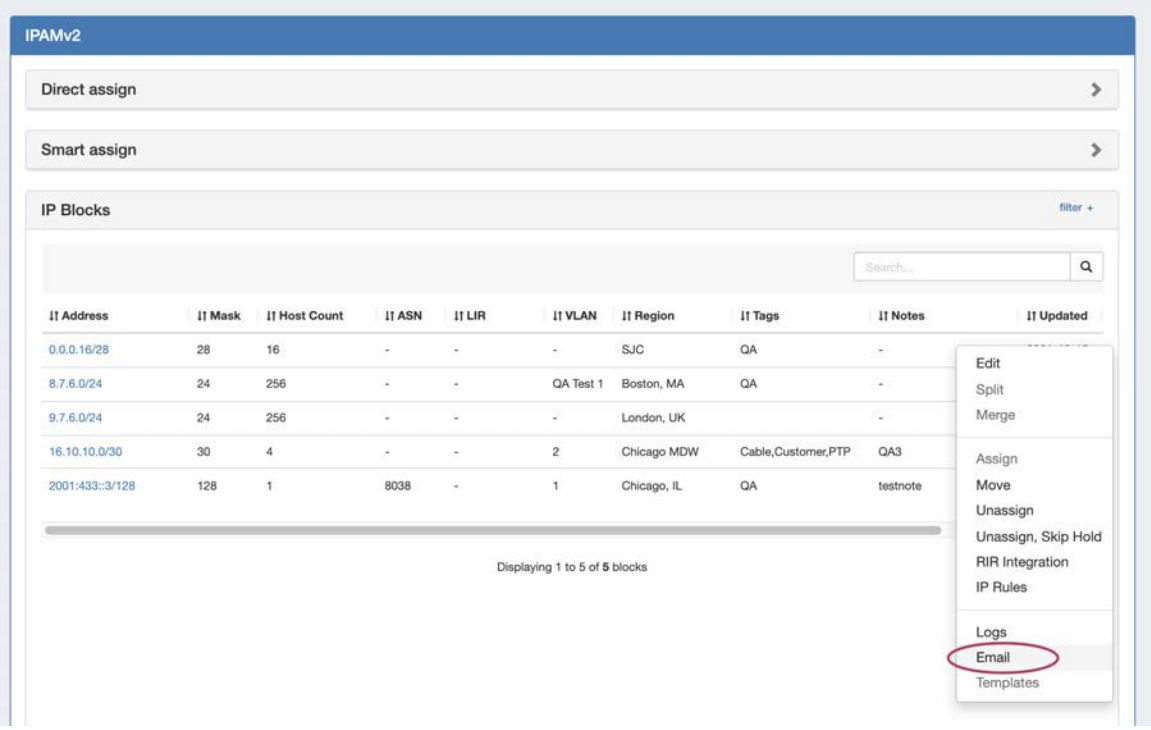
A success message will appear to confirm that your changes have saved.



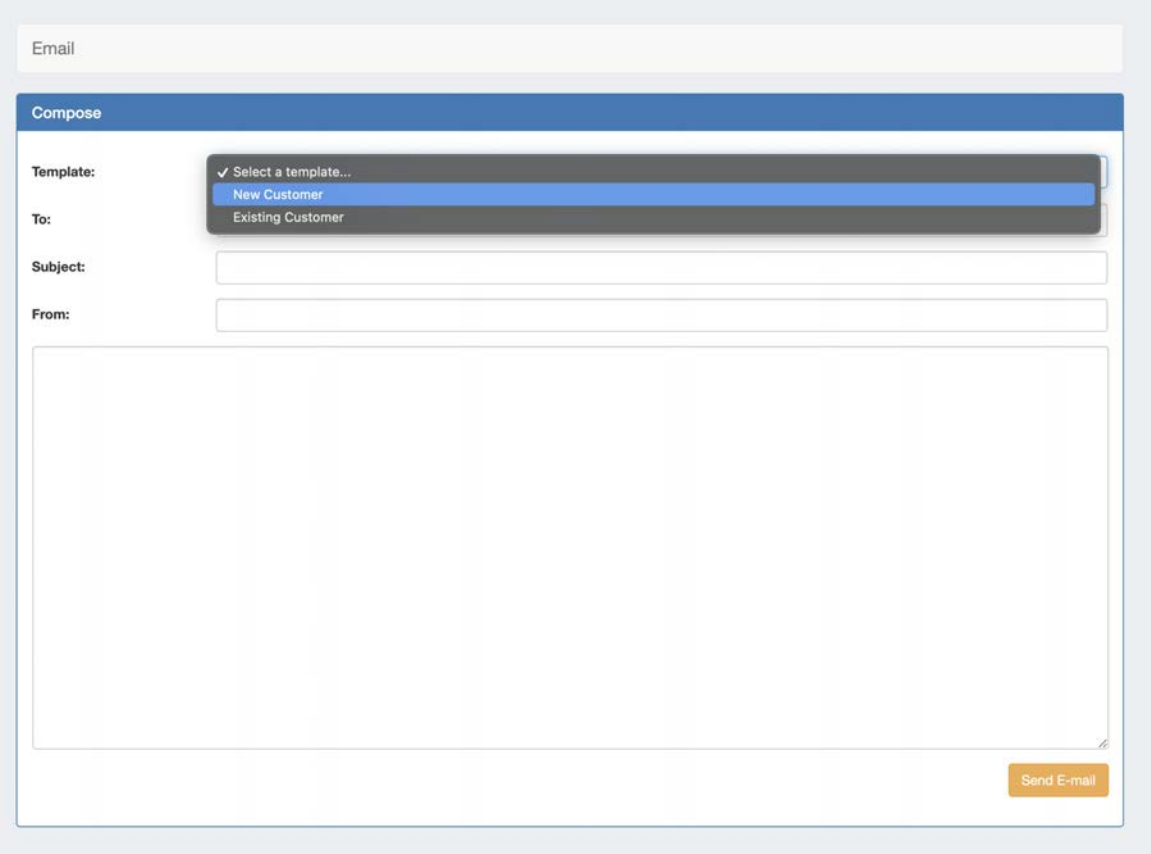
Use a Template

Templates are accessible when selecting the "Email" option from the action menu in either IPAM Manage or the IPAM Gadget, when a contact is associated with the resource.

Select "Email" from the action menu for an assigned block.



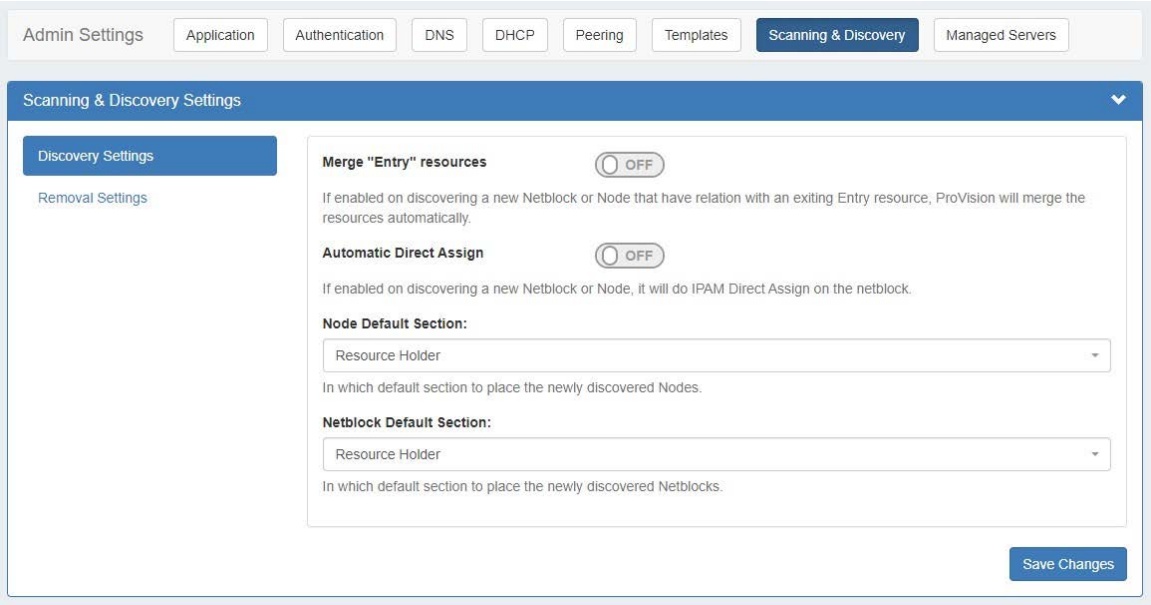
The Email page will open. It will automatically be addressed to the resource's associated contact. Next to "Template", select which template to use, and the email will populate with the selected template text.



Edit the template text as desired for the specific email, and when done, click "Send E-mail".

Scanning and Discovery Settings

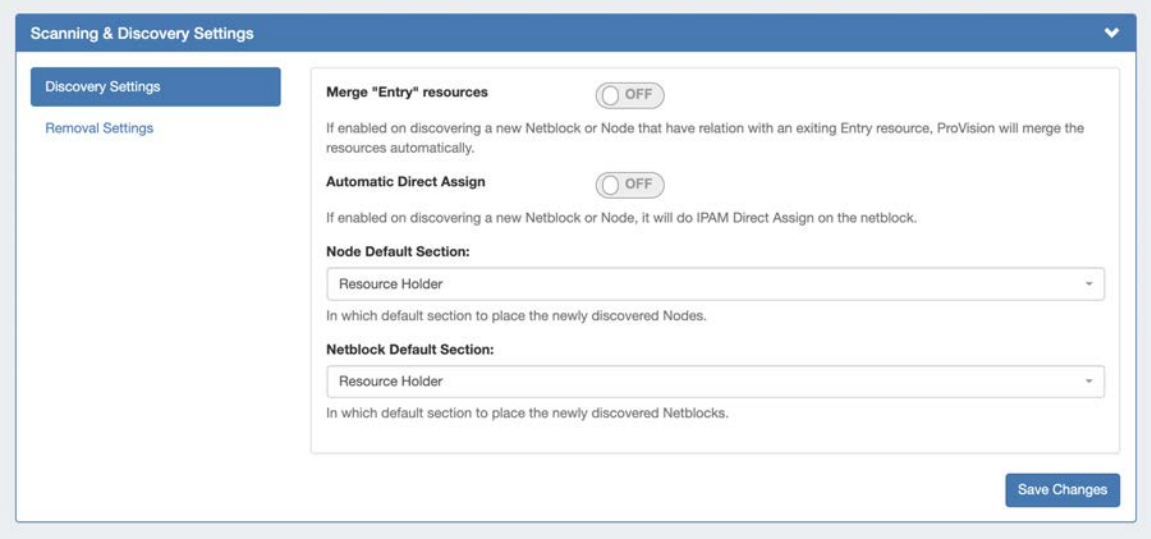
Scanning & Discovery Settings



Scanning & Discovery settings are accessed by clicking the "Scanning & Discovery" sub-tab at the top of the Admin Settings page, and are used to support the Scanning tab for local installations.

- Discovery Settings
- Removal Settings

Discovery Settings



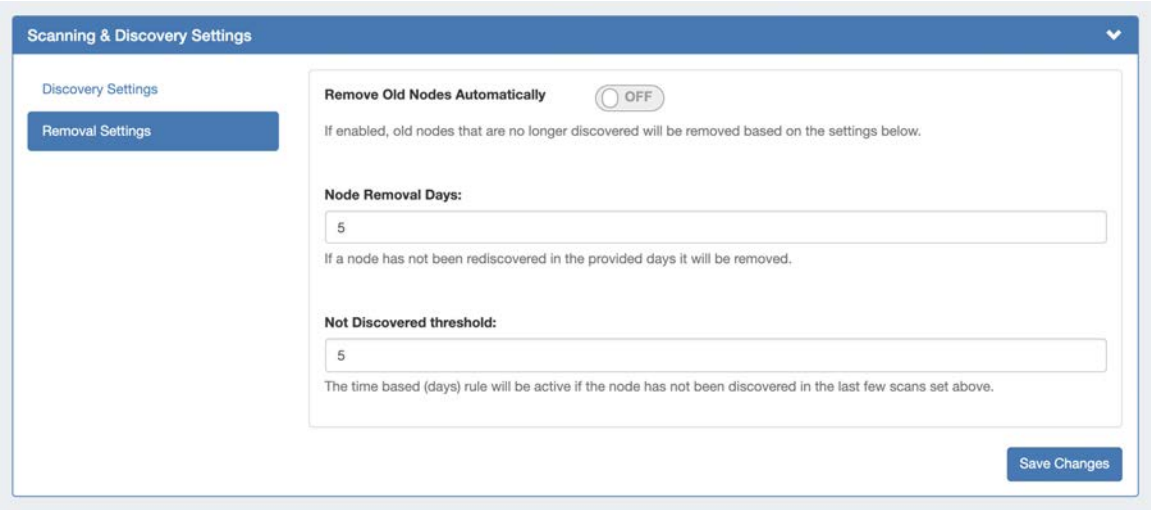
Merge "Entry" resources: If enabled, on discovering a new Netblock or Node that have relation with an exiting Entry resource, ProVision will merge the resources automatically.

Automatic Direct Assign: If enabled, on discovering a new Netblock or Node, performs an IPAM Direct Assign on the netblock.

Node Default Section: In which default section to place the newly discovered Nodes.

Netblock Default Section: In which default section to place the newly discovered Netblocks.

Removal Settings



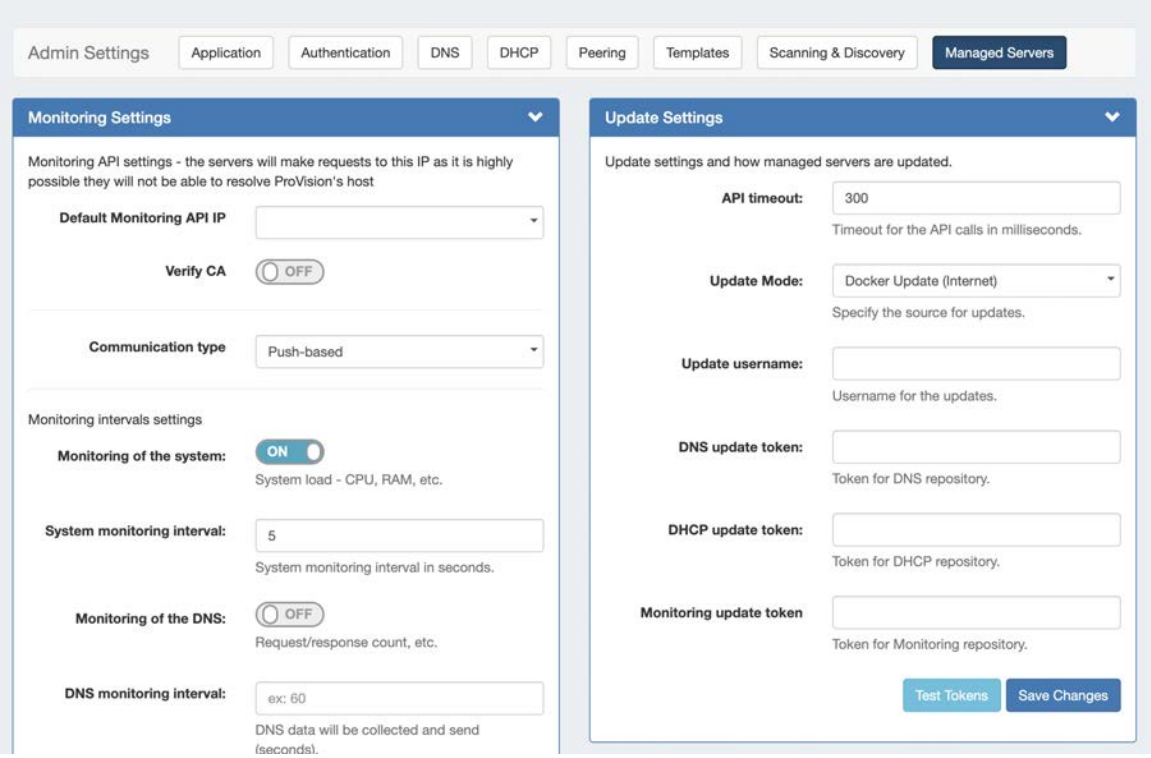
Remove Old Nodes Automatically: If enabled, old nodes that are no longer discovered will be removed based on the settings below.

Node Removal Days: If a node has not been rediscovered in the provided days, it will be removed.

Not Discovered threshold: If the node has not been discovered in the last few scans, it will be removed after the number of threshold days.

Managed Servers Settings

Managed Servers



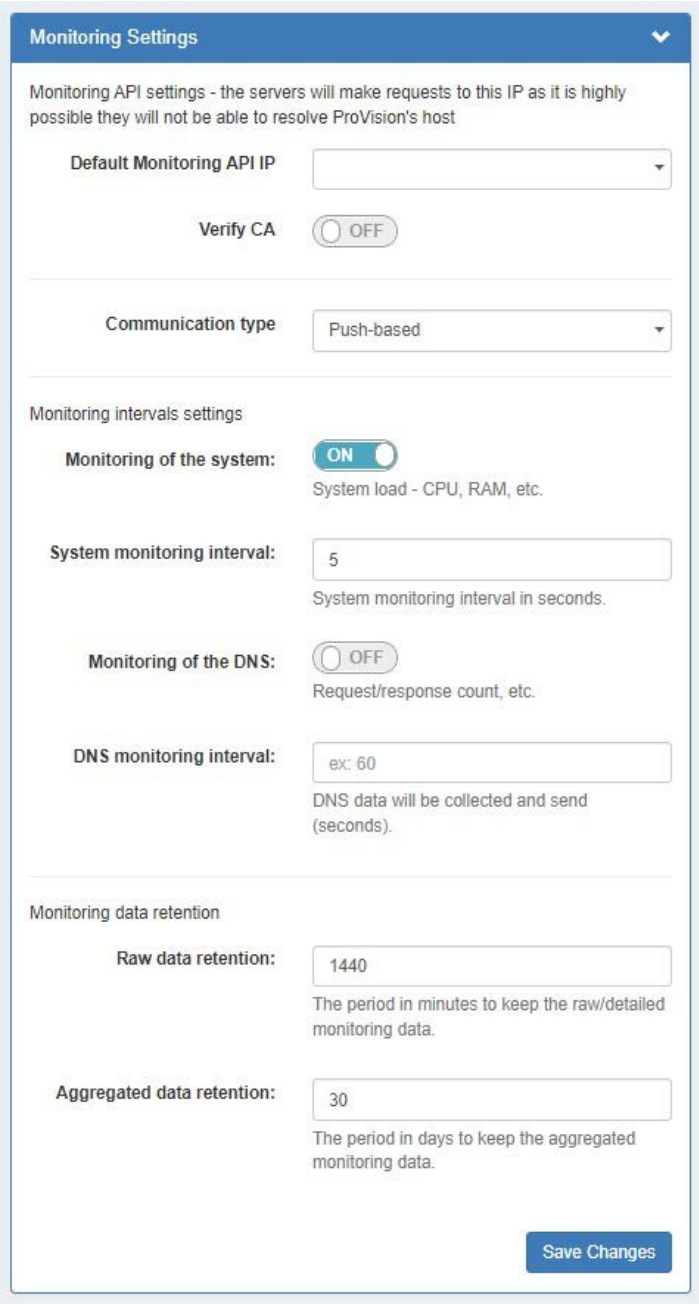
The "Managed Servers" sub-tab under Admin Settings includes modules for Monitoring Settings, Update Settings, Monitoring Services, and RabbitMQ settings.

After making any settings updates, be sure to click "Save Changes" under the updated module.

- Managed Servers
  - Monitoring Settings
  - Update Settings
    - Update Settings - Docker Update Mode (Internet)
    - Update Settings - Image Download (Local)
  - Monitoring Services
  - RabbitMQ Settings
    - Installing RabbitMQ
  - Additional Information

Monitoring Settings

Under Monitoring Settings, select the "Default Monitoring API IP", and enter any additional setting options as follows:



Default Monitoring API IP: The default IP to be used for API calls (heartbeat, activation, etc.) for managed server monitoring and to send API requests, as multiple IPs may be available depending on the Provision set up.

- Note: The Default Monitoring API IP can be set to a default value in this area, but it may also be set individually per managed server as an override.

Verify CA: Toggle to "on" if you wish to enable the CA check.

Communication type: Push (when the server pushes data to ProVision) and pull (when ProVision connects to the server and pulls the data). Push is preferred, but Pull-based may be desirable in cases where a firewall would not allow inbound connections to ProVision.

Monitoring of the system: Toggle to "on" to enable monitoring of system statistics.

System monitoring interval: How often (in seconds) the system will be checked. The smaller the interval, the more data there will be to store.

Monitoring of the DNS: Toggle to "on" to enable gathering statistics from the DNS server.

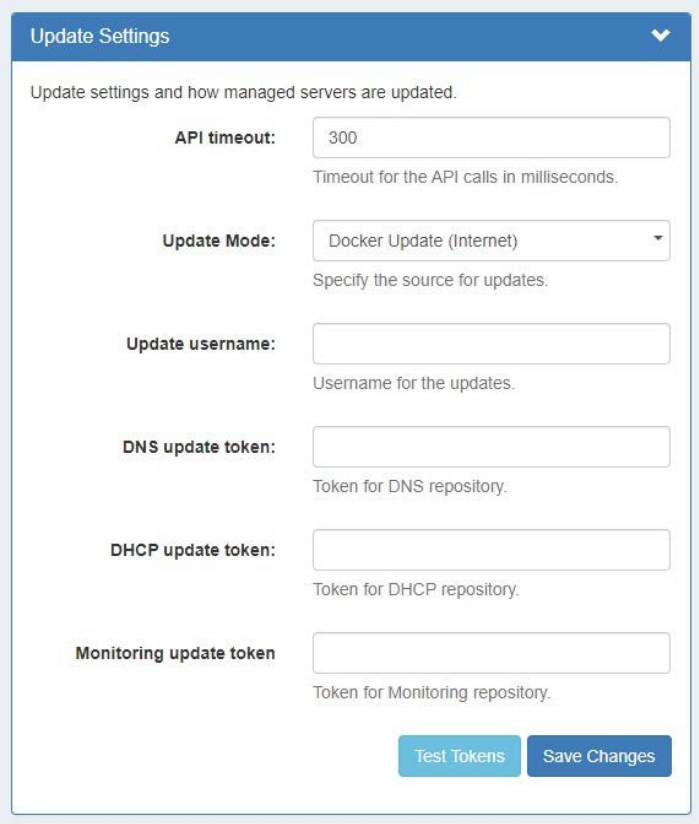
DNS monitoring interval: How often (in seconds) the DNS server will be monitored. Data will be aggregated for the set period of time and the aggregated results will be sent.

Raw data retention: The number of minutes to retain raw data. By default, this is set to 1440 minutes (1 day). Raw data requires sizable storage needs.

Aggregated data retention: The number of days to retain aggregated data.

Update Settings

Enter Update settings to use for Managed Servers, starting with API timeout (in milliseconds) and Update Mode.



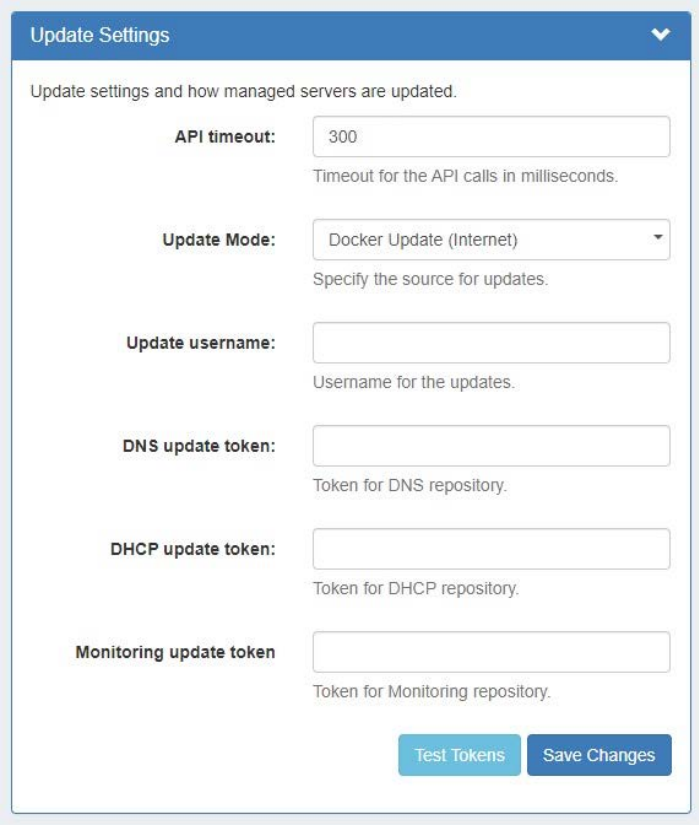
Fill in the remaining update settings as applicable to the selected update mode:

Internet Docker Update (Recommended) - This uses a Docker update directly from our docker registry. Internet connection is required for the managed server in order this mode to work.

- When this is chosen, fields to enter tokens for the DNS / DHCP repository will displayed.

> For assistance obtaining repository tokens, please contact support@6connect.com.

Update Settings - Docker Update Mode (Internet)



API timeout: Timeout for API calls in milliseconds.

Update Mode: Enter the source for updates, depending on internet accessibility. Two options are available:

- Image Download (Local) - This option is to update from ProVision, locally. No internet connection is required from the managed server, but an image file must be manually downloaded from a separate secure site and then uploaded into ProVision.

> If "Image Download (Local)" is selected, you must download the image file from a secure 6connect site to then upload for this setting. Please contact support@6connect.com for credentials to access the image download area.

- Internet Docker Update - This uses a Docker update directly from our docker registry. Internet connection is required for the managed server in order this mode to work. When this is chosen fields for tokens for our gitlab/registry appear to be filled in:
  - **Update username:** Enter the username for updates.
  - **DNS update token:** Enter the token for the DNS repository.
  - **DHCP update token:** Enter the token for the DHCP repository.
  - **Monitoring update token:** Enter the token for the Monitoring repository.
- **Test Tokens:** Click to test the applied tokens for DNS, DHCP, and Monitor.

> For assistance obtaining repository tokens, please contact support@6connect.com.

ProVision Image Download - If Update Mode is set to "Image Download (Local)", then no internet connection is required from the managed server, but an image file must be manually downloaded from a separate secure site to then upload into ProVision.

Update Settings - Image Download (Local)

If Update Mode is set to "Image Download (Local)", the following settings will display to enter:

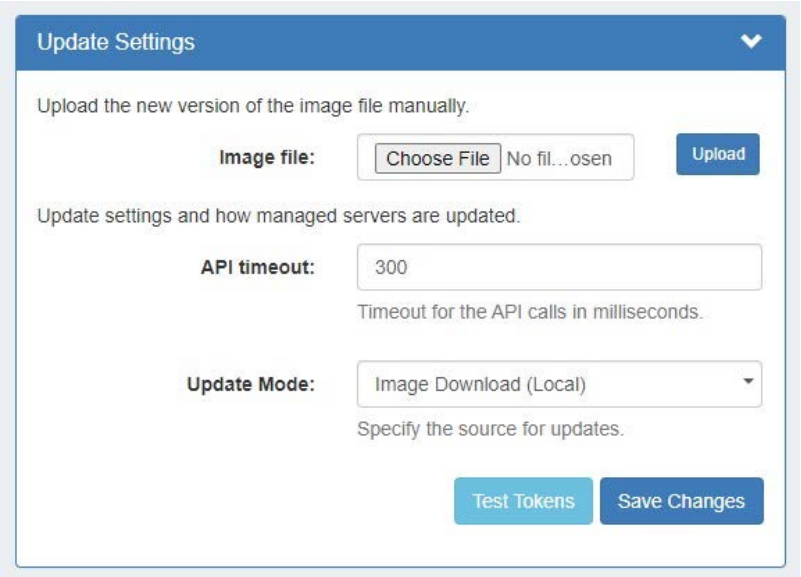


Image file: Attach the Image file for upload to ProVision.

> If "Image Download (Local)" is selected, you must download the image file from a secure 6connect site to then upload for this setting. Please contact support@6connect.com for credentials to access the image download area.

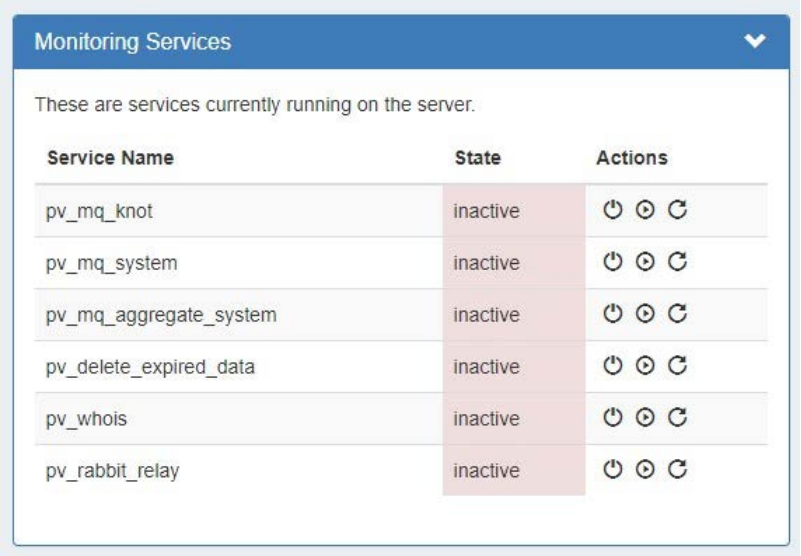
API timeout: Timeout for API calls in milliseconds.

Update Mode: Enter the source for updates - Image Download (Local), or opt to change to Docker Update (Requires Internet).

Images history: Available only after saving changes.

Test Tokens: Click to test the applied tokens for DNS, DHCP, and Monitor.

Monitoring Services



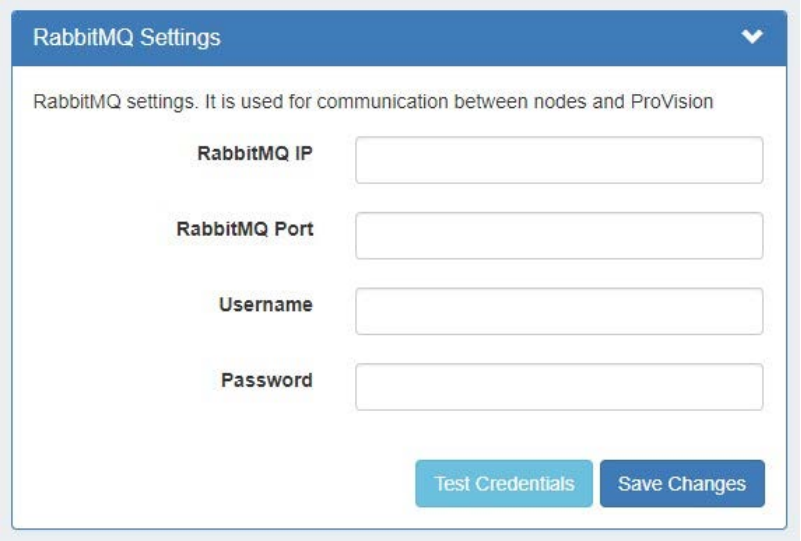
The Monitoring Services module shows the OS services running on Provision's server and their activity state. Available actions are: Stop, Start, and Restart Service.

- **pv_heartbeat:** sends simple stats from a managed server to ProVision, runs on the managed server

- **pv_mq_knot:** processes KNOT DNS data from RabbitMQ, runs on ProVision's server
- **pv_mq_system:** processes system data from RabbitMQ, runs on ProVision's server
- **pv_mq_aggregate_system:** aggregates system data , runs on ProVision's server
- **pv_delete_expired_data:** deletes data according to the retention settings, runs on ProVision's server
- **pv_whois:** runs on ProVision's server
- **pv_rabbit_relay:** services used in "Pull" setups (see below), runs on ProVision's server

RabbitMQ Settings

RabbitMQ is used to handle communication between ProVision and the managed server, and settings must be included for successful server communication and monitoring.



Enter or update the following settings:

- **RabbitMQ IP:** RabbitMQ IP is the address to which managed serves will send data, and to which the worker scripts will connect to get data.
    - Note: This should typically be the same as Default Monitoring API IP, if RabbitMQ is installed there.
- **RabbitMQ Port:** The RabbitMQ Port used
- **Username:** The RabbitMQ username
- **Password:** The RabbitMQ password

To verify the settings, click "Test Credentials". When done, click "Save Changes".

After making any settings updates, be sure to click "Save Changes" under the updated module.

Installing RabbitMQ

If RabbitMQ has not already been installed on your ProVision instance / VM, you will need to install it by running the included shell script (Note: Installing RabbitMQ requires internet access.):

1) Run install_rabbitmq.sh.

```
/usr/bin/sh /path_to_provision/tools/install_rabbitmq_{OS}.sh
```

Ubuntu RabbitMQ installation script:

install_rabbitmq_ubuntu.sh

```
#!/usr/bin/sh

# https://www.rabbitmq.com/install-debian.html#apt-quick-start-cloudsmith
```

```
sudo apt-get install curl gnupg apt-transport-https -y

## Team RabbitMQ's main signing key
curl -1sLf "https://keys.openpgp.org/vks/v1/by-fingerprint/0A9AF2115F4687BD29803A206B73A36E6026DFCA" | sudo
gpg --dearmor | sudo tee /usr/share/keyrings/com.rabbitmq.team.gpg > /dev/null
## Launchpad PPA that provides modern Erlang releases
curl -1sLf "https://keyserver.ubuntu.com/pks/lookup?op=get&search=0xf77f1eda57ebb1cc" | sudo gpg --dearmor |
sudo tee /usr/share/keyrings/net.launchpad.ppa.rabbitmq.erlang.gpg > /dev/null
## PackageCloud RabbitMQ repository
curl -1sLf "https://packagecloud.io/rabbitmq/rabbitmq-server/gpgkey" | sudo gpg --dearmor | sudo tee /usr
/share/keyrings/io.packagecloud.rabbitmq.gpg > /dev/null

## Add apt repositories maintained by Team RabbitMQ
sudo tee /etc/apt/sources.list.d/rabbitmq.list <<EOF
## Provides modern Erlang/OTP releases
##
## "bionic" as distribution name should work for any reasonably recent Ubuntu or Debian release.
## See the release to distribution mapping table in RabbitMQ doc guides to learn more.
deb [signed-by=/usr/share/keyrings/net.launchpad.ppa.rabbitmq.erlang.gpg] http://ppa.launchpad.net/rabbitmq
/rabbitmq-erlang/ubuntu focal main
deb-src [signed-by=/usr/share/keyrings/net.launchpad.ppa.rabbitmq.erlang.gpg] http://ppa.launchpad.net
/rabbitmq/rabbitmq-erlang/ubuntu focal main

## Provides RabbitMQ
##
## "bionic" as distribution name should work for any reasonably recent Ubuntu or Debian release.
## See the release to distribution mapping table in RabbitMQ doc guides to learn more.
deb [signed-by=/usr/share/keyrings/io.packagecloud.rabbitmq.gpg] https://packagecloud.io/rabbitmq/rabbitmq-
server/ubuntu/ focal main
deb-src [signed-by=/usr/share/keyrings/io.packagecloud.rabbitmq.gpg] https://packagecloud.io/rabbitmq
/rabbitmq-server/ubuntu/ focal main
EOF

## Update package indices
sudo apt-get update -y

## Install Erlang packages
sudo apt-get install -y erlang-base \
                               erlang-asn1 erlang-crypto erlang-eldap erlang-ftp erlang-inets \
                                                  erlang-mnesia erlang-os-mon erlang-parsetools erlang-
public-key \
                                                                                  erlang-runtime-tools erlang-
snmp erlang-ssl \

erlang-syntax-tools erlang-tftp erlang-tools erlang-xmerl

## Install rabbitmq-server and its dependencies
sudo apt-get install rabbitmq-server -y --fix-missing

sudo rabbitmq-plugins enable rabbitmq_management

sudo rabbitmq-server start -detached

sleep 5

sudo rabbitmqctl add_user pv_rabbitmq S3curePassW0rd!
sudo rabbitmqctl set_user_tags pv_rabbitmq administrator
sudo rabbitmqctl set_permissions -p / pv_rabbitmq ".*" ".*" ".*"

sudo systemctl enable rabbitmq-server

echo "RabbitMQ user is:  pv_rabbitmq"
echo "RabbitMQ password is:  S3curePassW0rd!"
echo "RabbitMQ port is:  5672"
echo "RabbitMQ management port is:  15672"
```

CentOS RabbitMQ installation script:

install_rabbitmq_centos.sh

```
#!/usr/bin/sh
```

```
# https://www.rabbitmq.com/install-debian.html#apt-quick-start-cloudsmith

sudo yum install curl gnupg apt-transport-https -y

## Team RabbitMQ's main signing key
curl -1sLf "https://keys.openpgp.org/vks/v1/by-fingerprint/0A9AF2115F4687BD29803A206B73A36E6026DFCA" | sudo
gpg --dearmor | sudo tee /usr/share/keyrings/com.rabbitmq.team.gpg > /dev/null
## Launchpad PPA that provides modern Erlang releases
curl -1sLf "https://keyserver.ubuntu.com/pks/lookup?op=get&search=0xf77f1eda57ebb1cc" | sudo gpg --dearmor |
sudo tee /usr/share/keyrings/net.launchpad.ppa.rabbitmq.erlang.gpg > /dev/null
## PackageCloud RabbitMQ repository
curl -1sLf "https://packagecloud.io/rabbitmq/rabbitmq-server/gpgkey" | sudo gpg --dearmor | sudo tee /usr
/share/keyrings/io.packagecloud.rabbitmq.gpg > /dev/null

## Add apt repositories maintained by Team RabbitMQ
#sudo tee /etc/apt/sources.list.d/rabbitmq.list <<EOF
## Provides modern Erlang/OTP releases
##
## "bionic" as distribution name should work for any reasonably recent Ubuntu or Debian release.
## See the release to distribution mapping table in RabbitMQ doc guides to learn more.
#deb [signed-by=/usr/share/keyrings/net.launchpad.ppa.rabbitmq.erlang.gpg] http://ppa.launchpad.net/rabbitmq
/rabbitmq-erlang/ubuntu focal main
#deb-src [signed-by=/usr/share/keyrings/net.launchpad.ppa.rabbitmq.erlang.gpg] http://ppa.launchpad.net
/rabbitmq/rabbitmq-erlang/ubuntu focal main

## Provides RabbitMQ
##
## "bionic" as distribution name should work for any reasonably recent Ubuntu or Debian release.
## See the release to distribution mapping table in RabbitMQ doc guides to learn more.
#deb [signed-by=/usr/share/keyrings/io.packagecloud.rabbitmq.gpg] https://packagecloud.io/rabbitmq/rabbitmq-
server/ubuntu/ focal main
#deb-src [signed-by=/usr/share/keyrings/io.packagecloud.rabbitmq.gpg] https://packagecloud.io/rabbitmq
/rabbitmq-server/ubuntu/ focal main
#EOF

## Update package indices
sudo yum update -y

## Install Erlang packages
sudo yum install -y erlang-base erlang-asn1 erlang-crypto erlang-eldap erlang-ftp erlang-inets erlang-mnesia
erlang-os-mon erlang-parsetools erlang-public-key erlang-runtime-tools erlang-snmp erlang-ssl erlang-syntax-
tools erlang-tftp erlang-tools erlang-xmerl

## Install rabbitmq-server and its dependencies
sudo yum install rabbitmq-server -y

sudo rabbitmq-plugins enable rabbitmq_management

sudo rabbitmq-server start -detached

sleep 5

sudo rabbitmqctl add_user pv_rabbitmq S3curePassW0rd!
sudo rabbitmqctl set_user_tags pv_rabbitmq administrator
sudo rabbitmqctl set_permissions -p / pv_rabbitmq ".*" ".*" ".*"

sudo systemctl enable rabbitmq-server

echo "RabbitMQ user is:  pv_rabbitmq"
echo "RabbitMQ password is:  S3curePassW0rd!"
echo "RabbitMQ port is:  5672"
echo "RabbitMQ management port is:  15672"
```

This script is taken from Installing on Debian and Ubuntu — RabbitMQ and may need an update in future.

2) You may verify the installation is working by opening http://your.host:15672

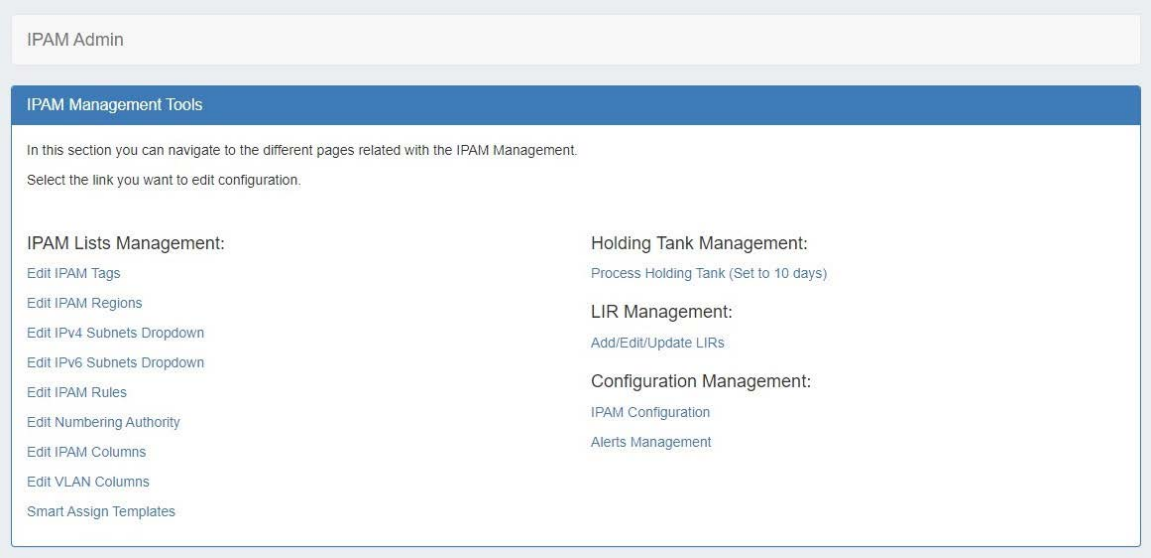
3) Once confirmed working, go to ProVision Admin Settings Managed Server Settings. Then, enter the RabbitMQ IP, port, username, and password into the RabbitMQ Settings section. When done, click "Save Changes".

Additional Information

For additional information on working with Managed Servers, see Managed Servers

IPAM Administration

Overview



IPAM Administration is accessed through the Admin area of ProVision. It includes sections to manage IPAM Lists, the Holding Tank, LIR, Smart Assign Templates, and IPAM Configuration.

- Overview
  - IPAM Lists Management
  - Holding Tank Management
  - LIR Management and Use
  - Smart Assign Templates
  - Alerts Management
  - IPAM Configuration
  - Additional Information:

IPAM Lists Management

These links are to the respective IPAM Lists Management that are available for customization - tags, regions, subnets, IPAM Rules, Numbering Authority, and IPAM / VLAN Columns.

See the IPAM Lists Management page for additional details and examples for updating IPAM Parameters, IPAM / VLAN column customization, and IPAM Rules for additional information on managing IPAM Rules.

Holding Tank Management

When IPv4/IPv6 resources are reclaimed, they are placed into the "Holding Tank". This feature allows for a block to stay out of the available address pools until the administrator approves it.

See the Holding Tank Management page for more details.

LIR Management and Use

ProVision supports multiple LIRs from the UI. This allows users to select from various LIRs when they want to update SWIP/RPSL information for a subnet allocation.

See the LIR Management and Use page for more details.

Smart Assign Templates

Smart Assign Templates provide the ability to define complex IPAM assignment scenarios including those with multiple steps.

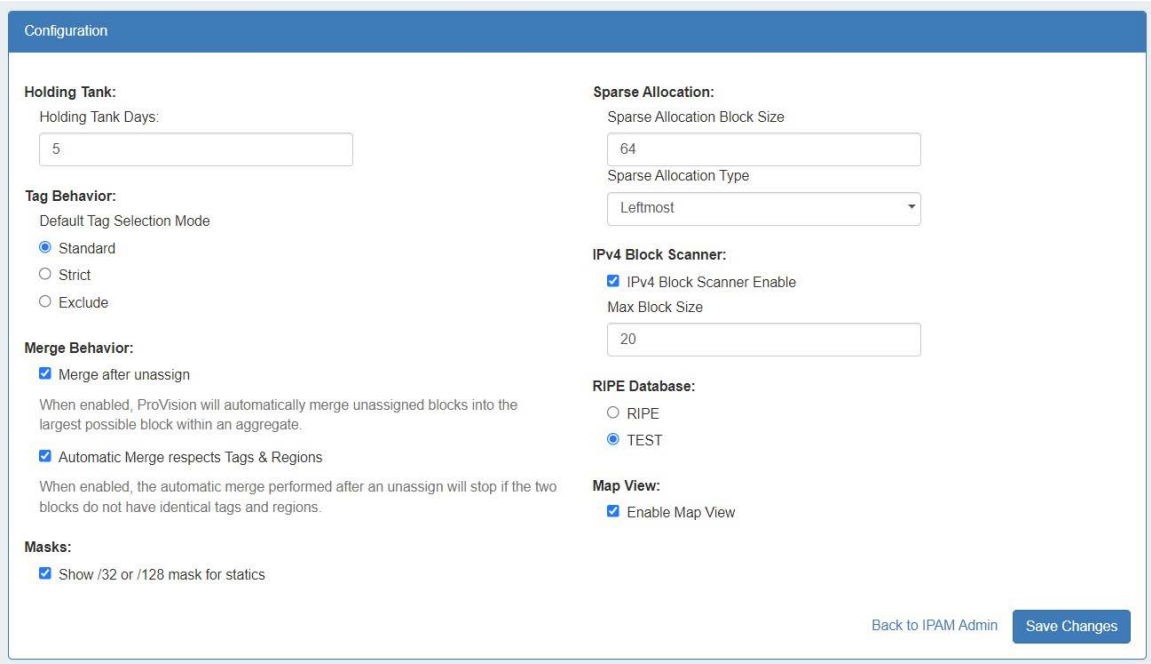
See the Smart Assign Templates page for more details.

Alerts Management

Alerts Management allows users to view, edit, and manage all IPAM Alerts set on aggregates or IP blocks.

See the Alerts Management page for more details.

IPAM Configuration



Holding Tank Days: This is the number of days that a block will be held in "Holding" status before being available to be moved to the Available pool, and thus ready to be assigned. By default this is initially set to 30 days.

IPv4 Block Scanner Enable: This is a beta feature that allows a user to scan a block of IPv4 space and show host counts of responding addresses.

IPv4 Block Scanner Max Block Size: The max size (mask) the IPv4 Block Scanner considers (Command Line tool only).

RIPE Database: Select the desired database - RIPE or TEST.

Show /32 or /128 mask for statics: Enable to show /32 or /128 masks.

Merge after unassign: Select to automatically merge adjacent blocks when they become available after unassign.

Automatic Merge respects Tags & Regions: When "Merge after unassign" is selected, the automatic merge will stop if the two blocks do not have matching tags and regions.

Enable Map View: Select to enable a map view of assigned aggregates on the IPAM tab, determined by assigned region.

Default Tag Selection Mode: Set which radio button will be selected by default when working with tags in the IPAM Gadget

Sparse Allocation Block Size: Sets the size of the blocks generated for IPv6 Sparse Allocation

Sparse Allocation Type: Sets the Sparse Allocation scheme to Leftmost, Rightmost, or Center.

Additional Information:

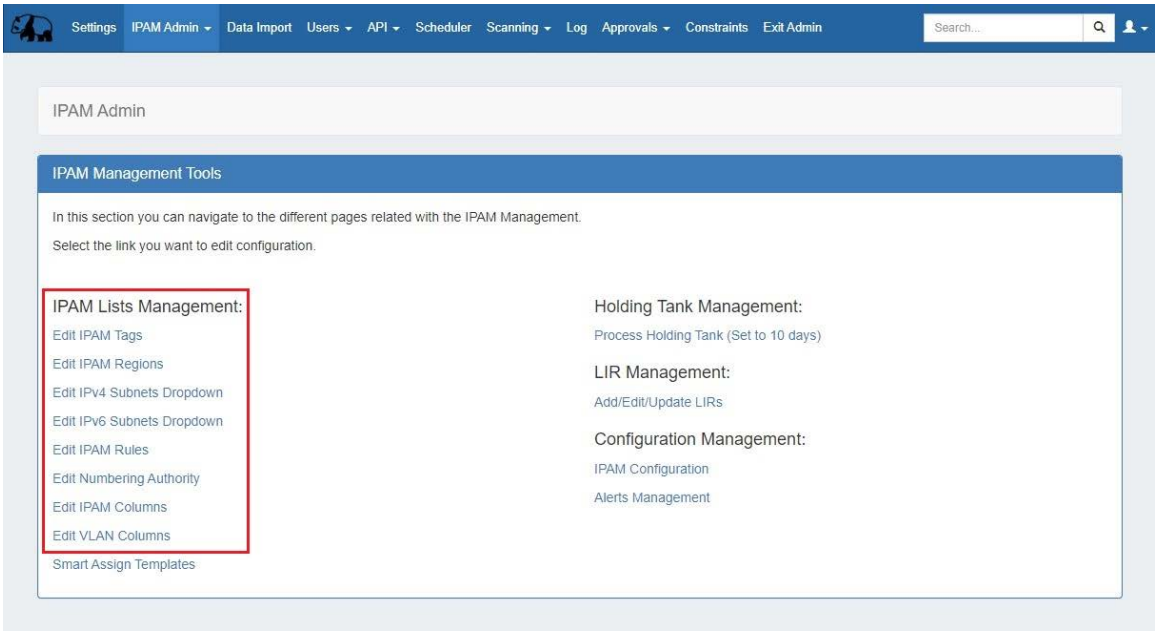
- IPAM Lists Management
- IPAM Rules
- Holding Tank Management
- RIR Integration: SWIP/RPSL
- LIR Management and Use
- Smart Assign Templates
- Alerts Management

IPAM Parameters

IPAM Lists Management - Overview

IPAM Lists Management is accessed from the Admin section of ProVision, under the **IPAM Admin** tab.

Through this area, admin users can update IPAM tags, IPAM Regions, IPv4 / IPv6 subnets, IPAM Rules, Numbering Authority, and IPAM / VLAN Columns.

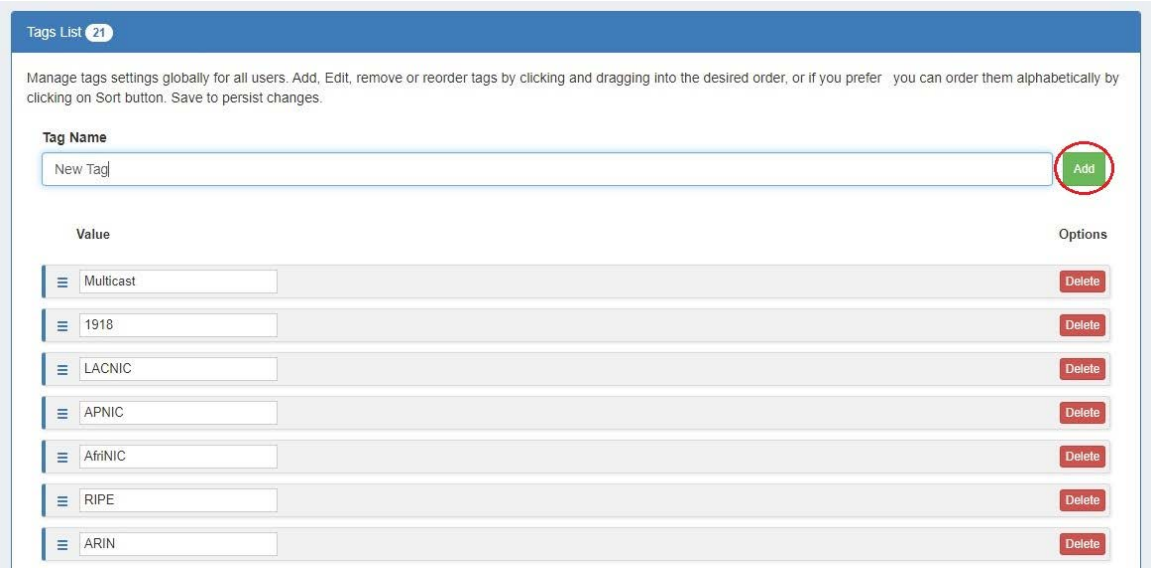


- Add / Edit IPAM Tags
- Add / Edit Regions
  - Applying a Geocoding API Key:
  - Managing Regions
    - Valid / Invalid Regions
    - Fill Empty Region Locations
    - Region Resource Generation
- Add / Edit IPv4 / IPv6 Subnet Dropdowns
- Edit IPAM Rules
- Numbering Authority
  - Available Domain Types
  - Working with Numbering Domains
    - Create a Numbering Domain
    - Number Domain Actions
- Edit IPAM or VLAN Columns
- Additional Information

Add / Edit IPAM Tags

When you are applying properties to IP blocks, you have the option to edit tags. IPAM Tags are used in a number of areas in ProVision and can be added or edited from this screen.

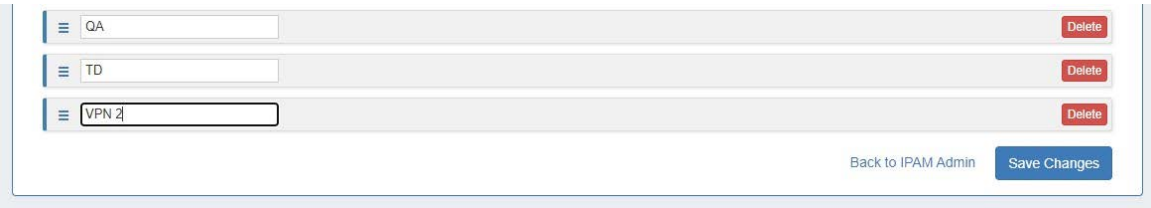
To add a new IPAM tag, type in the desired name value for the new tag in the box at the top of the Edit IPAM Tags page and click "Add".



To **edit** a tag, simply type your changes in to the text box with the tag name.

To **reorder** the tag list, click and hold on the "list" icon (three lines) to the left of the tag name, then drag to the desired location in the list and release. You can also click the "Sort Alphabetically" button at the top.

To **delete** a tag, click on the red "Delete" button to the right of the tag name.

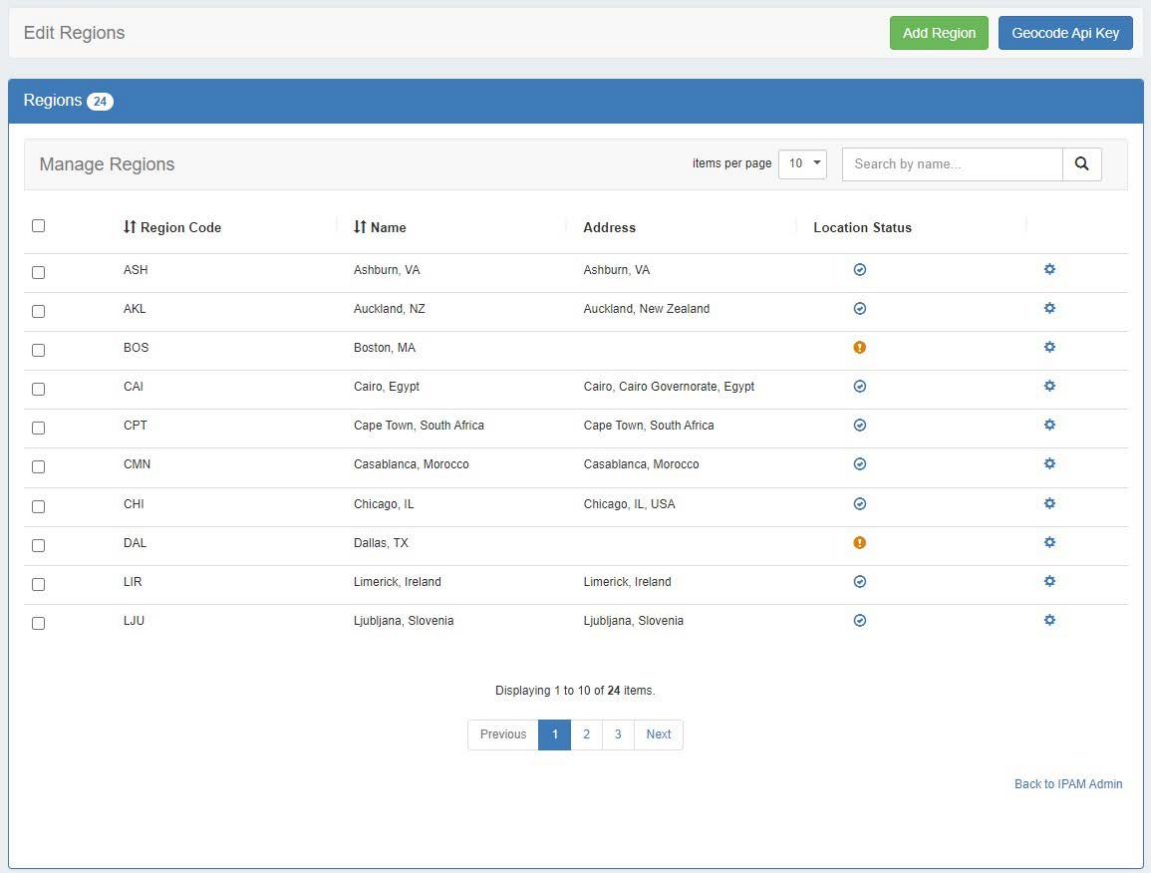


When complete, be sure to click on the "Save Changes" button to save your changes.

Add / Edit Regions

If enabled, Regions can function as a way to further define your network segments (regional tie-downs, etc.). This gives you flexibility for allocations and assignments beyond simply using Tags. Regions are used by the IPAM Gadget, the IPAM Manage UI, and IPAM Map View.

Access IPAM regions from **IPAM Admin** **Edit IPAM Regions**.



The Regions display includes fields for Region Code, Name, and Address.

- 'Region Code' is the shorthand name that will show in the IPAM Gadget and IPAM Manage screens.
- 'Name' is the long form name value that will be written to the database, used for API calls, and is also used for some filter selectors.
- The 'Address' field is used by IPAM map view (via Geocode API) to geolocate aggregates with that assigned region. Address may be in the form of a City / State / Country, a full street address, a company name, or other search term that the Geocode API can return a location for. The more accurate your address information, the more accurate map view will be with your aggregate locations. To use regions, you will need to apply a Geocode API Key. An "address" value that appears invalid will display a yellow warning symbol.

Applying a Geocoding API Key:

Step 1: Obtain a Google Geocoding API Key

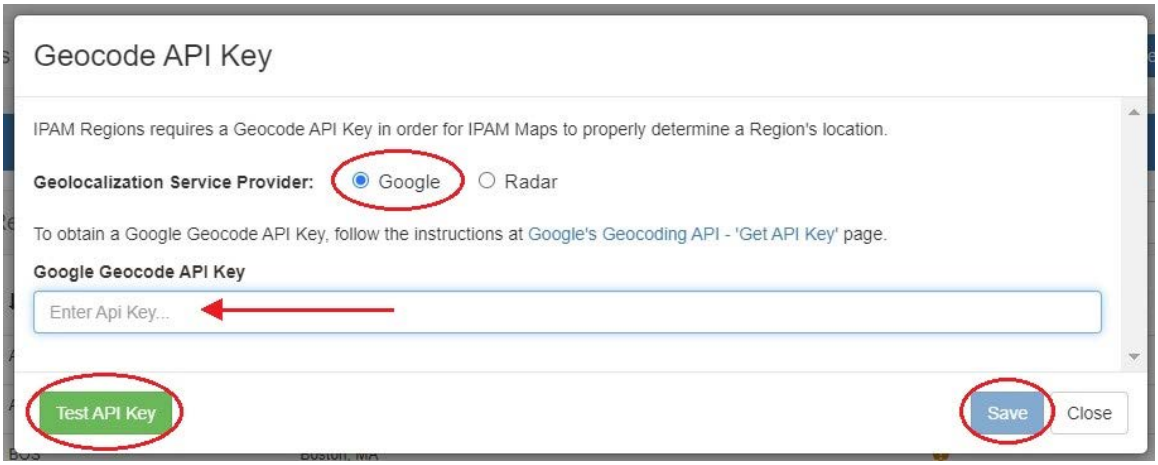
To get a Google Geocoding API Key, follow the instructions listed here:

How to get a Google Geocoding API Key

Note: In order to obtain a Google Geocoding API Key, a company must have a subscription enabled to Google Cloud Platform Console.

Step 2: Assign the API Key to IPAM Regions

Once assigned a Google Geocoding API Key, from the Edit Regions page, click "Geocode API Key". Then select the Google radio button, paste the API key into the Geocode API dialog, and click "Save" . You can test the API Key by clicking the Test button at lower left.



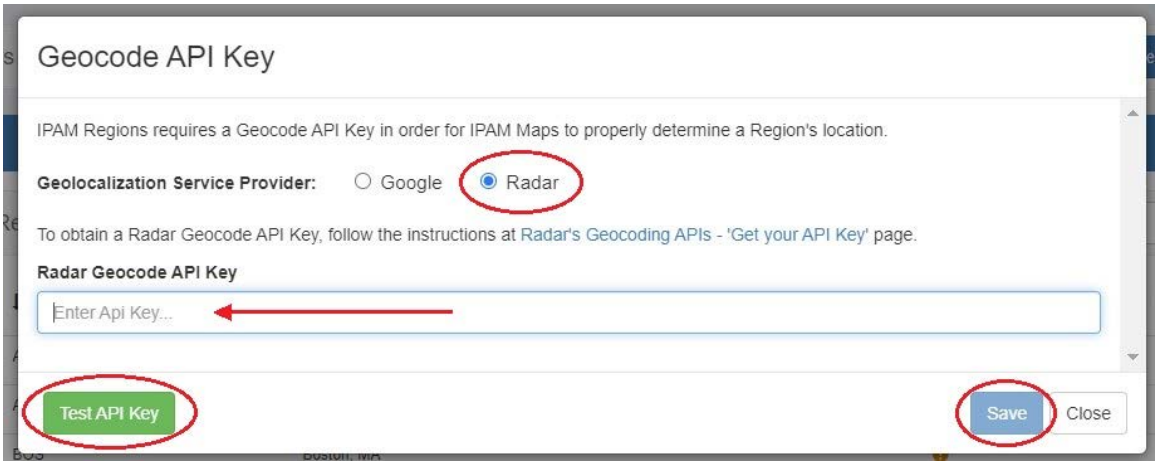
Step 1: Obtain a Radar Geocoding API Key

To get a Radar Geocoding API Key, follow the instructions listed here:

> *How to get a Radar Geocoding API Key*

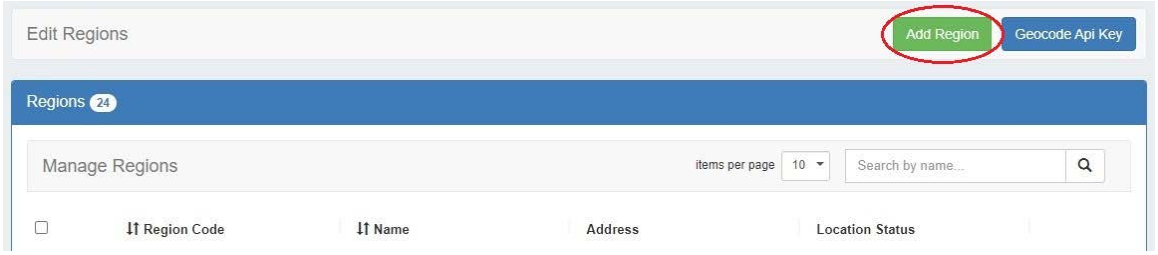
Step 2: Assign the API Key to IPAM Regions

Once assigned a Radar Geocoding API Key, from the Edit Regions page, click "Geocode API Key". Then select the Radar radio button, paste the API key into the Geocode API dialog, and click "Save". You can test the API Key by clicking the Test button at lower left.

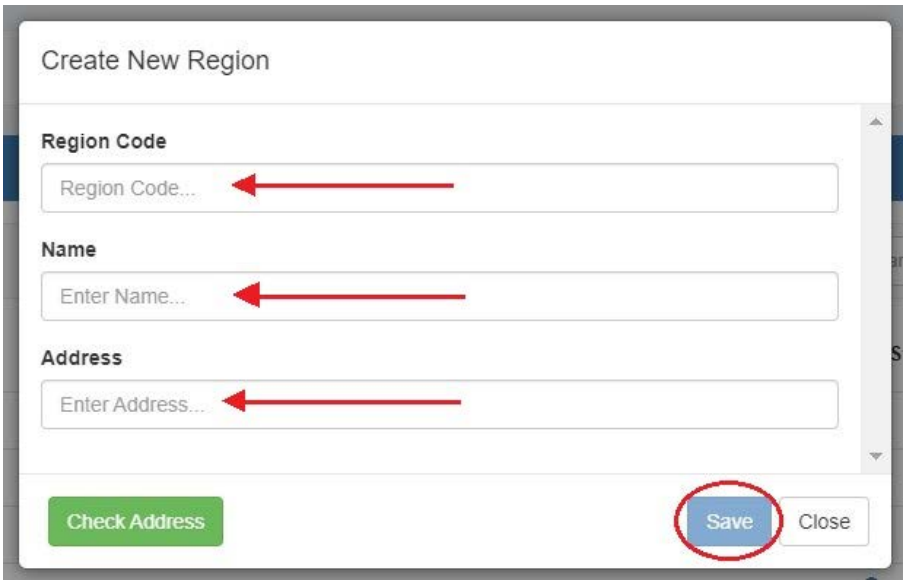


Managing Regions

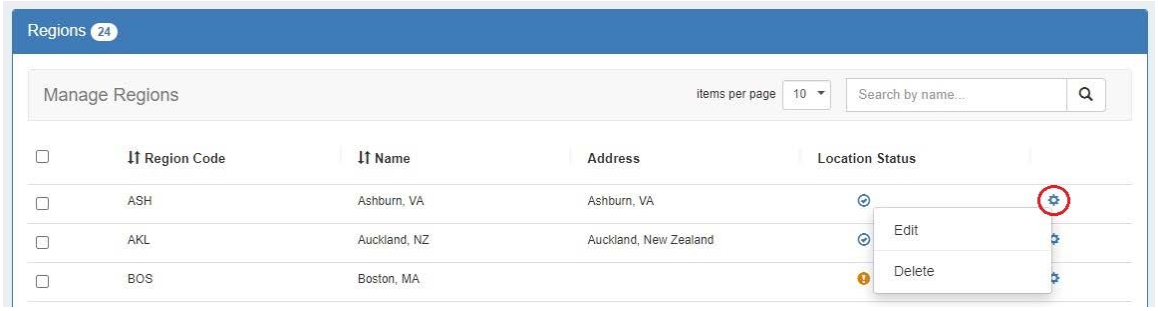
To **add** a new Region item, click the "Add Region" button at the top of the screen.



In the form that appears, type in a new Region Code, Name, and Address into the empty fields and click "Save".



The new Region will be added to the Region list.

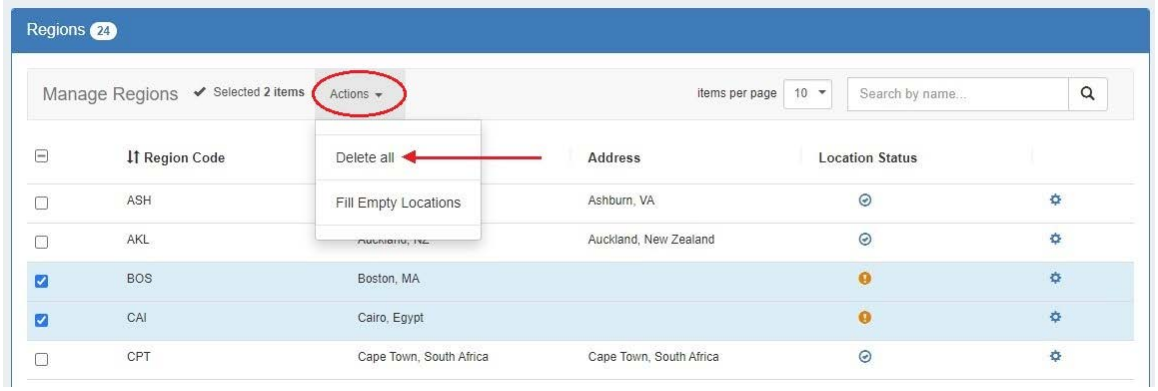


To **sort** the regions list, click on a column header to sort by Region Code or Name.

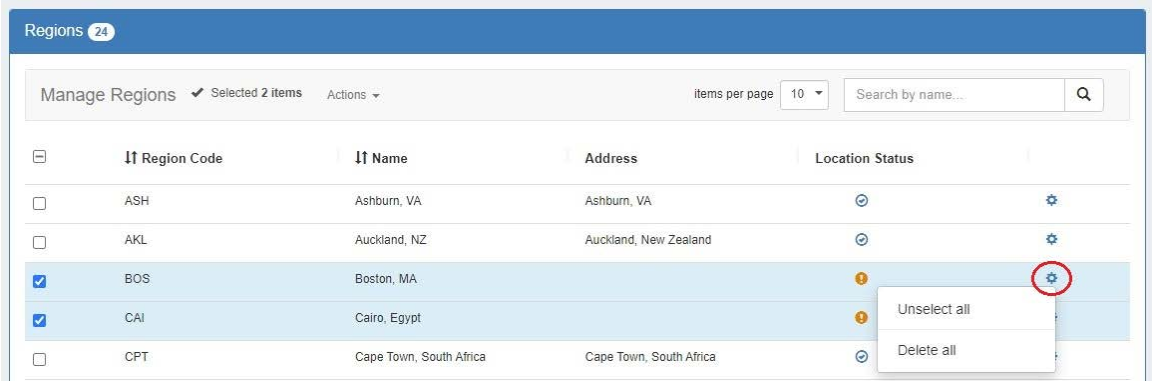
To **edit** a region, right click on the row and select "Edit" from the Action Menu. This will bring up the edit modal. Input your desired changes, then click "Save".

To **delete** a single region, select "Delete" from the the Action Menu (gear icon).

To **delete multiple** regions, select the regions to delete by clicking the checkboxes at left. Then, click on the "Actions" menu at the top of the list and select "Delete All".

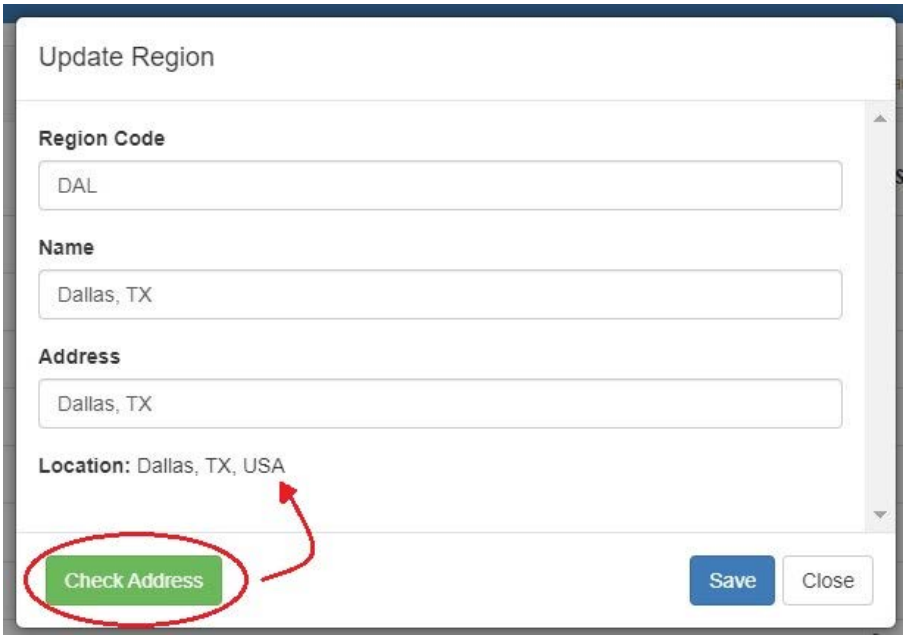


You may also right click on the selected items to open a context menu to either "Unselected all" or "Delete all".



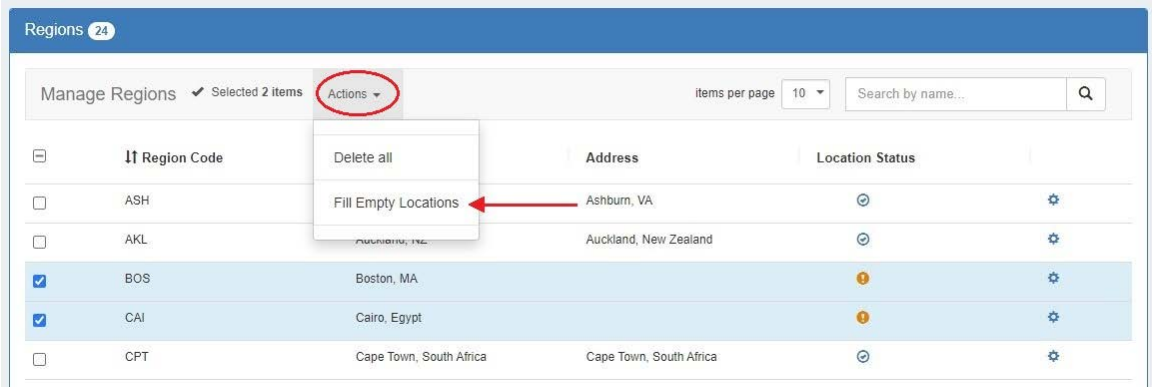
Valid / Invalid Regions

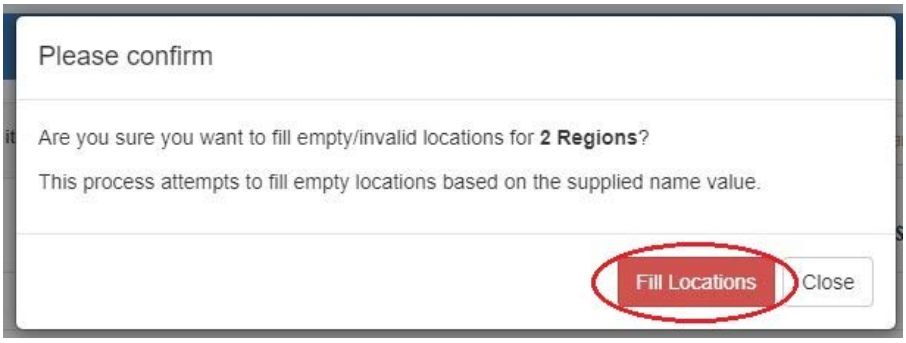
Valid addresses will show a check mark in the "Location Status" field, invalid/empty addresses (unable to be mapped) will show a yellow exclamation point. When adding or editing a region, click the "Check Address" button at the lower left of the modal to check the validity of an address.



Fill Empty Region Locations

To quickly fill empty addresses for multiple regions, select "Fill Empty Locations" from the "Actions" menu at the top of the Regions list. This will fill the addresses based on their supplied "Name" value.

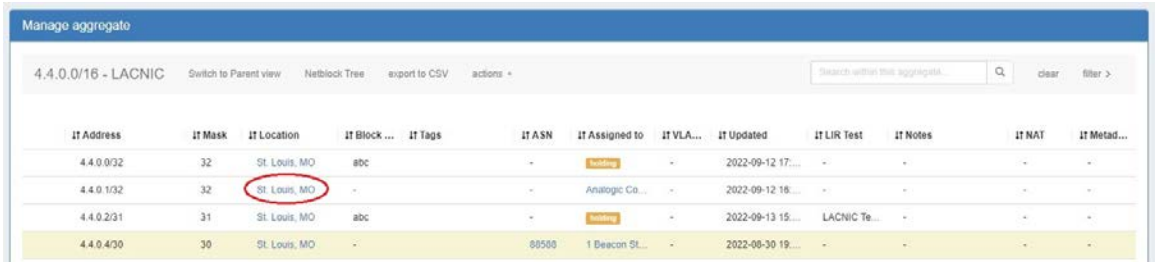




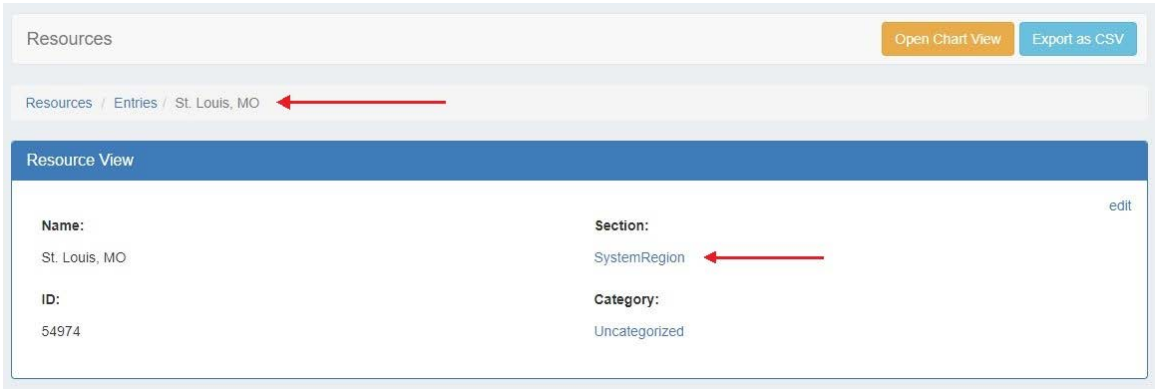
Region Resource Generation

Optionally, users may generate a resource entry for a region, in order to associate items such as contacts, notes, linked resources, or fields with that region.

Clicking on a region link from IPAM Manage will automatically generate a resource entry for that region, under the "SystemRegion" section.



The (non-editable) SystemRegion section includes the following Gadgets: Resource View, IPAMv2, Contacts, Resource Linkage, Notes, Document Storage, and Fields.



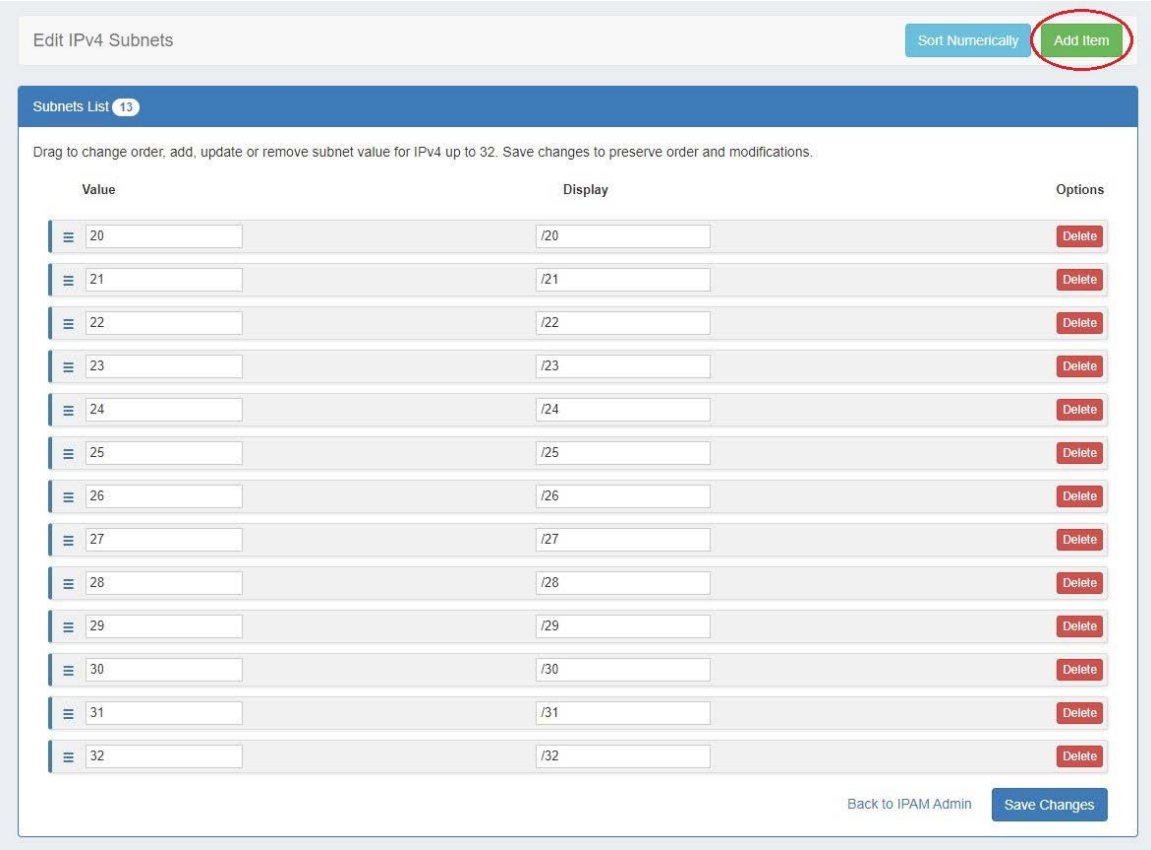
Users may then use those Gadgets on the region resource to associate contacts, notes, custom fields, or other information to that region.

Add / Edit IPv4 / IPv6 Subnet Dropdowns

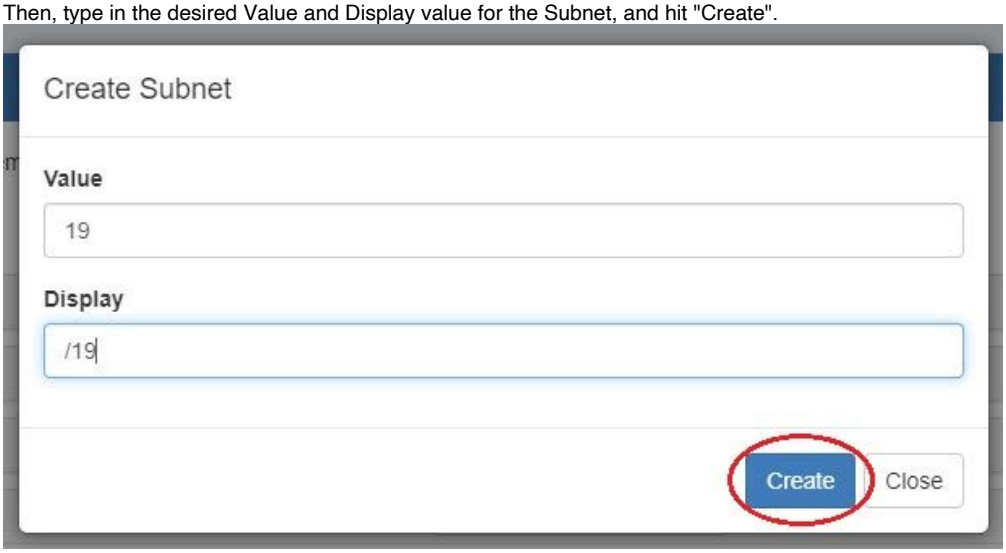
When assigning blocks using the "Smart Assign" function in the IPAM Gadget, the user has an option to assign an IP resource by allocation size. ProVision supports assignments down to a single host level (/32 for IPv4, /128 for IPv6).

> **Note on Editing the Subnet Dropdown**
>
> Keep in mind that this is a global edit. If the values in the dropdown are changed, it will affect ALL users of the ProVision application.

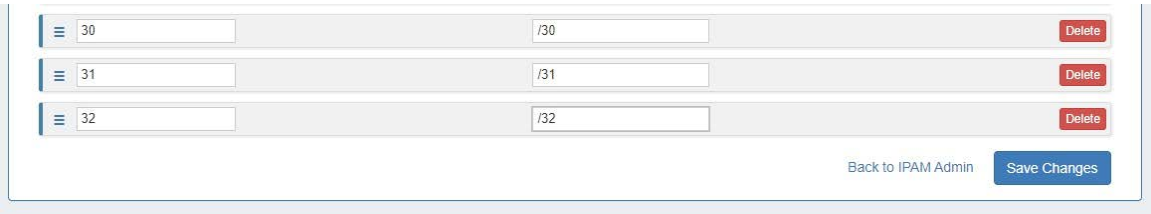
To add a new Subnet item, click on "Add Item" at the top of the Edit List: IPv4 or IPv6 Subnets page.



Then, type in the desired Value and Display value for the Subnet, and hit "Create".



After adding a new item, it will show at the bottom of the list. Hit "Save Changes" to save your changes.



To **edit** a subnet, simply type your changes in to the text box. Remember to click "Save Changes" before exiting.

To **reorder** the subnet list, click and hold on the "list" icon (three lines) to the left of the subnet, then drag to the desired location in the list and release.

After adding or editing a subnet, you may wish to clean up the list order by hitting "Sort Numerically" at the top of the page to reset the list order, including the new entry.

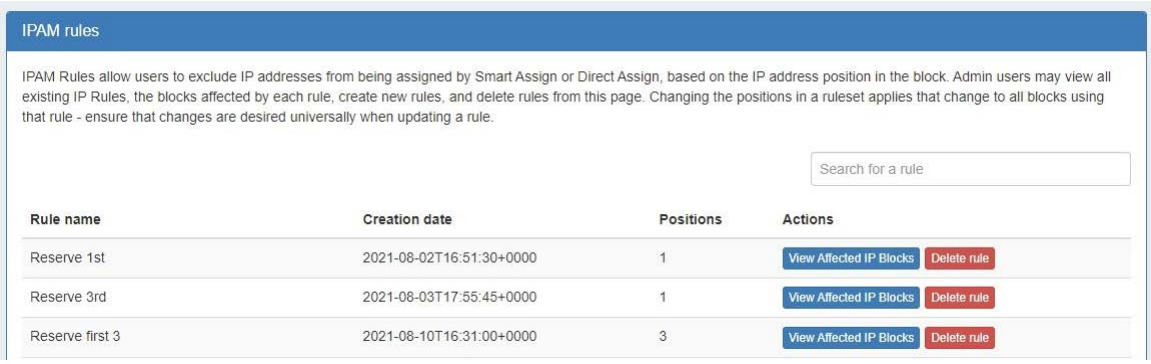
To **delete** a subnet, click on the red "Delete" button to the right of the subnet entry.

When complete, be sure to click on the "Save" button to save your changes.

Edit IPAM Rules

IPAM Rules allow for certain address positions within an IP Block to be reserved when utilizing Direct Assign and Smart Assign.

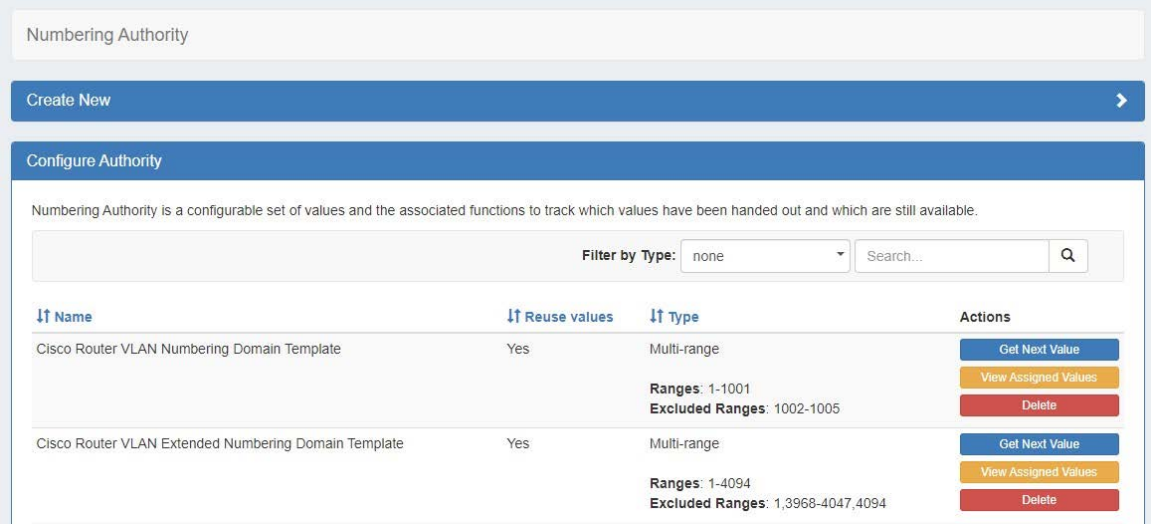
These rulesets may be managed in the "Edit IPAM Rules" section of IPAM Admin.



For additional details, see IPAM Rules.

Numbering Authority

Numbering Authority allows Admin users to configure domain sets of values, for use with associated ProVision functions or external number tracking.



With Numbering Authority, you can create new numbering domains, track which values have been handed out, free values no longer in use, generate the next sequence value, and associate keys-value pairs to a number value. Numbering Domains may be used with ProVision's APIv2 to generate numbers for use within ProVision instances or custom applications.

Available Domain Types

Six numbering domain types are available in Numbering Authority: Sequential, Multi-Range, Meta Multi-range, UIUDv4, IPv6 Sparse Allocation, and Meta IPv6.

Sequential:

Provides a sequential number domain starting with '0' and progressing in numerical order. Potential Applications: Ticketing Queues, Customer Numbers

Multi-Range:

User-defined numbers and number ranges (e.g.: 2-3,4-6, 25, 27-28) to include or exclude as available. Potential Applications: VLANs

Meta Multi-Range:

The Meta Multi-range numbering type is similar to Multi-range, but includes additional options to specify the ordering sequence.

Users define individual numbers and number ranges (e.g.: 2-3,4-6, 25, 27-28) to include or exclude as available, and then may also specify a Selection name and algorithm to specify the order.

UIUD v4:

Generates a Universally Unique Identifier according to v4 (Random) standard. Potential Applications: Unique Identifiers

IPv6 Sparse Allocate:

Determines the next IPv6 block to assign to evenly distribute assignments throughout the provided range. Used with the IPAM IPv6 Aggregate Sparse Allocate function. See: Working with IP Aggregates . Applications: ProVision IPv6 Sparse Allocation

Meta IPv6:

The Meta IPv6 numbering type generates the next IPv6 block of the specified mask from a larger aggregate. Users may specify a Selection name and algorithm to specify the order (forwards/backwards).

Optionally, new sub numbering domains may be created automatically at each number generation in order to generate assignment blocks for hierarchical IPv6 relationships.

Working with Numbering Domains

See below for additional information on creating Numbering Domains and using domain actions.

Create a Numbering Domain

Go to Admin IPAM Admin, and select the "Numbering Authority" page.

Create a new numbering domain by expanding the "Create New Numbering Domain" section, then typing in a name for the new domain and selecting a domain type.



Enter information for the specific domain type, if necessary, and select whether to allow number reuse. When done, click "Create".

All Numbering Domains must have, at minimum "Name" provided and a "Type" selected.

Additional options may exist based on the selected Numbering Domain type:

Multi-Range:

- **Ranges:** Enter the numbers / number ranges to include
- **Exclude Ranges (optional)**: Enter any numbers / number ranges to exclude

Meta Multi-range:

- **Domain**
  - **Ranges:** Enter the numbers / number ranges to include
  - **Exclude Ranges (optional)**: Enter any numbers / number ranges to exclude
- **Selection Types**:
  - **Selection Name:** Enter a nickname for each desired selection order to add
  - **Selection algorithm:** Choose the number ordering method to use for each selection type added. Options are: Forwards, Backwards, Even first, or Odds First.

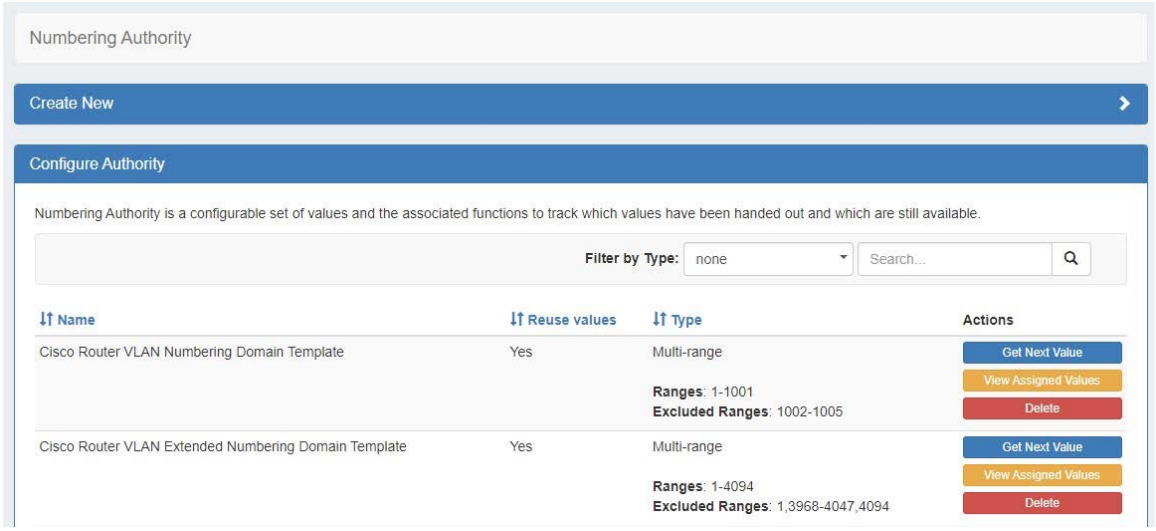
Meta IPv6:

- **Domain**
  - **IP Block:** Enter the parent IP Block from which to generate the IPv6 addresses
  - **IP Mask**: Enter the mask of the parent IP Block
- **Selection Types**:
  - **Selection Name:** Enter a nickname for each desired selection type to add
  - **Mask**: Enter the desired mask of the child blocks to generate
  - **Selection algorithm:** Choose the number ordering method to use for each selection type added. Options are: Forwards, Backwards.
  - **Create Numbering Domain**: If other Meta IPv6 Numbering Authority Domains exist, you may opt to create a new numbering domain from an existing domain each time a number is generated. The automatically generated sub-domain may then have numbers generated independently. This may be useful in cases of complicated hierarchical IPv6 relationships, or which multiple levels of exclusions exists.

IPv6 Sparse Allocate:

- **Starting IPv6:** The starting IPv6 block, e.g ABCD:EF01:2345::
- **Starting Block Prefix**: Prefix for the starting IPv6 block, e.g 48
- **Increments:** the size / increment to use when sparse allocating, e.g. 64
- **Allocation Type:** the allocation direction to use - Leftmost, Center, or Rightmost

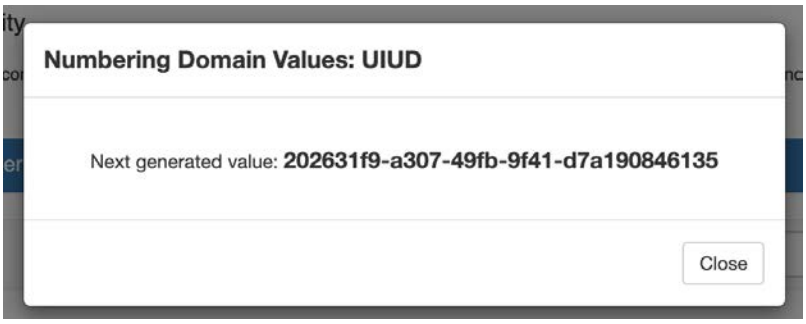
Number Domain Actions



Once a numbering domain is created, you may perform the following actions:

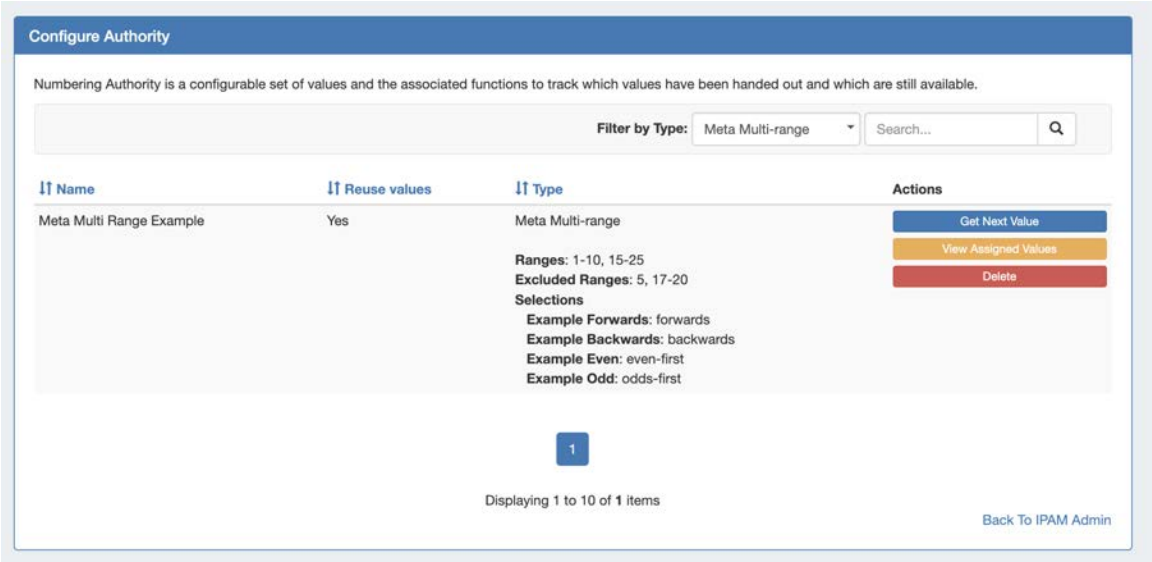
Get Next Value:

Gets the next value in the domain, adds it to the list of used domain values (assigns to the domain), and displays that value to the user.

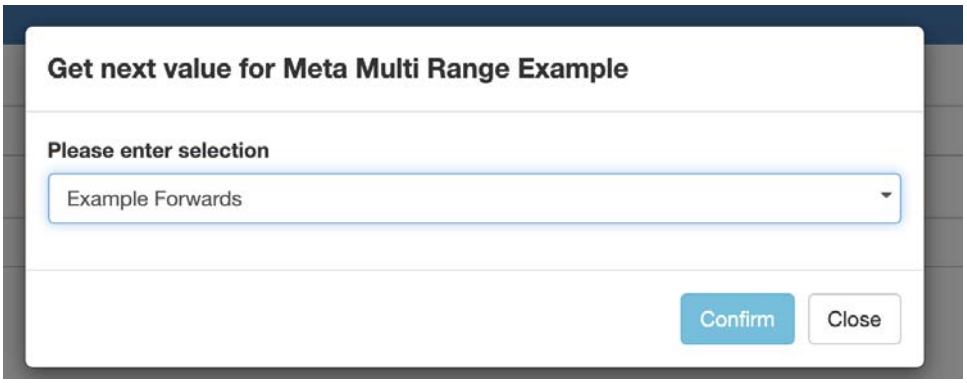


Get Next Value with Selection Types:

If the numbering domain has associated Selections, such as the Meta Multi-range Example below, then the Selection type (pick order) will need to be set prior to generating the next number.



- To get the next value, Click "Get Next Value" under "Actions", then choose the selection name to use for the number generation.



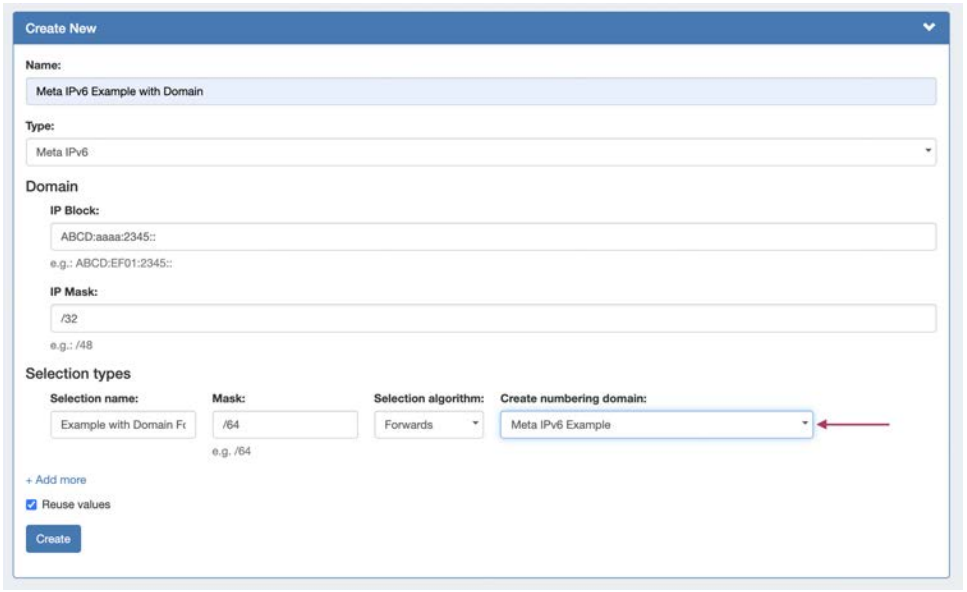
Click "Confirm". The next number, according to the chosen selection order, will be displayed.



Get Next Value with Selection Types:

If "Create numbering domain" was set to create a new domain from an existing Meta IPv6 setup, then each time a number is generated a new Meta-IPv6 sub-domain item will be created using the settings from the referenced domain.

- Here, we've created a new Meta IPv6 Numbering Authority "Meta IPv6 Example with Domain", where the selection creates a new domain based off "Meta IPv6 Example".

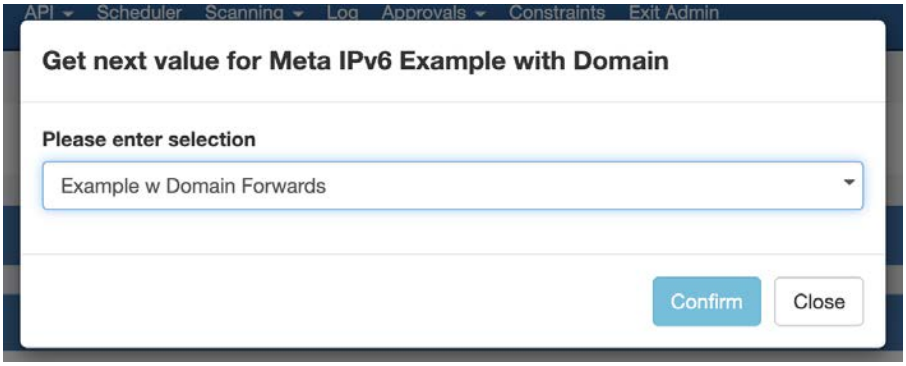


Once created, the new Meta IPv6 domain will be added to the Numbering Authority list. When you are ready, click "Get Next Value" for the domain we just created.

Note: Above our newly created domain, you can see the domain "Meta IPv6 Example", that we referenced under the "Create numbering domain" setting.



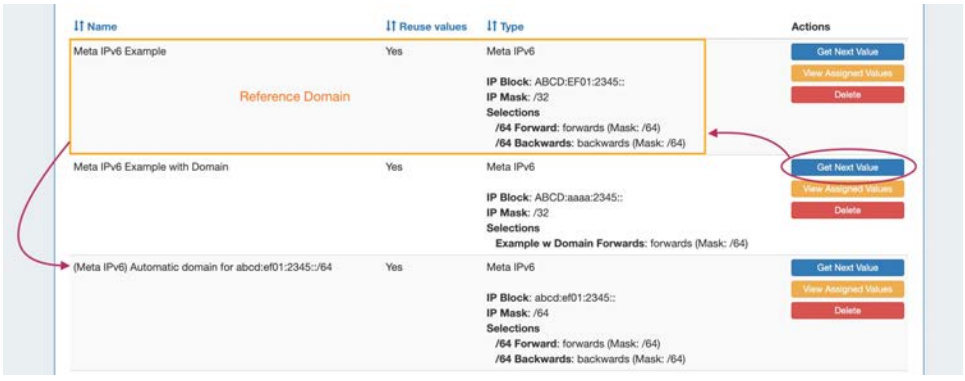
Pick the ordering selection to use with the Meta IPv6 domain to generate the next number, then click "Confirm".



Once confirmed, the next IPv6 value will be provided.



After closing out of the value result, you will see that an entirely new numbering domain was created - ("Meta IPv6) Automatic domain for abcd:ef01:2345:1::/64" using the settings referenced from "Meta IPv6" example (Note: the browser page may need to be refreshed in order to see the update).

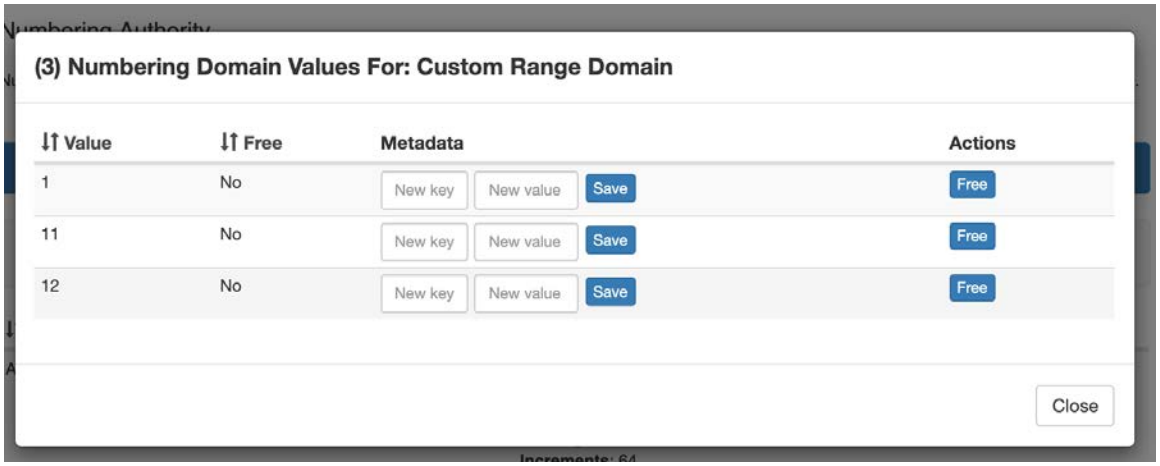


Once an Automatic domain has been created, it can have values generated and be managed independently from the original parent domain.

This allows for more complicated hierarchy assignment systems to have numbers generated at each tier separately, using different masks and/or selection ordering.

View Assigned Values:

View values that are assigned to the domain, view used/free status, free assigned blocks, and save key-value metadata to values.



Sort by Value and Free/Used values by clicking the column names

To add metadata to a value, enter your information into the "Key" and "Value" fields under Metadata, then click "Save".

Free a value for reuse, if allowed, by clicking "Free" under the value Actions column.

Delete:

Deletes the numbering domain.

Edit IPAM or VLAN Columns

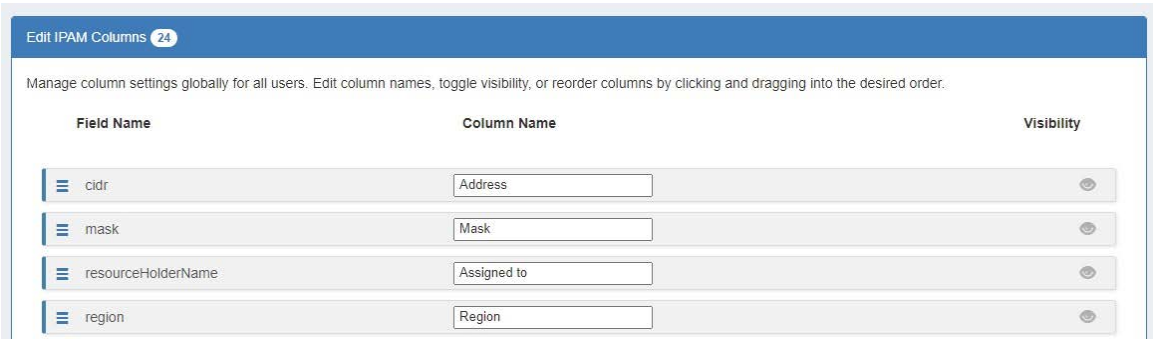
The Edit IPAM Columns and Edit VLAN Columns pages lets you change the order, column name, and visibility of IPAM / VLAN columns globally for IPAM / VLAN areas, respectively, in ProVision.

Editing IPAM Columns will affect the order, name, and visibility of columns in IPAM Manage and the IPAM Gadget, and the available fields in Edit Block for both VLAN and IPAM.

Editing VLAN columns will affect the order, name, and visibility of columns in VLAN Manage, VLAN Advanced, and the available fields in Edit Domain / Edit VLAN.

Additionally, for both IPAM and VLAN, any disabled fields will not be filterable or accessible in IPAM / VLAN Reports.

Eleven default ProVision fields and ten user-defined "Metadata" fields are available for customization.



> Keep in mind that "Edit Columns" is a global edit. If the values for order, header, or visibility are changed, it will affect ALL users of the ProVision application!

To **edit** a column name, simply type your changes into the text box. and click the "Save Changes" button.



To **reorder** the columns, click and hold on the "list" icon (three lines) to the left of the subnet, then drag to the desired location in the list and release.



To **toggle visibility** for a column, click the eye icon to the right of the column name to enable / disable visibility.

This shows or hides the column in both IPAM Manage and the IPAM Gadget, and affects all users.



When complete, be sure to click on the "Save Changes" button to save your changes.

Additional Information

Continue on to the following pages for additional information on IPAM Admin tasks in ProVision:

- IPAM Rules
- Holding Tank Management
- LIR Management and Use

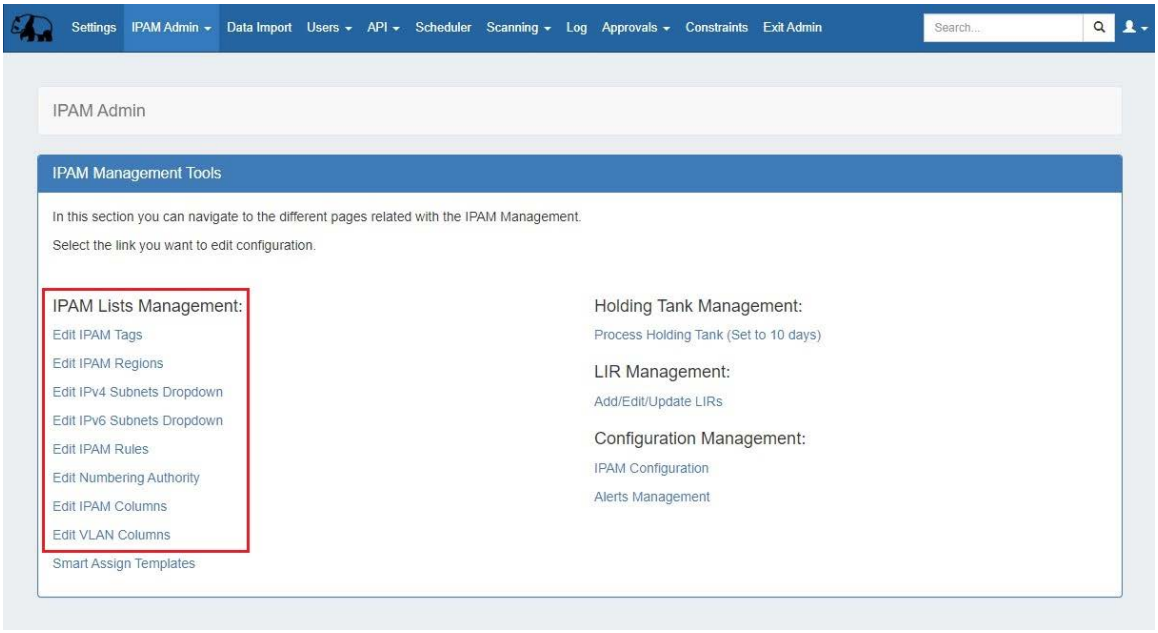
For additional information on non-admin IPAM areas, see:

- IPAM Tab

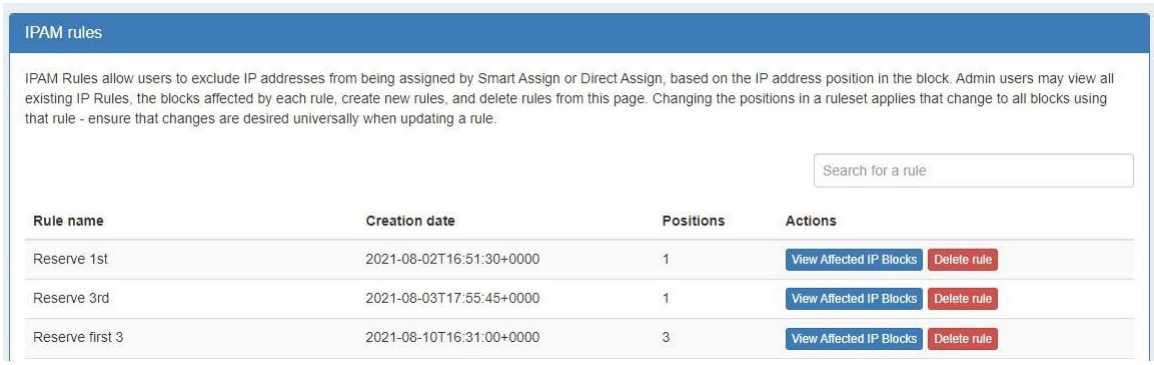
IPAM Rules

IPAM Rules

IPAM Rules are accessed from the Admin section of ProVision, under the **IPAM Admin** tab by clicking on "Edit IPAM Rules".



In the IPAM Admin "Edit IPAM Rules" section, Admin users may view all existing IPAM Rules, the blocks affected by each rule, and delete rules.



- IPAM Rules Overview
- IPAM Rules Behavior and Bounds:
- Edit IPAM Rules Page
- Add an IPAM Rule:
  - IP Rule Positions
- Edit an IPAM Rule:
- View Affected IP Blocks:
- Delete an IP Rule:
- Working with IP Rules:
- Additional Information

IPAM Rules Overview

IPAM Rules allow users to exclude IP addresses from being assigned by Smart Assign or Direct Assign, based on the address position in the block (ie, first address, last address, n^{th} from last).

Reserved addresses are set by their position in the block, starting with position '1' to represent the first address, '2' the second, and so on (1,2,3). The last position in the block is represented as '0', with each step backwards set as the next lowest negative integer (0, -1, -2, 3). Rulesets may reserve one or many positions in a block, so you can choose to reserve only the first address (1), only the last address (0), or combinations as desired - reserving the first three and last three addresses on a block would look like (1,2,3,0,1,-2).

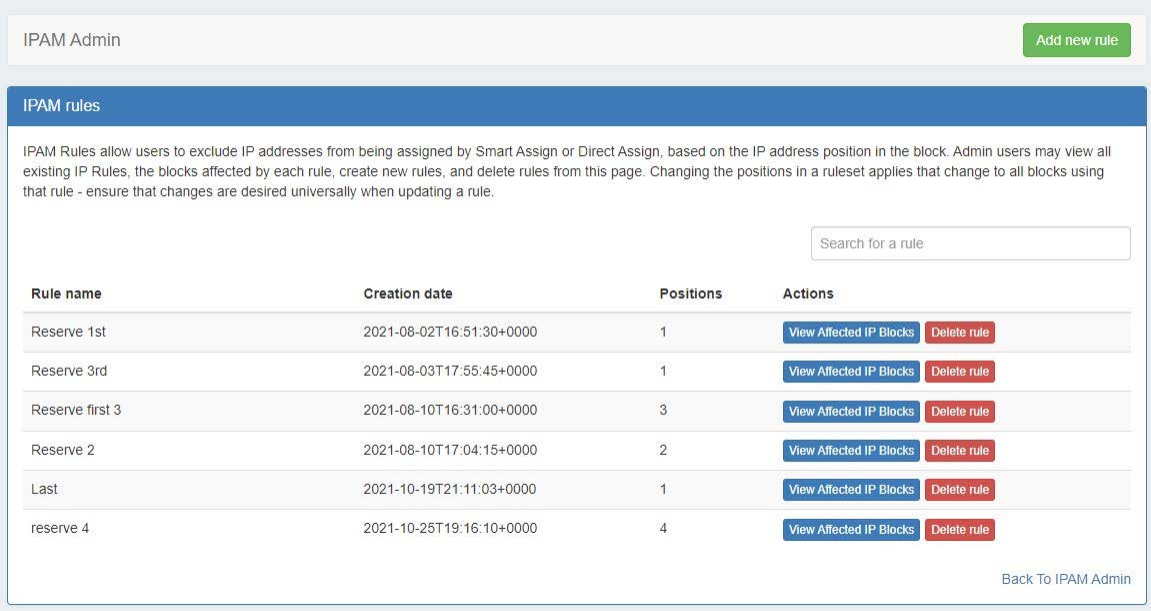
IPAM Rules may be created and applied to blocks under the IPAM Tab -> IPAM Manage screen, in the Action Menu for the desired block. Additional management tasks are available under the IPAM Admin -> "Edit IPAM Rules" page.

IPAM Rules Behavior and Bounds:

- Rules may be applied to IPv4 or IPv6 blocks
- Once a rule has been applied to a block, the addresses at the selected rule positions will by bypassed when Smart Assigning from that block, or return an error when Direct Assigning that position from the IPAM Gadget.
- Only one ruleset may be applied per block - so if a rule already exists for reserving the first address in a block, and a second rule exists for reserving the last address, and you would like to use both, a third, new ruleset must be created that combines reserving both first and last.
- Rules cascade down the IP tree. If a rule is applied to a /24, child blocks under that /24 (/30s, etc) will have the same ruleset applied.
- Changing the positions in a ruleset applies that change to all blocks using that rule - ensure that changes are desired universally when updating a rule.
- If a rule's position(s) is outside of the boundary of the selected block (for example, trying to reserve the 60th address of /30), an error message will notify the user and prompt for a different rule selection.

Edit IPAM Rules Page

In the IPAM Admin "Edit IPAM Rules" section, Admin users may view all existing IPAM Rules, the blocks affected by each rule, create new rules, and delete existing rules.



Add New Rule: Opens the "Manage Ruleset" interface where a new rule may be created. This module is also accessible from the "IP Rules" option on the IPAM Manage Action Menu.

Search: Filter the list of rules by searching for a rule name.

Rule Name: The user-created name of the rule. **Clicking** on the rule name will bring up the Manage Ruleset screen, showing an editable list of rule positions.

Creation Date: Date the rule was created.

Positions: How many positions are reserved by the rule.

View Applied Networks: Shows a list of blocks that have the rule applied.

Delete Rule: Deletes the selected rule.

Add an IPAM Rule:

Adding an IPAM Rule from the Admin area of ProVision functions the same way as if accessed from IPAM Manage.

Click on "Add new Rule", and the Manage Ruleset screen will appear, prompting you to enter a Ruleset name, and select positions to reserve.

IP Rule Positions

Reserved addresses are set by their position in the block. Positions start at '1', for the first address in a block, and step up by one for each subsequent IP address. The last position in a block is '0', representing the last address, and steps down a negative integer for each position from last - so the last three addresses in a block would be represented by (0, -1, -2). When reserving multiple positions, the typed order of the positions does not matter.

Position examples:

(1) - Reserves the first IP

(0) - Reserves the last IP

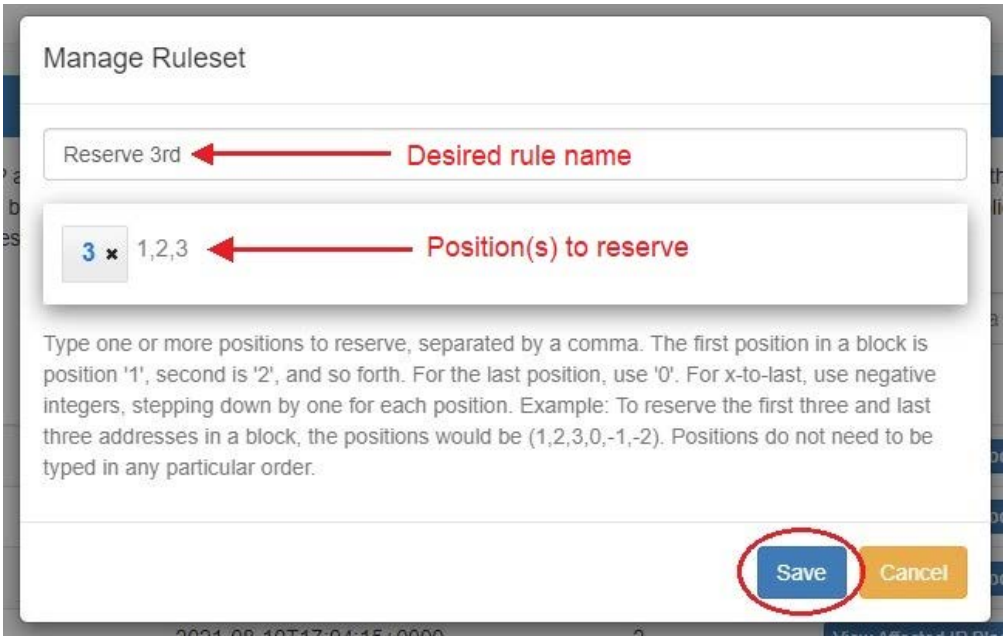
(1,2,3) - Reserves the first three IPs

(0, -1, -2) - Reserves the last three IPs.

(1,2,3,0,-1,-2) - Reserves the first three and last three IPs

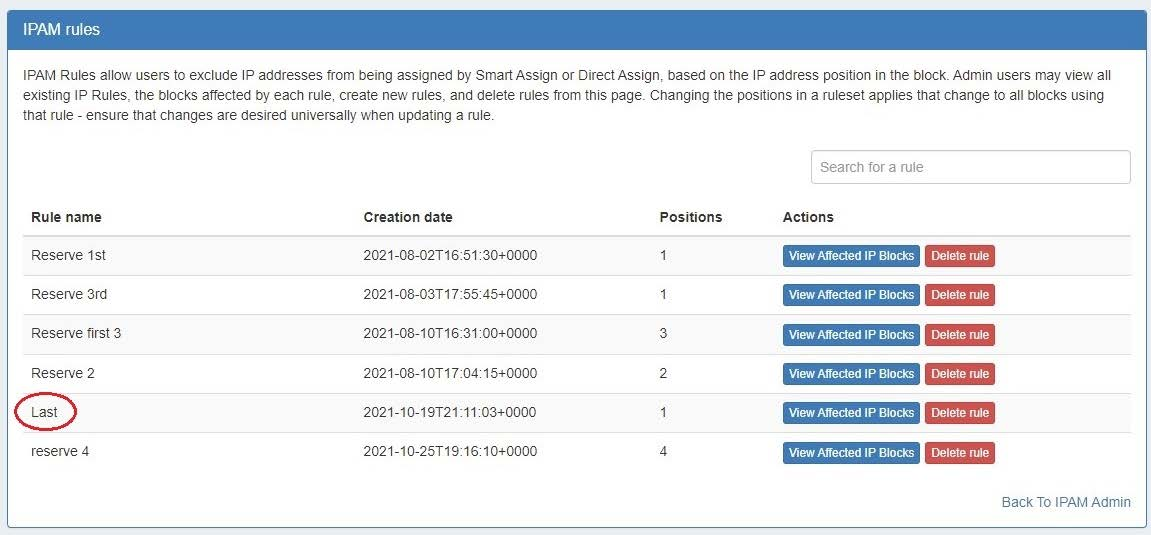
Type in the desired name for the new rule, and one or multiple positions (denoted by integers separated by commas) into the box below the name.

When complete, click the "Save" button, or hit "Cancel" to exit without saving. The Rule preview screen will appear.



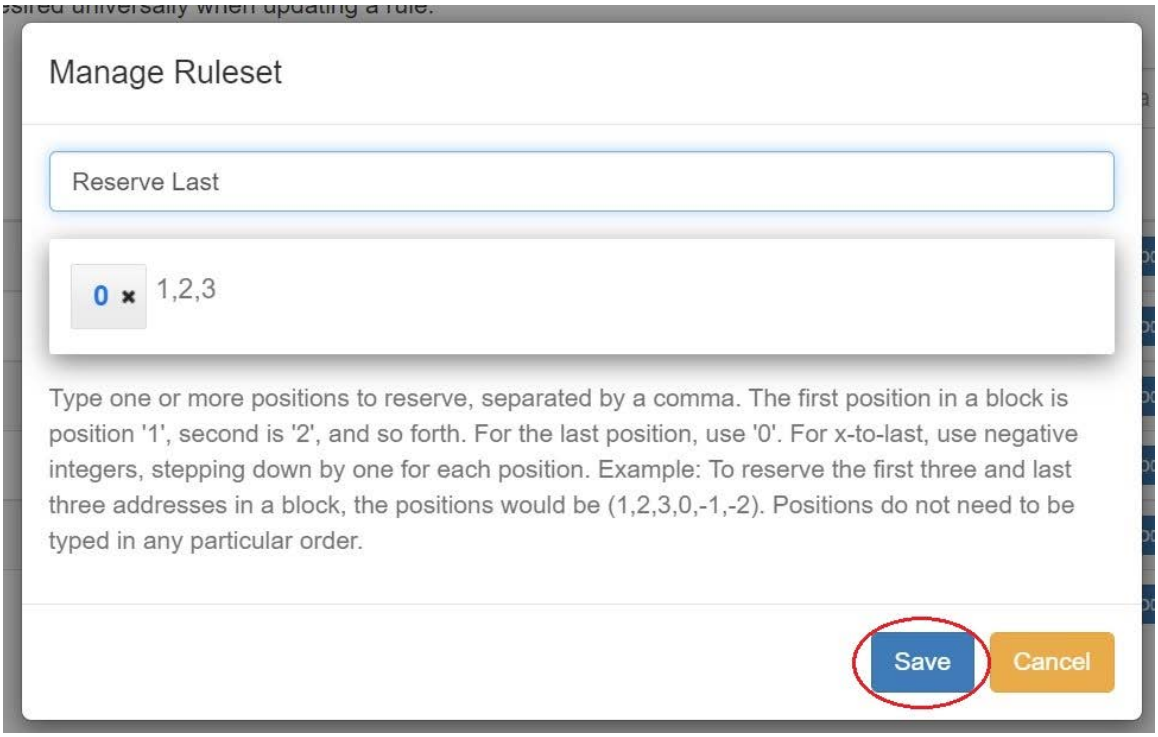
Edit an IPAM Rule:

From the Admin IPAM Rules page, click on the Rule entry in the list when highlighted.



This will bring up the "Manage Ruleset" module, showing the rule name and the currently reserved positions for the ruleset.

To change the rule name, simply type the desired changes into the Rule Name text box, and click "Save".



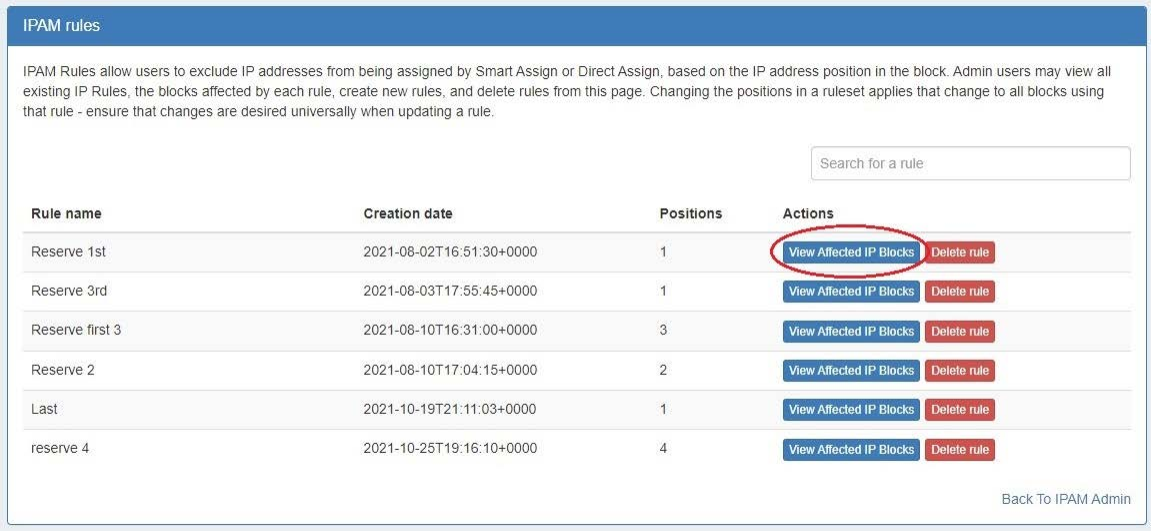
To edit the positions in the rule, either delete a position by clicking on the "x" for the position, or add a new position by typing the position number and then hit enter.

When you are done with your changes, click the "Save" button.

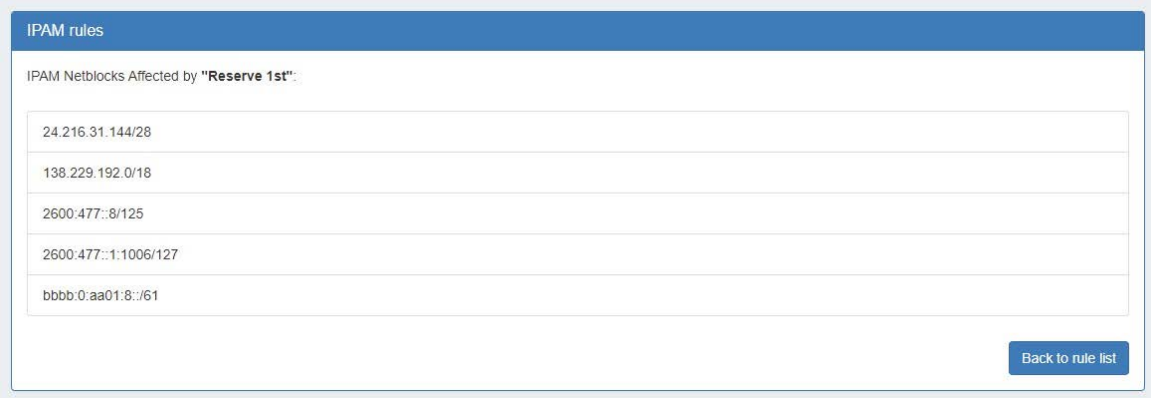
To discard changes, or exit the module, click "Cancel".

> Note: When positions are changed, the change applies to all blocks using that rule! Ensure that the change is desired universally for all blocks using that rule prior to updating.

View Affected IP Blocks:



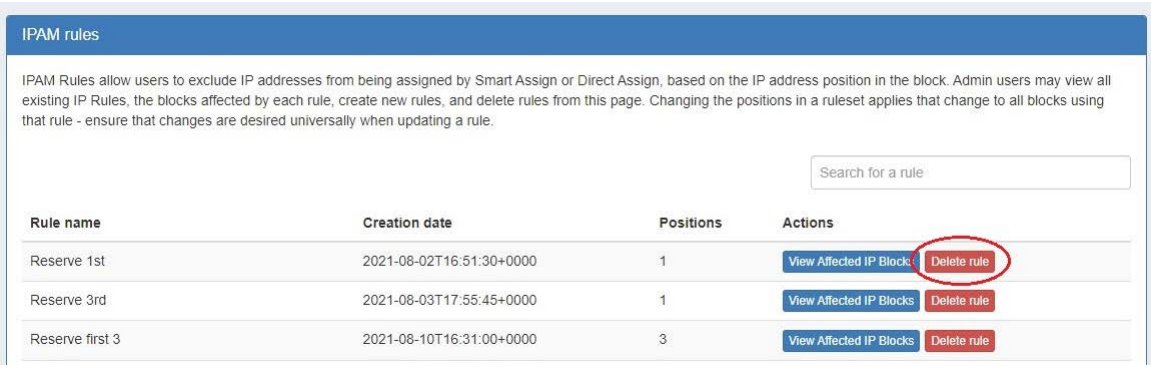
Clicking on "View Affected IP Blocks" in the IP Rules list for a rule will show a list of blocks that currently have the rule applied. It is recommended that you check the affected blocks list before editing or deleting an IP Rule to ensure that the changes are desired for the affected blocks.



Delete an IP Rule:

To delete an IP Rule, click on the "Delete Rule" button for the rule in the IPAM Rules list. This will permanently delete the rule and remove it from any blocks currently affected by the rule.

If you only wish to remove a rule from a block, but retain the rule for future use (or to retain use by other blocks), please see "Remove a rule from a block" detailed at Working with IP Rules.



Working with IP Rules:

For additional information on common IP Rules tasks that do not require Admin access, see Working with IP Rules in the ProVision User Guide.

Detailed walkthroughs of creating a new rule, applying an existing rule to a block, and removing a rule from a block are provided.

Additional Information

See the following pages for additional information on IPAM Admin tasks in ProVision:

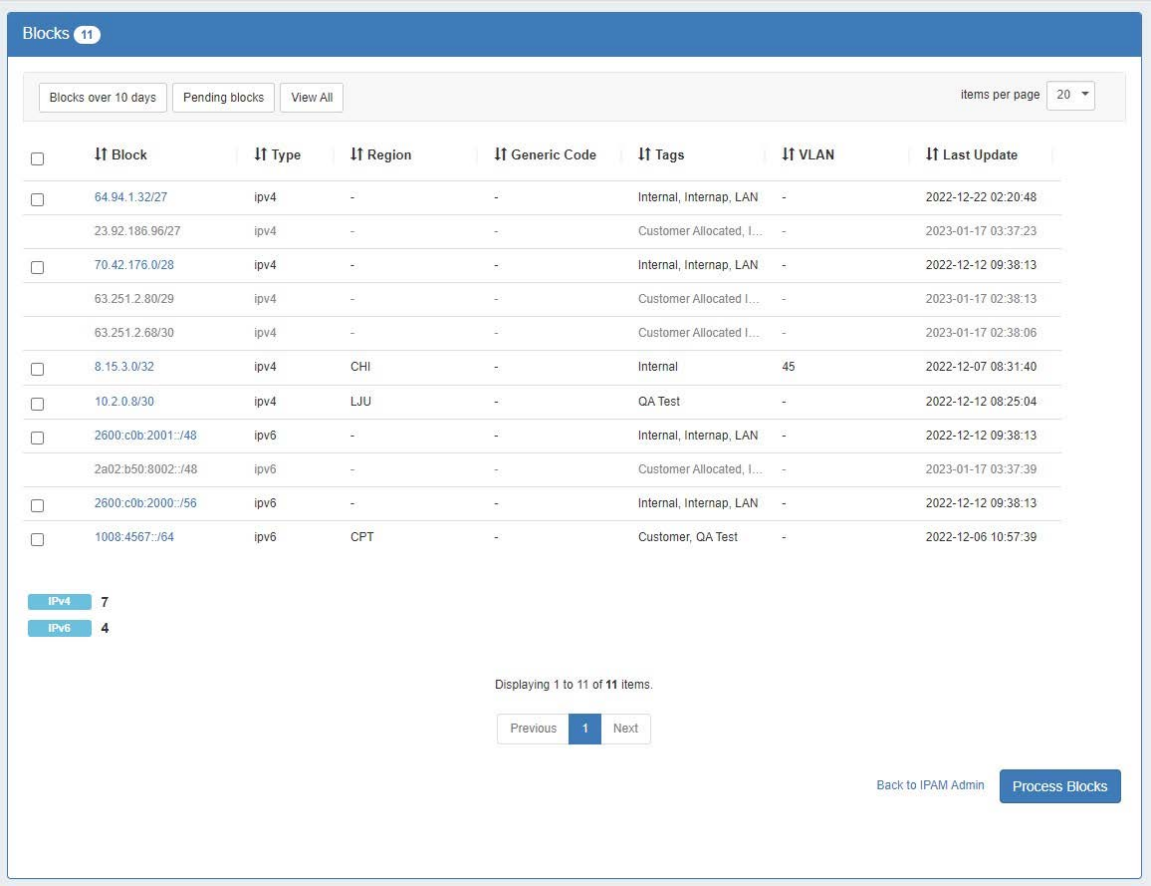
- IPAM Lists Management
- Holding Tank Management
- LIR Management and Use

For additional information on non-admin IPAM areas, see:

- IPAM Tab

Holding Tank Management

Holding Tank Overview

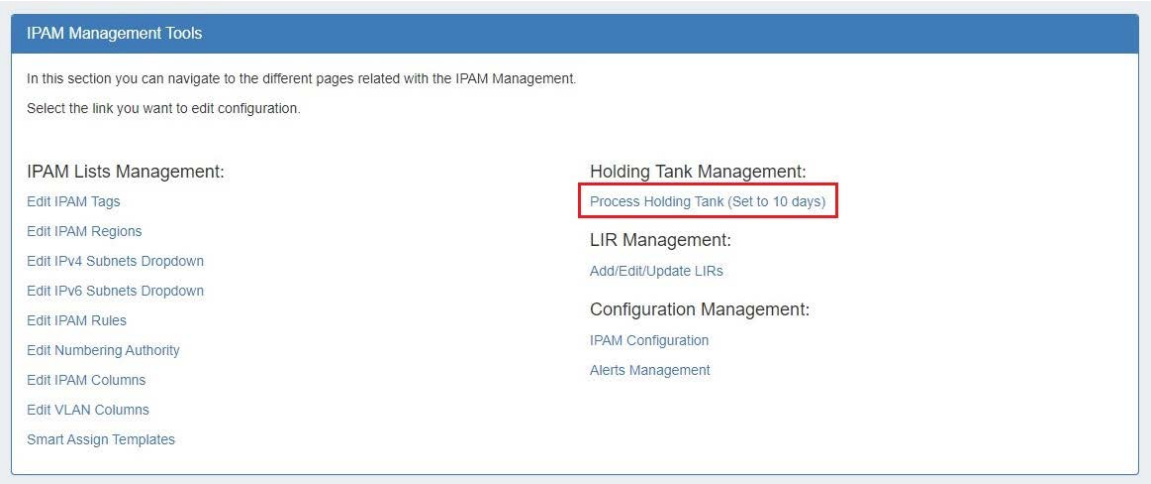


The Holding Tank, accessible from **IPAM Admin** Process Holding Tank, displays a list of all unassigned IPAM blocks with the "Holding" status. Blocks older than the IPAM Configuration Holding Tank Days setting may be processed to be returned to the "Available" status.

- Holding Tank Views
  - View Blocks over X days
  - View Pending Blocks
  - View All Blocks
- Sort Holding Tank Blocks
- View Block in IPAM Manage
- Processing Blocks
  - Process Individual Blocks
  - Process All Blocks
- Holding Tank Permissions
- Additional Information

Holding Tank Views

Access the holding tank from **IPAM Admin** Process Holding Tank.

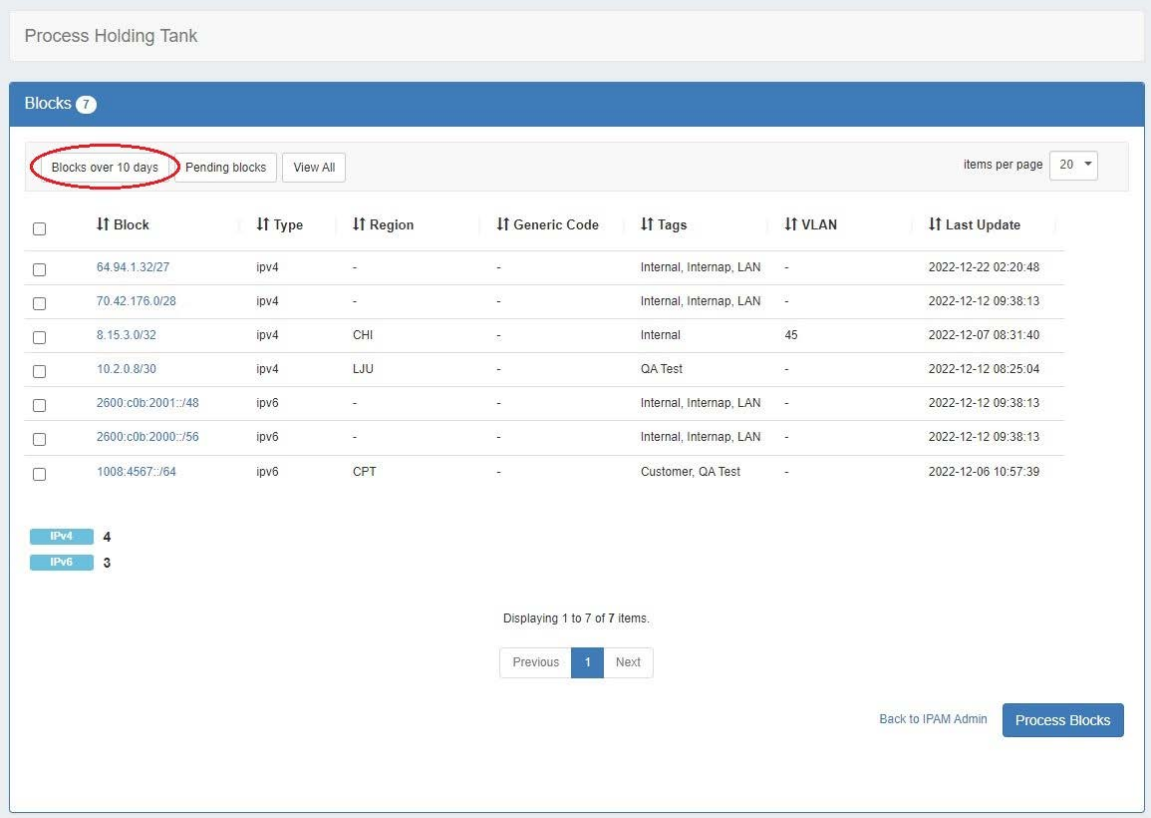


Then, at the top of the holding take, select the desired view from the top of the "Process Holding Tank" page in IPAM Admin. You may choose to view Blocks over X days, View Pending Blocks, or View All.

View Blocks over X days

"View Blocks over X days" only displays blocks over the "Holding Tank Days" setting in IPAM Configuration. To change to this view from a different view, click "View Blocks over X days" from the view list at the top of the Holding Tank.

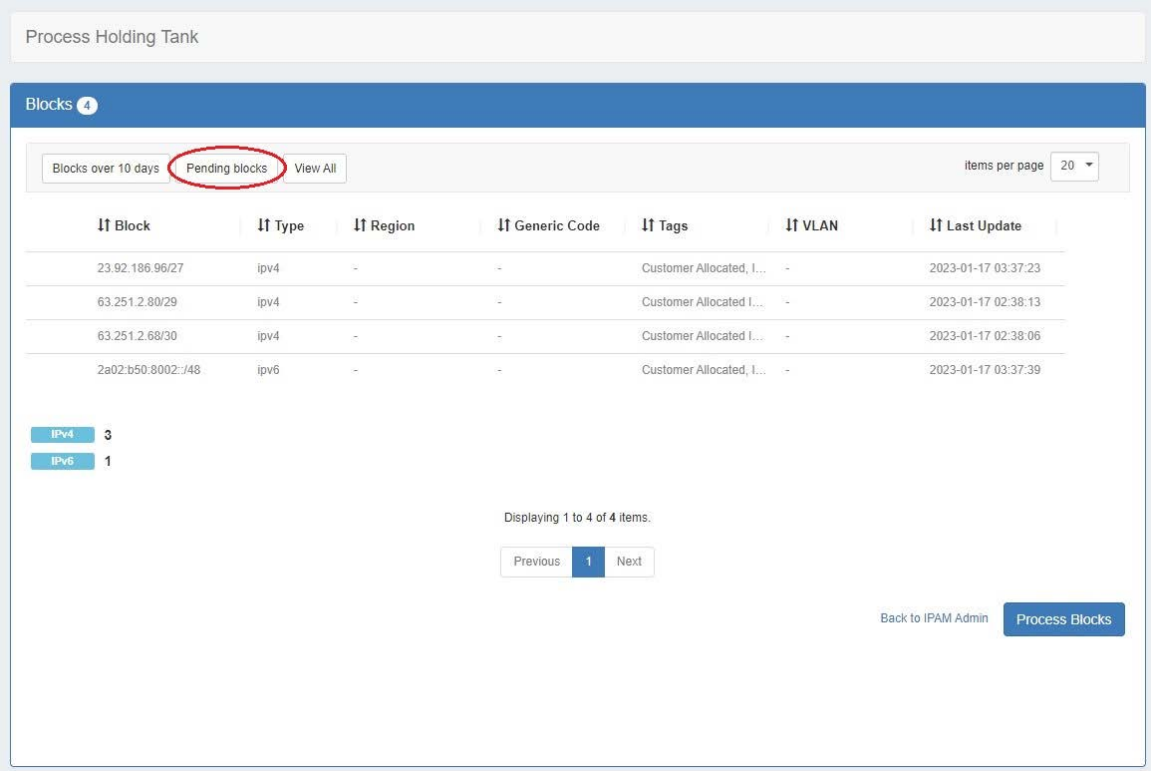
In this view, all processable blocks are shown, and you may select either specific blocks or all blocks for processing.



View Pending Blocks

To view only Pending blocks, click "View Pending Blocks " from the view list at the top of the Holding Tank. "View Blocks over X days" only displays blocks more recent than the "Holding Tank Days setting".

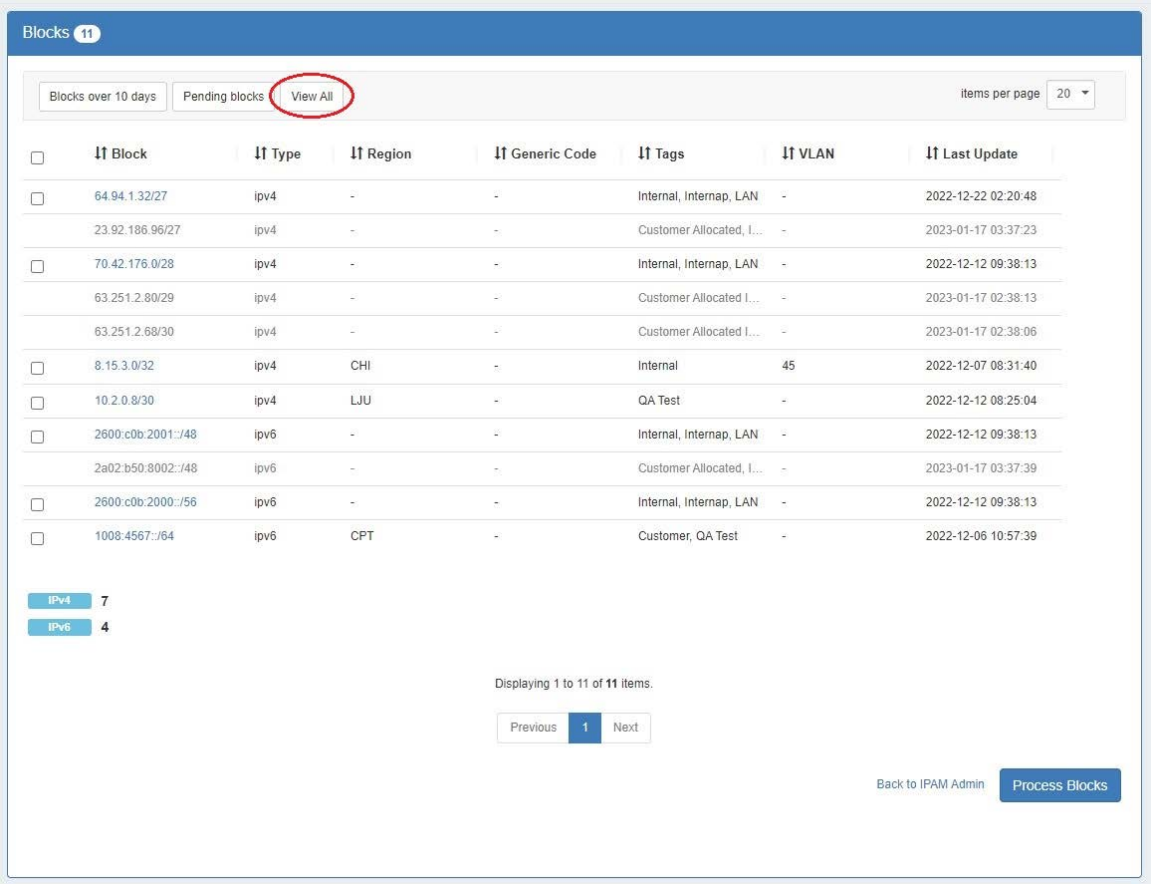
You may view additional details for the block in IPAM Manage by clicking on CIDR link for the desired block.



View All Blocks

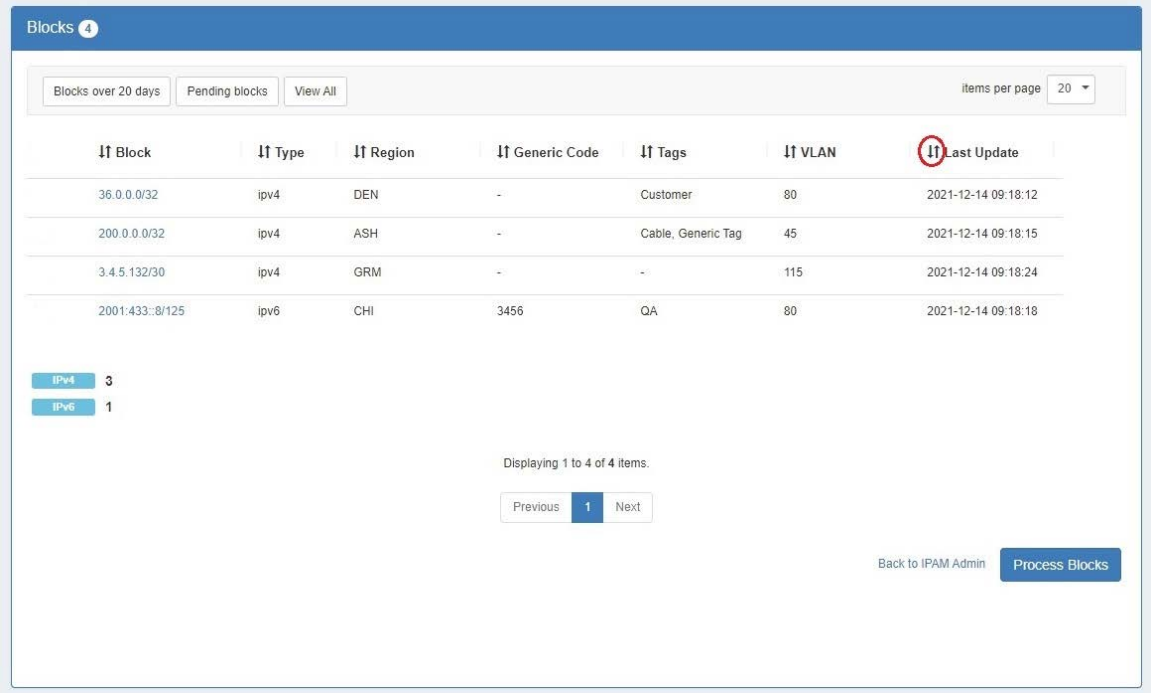
To view all blocks, click "View All" from the view list at the top of the Holding Tank. "View All" displays both Pending and processable blocks, but only processable blocks older than the Holding Tank Days may be selected for release.

Any block may be viewed in IPAM manage by clicking on the CIDR link for the block, and the list may be sorted into ascending/descending order for any field.



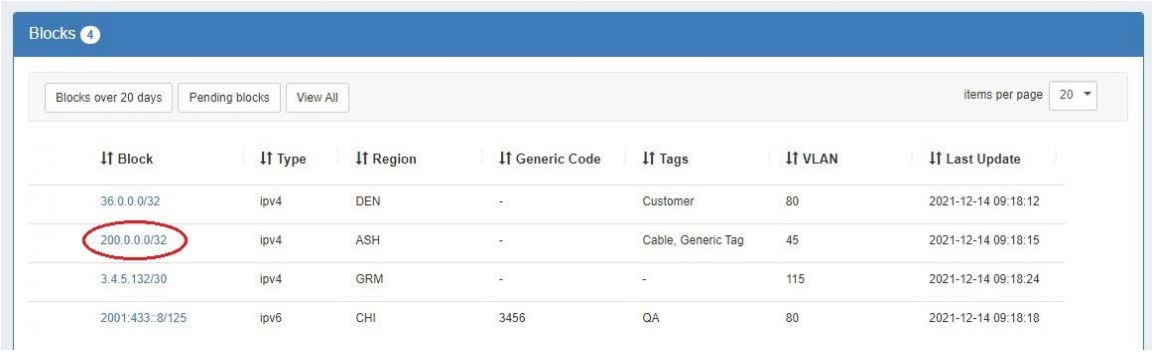
Sort Holding Tank Blocks

From any view in the Holding Tank, click on the up/down arrows next to the column name to sort the results by ascending/descending order for that field.



View Block in IPAM Manage

While in the Holding Tank, you may open the IPAM Manage page for a specific block by clicking on the block's CIDR - this allows you to review the block or manually manage it otherwise.



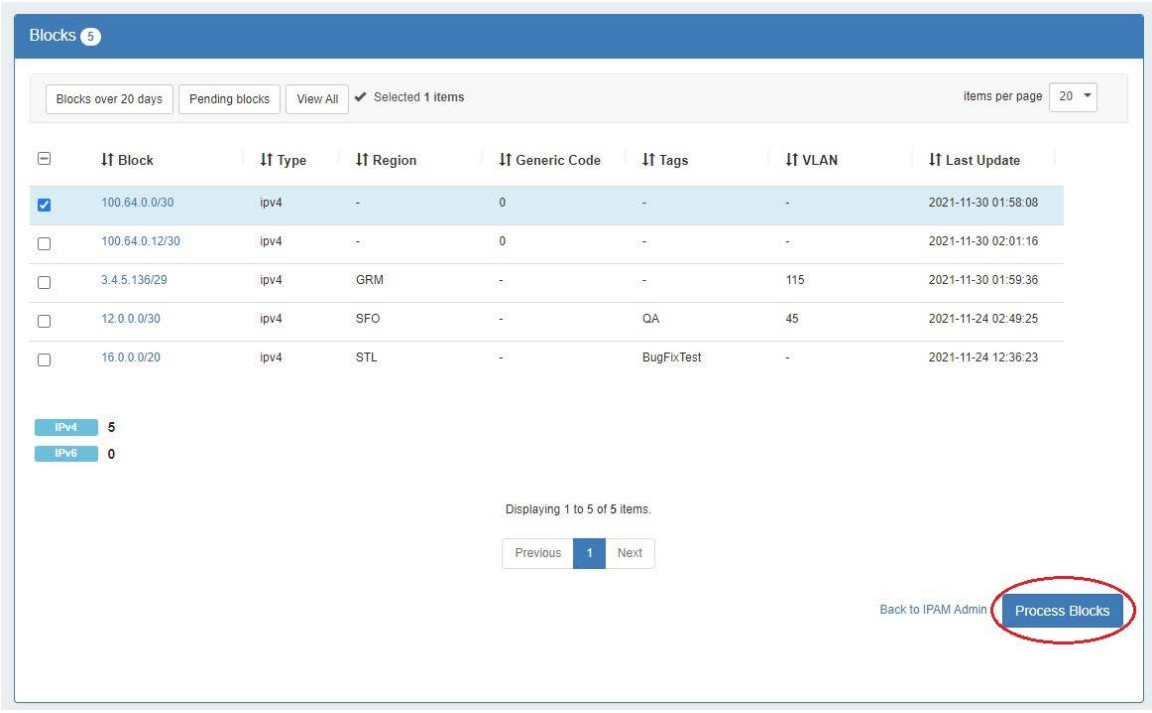
Processing Blocks

The Process Blocks action(s) in the Holding Tank will process all selected blocks and change them to the "Available" status. Processable Blocks will display with selection boxes next to them to mark for processing.

The default time for blocks to be held prior to showing in the holding tank is 30 days, but this number is customizable from the IPAM Configuration page. Regardless of the holding tank days setting, blocks may be manually reset to available at any time.

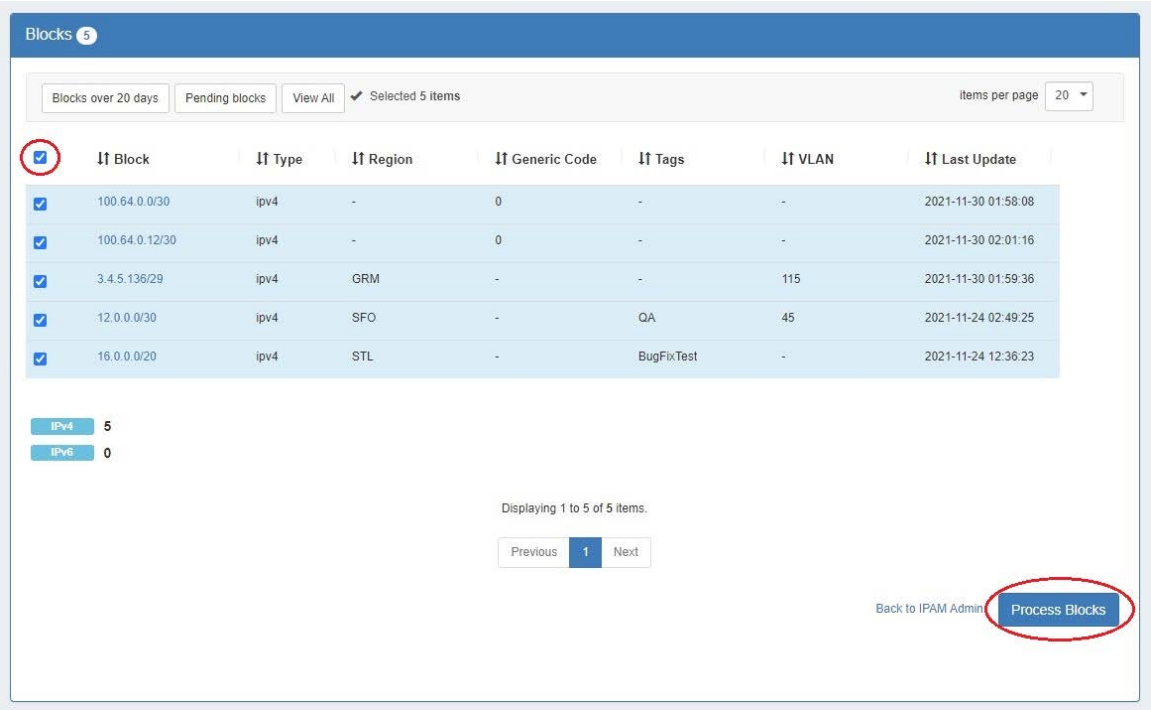
Process Individual Blocks

Select individual blocks to release from holding by clicking the checkbox for the desired block(s), then click "Process Blocks".



Process All Blocks

Click the "select all" checkbox at the top left header of the table, ensuring all blocks are selected, then click "Process Blocks".



Pro-Tip!

If you need to do a bulk "empty" of the holding tank, set the "Holding Tank Days" setting to "0" days. This will allow you to process all blocks in holding immediately.

Holding Tank Permissions

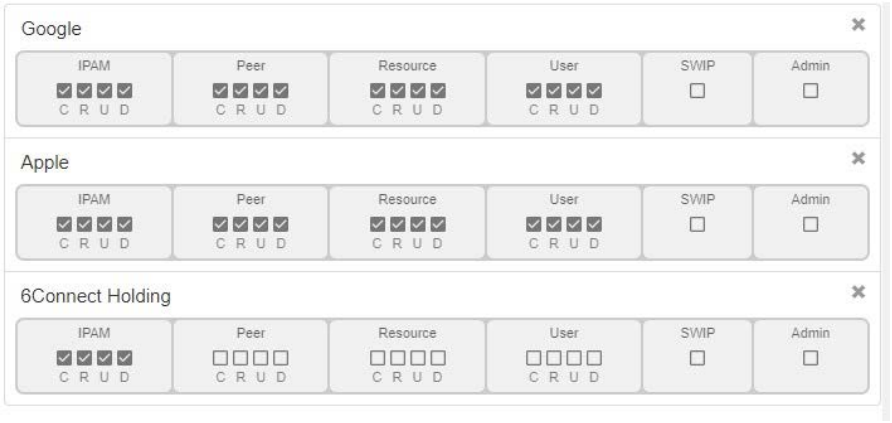
For blocks with subassignments, the Holding Tank can utilize ProVision's permissions structure in order to override holding. This allows the subbassigned block to be set as assigned to the parent resource.

Using this feature requires:

1) A block (block 1) assigned to a Resource (Resource A) that allows subassignments.

2) A block (block 2) subassigned to another Resource (Resource B) from the parent (block 1).

3) A User assigned to a Group with permissions to both Resource A and Resource B, and IPAM permissions for the 6connect Holding Resource. See Users and Permissions for additional information on setting up Users and Group permissions.



Steps:

1) While logged in as the user with the above permissions, go to the IPAM manage screen for the subassigned block (block 2).

2) Select "Unassign" from the Action Menu. The 'Assigned To' column will change from showing "Resource B" to "Holding"

3) For the same block, select "Override Holding" from the Action Menu. This is the step that setting the Holding resource permissions allows, that would otherwise be unaccessible.

4) You will then see the 'Assigned To' field change from "Holding" to "Resource A", as the assignment is reverted to match the parent level.

> Override Holding through the permissions structure is intended only for blocks that are subassigned. It is not intended for blocks that are not subassigned. Setting holding permissions for non-subassigned blocks simply allows viewing of the block(s) in holding, and permissions do -not- extend to allowing overrides by design.

Additional Information

See the following pages for additional information on IPAM Admin tasks:

- IPAM Lists Management
- IPAM Rules
- LIR Management and Use

For additional information on non-admin IPAM areas, see:

- IPAM Tab

RIR Integration: SWIP-RPSL

Overview

ProVision supports updating SWIP/RPSL functions for ARIN and RIPE blocks through simple reassigns using the RIR Integration action.

- RIR Integration
  - When do I use RIR Integration and Why?
  - What is Simple Re-assign?
- Workflow
  - 1) LIR Setup
  - 2) Assign IP blocks to the ARIN or RIPE RIRs
  - 3) RIR Integration
    - ARIN / Update SWIP
    - RIPE / Update RPSL

RIR Integration

When do I use RIR Integration and Why?

From ARIN.net:

Organizations that receive space allocations from ARIN, either directly or as a downstream customer, must provide reassignment information back to ARIN. This information must be sent within seven days of the reassignment so that the WHOIS database may be maintained. ARIN also uses utilization history, projected requirements, and other information in order to make future space allocations.

From RIPE.net:

All RIPE assignments and allocations must be registered in the RIPE Database. This is necessary to ensure uniqueness and to support network operations.
Only allocations and assignments registered in the RIPE Database are considered valid. Registration of objects in the database is the final step in making an allocation or assignment. Registration data (range, contact information, status etc.) must be correct at all times (i.e. they have to be maintained).The RIPE community's policies require LIRs to register an inetnum object in the RIPE Database for their own infrastructure and customers' networks. LIRs must ensure registration information is correct and up to date at all times.

> **RIPE Integration**
>
> You must be using an MD5 password to update RIPE objects from ProVision! Please refer to RIPE's authentication page for additional details:
>
> https://www.ripe.net/manage-ips-and-asns/db/support/security/protecting-data#solving-authentication-problems

What is Simple Re-assign?

From ARIN.net:

Used to subdelegate IP addresses to a customer that does not need to:

- subdelegate the addresses to their own customers
- maintain their own in-addr.arpa delegation
- display their own point of contact (POC) information.

It can also be used to change the customer name and address information (but not the range) on an existing simple reassignment and to remove simple reassignments. It is submitted by an ARIN Online user account linked to the parent organization's Admin or Tech POC, or the Tech POC for the resource.

Workflow

1) LIR Setup

ProVision supports multiple LIRs (Local Internet Registries) in a single instance. This means that you have the ability to update SWIP/RPSL functions for a given allocation with the LIR information that you wish. LIRs are set up and managed from the IPAM Admin area, and thus require Admin level permissions to set up.

While setting up the LIR, the POCs / Contact fields that are filled in will later be used for the RIR Integration.

For detailed step by step instructions, see:

LIR Management and Use

ARIN LIR Setup and Use

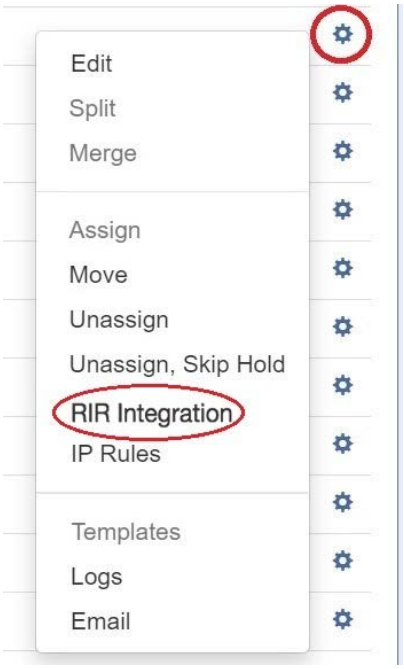
RIPE LIR Setup and Use

2) Assign IP blocks to the ARIN or RIPE RIRs

Assign an IP block to a Resource using the IPAM Gadget or the Assign function from the IPAM Manage screen. See Working with IP Blocks for additional detail.

3) RIR Integration

Once LIRs have been configured, and blocks assigned under the applicable RIR, you will be able to use the **RIR integration** feature from the Action Menu on the IPAM Manage screen or IPAM Gadget.

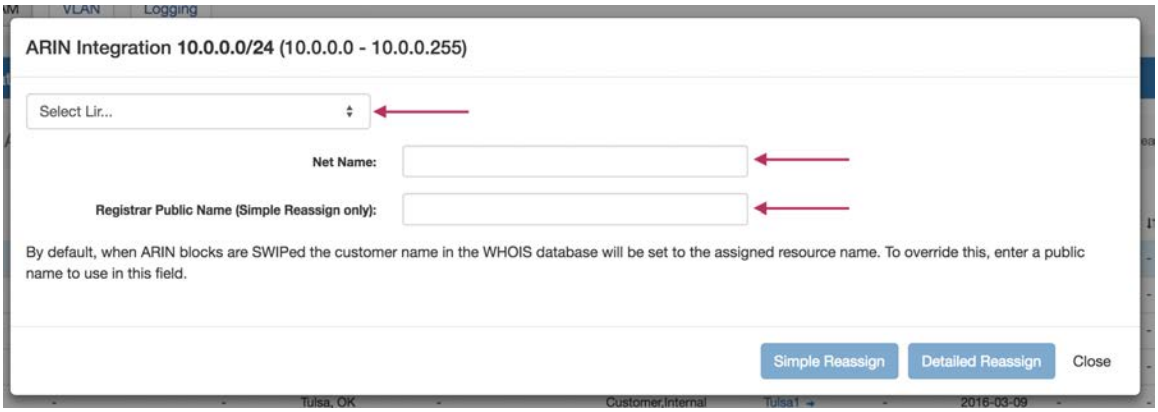


Depending on the RIR associated with the block, either an ARIN or RIPE Integration box will pop up.

ARIN / Update SWIP

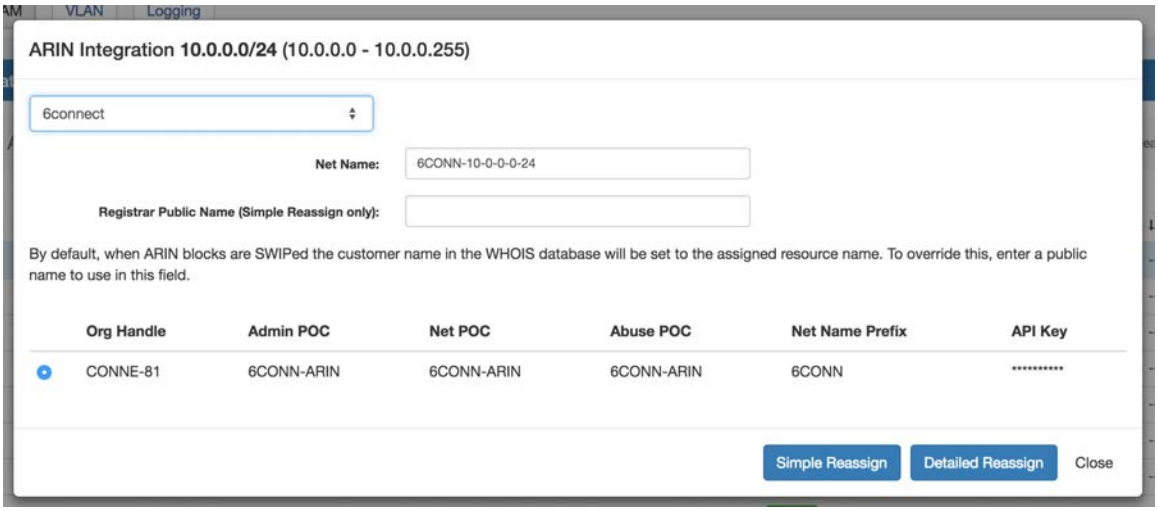
Select LIR:

Select the desired LIR, and verify the Net Name / Public Name if desired.



Reassign:

Once the LIR and Handle is selected, you can click either "Simple Reassign", "Detailed Reassign" or "Close" to exit.



For detailed step by step instructions, see:

ARIN LIR Setup and Use

RIPE / Update RPSL

Select LIR:



Select Data Set / Create Inetnum

Identify which LIR data you want to use for the netnum update, and select either "Create Inetnum" or "Close" to exit.

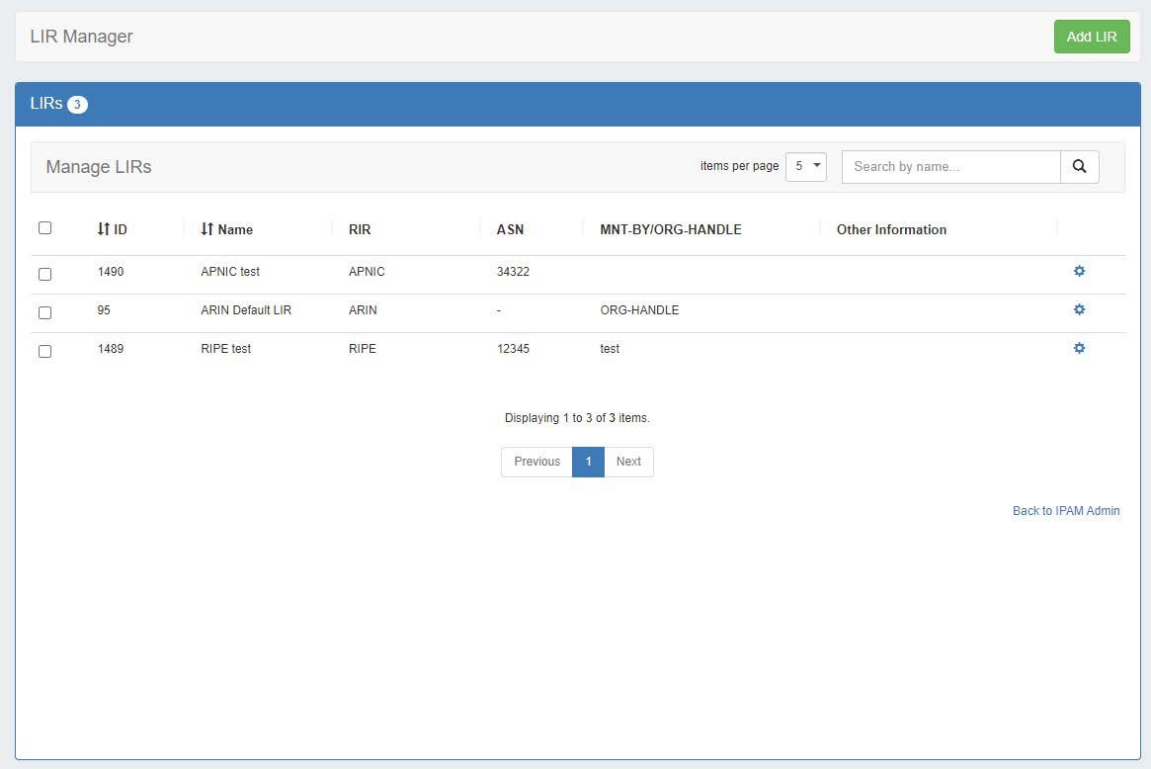


For detailed step by step instructions, see:

RIPE LIR Setup and Use

LIR Management and Use

LIR Manager

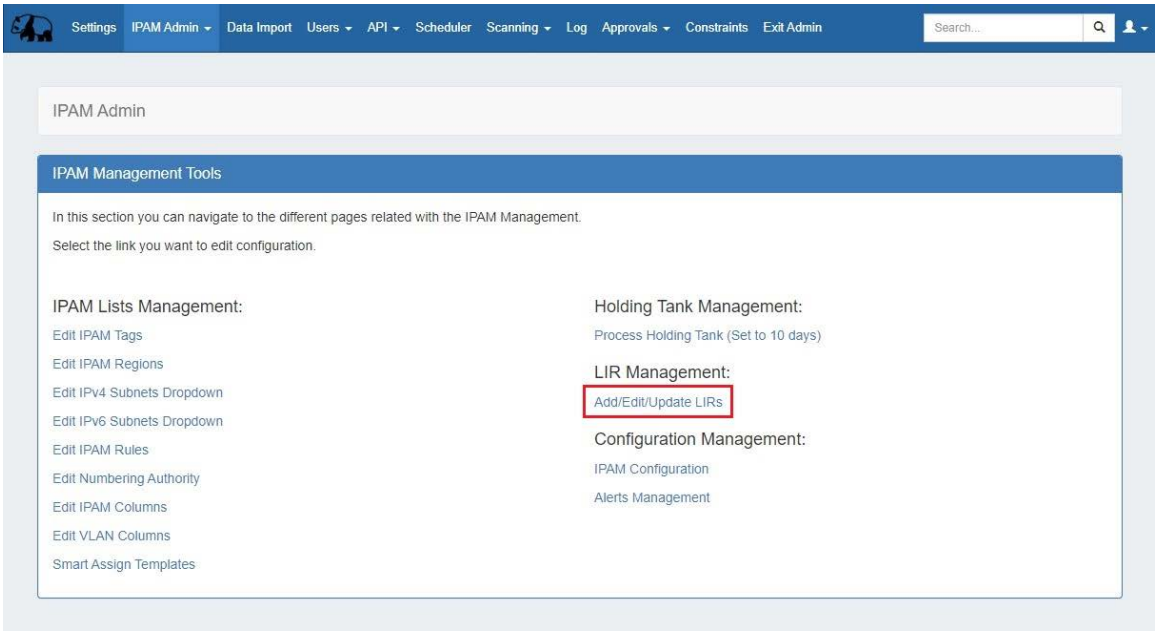


ProVision supports multiple LIRs (Local Internet Registries) in a single instance. This means that you have the ability to update SWIP/RPSL functions for a given allocation with the LIR information that you wish.

- LIR Manager
  - LIR Setup and Use
  - Add a LIR
    - ARIN
    - RIPE
  - Edit a LIR
  - Delete LIR(s)
  - RIR Integration
  - Additional Information

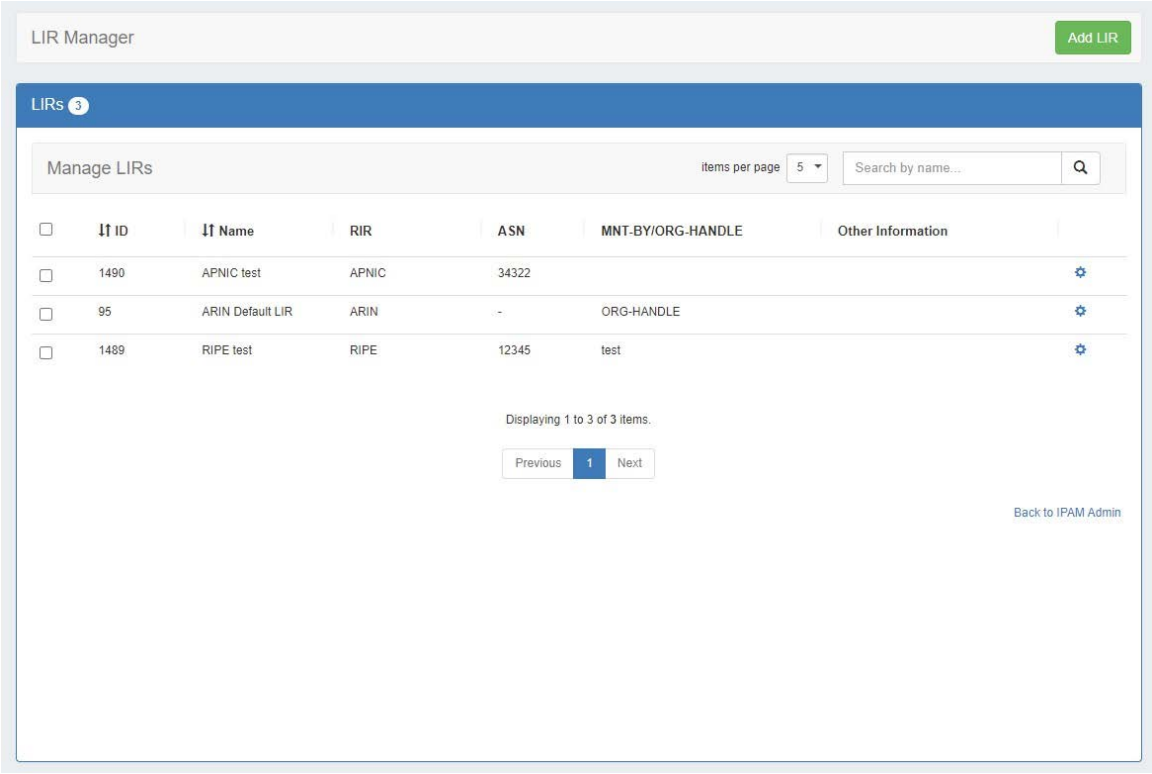
LIR Setup and Use

The LIR Manager is available from the IPAM Admin page. In the Admin section of ProVision, select the **IPAM Admin** tab, then "LIR Management: Add / Edit / Update LIRs".



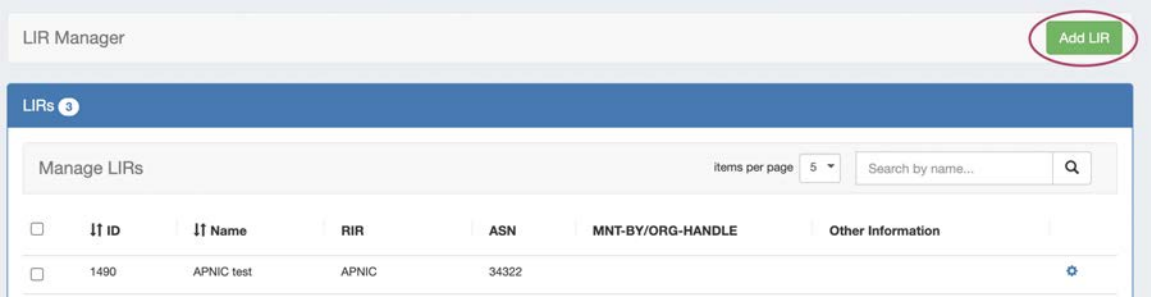
You will be taken to the LIR Manager page, showing your current LIRs.

You may Add LIRs from the top of the page, and edit or delete the individual LIRS by hitting the Action Menu (gear icon).



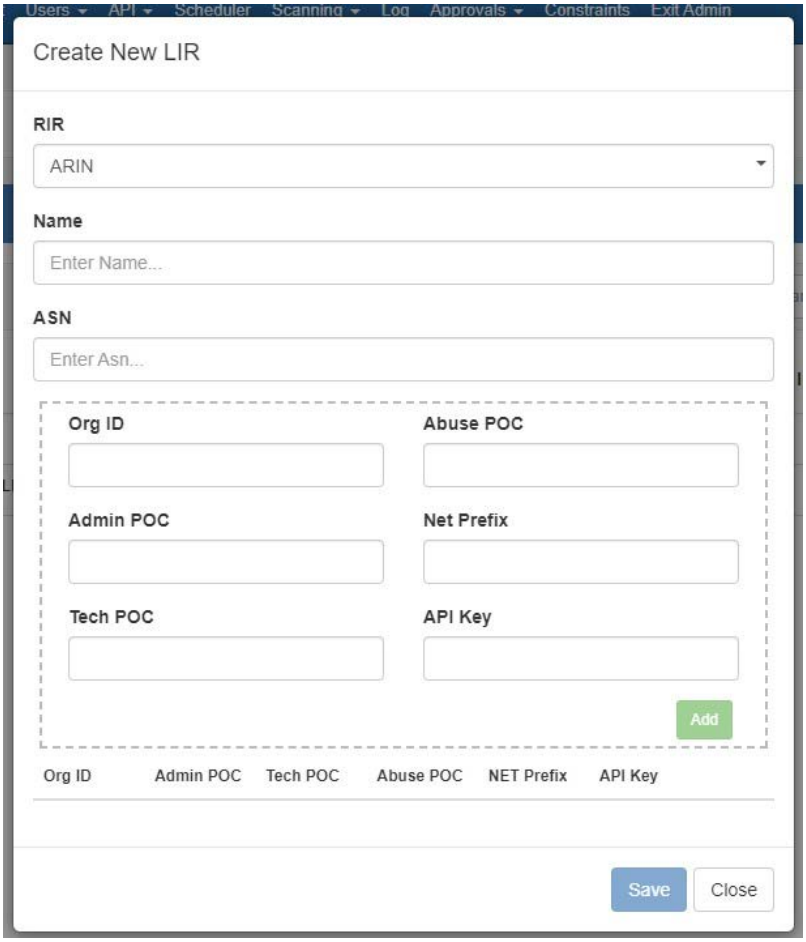
Add a LIR

After clicking on the **Add LIR** button, you can setup the required data for the specific RIR/LIR combination:



ARIN

Adding a new LIR with ARIN selected for RIR will bring up the following fields.



Enter the Name, ASN, ORG ID, POC information, NET Name Prefix, and API Key. Additional Orgs may be added by selecting the "Add Org" button.

Be sure to click the "Save" button when done to save your changes.

> **Remember to SAVE!**
>
> Make sure to click the Save button or else the LIR data will not save.

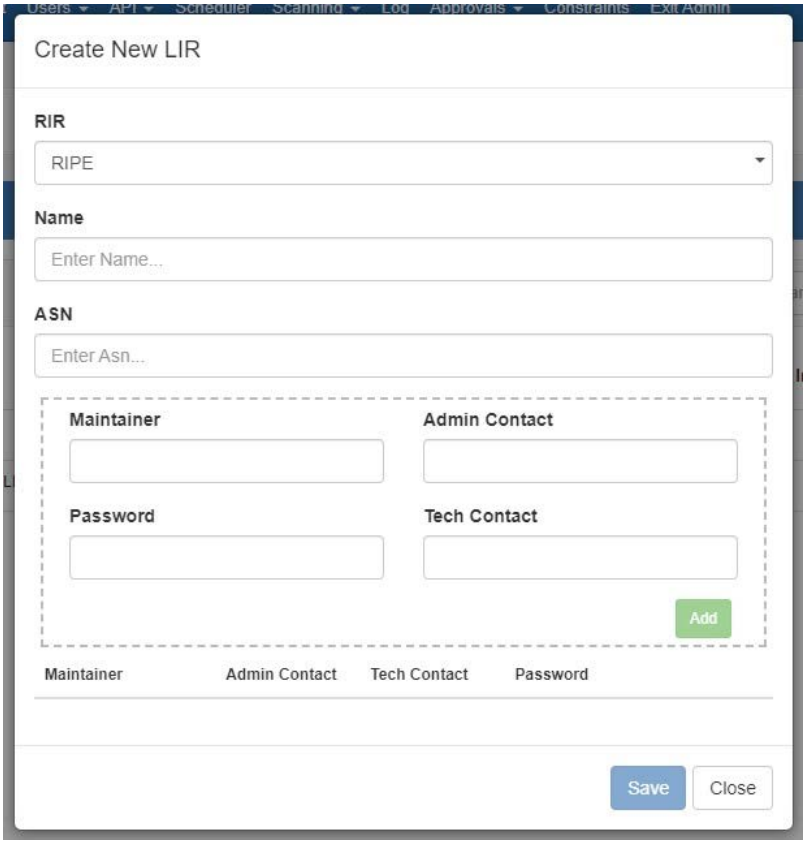
RIPE

Adding a new LIR with RIPE selected for RIR will bring up the following fields.

RIPE Integration

You must be using an MD5 password to update RIPE objects from ProVision! Please refer to RIPE's authentication page for additional details:

https://www.ripe.net/manage-ips-and-asns/db/support/security/protecting-data#solving-authentication-problems



Enter the Name, ASN, Maintainer, Password, and Contact information. Additional Maintainers may be added by selecting the "Add Maintainer" button.

Be sure to click the "Save" button when done to save your changes.

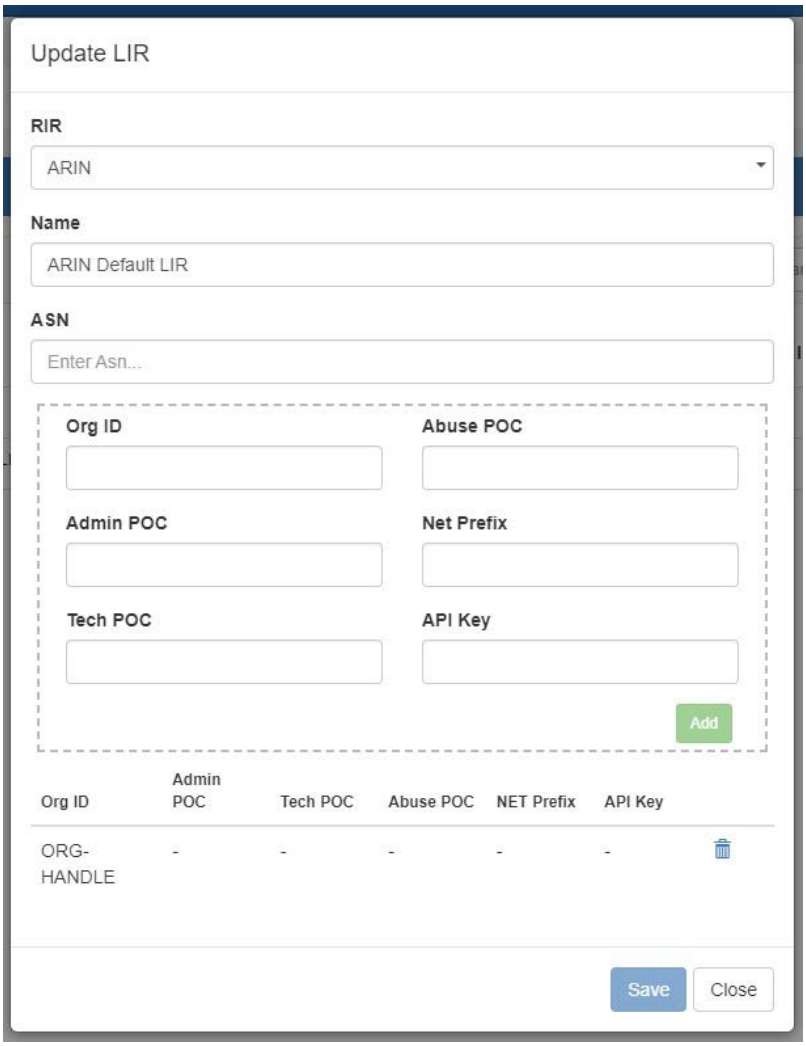
Remember to SAVE!

Make sure to click the Save button or else the LIR data will not save.

Edit a LIR

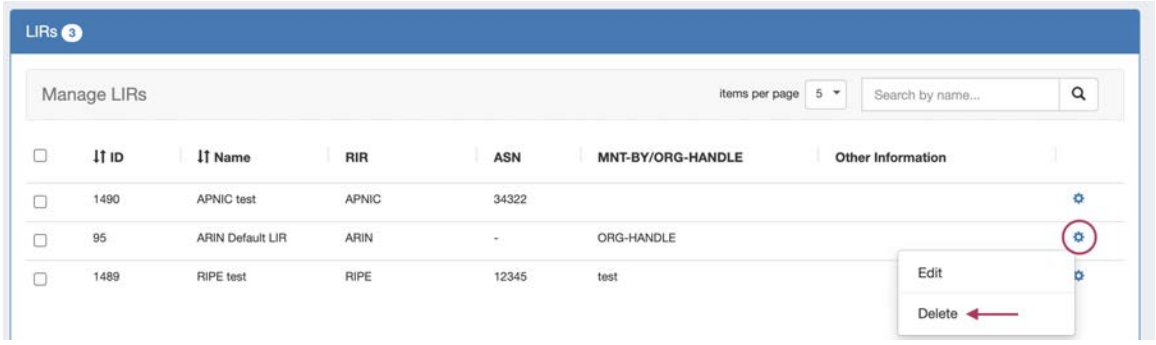
Edit a LIR by clicking on the Action Menu (gear icon) next to the entry in the LIR Manager.

The Update LIR dialog will open. From here, you can edit RIR, Name, ASN, and Org information, as well as add / delete Orgs.

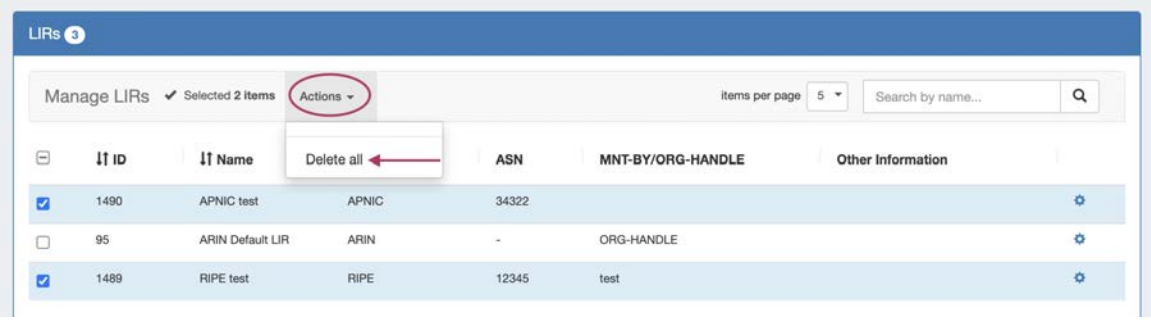


Delete LIR(s)

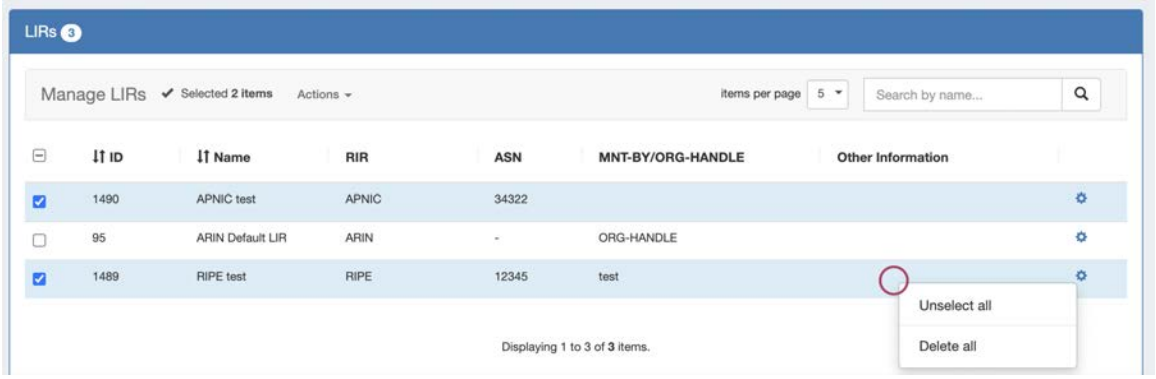
Delete a single LIR by clicking on the Action Menu (gear icon) next to the entry in the LIR Manager, and select "Delete".



Delete multiple LIRs by clicking the checkboxes next to the desired LIRs to delete. Then, under "Actions" at the top of the page, select "Delete All".

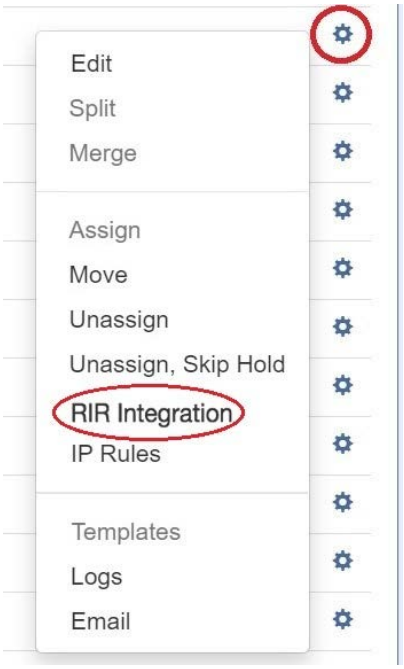


You may also right click anywhere on the selected rows to open the multi-select context menu, where you may choose "Unselect All" or "Delete All".

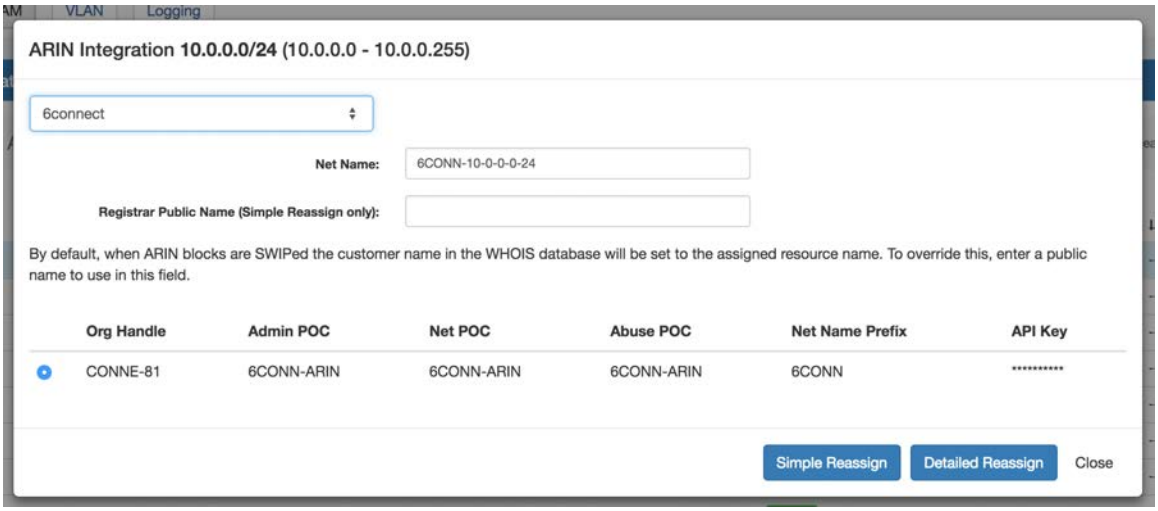


RIR Integration

Once these have been configured, you will be able to use the **RIR integration** feature from the Action Menu on the IPAM Manage screen or IPAM Gadget:



RIR specific options will pop up (see ARIN example below) and give the options for "Simple Reassign", "Detailed Reassign", or "Close" to exit.



Additional Information

For additional detail, continue on to:

- ARIN LIR Setup and Use
- RIPE LIR Setup and Use
- LIR Walkthrough

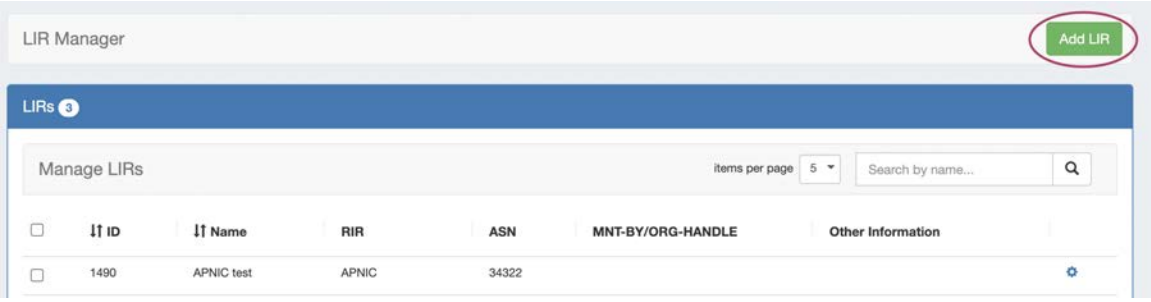
ARIN LIR Setup and Use

LIR Setup

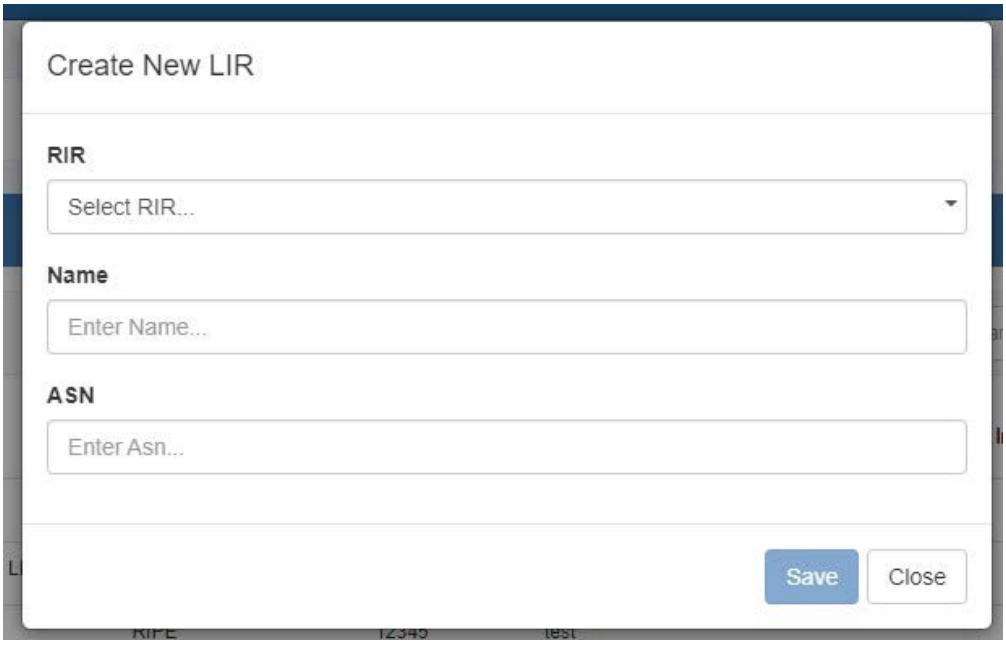
- Step 1: Setup the LIR information via the LIR Manager
- Step 2: Assign an IP block to a Resource using the IPAM Gadget or the Assign function from the IPAM Manage screen.
- Step 3: Update SWIP information
    - Simple Re-assign
    - Detailed Re-assign

Step 1: Setup the LIR information via the LIR Manager

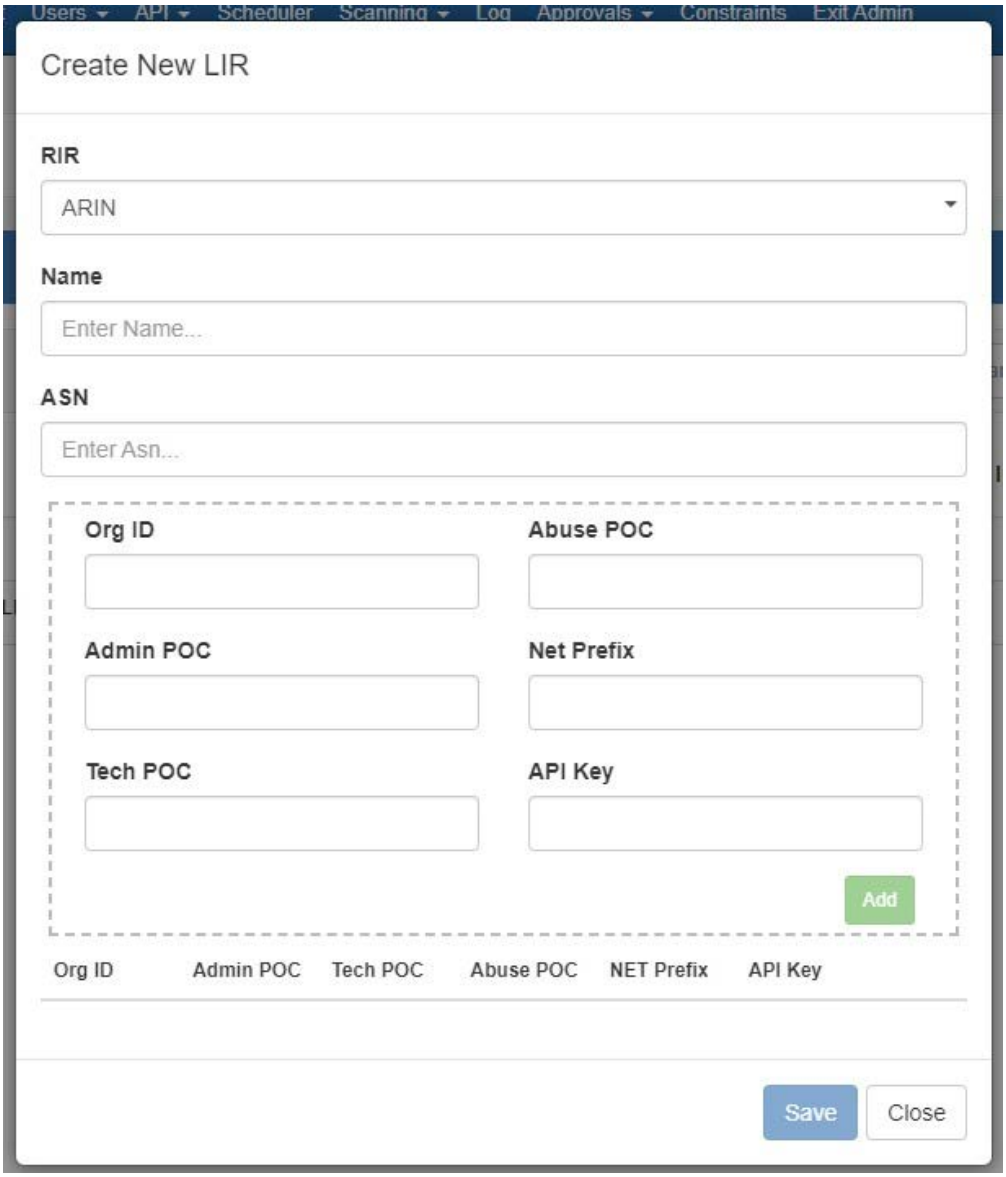
Add a New LIR by clicking "Add LIR" at the top right of the LIR Manager page.



You will be prompted to the select the RIR:



Add in the requisite Org and POC information:



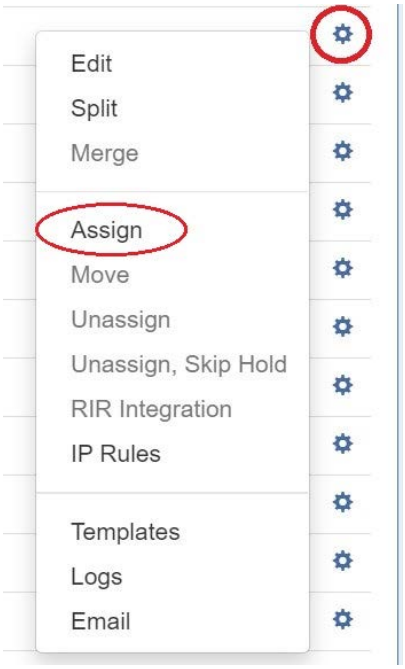
Be sure to hit "Save" when done to save your changes.

Multiple Org Support

Note that we support multiple Org Handles per ARIN entry. Simply complete the Org Handle fields and click "Add" after each addition. A list will display at the bottom of the Add LIR dialog box.

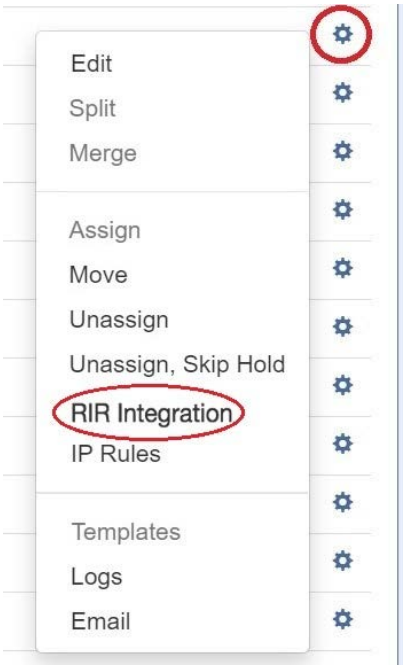
Step 2: Assign an IP block to a Resource using the **IPAM Gadget** or the Assign function from the IPAM Manage screen.

Go into IPAM Manage or the IPAM Gadget, and assign a block. See Working with IP Blocks for additional detail.

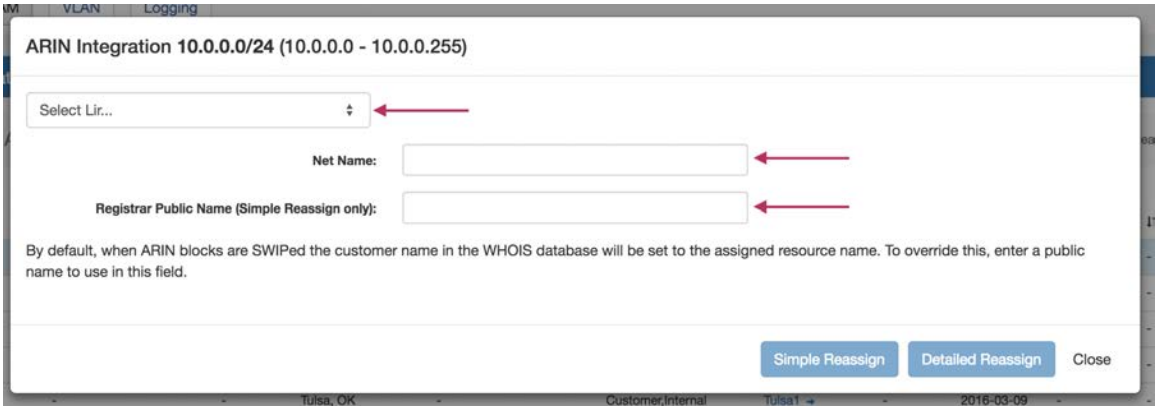


Step 3: Update SWIP information

Select "RIR Integration" from the Action Menu in IPAM Manage.

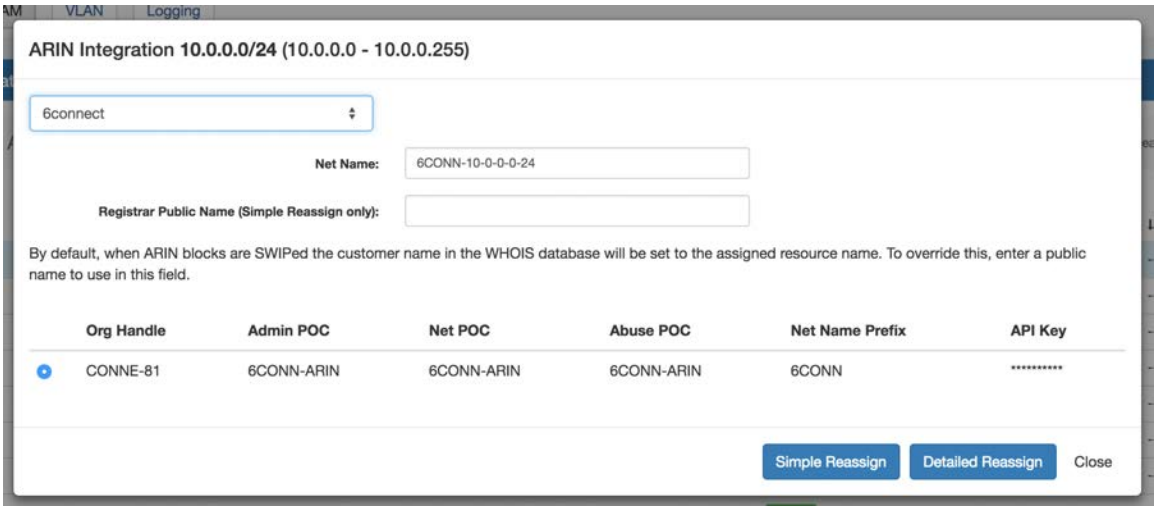


It will bring up an RIR Integration dialog, dependent on the selected RIR (ARIN example shown):



Select the ARIN LIR that has been created in ProVision, and add the Net Name / Registrar Public Name if desired.

Afterwards, you can select the Org Handle and chose "Simple Reassign", "Detailed Reassign", or "Close" to exit.



SWIP Update Functionality Details

In the case when a user already has SWIPped blocks to ARIN, ProVision checks prior to actually performing a SWIP. In the process, if the IP block is already SWIPped, it will check for existing ARIN customer data and update the ProVision data to reflect what ARIN has on file. Once that is complete, the user can then perform a de-SWIP function using ProVision.

Simple Re-assign

From ARIN.net:

Used to subdelegate IP addresses to a customer that does not need to:

- subdelegate the addresses to their own customers
- maintain their own in-addr.arpa delegation
- display their own point of contact (POC) information.

It can also be used to change the customer name and address information (but not the range) on an existing simple reassignment and to remove simple reassignments. It is submitted by an ARIN Online user account linked to the parent organization's Admin or Tech POC, or the Tech POC for the resource.

Detailed Re-assign

From ARIN.net:

Used to subdelegate IP addresses to a downstream organization that does not need to further subdelegate the IP addresses, but does need to maintain its own reverse name servers and/or display separate point of contact (POC) information. It is submitted by an ARIN Online user account linked to the parent organization's Admin or Tech POC, or the Tech POC for the resource.

RIPE LIR Setup and Use

LIR Setup - RIPE

- Before you begin:
- Step 1: Setup the LIR information via the LIR Manager
- Step 2: Assign an IP block to a Resource
- Step 3: Update RPSL information

Before you begin:

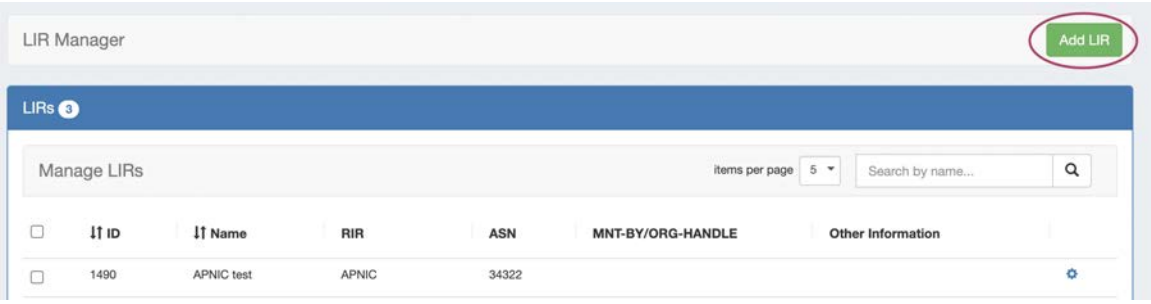
RIPE Integration

You must be using an MD5 password to update RIPE objects from ProVision! Please refer to RIPE's authentication page for additional details:

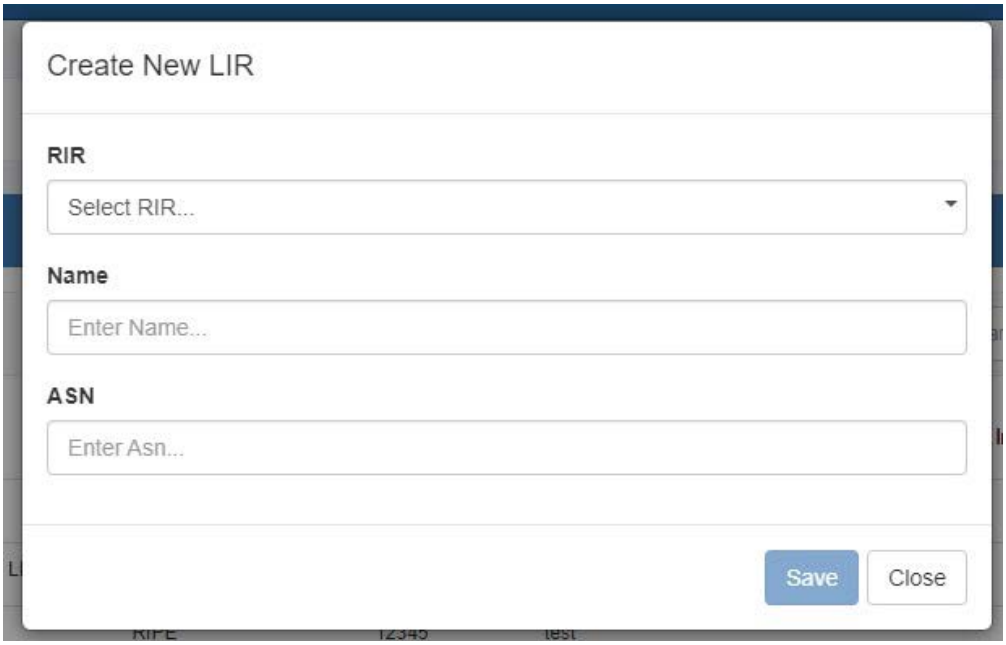
https://www.ripe.net/manage-ips-and-asns/db/support/security/protecting-data#solving-authentication-problems

Step 1: Setup the LIR information via the LIR Manager

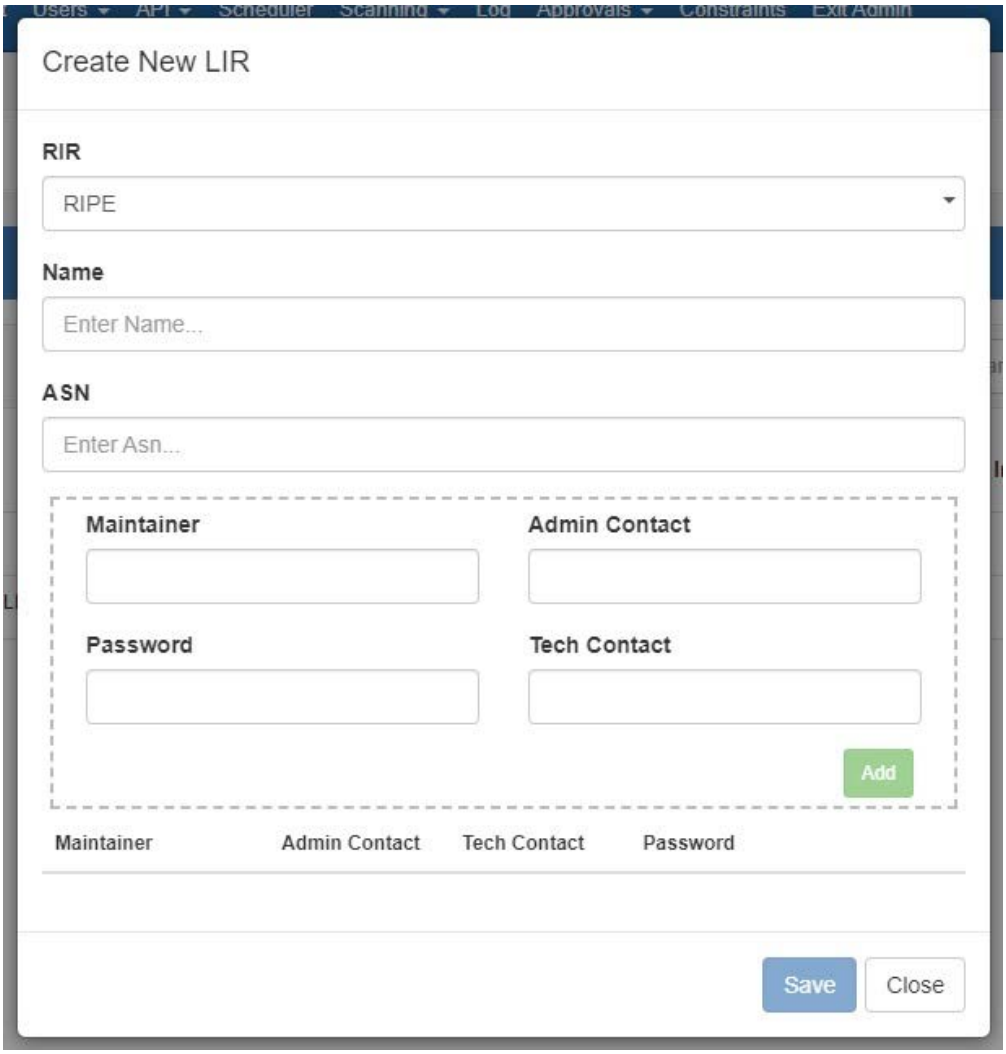
Add a New LIR by clicking "Add LIR" at the top right of the LIR Manager page.



You will be prompted to the select the RIR:



Select "RIPE", then add in the requisite Maintainer Object related information:



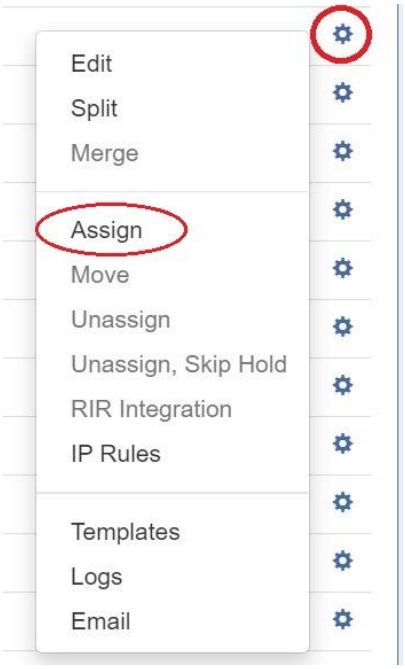
Be sure to hit "Save" when done to save your changes.

Multiple Maintainer Object Support

Note that we support multiple maintainer objects per LIR entry. Simply complete the maintainer fields and click "Add" after each addition. A list will display at the bottom of the Add LIR dialog box.

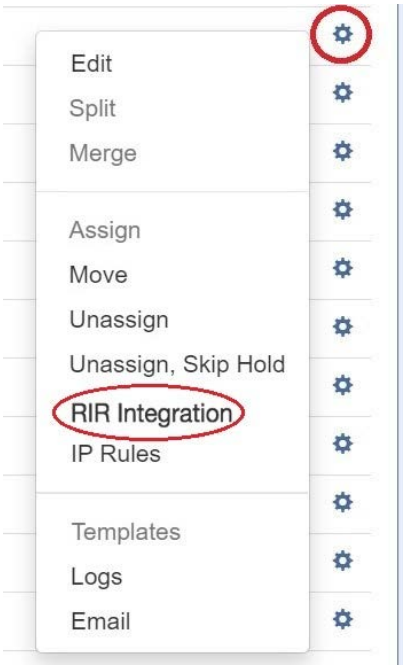
Step 2: Assign an IP block to a Resource

Navigate to either IPAM Manage or the IPAM Gadget, and assign a block under the RIPE RIR. See Working with IP Blocks for additional detail.

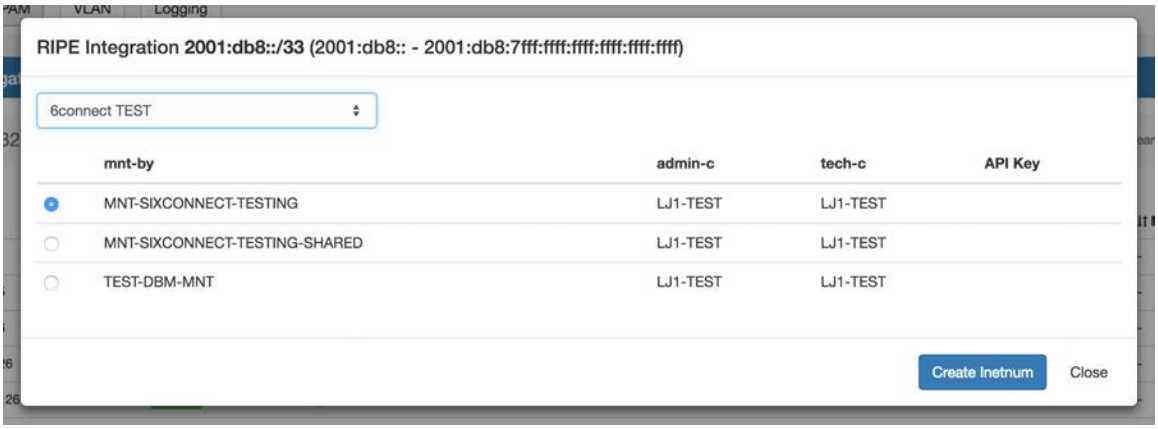


Step 3: Update RPSL information

Select "RIR Integration" from the Action Menu in IPAM Manage.



Identify which LIR data you want to use for the netnum update, and select either "Create Inetnum" or "Cancel" to exit.


RIPE Integration 2001:db8::/33 (2001:db8:: - 2001:db8:7fff:ffff:ffff:ffff:ffff:ffff)
6connect TEST
mnt-by
admin-c
tech-c
API Key
MNT-SIXCONNECT-TESTING
LJ1-TEST
LJ1-TEST
MNT-SIXCONNECT-TESTING-SHARED
LJ1-TEST
LJ1-TEST
TEST-DBM-MNT
LJ1-TEST
LJ1-TEST
Create Inetnum
Close

LIR Walkthrough

LIR Walkthrough

Before You Begin

Before you begin, determine who in your organization has access to the RIR API Keys related to the ASNs used by your organization and gather the following data:

For ARIN, you will need to gather data for the ASN, Org ID, Admin/Tech/Abuse POCs, Name Prefix, and API Keys for each ASN.

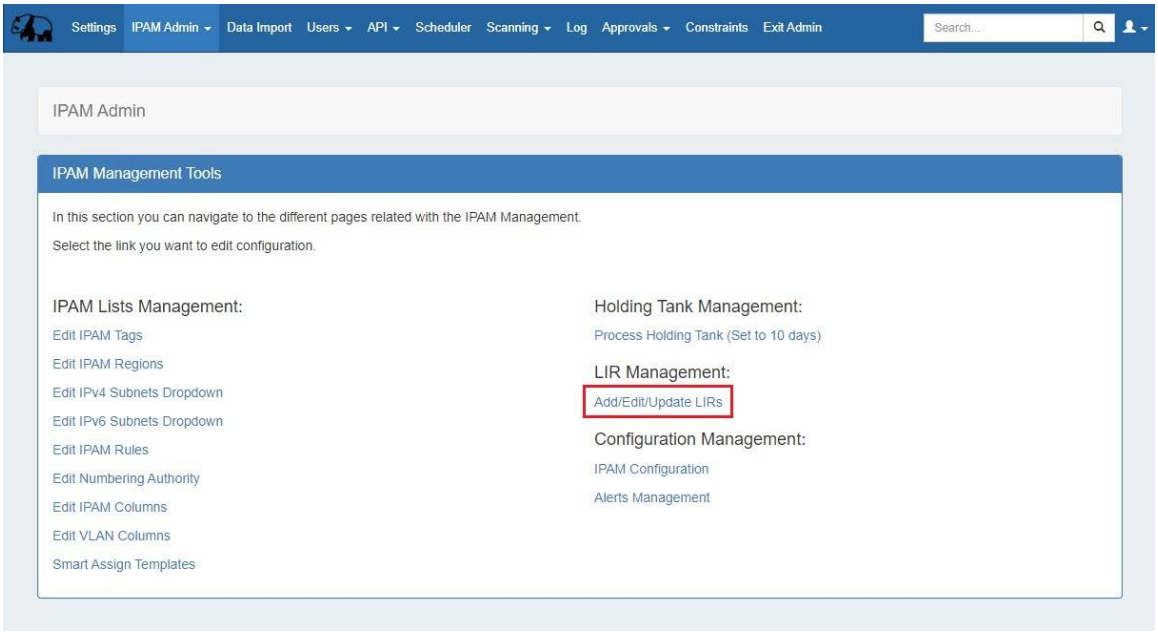
For all other RIRs, you will need information for the Maintainer, Password, and Admin/Tech Contacts per ASN.

- LIR Walkthrough
  - Create LIRs
  - Set up IP Associations
  - SWIP

Create LIRs

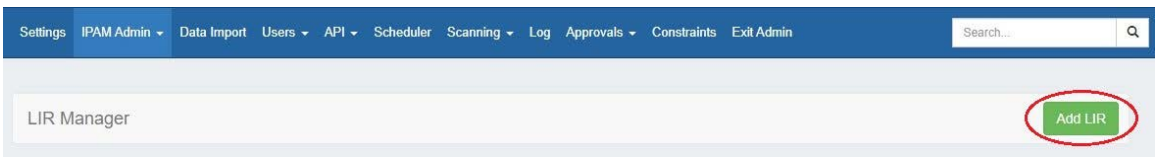
First, go and set up an LIR from Admin **IPAM Admin.**

Click "Add / Edit / Update LIRs"



Complicated or large organizations will likely need many.

Start by adding a new LIR by clicking the "Add LIR" button at the top of the page:



At this point, you should have data collected for each RIR/ASN combination used in your organization.

Select the RIR, enter the Name and ASN, and then enter the relevant Org ID / POC / API Key (or Password) for the LIR. Entering the ARIN API Keys for ARIN LIRs is critical for every SWIP action. The API Key contained within an LIR object will be used to authenticate against ARIN's systems when you want to update them.

When you are done, click "Save" and continue to add other LIRs as needed.

An example of how this should look:



We can verify this information by querying the ARIN database, like so:

```
https://whois.arin.net/rest/org/CONNE-81/pft?s=conne-81
https://whois.arin.net/rest/poc/6CONN-ARIN?s=6conn-arin
```

Once you have an LIR in ProVision, it is trivial to query the API of its resource from the ProVision database using the resource Id number.

Set up IP Associations

From here, ensure that IP space has been entered into ProVision, along with necessary Contacts and Resources.

Associate Contacts with the Resources, and assign IP space to the necessary Resources. See: Resources, Working with Entries, Contact Manager, and Working with IP Blocks.

Make sure that you have followed the following guidelines:

- Danger #1: Make sure you own the IP space in question. ARIN knows who is supposed to be administering every bit of IP space under its domain, and you will run into issues if you do not actually own the IP space according to the RIR.
- Danger #2: Make sure the IP space is actually assignable with ARIN.

An example of why SWIPs might fail

Lets imagine that 10 years ago some network administrator did a simple assignment with ARIN which noted that a certain /26 was under management by Company A. Since then, that administrator has been fired, the company he worked for has been acquired, that company was then itself acquired, and Company A has gone bankrupt and dissolved.

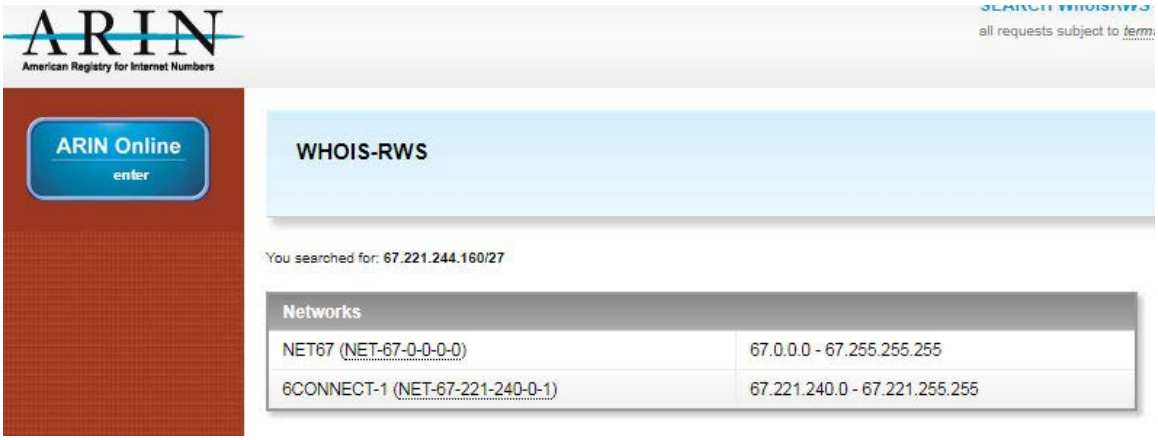
Today, nobody knows about all this. But ARIN remembers that a certain /26 has been delegated to Company A, and nobody has informed them otherwise. This is a not-uncommon issue.

So today, you come along and you are doing your tests with a /28 which happens to be a sub-block of the /26. You can configure everything correctly and despite that, ARIN will completely refuse to SWIP the /28, because ARIN thinks that the /28 is part of a /26 which is already SWIP'd.

To make matters worse, ARIN won't tell you why it is refusing to SWIP the /28 -- it will just tell you its invalid. The only way to debug this situation is manually probe the ARIN database until you find the already-SWIP'd block, construct this block in ProVision, try to SWIP it (and fail, because it is already SWIP'd), then de-SWIP it, clearing the erroneous state both from ProVision and from ARIN. Due to a lack of access to the ARIN database, ProVision is limited in its methods of handling situations such as these.

SWIP

We've got everything together so let's do some SWIP'ing. Our happy candidate is 67.221.244.160/27, which is a slice of 6connect's very own domain. Screenshot from ARIN:



From here we can see that the /27 is currently undivided as far as ARIN is concerned. ARIN's database is arranged in a hierarchy, so it first looks to see if that /27 exists in its

database (nope), then it looks for blocks it *does* know about it which contains it. Here we see 6connect's /20 as its immediate owner:

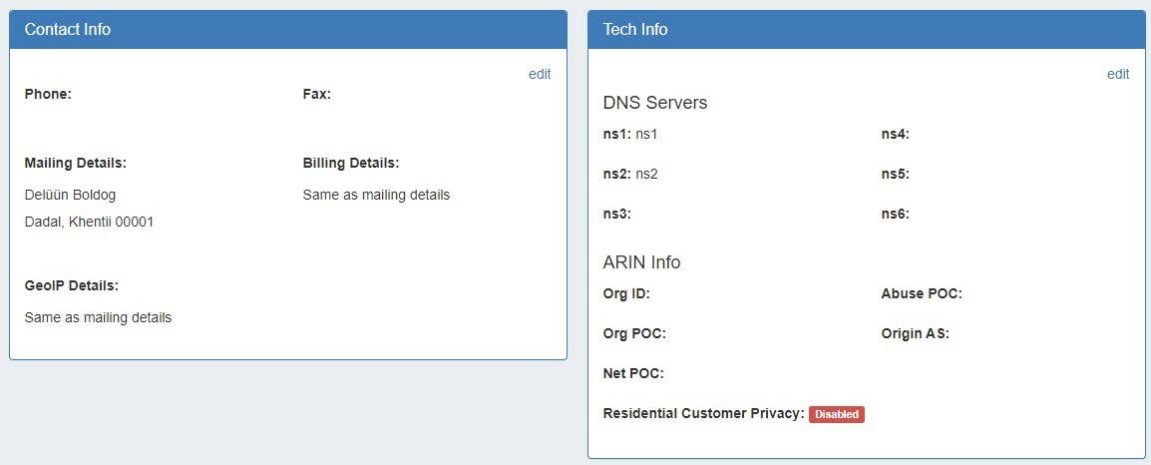
```
https://whois.arin.net/rest/net/NET-67-221-240-0-1
```

And ARIN's own base allocation as the next-highest owner:

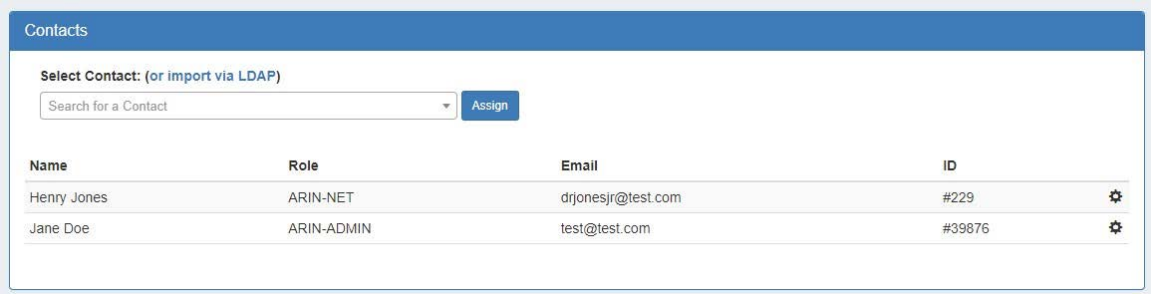
```
https://whois.arin.net/rest/net/NET-67-0-0-0-0
```

The story of this block is therefore: "ARIN was given this IP Block by ICANN, then ARIN did a Direct Allocation of a /20 to 6connect." And in a bit here, 6connect will do a detailed re-assign to MedaTeckle, a made-up company whose headquarters is the birthplace of Genghis Khan.

Here is the resource:

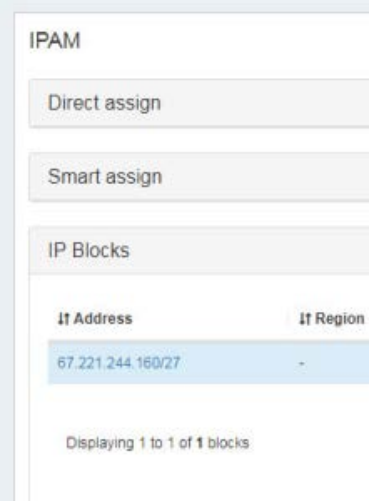


And here are the contacts:

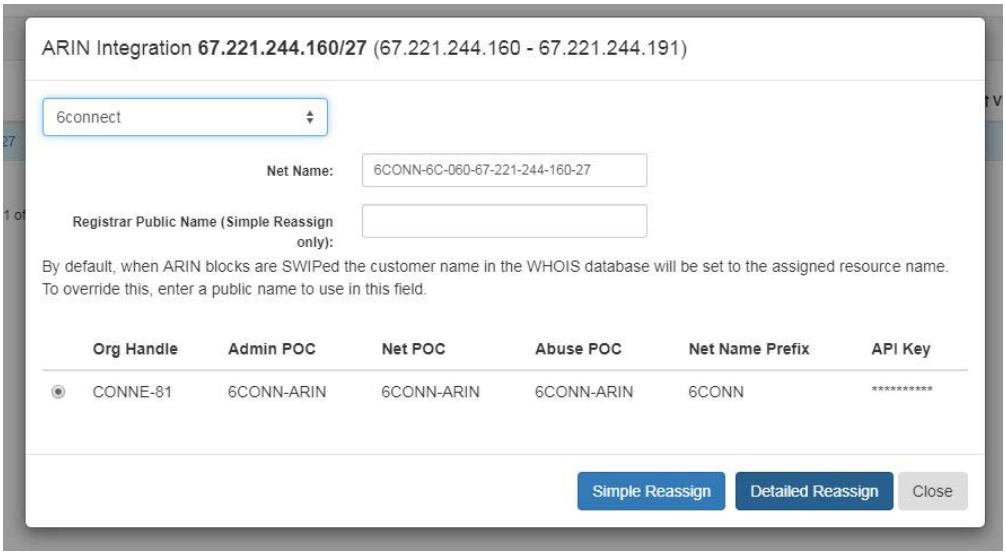


Having someone in the 'ARIN-NET' and the 'ARIN-ADMIN' roles is required for a Detailed Reassign. It is currently not possible to have a single Contact with both roles, so you'll need two contacts listed.

Here is the last piece, our IP block:



So I open up the gear menu for the IP block right here on the resource page and I get this screen:



I select the LIR in the upper-left (currently selected: 6connect), the Net Name is automatically generated from the LIR + netblock, and we are using the "CONNE-81" organization within the 6connect LIR. This will supply the ARIN API Key to make this all happen. I hit Detailed Reassign and after a few minutes of waiting for ARIN to catch up, here are the results:



Our /27 has been delegated to our new fake company, here:

```
https://whois.arin.net/rest/net/NET-67-221-244-160-1
```

A new ARIN entry for the fake company has been automatically made:

```
https://whois.arin.net/rest/org/MEDAT-1.html

https://whois.arin.net/rest/org/MEDAT-1.html
```

And the relevant Points of Contact have been generated:

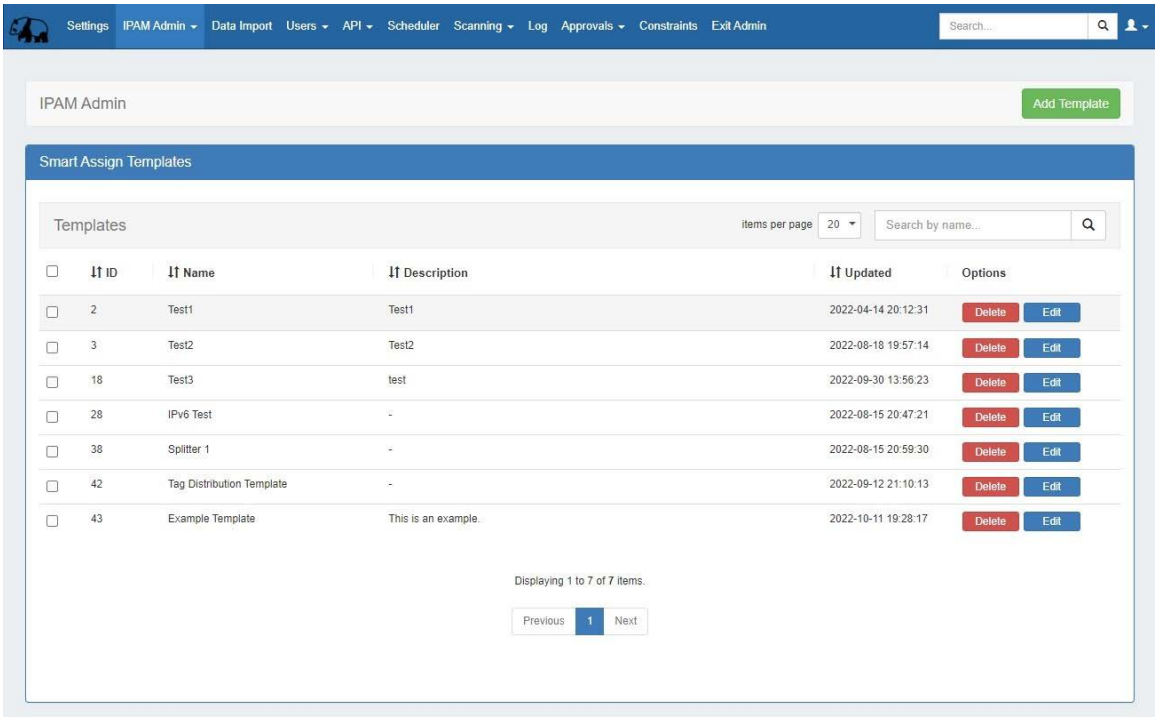
```
https://whois.arin.net/rest/org/MEDAT-1/pocs
```

This lets everyone know that if issues arise with that / 27, they know who to contact to resolve the issue.

Smart Assign Templates

Smart Assign Templates

Smart Assign Templates provide the ability to define complex assignment scenarios, including those with multiple steps or multiple filter conditions.



Smart Assign Templates are accessed from the Admin -> IPAM Admin dropdown menu.

Like Smart Assign, Smart Assign Templates allow you to enter criteria such as IP type, size, RIR, region, and tag information to automatically assign a block meeting that criteria, if any exist. But Smart Assign Templates allows users to breakdown IP space even further through multiple levels of conditions for more complex assignments. For example, if you need a /24 from Resource A with Tag B, then want to take the first /28 of it and sub-assign that to Resource C, and then take the last /30 of it and assign it to Resource D - you can create a template to do just that.

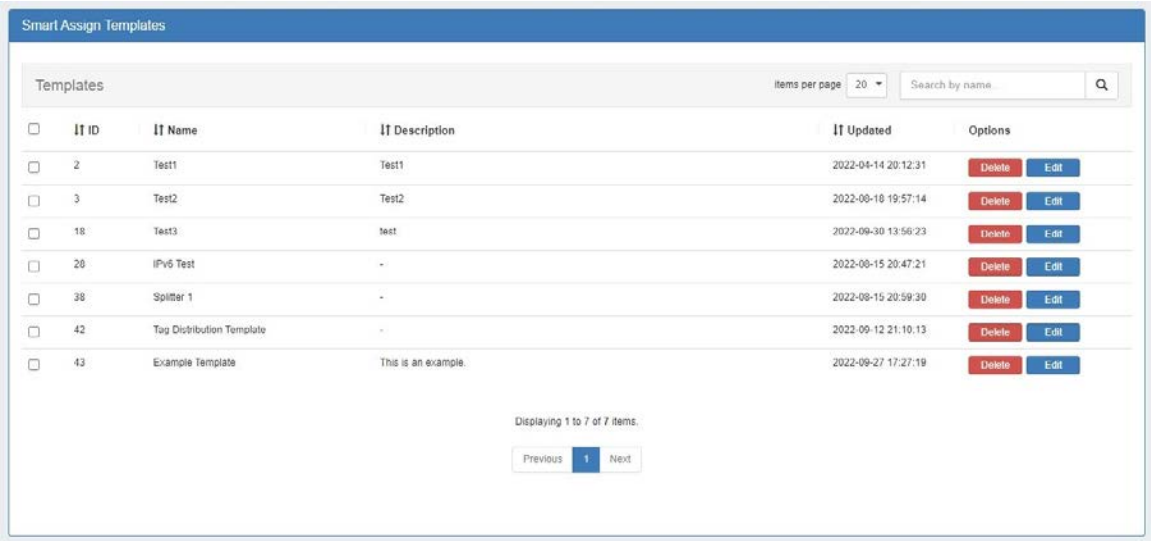
Once created, a Smart Assign Template is available to select and execute from either IPAM Admin Smart Assign Templates or directly from the Smart Assign module in the IPAM Gadget.

- Smart Assign Template List
  - Search
  - Sort
- View or Edit a Template
- Create a Template
  - Add Template Information
  - Add Assignment
  - Breakdown IP Address Space
  - Set an IPAM Alert
- Execute a Template
  - From Smart Assign Template
  - From IPAM Gadget
- Delete a Template
- Additional Information

Smart Assign Template List

The Smart Assign Template List displays all existing templates, and is where you can view, edit, and delete existing templates.

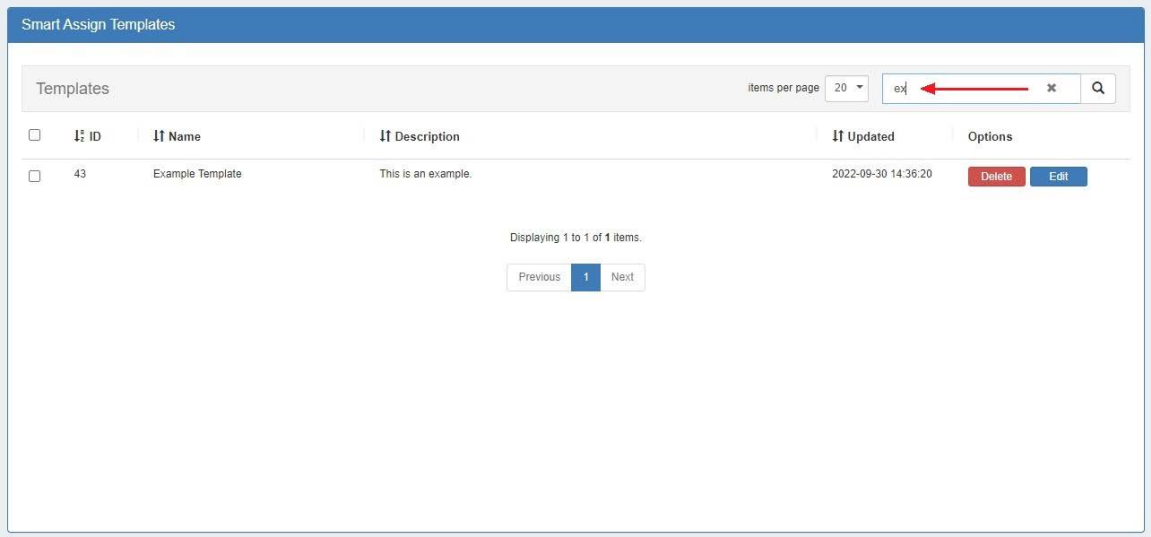
The template list displays the template ID, Name, user-provided description, and the last updated time.



Expand the area below for information on searching / filtering and sorting the template list:

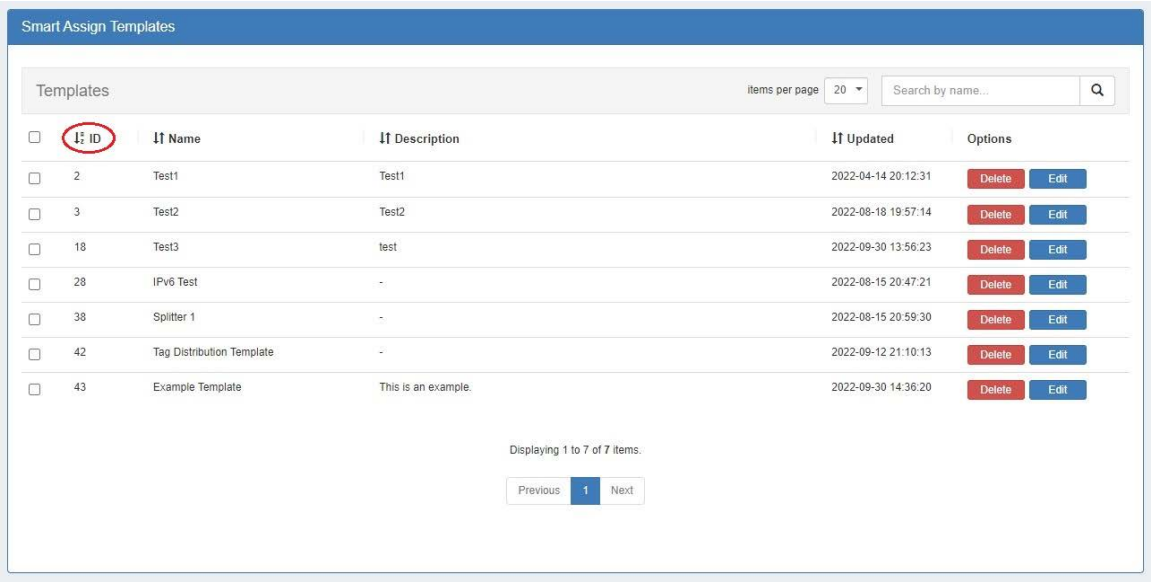
Search

Filter the list for a specific template name by typing all or part of the name in the search box.



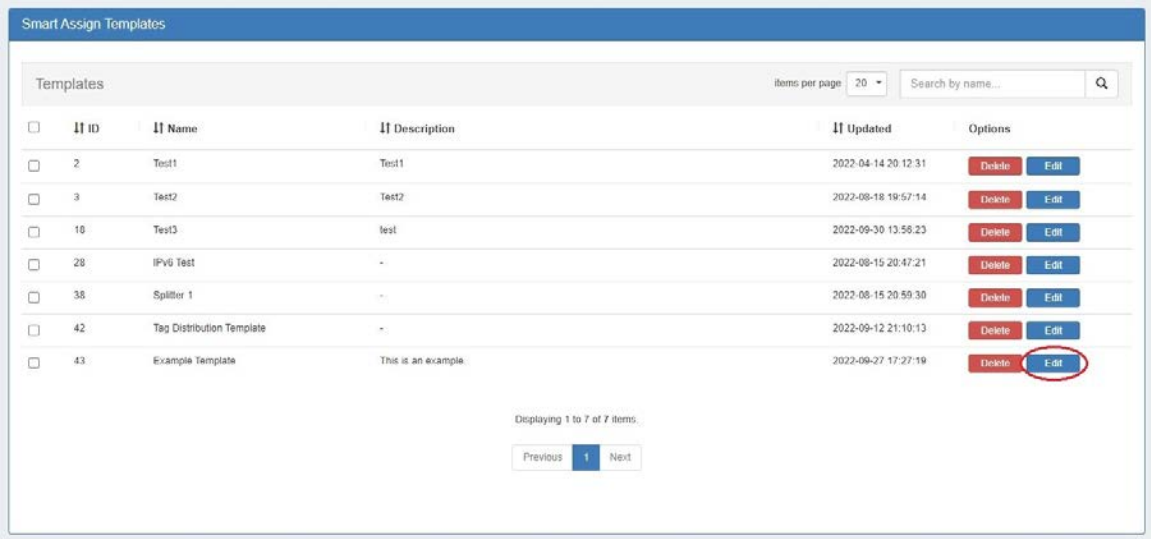
Sort

Sort columns into ascending/descending order by clicking on the column header for any column with an up/down arrow ().

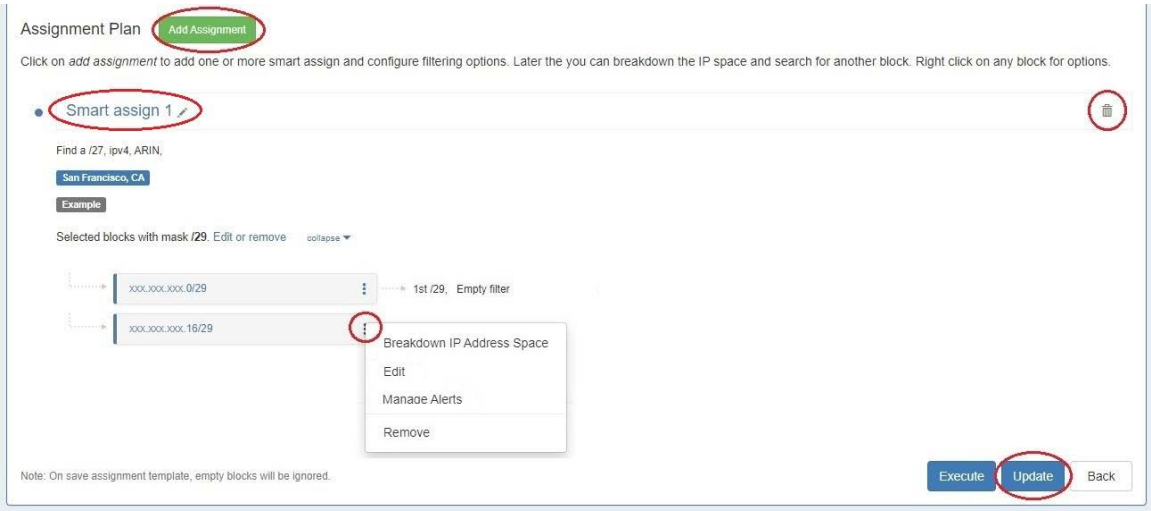


View or Edit a Template

To edit an existing template, go to the Admin Smart Assign Templates list, then click the "Edit" button in the "Options" column.

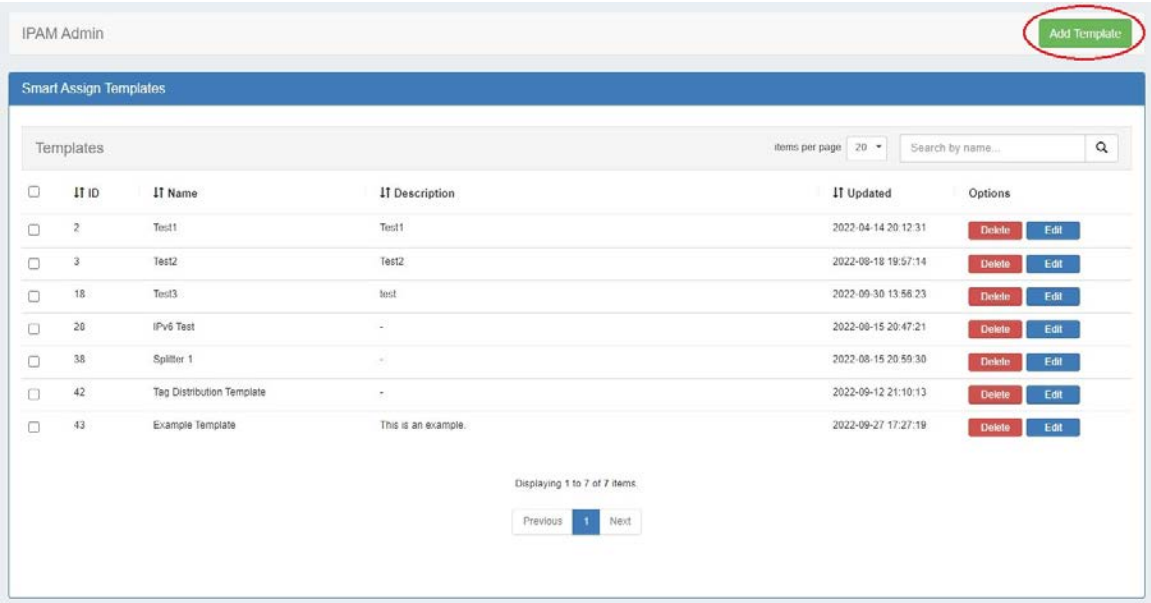


From the edit screen you can add another assignment, edit or delete the current assignment, edit or delete IP address space configuration, and set an IPAM alert. Click "Update" to save your changes.



Create a Template

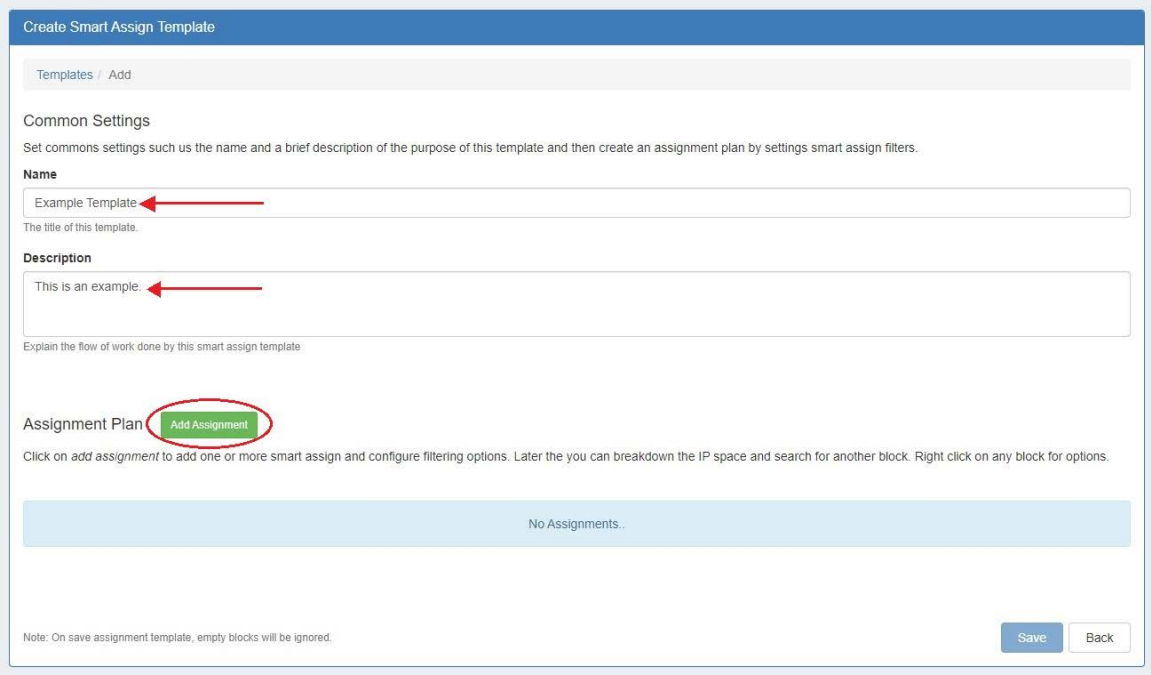
To create a new template, click "Add Template" at the upper right side of the Smart Assign Templates page.



This will open a new page to add information on the template and create the assignment plan.

Add Template Information

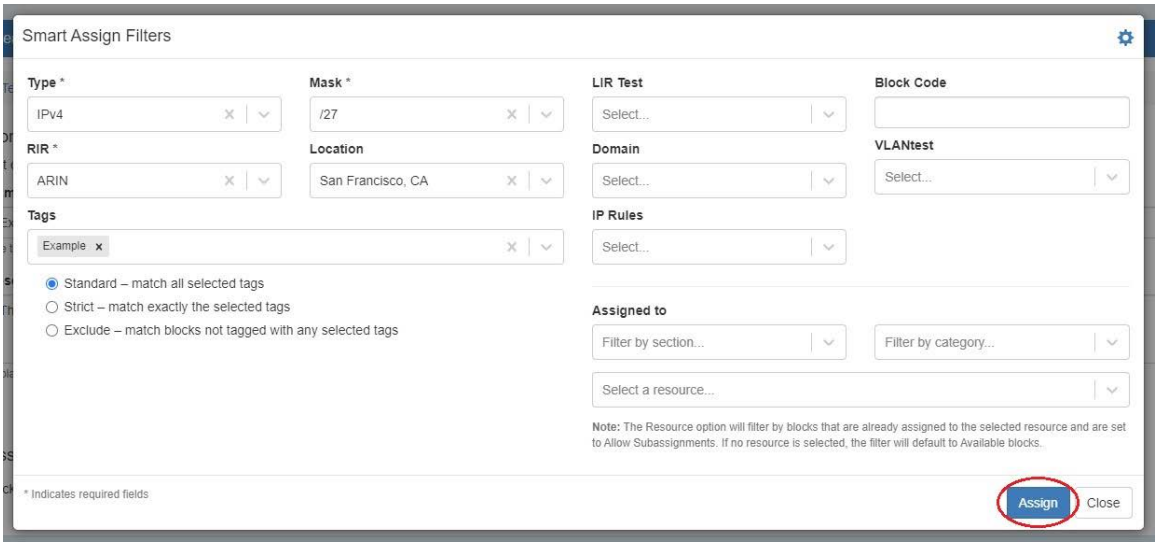
Enter a name and description for the new template, then click "Add Assignment" to proceed to the next step, selecting Smart Assign criteria.



Add Assignment

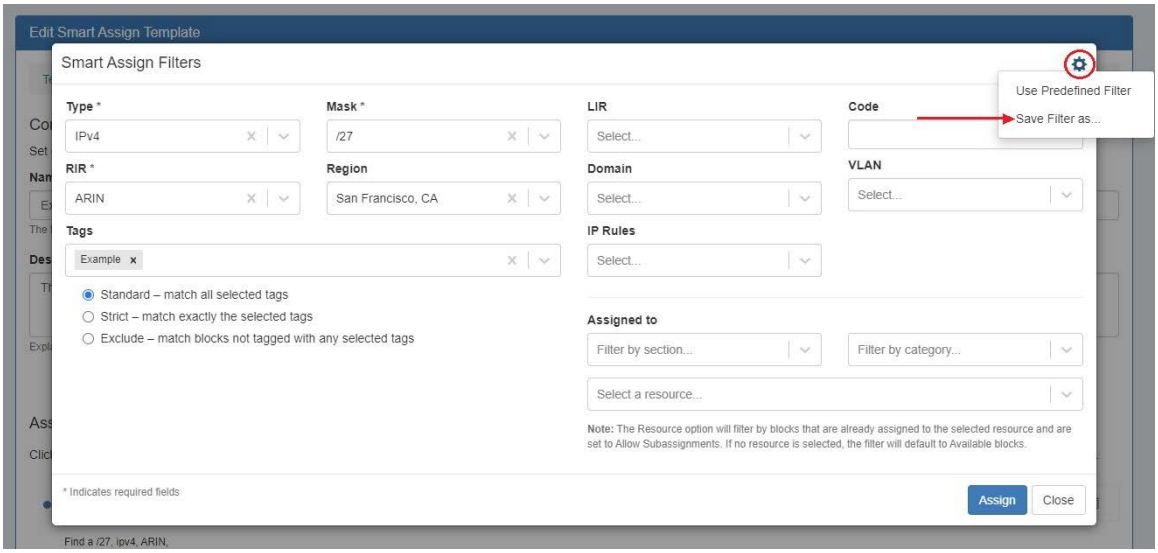
One or more assignments may be added to a template, with each assignment using the provided smart assign filter criteria. You may either manually define filter criteria, or use a predefined filter.

In the Smart Assign Filters modal, select the smart assign filter criteria to use for this assignment, or select a predefined filter from the gear menu at the upper right corner.

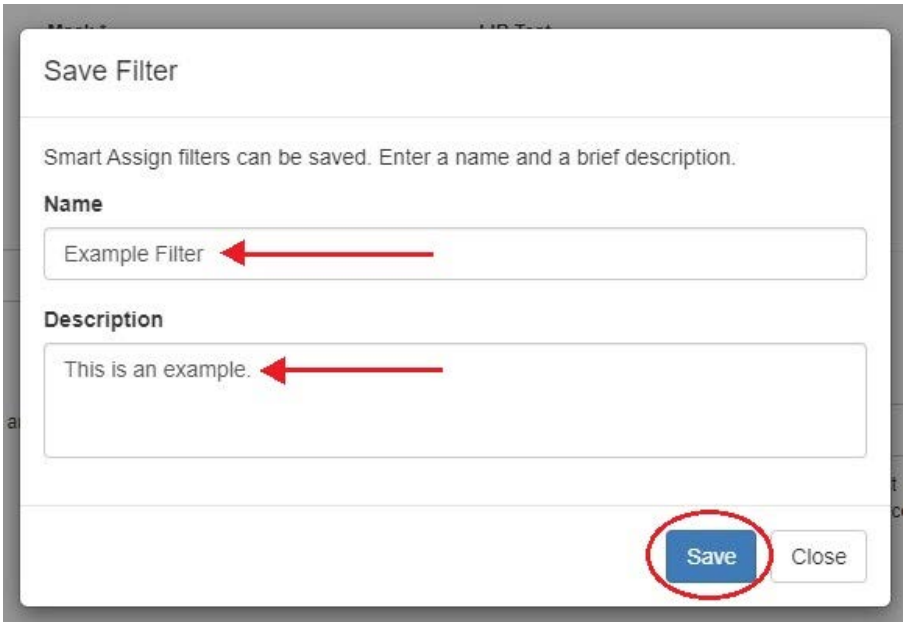


If you would like to save manually entered filter criteria as a new filter before assigning, you may save the filter as a new Predefined Filter. Otherwise, click "Assign".

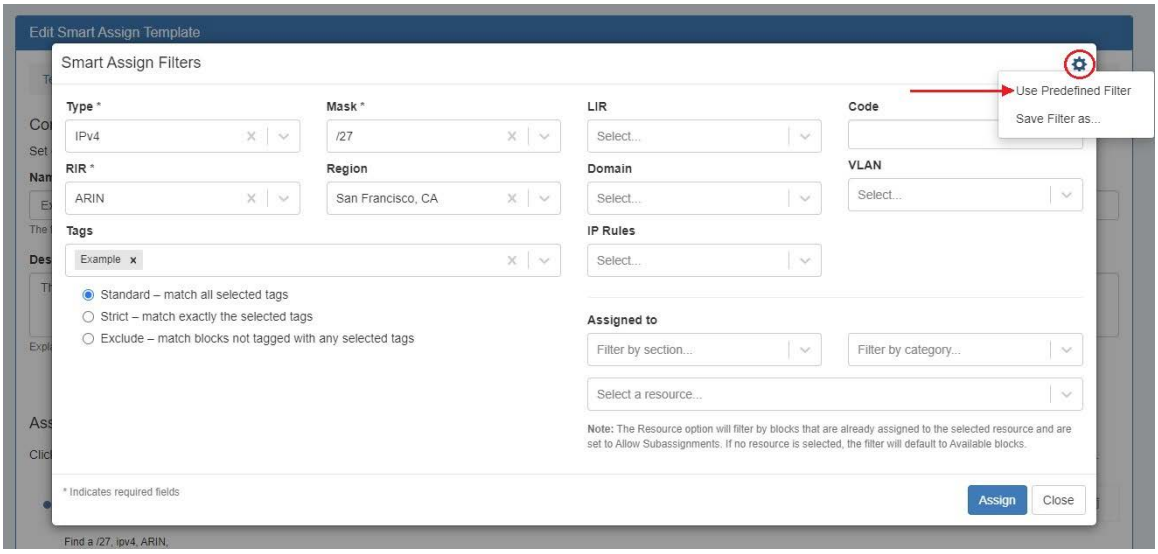
To create a Predefined Filter, select Smart Assign filter criteria. Click on the gear icon at upper right and select "Save filter as..."



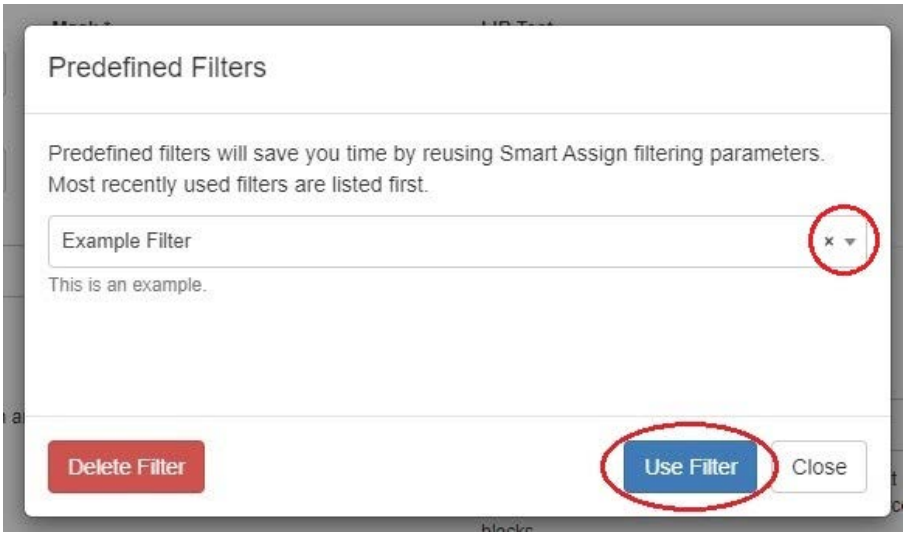
Enter a name and brief description for the filter and click "Save".



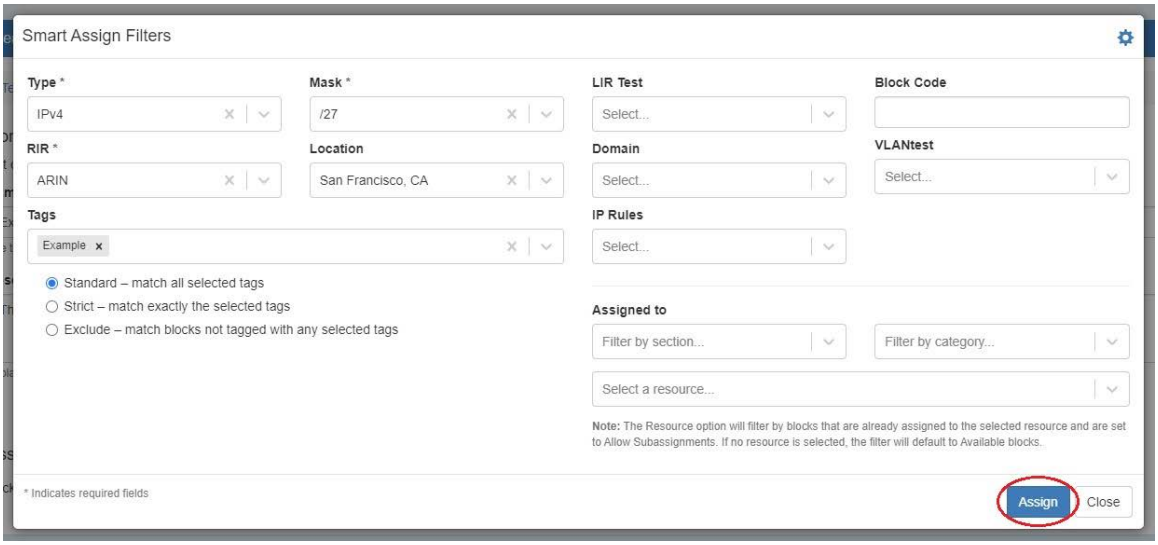
To use a saved filter, click on the gear menu and click "Use Predefined Filter".



Select a filter from the dropdown and click "Use Filter". A saved filter may be deleted by selecting "Delete Filter".

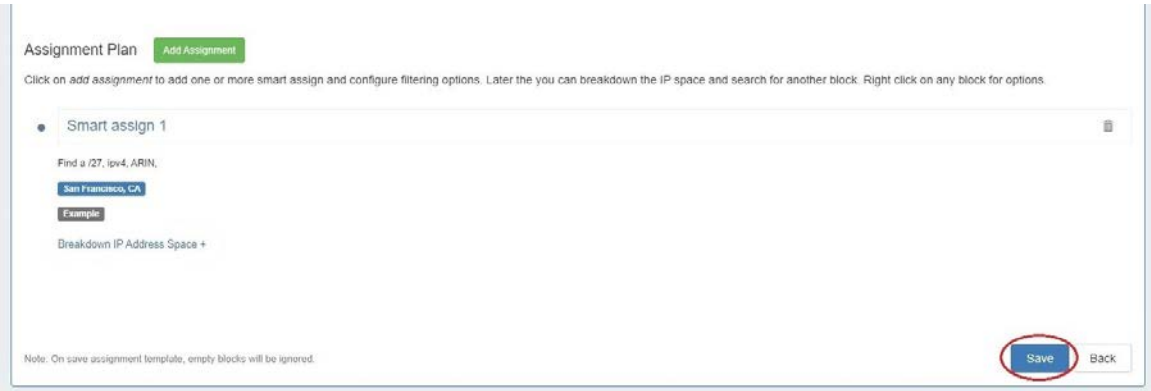


Once the filter is applied, click "Assign".



From here, you may proceed with adding more assignments or breaking down IP space.

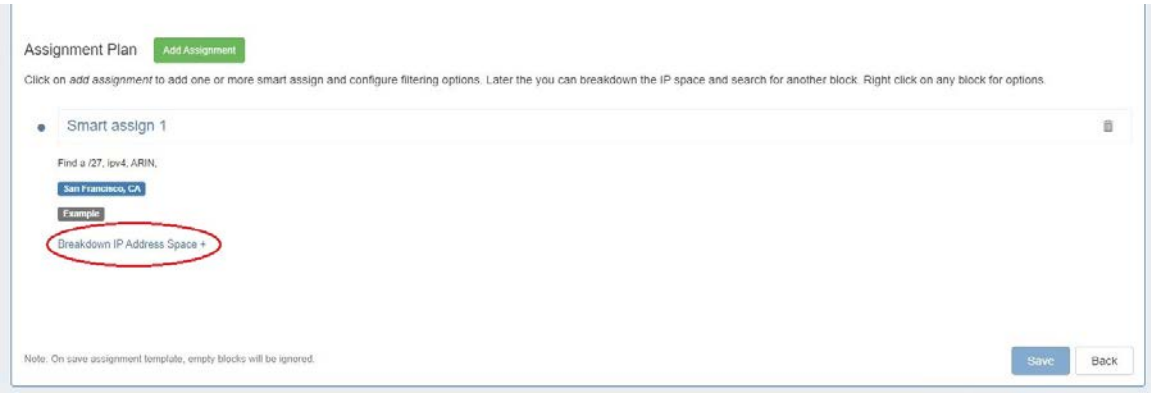
You may also save and resume editing later by clicking "Save" at lower right.



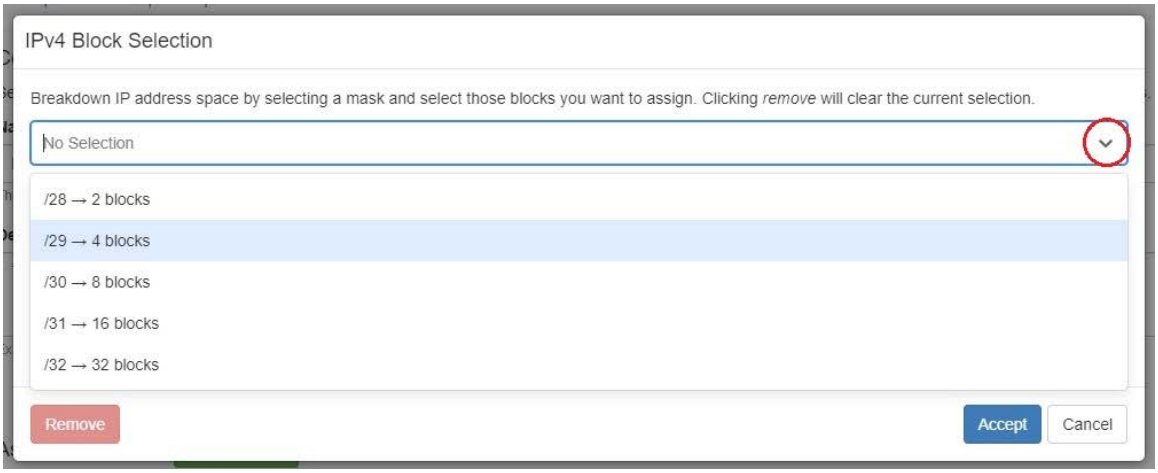
Breakdown IP Address Space

To define more complicated assignments IP address space may be broken down further.

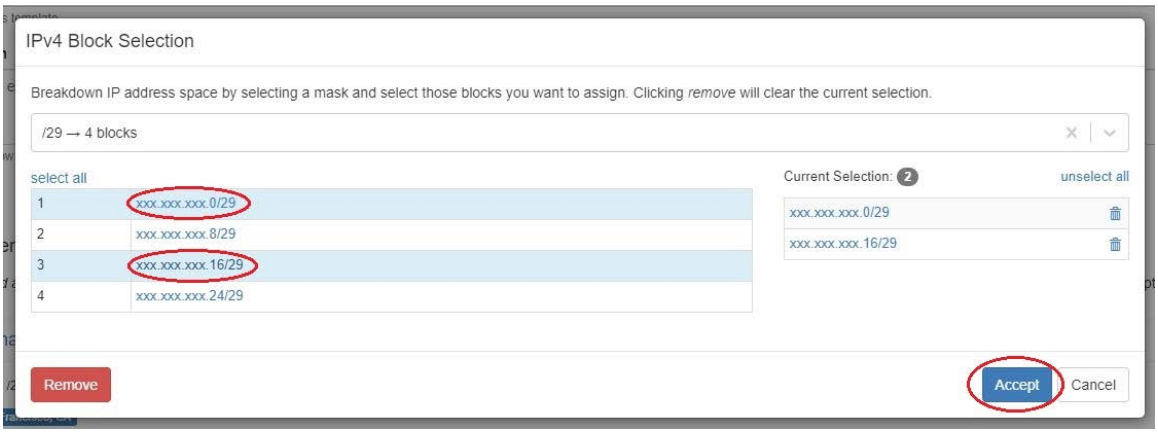
From the template list, click "Edit" for the desired template to view the assignment plan, then click "Breakdown IP Address Space". and select a mask.



The Block selection screen will open. Select a mask to use for the breakdown criteria, then review the available blocks.

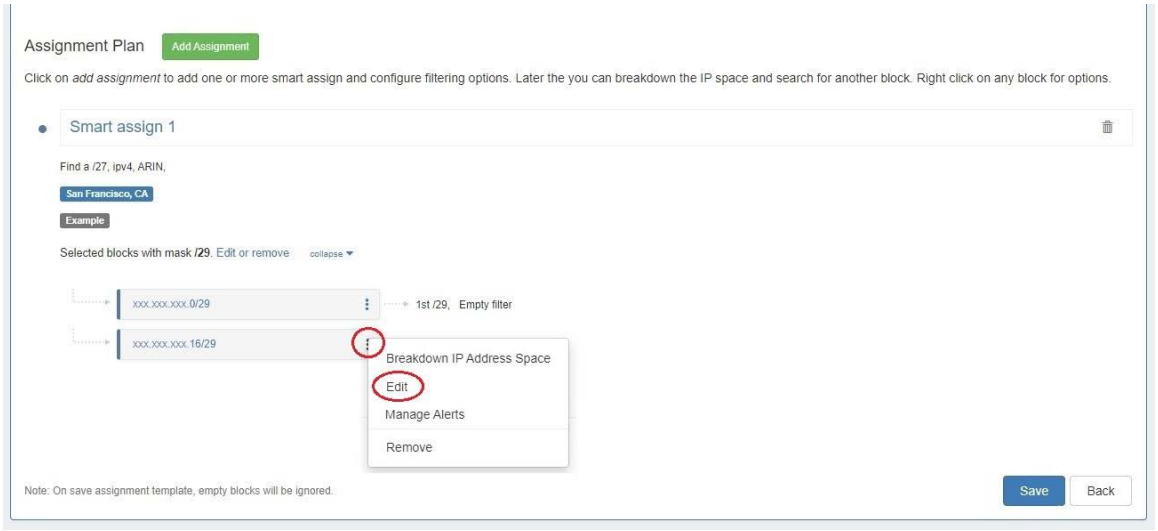


Click on a block CIDR to select that position for assignment, or you may select all. A block may be deselected by clicking the delete icon. Click "Accept" when done.

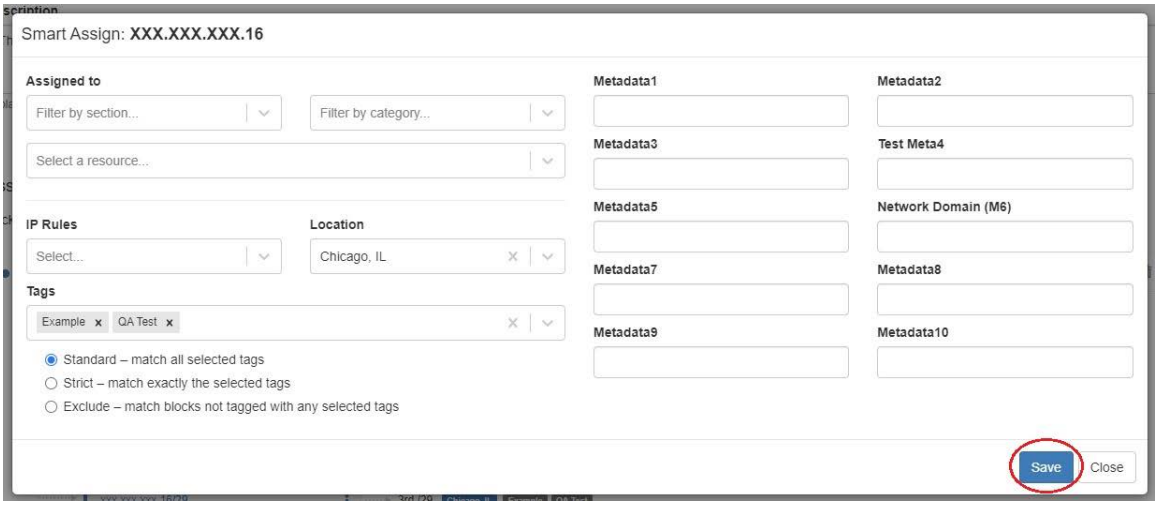


The breakdown summary will display under the template Assignment plan. You may view or hide the block details by clicking the "expand"/" collapse" toggle, or click "Edit or remove" to change or remove your selection(s).

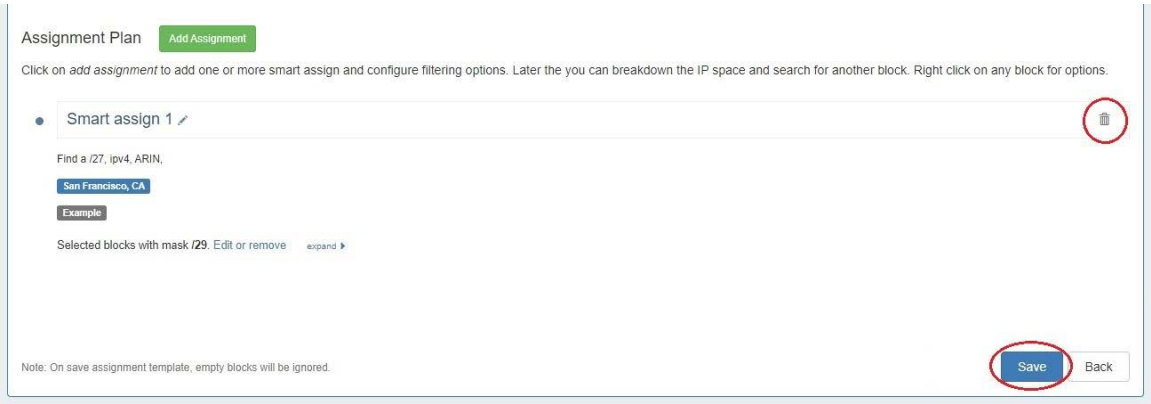
To configure filters for a specific block, click on a block menu (three dots) to open the Action Menu, then select "Edit". The block can be further broken down by selecting "Breakdown IP Address Space" or removed by clicking "Remove".



Select desired filters to apply to that block and click "Save".



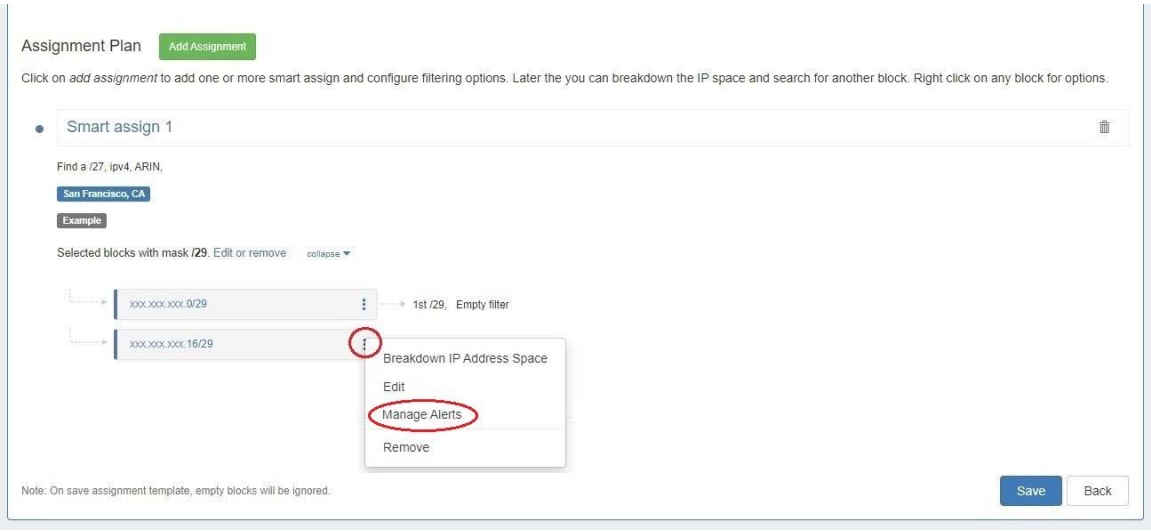
Once block filters are configured, click "Save" or "Update". The assignment may be deleted by clicking the delete icon.



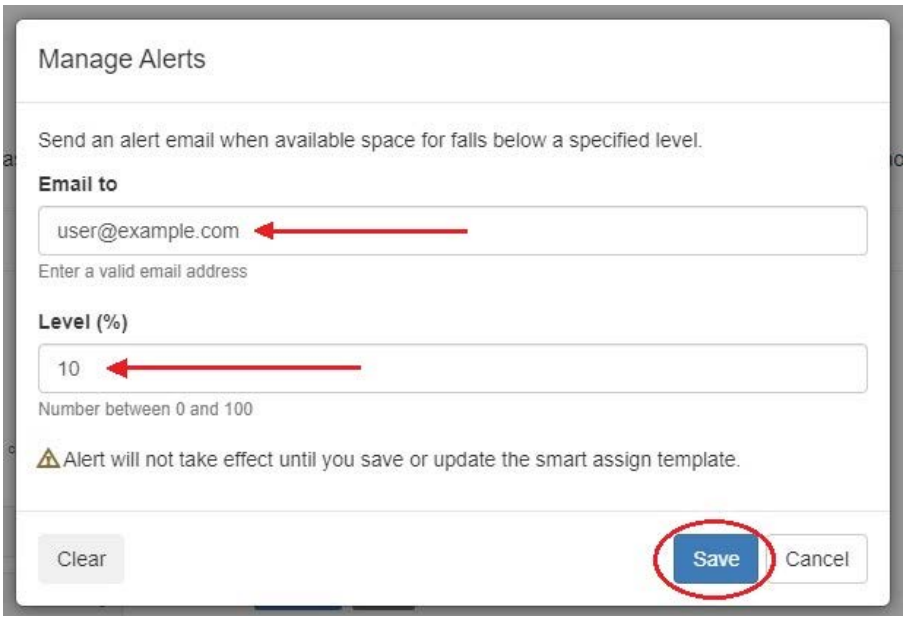
Set an IPAM Alert

Enable or clear alert emails for an IP block by setting an email address and utilization percentage level. When the block is utilized to the set percent, an email alert will be sent to the provided address.

To set an alert, select the "Manage Alerts" option from the Action Menu.



Enter an email address and utilization level for the alert.

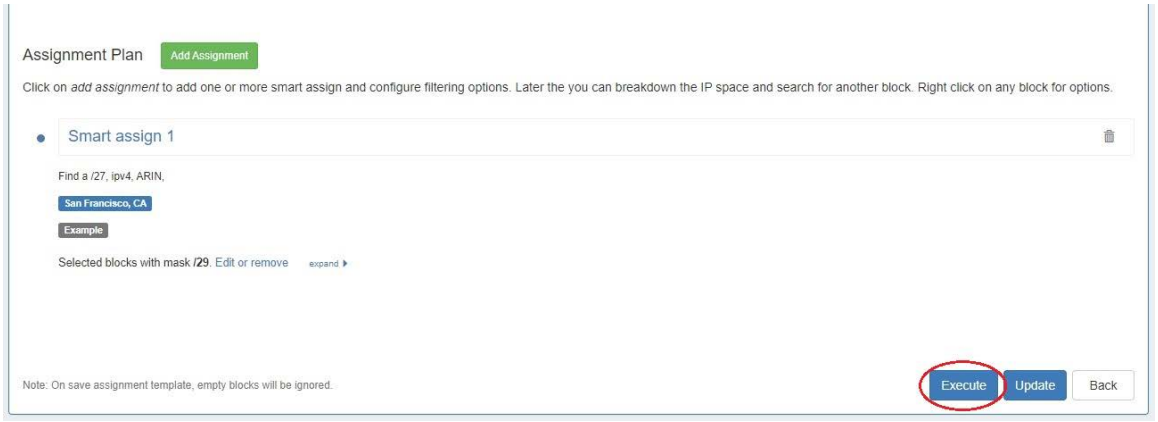


When done, click "Save". To clear an existing alert, hit "Clear", and the alert information will be removed. After adding or clearing an alert you must also save or update the entire template to retain any changes.

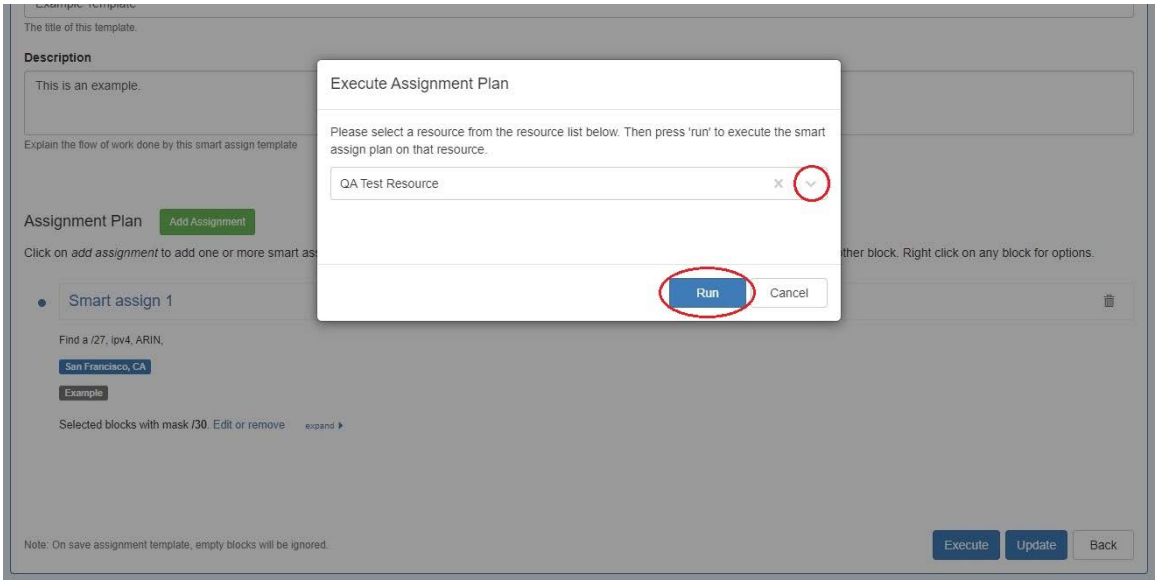
Execute a Template

From Smart Assign Template

To execute the template assignment plan, go to the edit screen for a template and click "Execute".

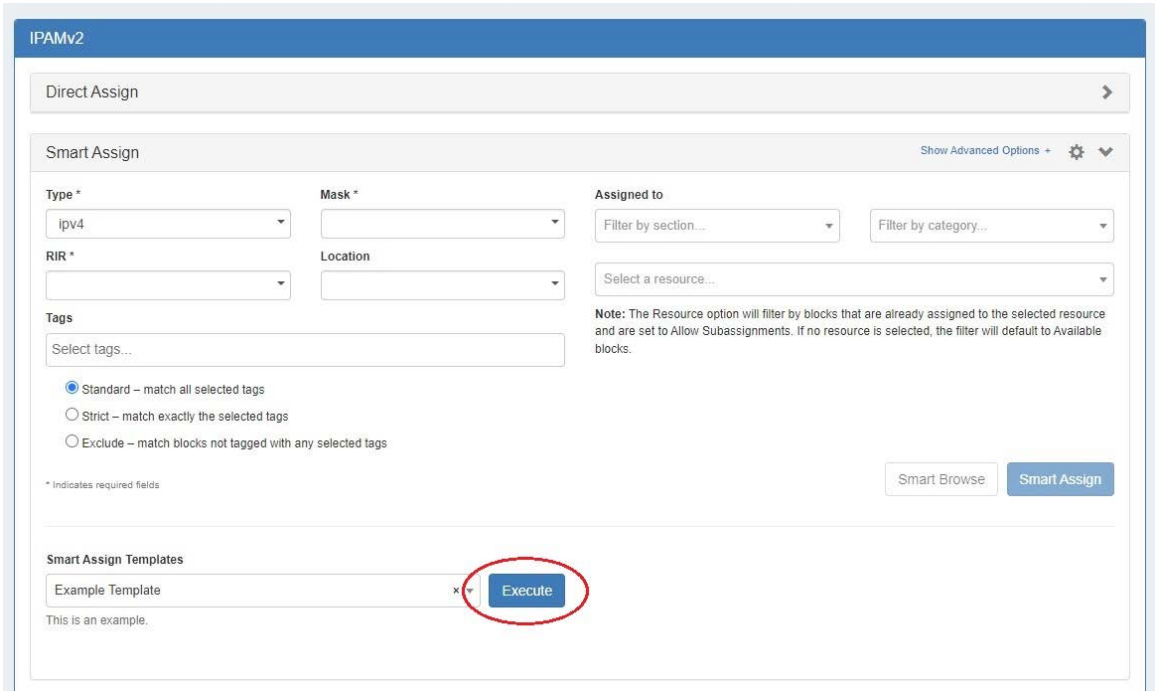


Select a Resource from the dropdown and click "Run".



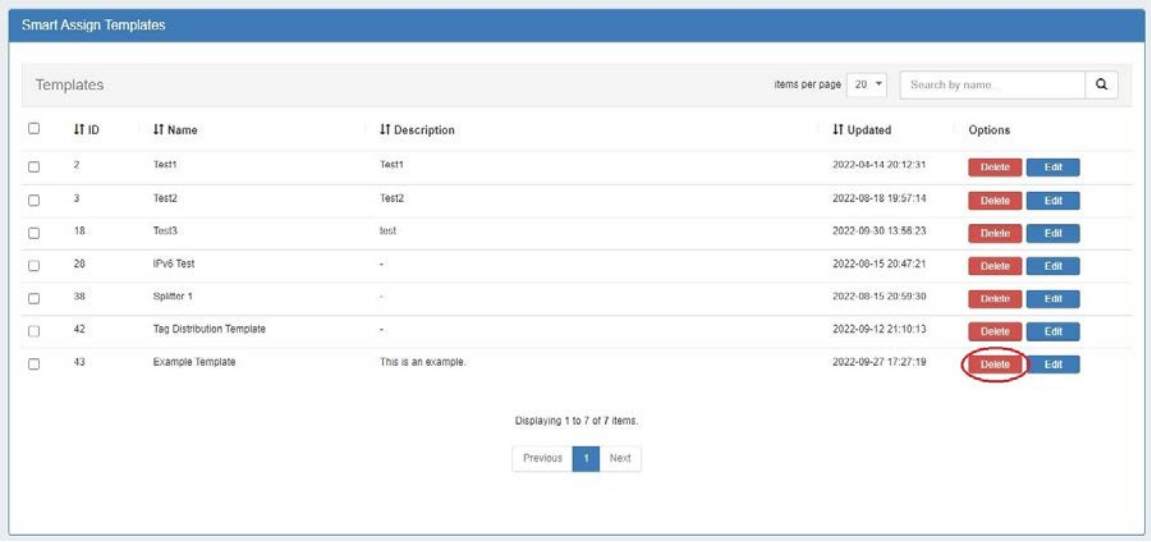
From IPAM Gadget

To run the template from a Resource's IPAM Gadget, open Smart Assign and select the template from the "Smart Assign Templates" dropdown and click "Execute".



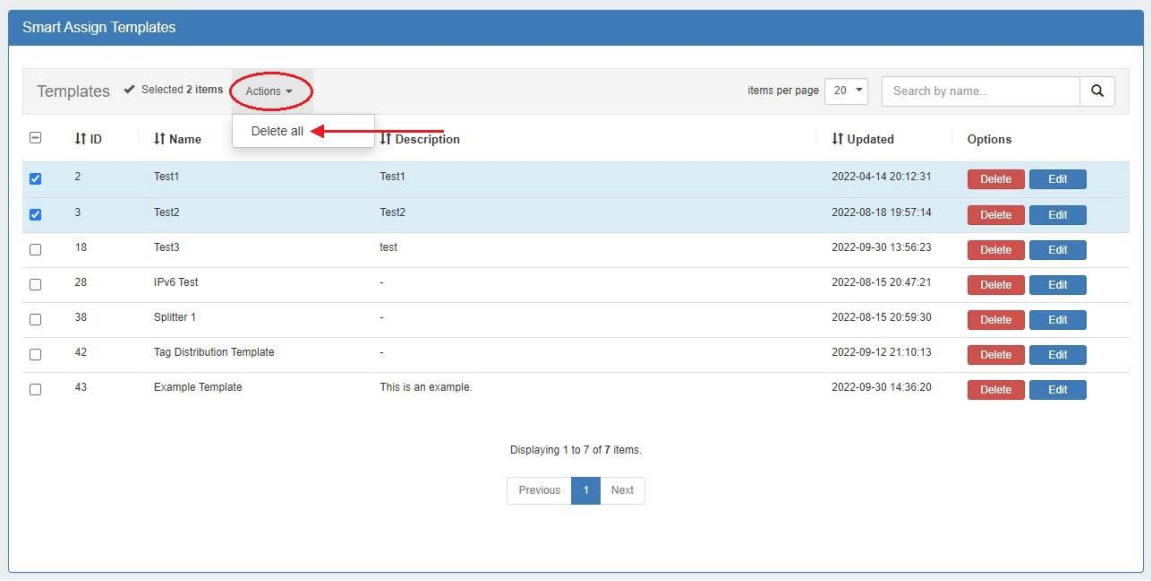
Delete a Template

To delete a template, click the "Delete" button in the "Options" column.



You may also select more than one template to delete.

To do so, select the checkboxes for the desired templates, then under the "Actions" menu at the top of the list, select "Delete all".



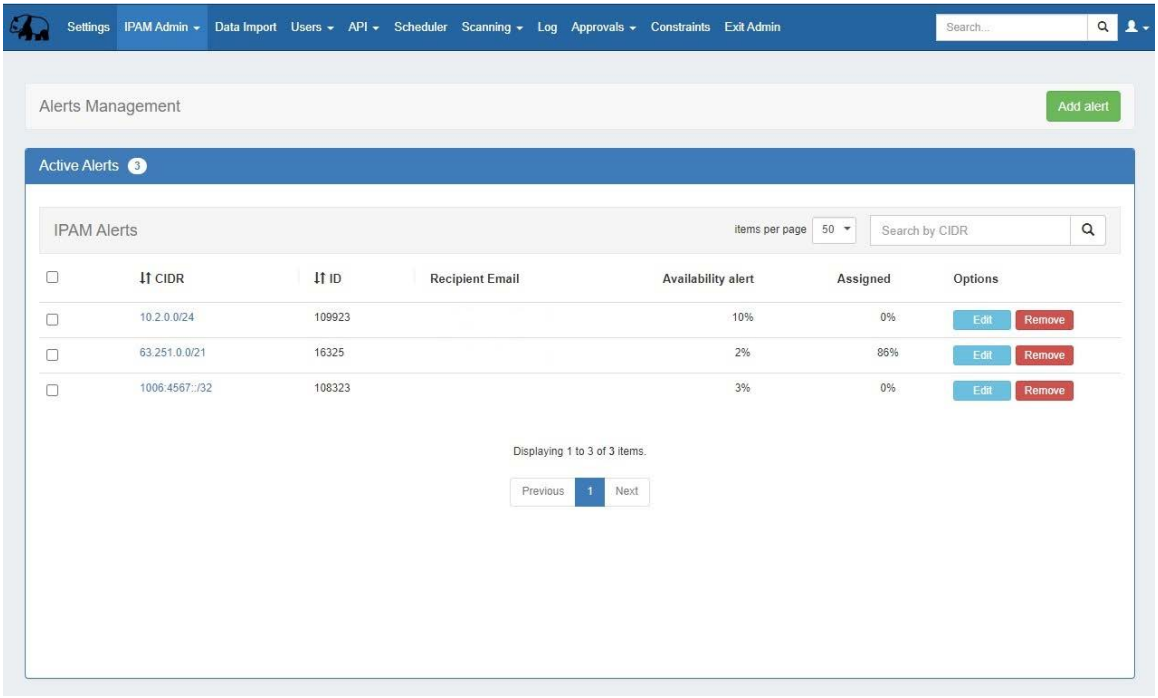
Additional Information

See the following pages for additional information:

- IPAM Tab
- Working with IP Blocks - Common Tasks
- IPAM Gadgets

Alerts Management

Alerts Management

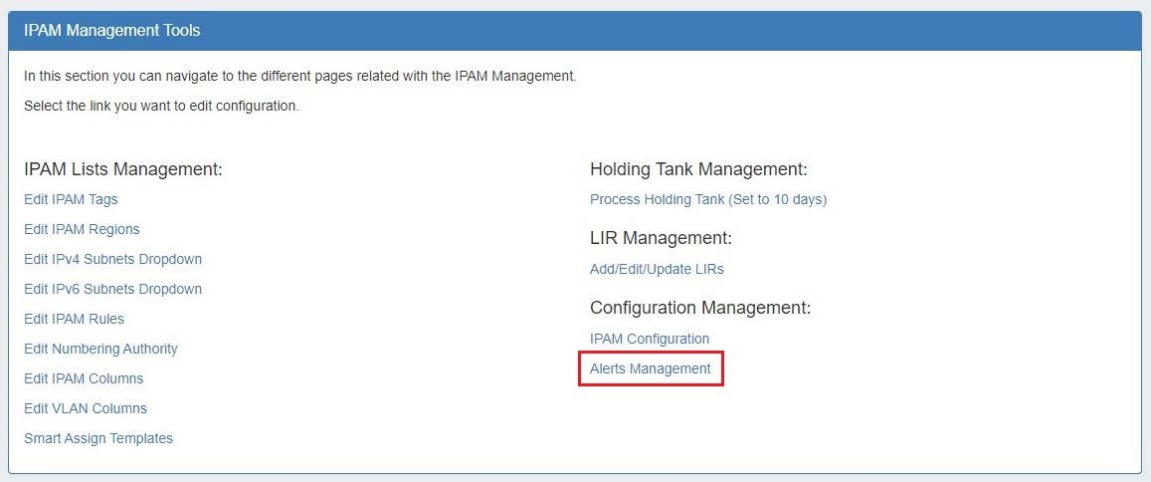


Alerts Management, accessible from **IPAM Admin** Alerts Management, displays a list of all currently set IPAM Alerts. Alerts may be created and applied to blocks under the IPAM Tab -> IPAM Manage screen, in the Action Menu for the desired block or from Alerts Management.

- Alerts Management
  - Alerts List Overview
    - Search
    - Sort
  - Add an Alert
  - View or Edit an Alert
  - Remove an Alert
  - Additional Information

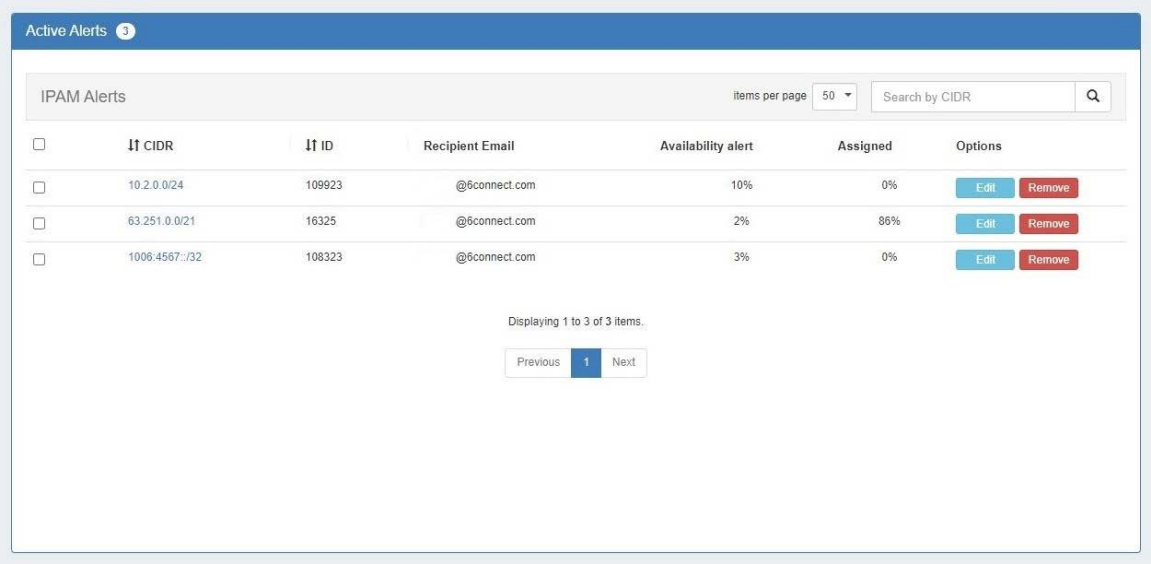
Alerts List Overview

Access the Alerts Management List from **IPAM Admin** Alerts Management.



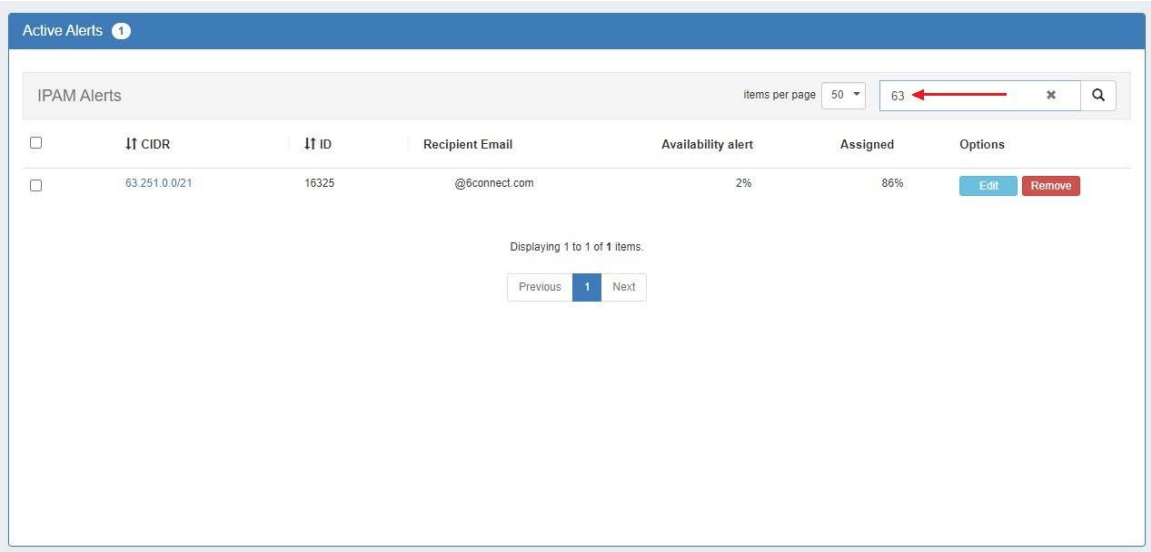
The Alerts List displays all active alerts and is where you can view, edit, and delete existing alerts.

The list displays the CIDR, ID, recipient email, the alert threshold, and current usage of an alert. Clicking on the CIDR will take you to the IPAM Aggregate Manage screen.



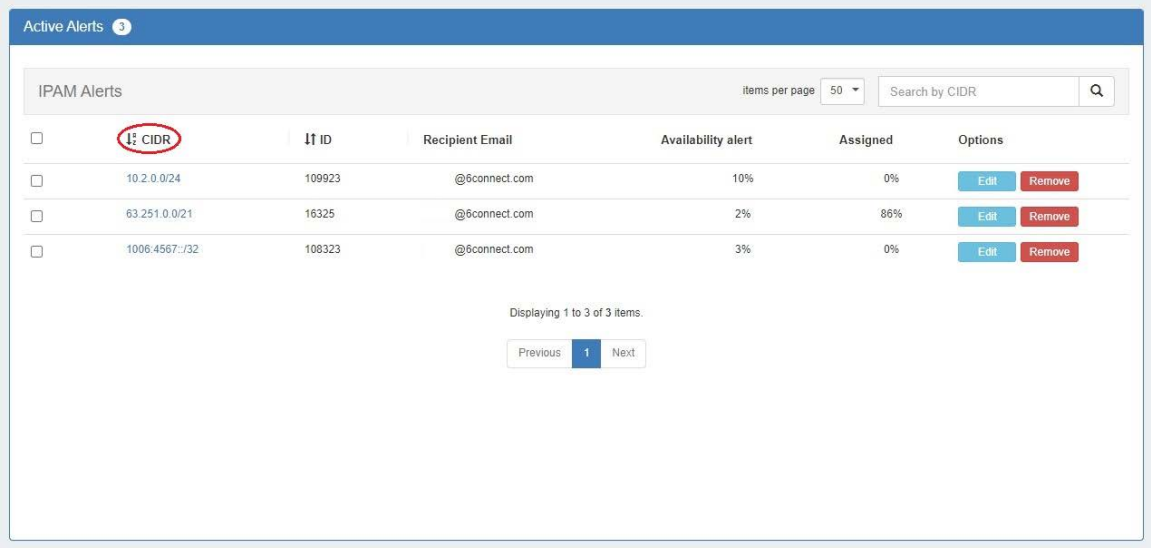
Search

Filter the list for a specific alert CIDR by typing all or part of the name in the searchbox.



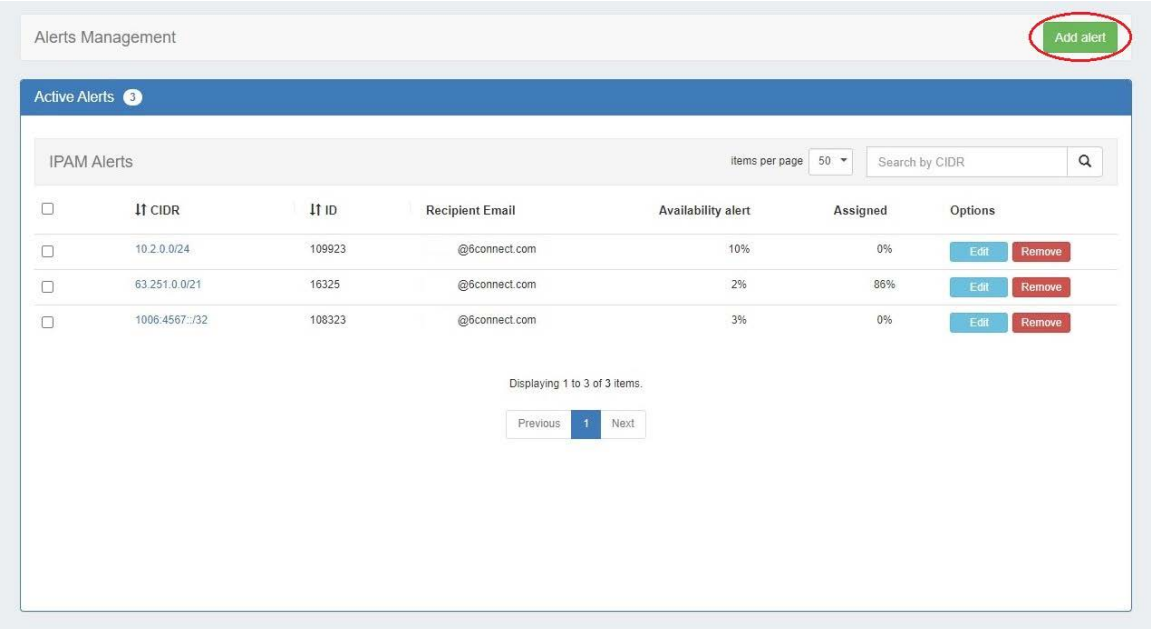
Sort

Sort columns into ascending/descending order by clicking on the column header for any column with an up/down arrow ().

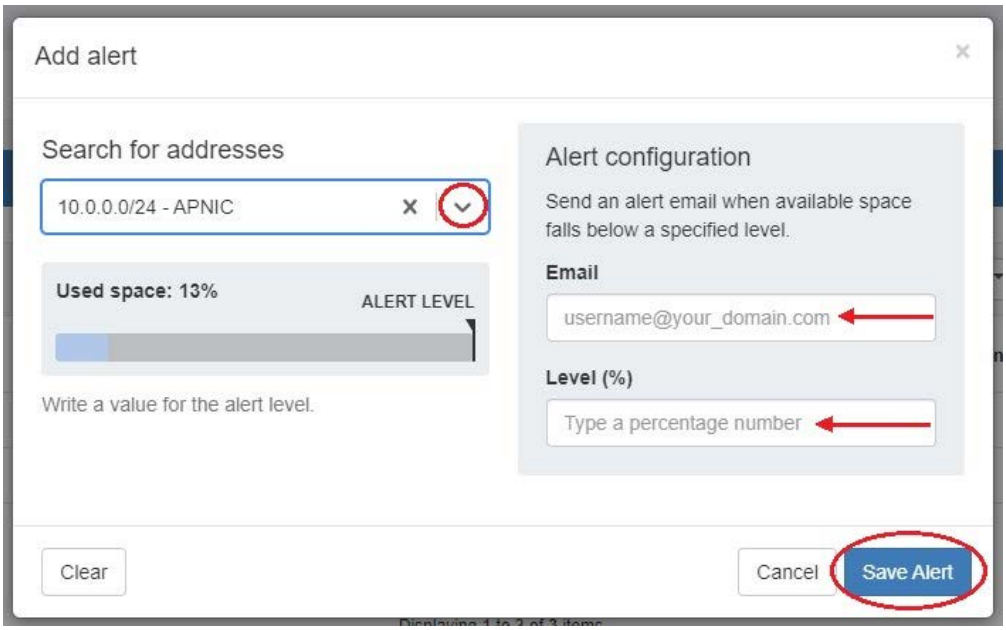


Add an Alert

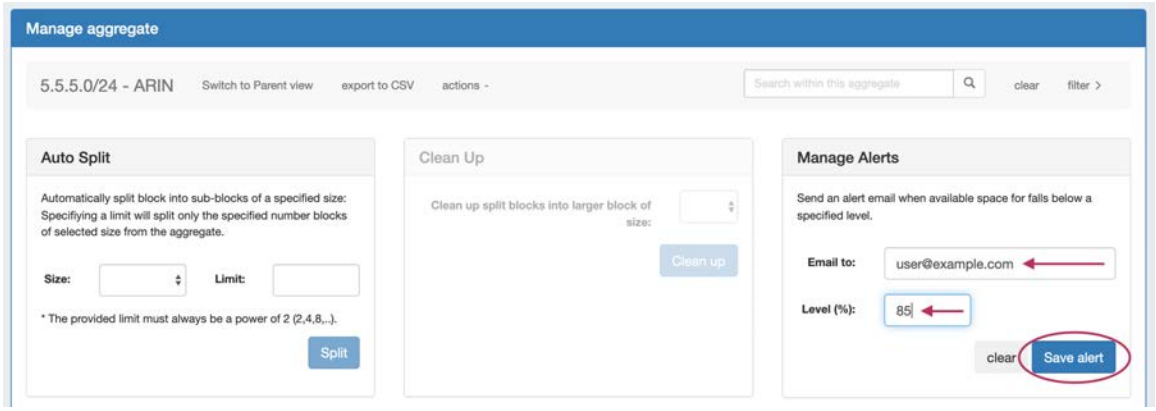
To add a new alert, click the "Add Alert" button at upper right.



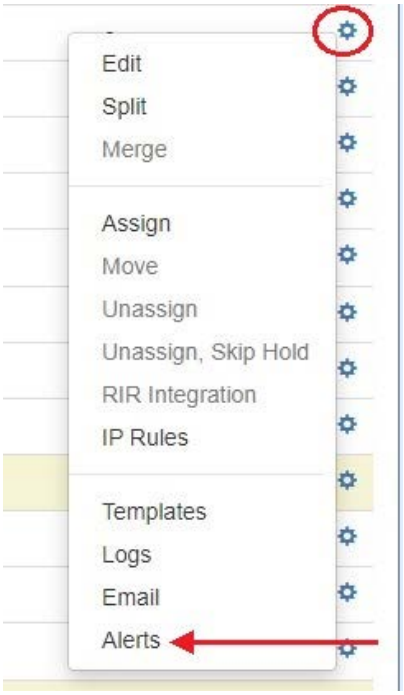
Select an aggregate or IP block from the dropdown. Once selected, the current utilization of the space is displayed on a bar chart. Enter an alert level (percentage) and a recipient email address for the alert and hit "Save Alert".



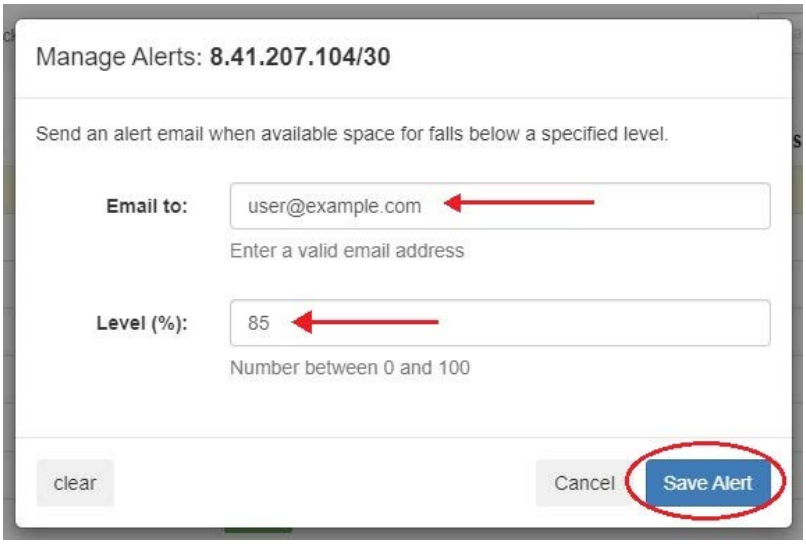
From an aggregate's manage screen, open the top "Actions" menu and enter and email and alert threshold in the "Manage Alerts" section. Click "Save alert" when done.



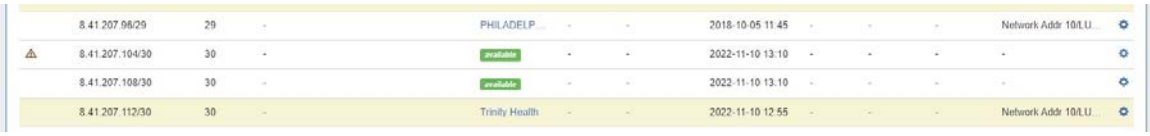
To set an alert for an individual block, select the "Alerts" option from the Action Menu for the block.



Enter an email address and utilization level for the alert. When done, click "Save Alert".

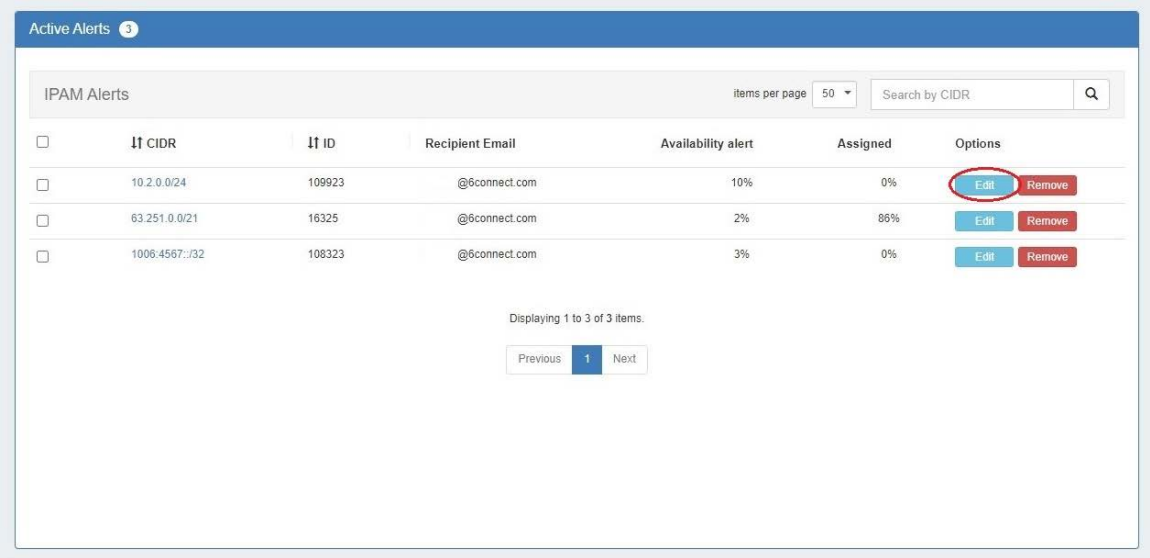


An alert icon will be visible in IPAM Manage next to any block that has an active alert set.

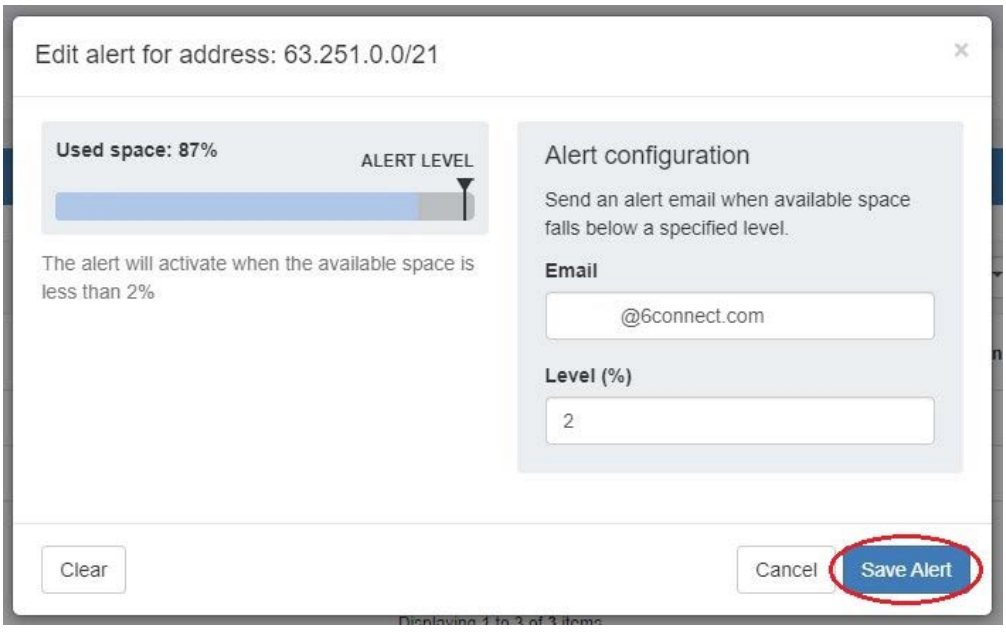


View or Edit an Alert

To edit an existing alert, click the "Edit" button in the "Options" column.

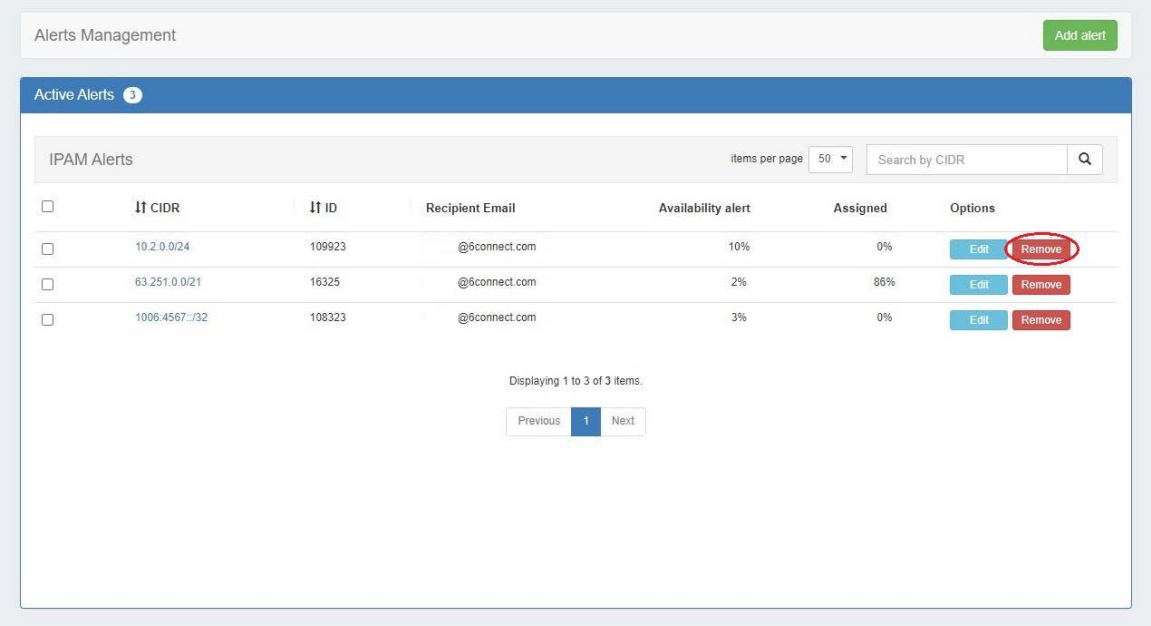


From here you can edit the recipient email or alert level. Click "Save Alert" to save any changes.

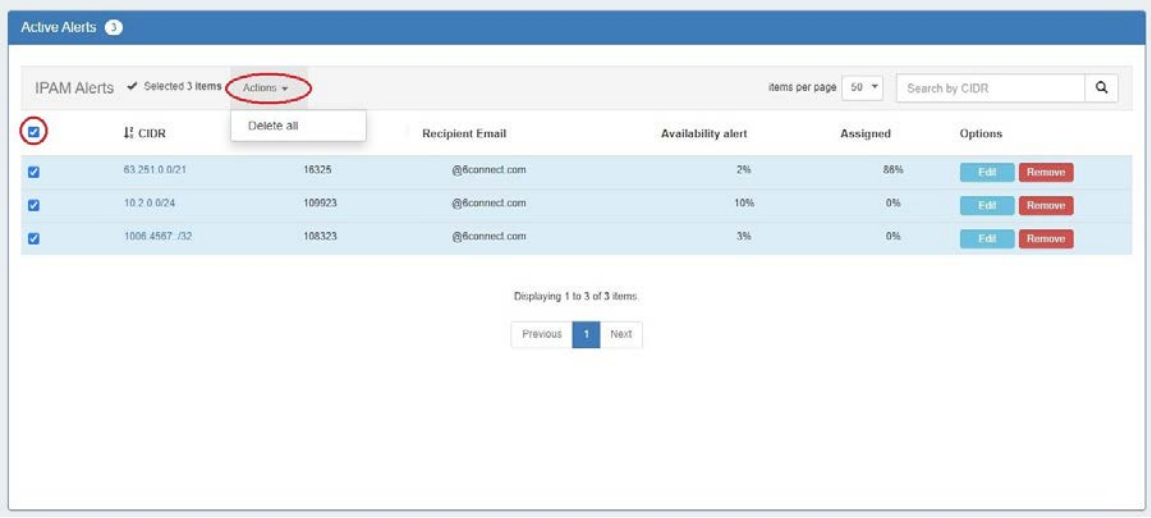


Remove an Alert

To remove an alert from Alerts Management, click the "Remove" button in the Options column.



To remove multiple alerts, select the checkboxes for the desired alerts, then under the "Actions" menu at the top of the list, select "Delete all".



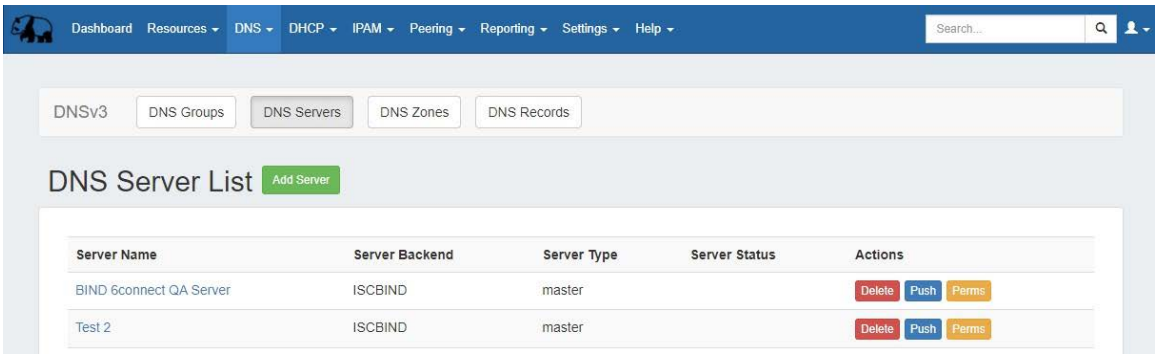
Additional Information

See the following pages for additional information:

- Working with IP Aggregates
- Working with IP Blocks - Common Tasks

DNS Administration

DNS Administration



DNS Administration in DNSv3 is primarily handled under the DNS tab **DNS Servers** sub-tab, with DNS Administrative settings available under the Admin Settings page.

Users with resource "read" permissions may view DNS Server information, however only those with either Admin permissions or granted group-level server permissions can manage DNS server creation, edits, and deletion.

Additional DNS Admin tasks occur in other ProVision areas, and not all management tasks require Admin-level permissions - some only require appropriate resource permissions on the DNS Groups, Zones, and servers involved. See additional sections on this page for more detailed information:

- DNSv3 Overview
  - DNSv3 Permissions
    - Permission Shortcut Button ("Perms")
  - DNS Approvals
  - DNSv3 Administrative Tasks
- Manage DNS Servers
- ACLs / Views
- DNS Zone Transfers (Pushes)
  - Manual DNS Pushes:
  - Scheduled DNS Pushes:
- DNS Record Types
- Global DNS Settings (Local Installation Only)
  - DNSSEC Settings:
  - DNS Dynamic Update Settings
  - DNS Backup Settings
  - DNS Import Settings
  - Push Settings
  - DNS Cache Settings
  - DNS Server Statistics
- DNS Export Functions
  - Exporting Zones
- Importing DNS Zones:
- Additional Information:
  - System Information for Local Installations
  - Additional Sections:

DNSv3 Overview

DNSv3 reorganizes the DNS system into a more unified and accessible interface, combining both admin and non-admin DNS tasks together under the DNS tab.

In DNSv3, zones are gathered under DNS Groups, servers are attached to those Groups, and Nameservers, Default SOA values, and ACLs are managed at a per-Group level.

Users can then view and manage Groups, individual zones, default SOA values, ACLs, attach servers, and perform pushes all on the same page.

> **DNSv3 Zone Name Response Change**
>
> Note: In DNSv3, zone name responses will enforce and return a trailing period (i.e., "example.com" will be converted and returned as "example.com.").

DNSv3 is designed to reflect RFC 1035 standards for valid data formats and will return error messaging for data not meeting those formats.

DNSv3 Permissions

DNSv3 incorporates DNS zones and Groups into the Resource System. Zones and Groups are Resources just like Customers, Servers, Routers, or Contacts (See Resource Concepts and The Resource System for a more detailed explanation of Resources in ProVision).

This allows for DNS zones and Group permissions to be managed similarly to other resources, where users with Resource permissions (Create / Read / Update / Delete) on the parent resource of the DNS Group can create groups and zones, manage those groups and zones, push (if a server is attached), and delete.

A user with full Resource permissions on a DNS Server, as well as the parent resource of a Group, may view and attach that server to a Group.

Users with resource "read" permissions may view DNS Server information, however only those with either Admin permissions or granted group-level server permissions can manage DNS server creation, edits, and deletion.

For more information on setting up permissions groups in ProVision, see Users & Permissions.

Permission Shortcut Button ("Perms")

Throughout DNS, a shortcut permissions button ("Perms") is available on a per-item level, accessible only to Admin users.

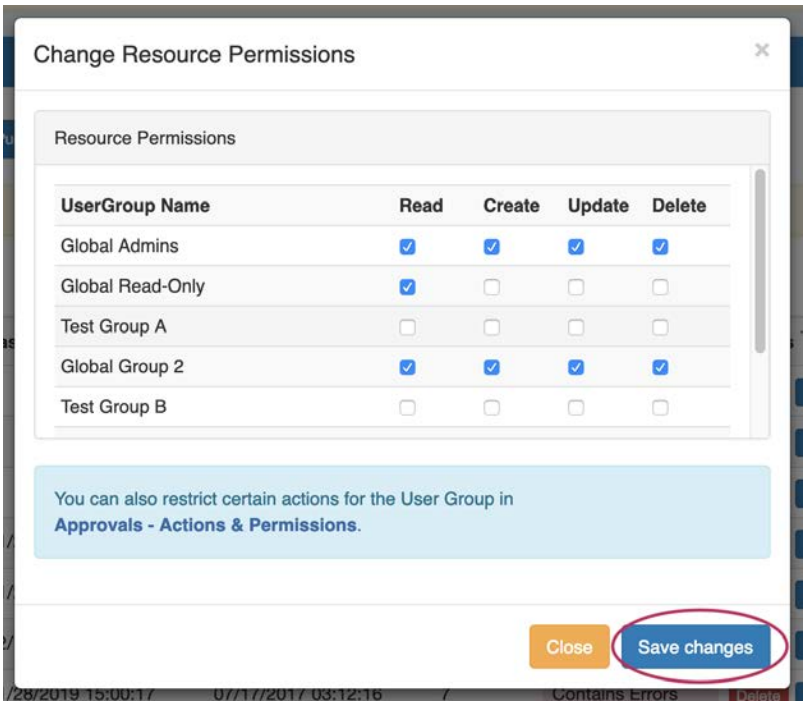
This permissions button allows for direct, point-of-use permissions adjustments to individual DNS Groups, Servers, Zones, and Records. It uses the same CRUD permissions and groups available in the Admin Users tab, but removes the need to remember and search for the DNS item name.

To open the Change Resource Permissions module, click on the "Perms" Button for any DNS item.



Edit the CRUD permissions for any ProVision user group by clicking the checkbox for the desired group and permission type.

When done, click "Save Changes". The permission changes will be also be reflected in the Admin **User** tab Group settings.

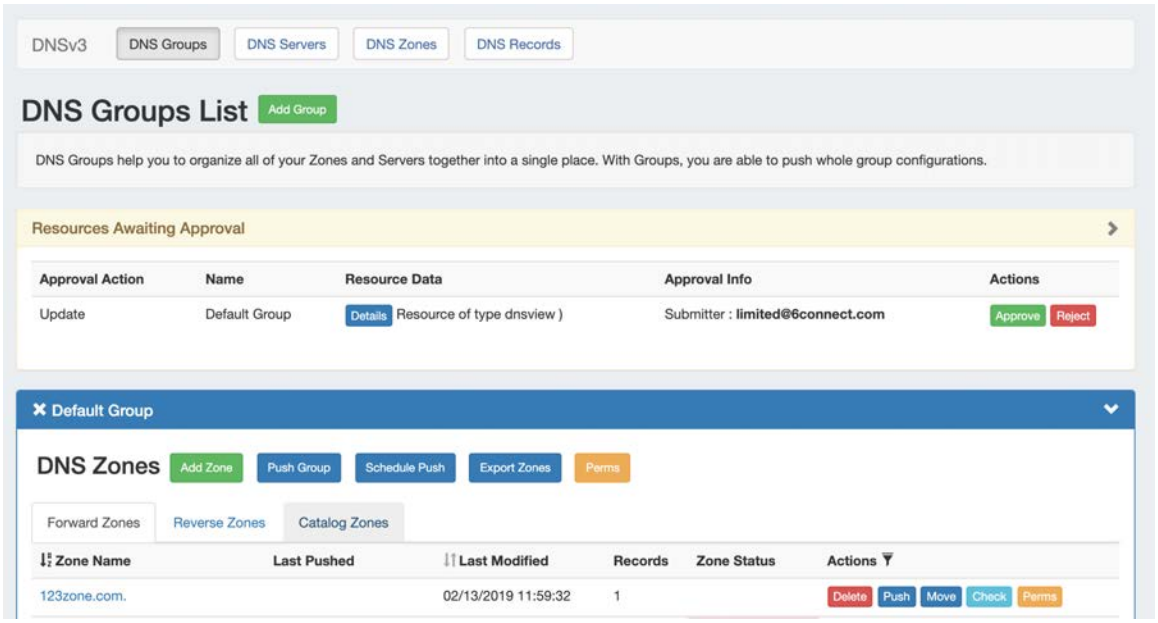


DNS Approvals

The Approvals module stores and queues DNS actions made by selected User Groups, and sends those actions to a Pending Changes list for administrative review. Later, an administrator (or combination of administrators) can approve or reject these stored actions.

Approvals is primarily set up and managed via the Admin **Approvals** Tab. See the Approvals for details on setting up and using Approvals from the Administrative viewpoint.

In the **DNS** Tab, a "Resources Awaiting Approval" module will display near the top of DNS Groups, DNS Zone Lists, and DNS Servers pages, if a change has been submitted on that page that is pending approval.



Users who submitted a change for approval will see the details of their change request in this module.

Admin users with permissions to approve or reject the request will have the option to Approve or Deny the change.

DNSv3 Administrative Tasks

Admin-only tasks in DNSv3 include setting DNS Globals, importing zones, scheduling pushes, managing DNS Servers, and managing DNS Approvals.

These tasks may be accessed in the following areas:

- DNS Global Settings: Admin Settings page.
- Importing DNS Zones: the **Data Import** tab, see Import DNS Zones.
- Scheduling DNS Pushes:
    - May be set up from the Scheduler Tab or,
    - Set by server from the DNS Servers page, or
    - Set by DNS Group from the DNS Groups page, or
    - Set by individual zone from the View Zone page
- Managing DNS Servers: The DNS Servers page
- Approvals: The Approvals Tab.

Tasks such as working with zones, DNS Groups, adding ACLs, attaching servers to Groups, and manually pushing zones do not require ProVision Admin permissions.

Instead, these tasks simply require that the user be included in a User Group that has appropriate permissions (either direct, or inherited) on the DNS zones, Groups, and servers involved.

Manage DNS Servers

Adding, configuring, and managing DNS Servers occurs in the Admin-only **DNS Servers** page under the **DNS** Tab.

Supported DNSv3 server types include:

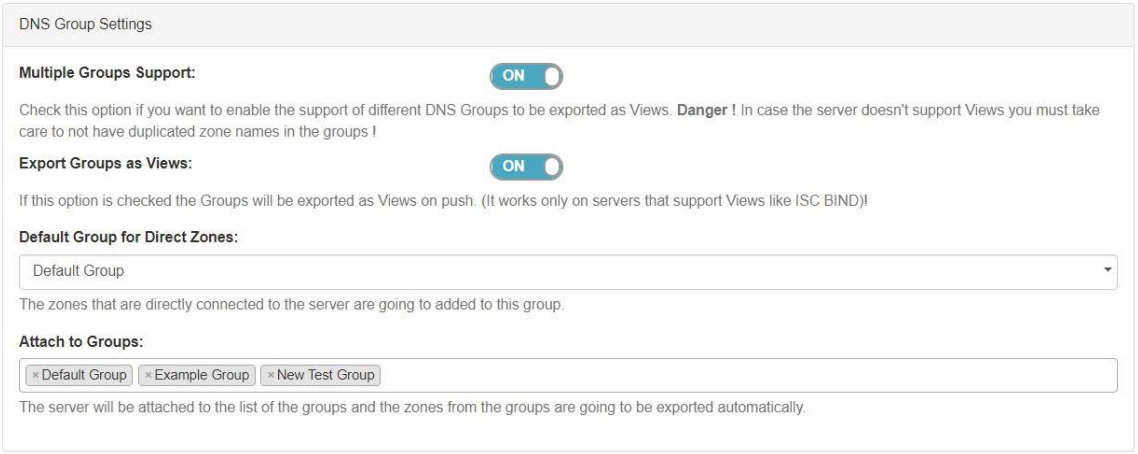
- ISC BIND
- Secure 64 (Authority, x86 Authority, KNOT Authority, Cache, Signer)
- PowerDNS (BIND and MySQL)
- InfoBlox
- Knot DNS
- NS ONE
- DynDNS (Beta)
- DNSMadeEasy
- AWS Route53 (Beta)
- Dummy (a fake server entry used for servers outside of ProVision access, in order to manage master / slave configurations)

Some server types may require outside subscriptions or accounts.

For detailed information on adding, editing, and deleting DNS Servers, see Working with DNS Servers.

ACLs / Views

In DNSv3, Views may be created by selecting the "Export Groups as Views" toggle and selecting a DNS Group under the server details sections "DNS Group Settings".



ACLs are managed on a per-DNS Group level, and may be added, edited, or removed by any user with appropriate resource permissions on the DNS Group.



For details on working with ACLs, see Configuring Split Horizon and Views.

DNS Zone Transfers (Pushes)

In DNSv3, zones may be pushed manually or scheduled for a future time, and may be performed for a single zone, all zones in a DNS Group, or all zones on a server.

Scheduling DNS pushes requires administrative access, but manual pushes only require permissions on the DNS Group / DNS Zone, and the server(s) attached.

Manual DNS Pushes:

Manual pushes may be performed from the following locations in ProVision:

- Single Zone: From the DNS Groups Zone list "Push" button.
- Single Zone: From the DNS View Zone page "Push Zone Now" button.
- Group: From the DNS Groups Zone list "Push Group" button.
- Server: From the DNS Servers list "Push" button.
- Server: From the DNS Server Settings page "Push Zones" button.

For details on performing pushes, see the following sections:

- Working with DNS Groups
- Working with DNS Zones
- Working with DNS Servers

Scheduled DNS Pushes:

Scheduled pushes may be performed from the following locations in ProVision:

- May be set up from the Scheduler Tab for single zones, all zones in a Group, or all zones on a server.

- Set by server from the DNS Servers page, or
- Set by DNS Group from the DNS Groups page, or
- Set by individual zone from the View Zone page

DNS Record Types

ProVision supports 18 standard record types, as well as the ability to add a custom/arbitrary record type manually.

Available record types include the following:

- A
- A6
- AAAA
- CNAME
- CAA
- DNAME
- DNSKEY
- DS
- MX
- NAPTR
- NS
- PTR
- RP
- SRV
- TLSA
- SPF
- HINFO
- TXT
- Other

OTHER Record Types

When working with DNS Zones and Records, additional record types may be manually added by selecting "Other" when adding a new record.

S64 DNS users can use record type "Other" to add "SYNTH" or "TYPE65464" type records similar to the format below:

```
$ORIGIN 30 IN TYPE65464 ${p4} PTR ${a4}.pool.example.com.
$ORIGIN 600 IN TYPE65464 ${a4} A ${a4}
$ORIGIN TYPE65464 ${p6} PTR user${a6}.my.example.com.
$ORIGIN 5 IN SYNTH user${a6} AAAA ${a6}
$ORIGIN IN SYNTH nptr-${u} NAPTR 10 20 "A" "" "" srv-${u}
$ORIGIN IN SYNTH srv-${u} SRV 10 20 1234 srv-addr-${u}
```

However, arbitrary / other record types are unable to be validated, so use with care!

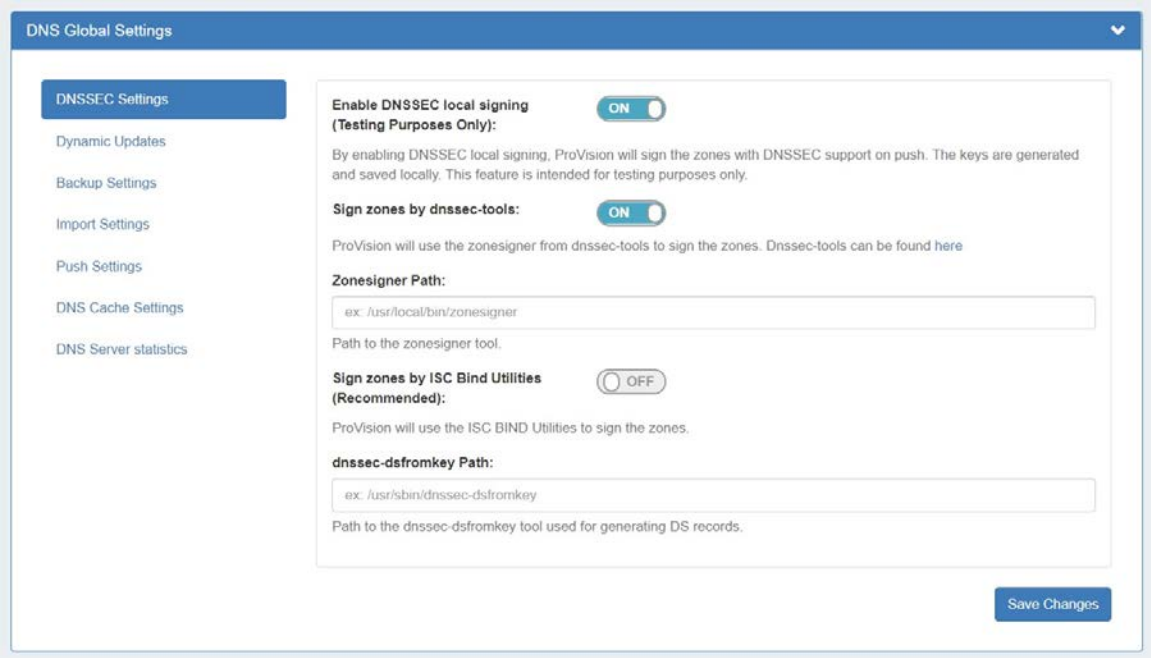
Any user with appropriate resource permissions on the DNS Zone / DNS Group may add, edit, or delete DNS Records.

See Working with DNS Zones for detailed information on managing DNS Records.

Global DNS Settings (Local Installation Only)

DNS Global Settings is accessible from the Admin Settings page by users with Admin level permissions.

DNSSEC Settings:



If using DNSSEC, select whether to enabled DNSSEC local signing, or sign zones by dnssec-tools, then enter the following information:

zonesigner path : Enter the zonesigner path that will be used for DNS. Zonesigner is required if dnssec-keygen and dnssec-signzone are not set.

Sign zones by ISC BIND Utilities: Select whether to use ISC BIND utilities to sign zones.

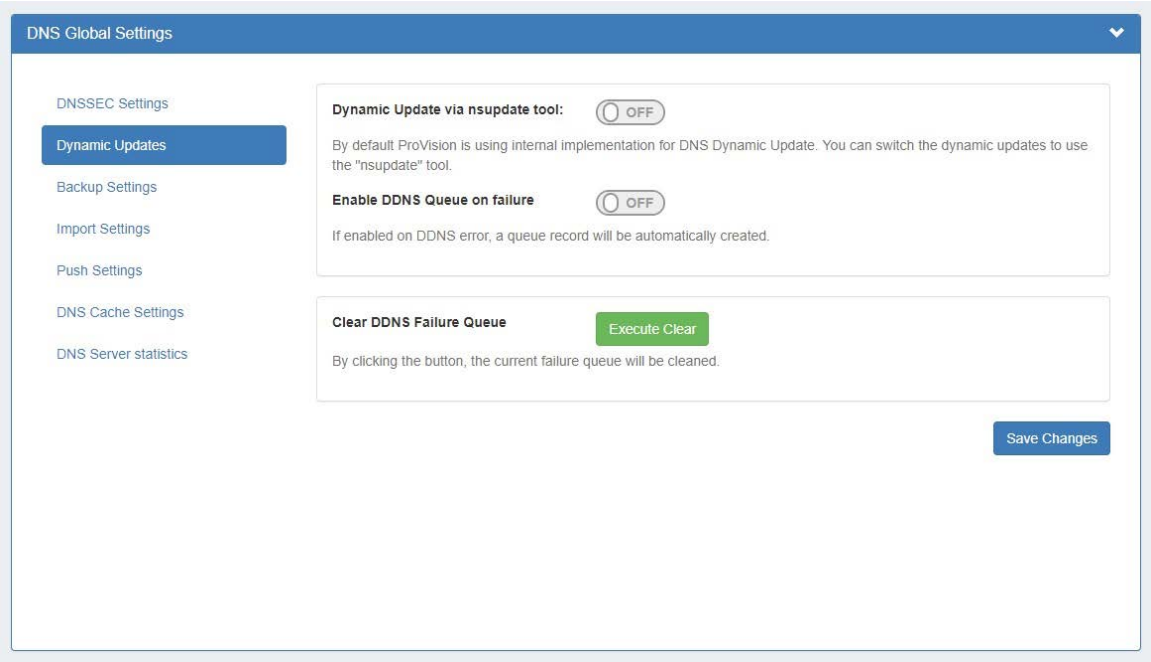
dnssec-dsfromkey path : Enter the dnssec-dsfromkey path that will be used for DNS. Required in all cases.

Additional Entropy

If delays occur due to lack of available entropy on servers, see the following article on how to set up additional entropy using haveged here:

https://www.digitalocean.com/community/tutorials/how-to-setup-additional-entropy-for-cloud-servers-using-haveged

DNS Dynamic Update Settings

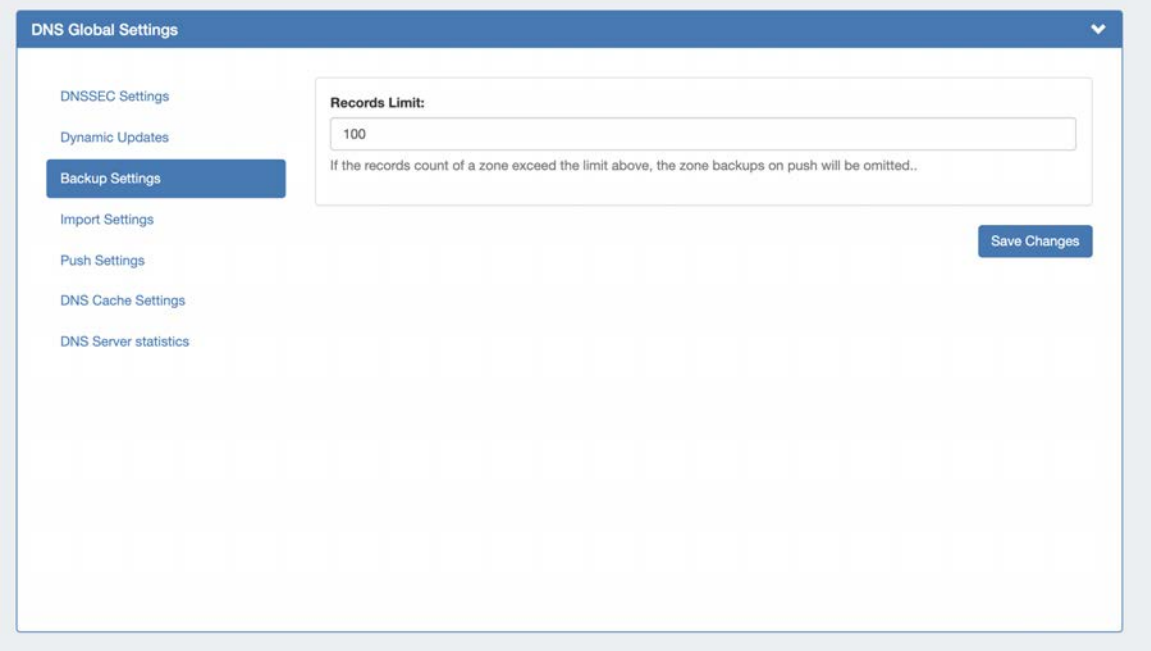


Dynamic Update via nsupdate: Toggle to "On" if you wish to use Dynamic Updates via nsupdate, instead of ProVision's internal implementation.

Enable DDNS Queue on failure: Toggle to "On" if you wish to enable the automatic creation of a queue record on DDNS error.

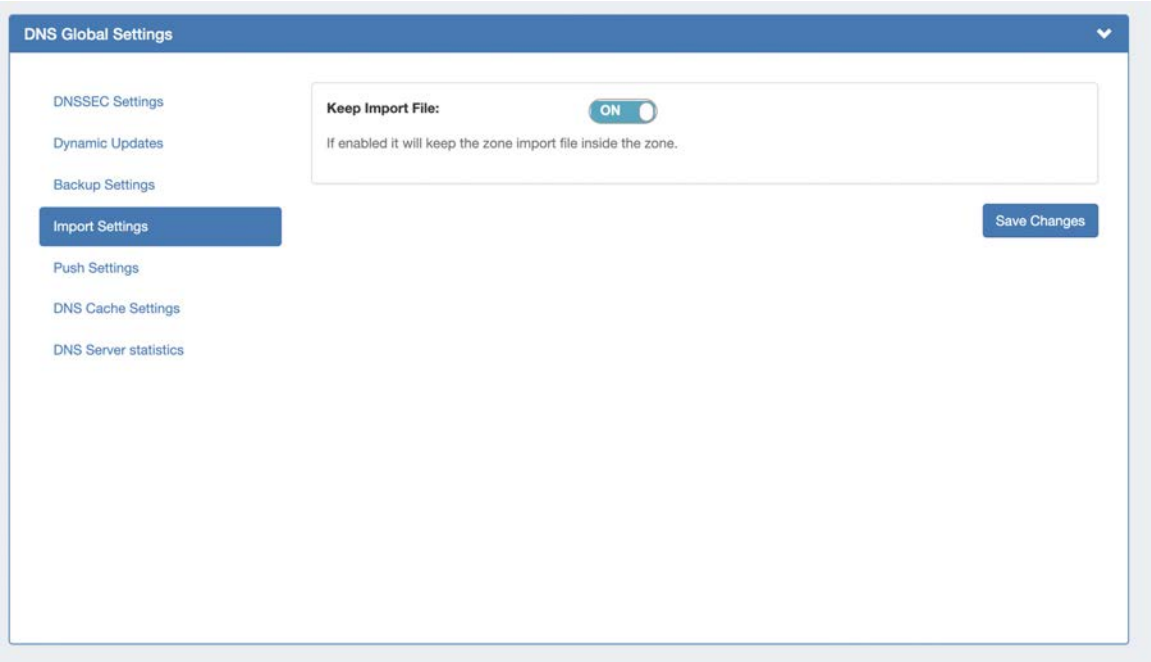
Clear DDNS Failure Queue: Clears the current failure queue.

DNS Backup Settings



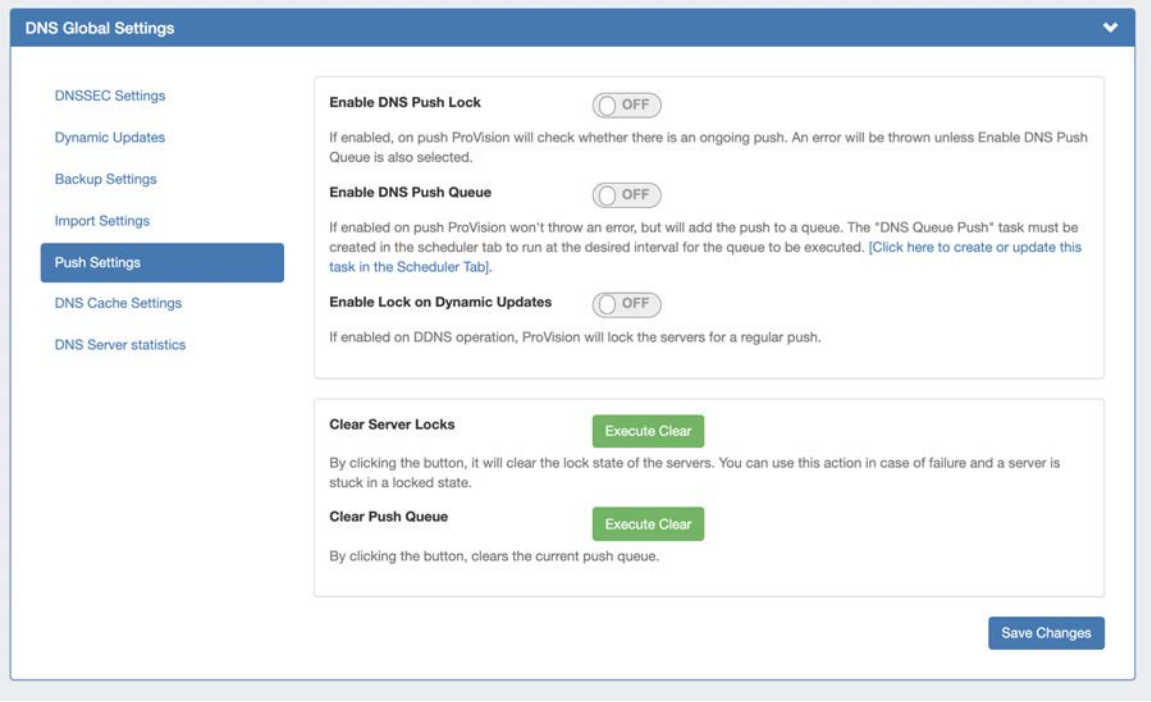
Records Limit : The limit for the number of records a zone may have for a zone to process a backup. If the records count exceed this number, zone backups will be omitted at zone push.

DNS Import Settings



Keep Import File: Saves DNS zone import files to the zone's "Zone Backups and Attached Files" area, for later download. Optional.

Push Settings



Enable DNS Push Lock: If enabled, on push ProVision will check whether there is an ongoing push. An error will be thrown unless Enable DNS Push Queue is also selected.

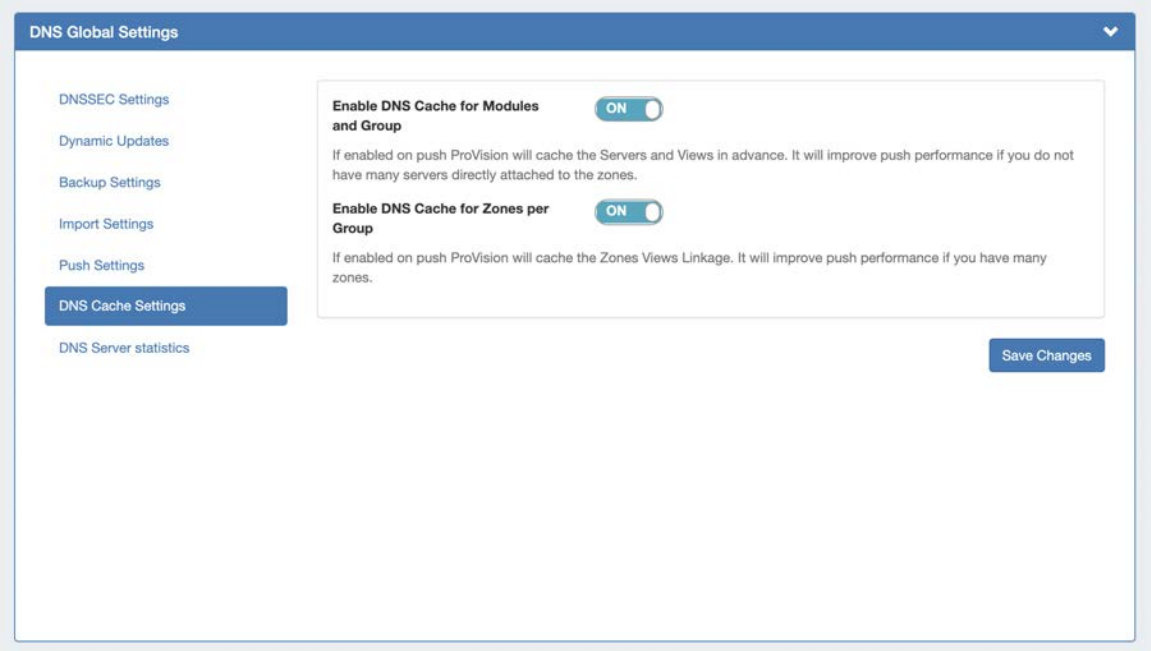
Enable DNS Push Queue: If enabled, on push ProVision won't throw an error, but will instead add the push to a queue. The "DNS Queue Push" task must be created in the scheduler tab to run at the desired interval for the queue to be executed.

Enable Lock on Dynamic Updates: If enabled on DDNS operation, ProVision will lock the servers for a regular push.

Clear Server Locks: Clears the lock state of the servers. You can use this action in case of failure, and a server is stuck in a locked state.

Clear Push Queue: Clears the current push queue.

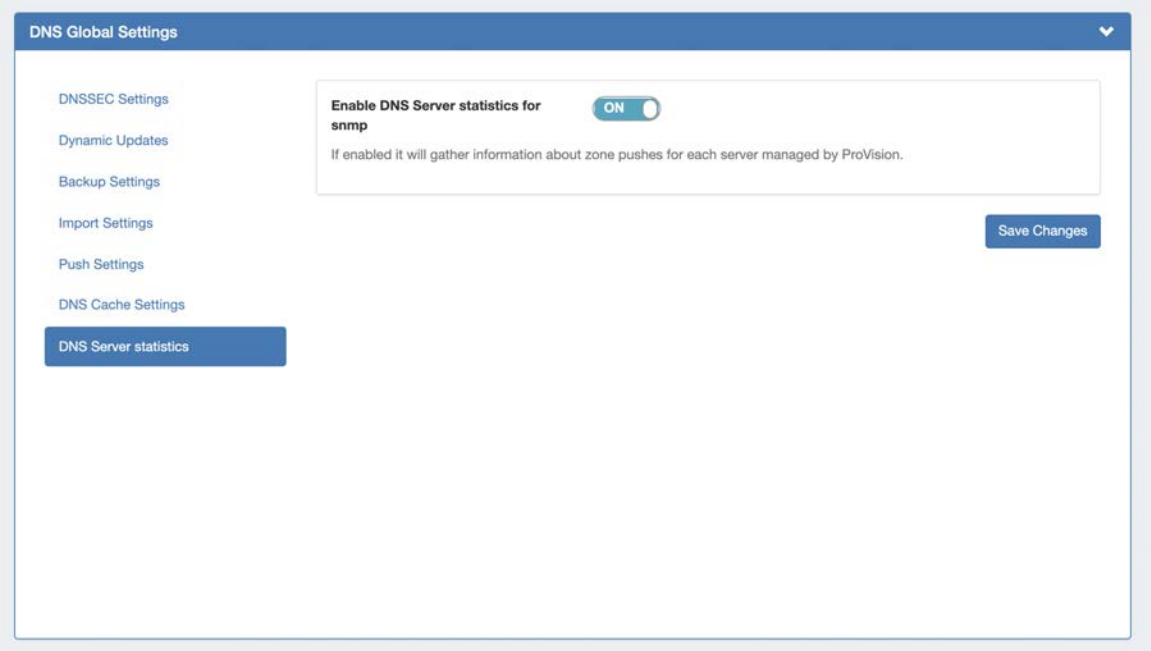
DNS Cache Settings



Enable DNS Cache for Modules and Group: If enabled, on push ProVision will cache the Servers and Views in advance. Improves push performance, if you do not have many servers directly attached to the zones.

Enable DNS Cache for Zones per Group: If enabled, on push ProVision will cache the Zones Views Linkage. Improves push performance, if you have many zones.

DNS Server Statistics



Enable DNS Server statistics for snmp: If enabled, it will gather information about zone pushes for each server managed by ProVision.

DNS Export Functions

Exporting Zones

Individual Zones:

DNS zones may be exported individually from the zone's View Zone page "Export Zone" button, by any user with appropriate zone permissions (see: DNS Zones Overview).

Zones in a DNS Group:

All zones under a DNS Group may be exported from the DNS Group "Export Zones" button, by any user with the appropriate group permissions (see: Working with DNS Groups).

Zones directly connected to a server:

Zones directly connected to a server may be exported by Admin users from the DNS Server Details page, under the section "Zones connected directly to the server".

Expand the module by clicking the (>) arrow, and then click the "Export Zones" button.



Importing DNS Zones:

ProVision offers six DNS zone import options, available under the **Data Import** tab in the Admin section. For more information on importing DNS zones, see Importing your Data and Import DNS Zones.

BIND Zone Upload / Import: Imports DNS zones using the named.conf configuration file tied to the zones you are uploading, a .zip or .tar file of the zones themselves, and an optional .csv file mapping zones to customers and DNS Servers. This is the simplest and most commonly used import method. Refer to Import DNS Zones for more information.

PowerDNS Zone Import: This tool is available after configuring a PowerDNS server with a MySQL backend. The PowerDNS Import connects to the selected server and imports all zones.

InfoBlox Zone Import: Imports DNS zones using a provided Host, Username, and Password. The InfoBlox import pulls all zones on the InfoBlox LOCAL grid and adds them to a designated Group. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

NS ONE Zone Import: Imports DNS zones using a NS One API Key. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

Dyn DNS Zone Import: Imports DNS zones using a Dyn DNS Customer Name, Username, and Password. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

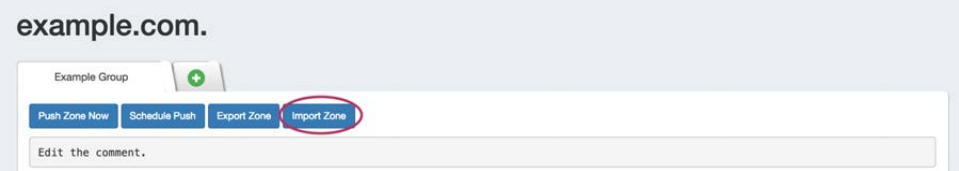
DNSMadeEasy Zone Import: Imports DNS zones using a DNSMadeEasy API Key and API Secret. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

IPPlan Zone Import: Imports DNS zones using IPPlan MySQL database options. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

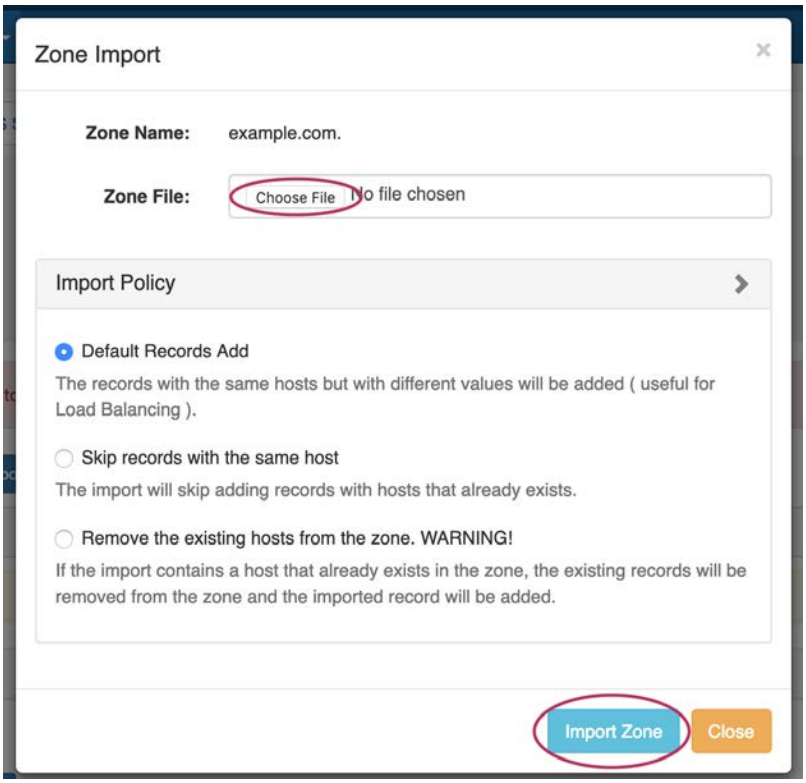
Additional DNS import options may be available on a per-zone or per-server level, accessed from the **DNS** Tab:

DNS Zone Import: This tool is available on a zone's "View Zone" page, and allows the user to import additional zone/record information into an existing ProVision zone by uploading a zone file (.zone).

- From the View Zone page, a zone file (.zone) may be imported into a ProVision zone to populate record data. Click "Import Zone".



A Zone Import dialog box will open. Next to **Zone File:**, click "Choose File" and select your .zone file to import. Then, select an import policy to follow.



When done, Click "Import Zone".

Additional Information:

System Information for Local Installations

Zones are stored in the 6connect web root under /zones.

DS keys are stored in the 6connect web root under /keys.

Global DNS Settings may be set from the Admin Settings page.

Additional Sections:

For more information on DNS and configurations, see the following sections:

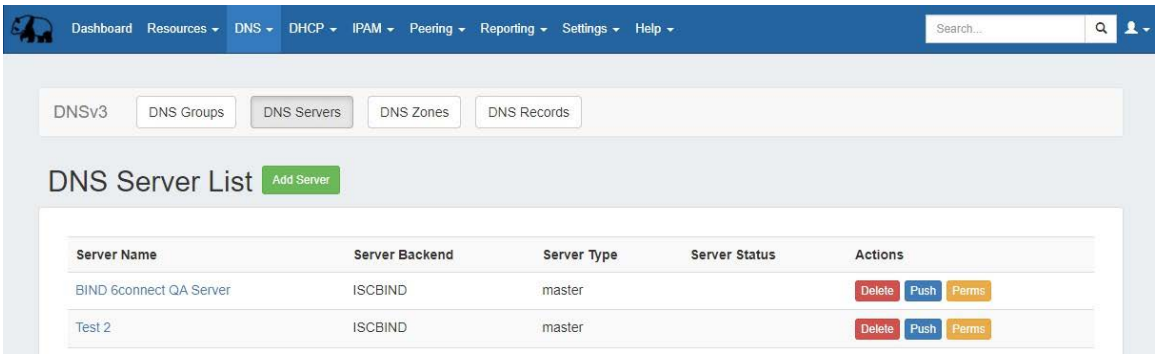
- Working with DNS Servers

- Configuring ISC BIND Support
- Configuring PowerDNS Support
- Configuring Secure64 Support
- Configuring Secure64 x86 Support
- Configuring Route53 Support
- Configuring Split Horizon and Views
- Configuring DNSSEC

Working with DNS Servers

DNS Servers

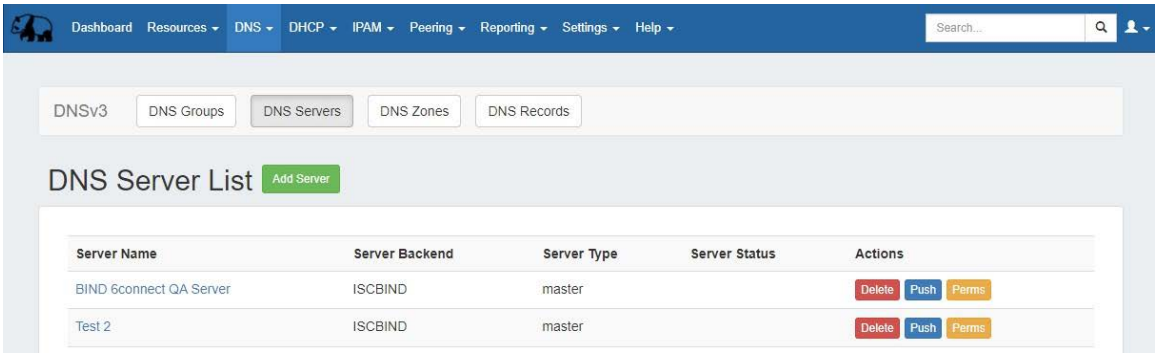
ProVision's DNSv3 combines server management, group organization, and zone management under the **DNS** tab.



The **DNS Servers** tab is viewable by users with Resource read permissions, though only Admin users or those specifically granted server permissions may perform management actions. The Sever List contains functions for adding, updating, and managing DNS servers as well as scheduling server tasks.

- DNS Servers
  - DNS Server List Interface
- Working with DNS Servers
  - Add a Server
    - Server Settings
      - 1) Set Server Common Settings
      - 2) Set Server Specific Settings
      - 3) Set DNS Group Settings for Server
      - 4) Save Changes
  - Edit Servers
  - Review Zones Connected to a Server
    - Zones Directly Connected to the Server
    - Zones Connected via a Group
  - Pushing a Server
    - Manual Push
    - Scheduled Push
  - Delete a Server
- Additional Information

DNS Server List Interface



1) Add Server Button: Opens a dialog for creating a DNS server.

2) Server List:

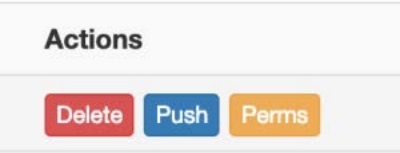
3) Server Name: Name of the DNS server. Click to open server details.

4) Server Backend: The DNS Service backend type for the server.

5) Server Type: Whether the server is a master or slave type.

6) Server Status: Currently a placeholder column for future display of server error and connection status messages.

7) Actions: The actions that may be performed on each server:



8) Delete: Deletes the server from ProVision.

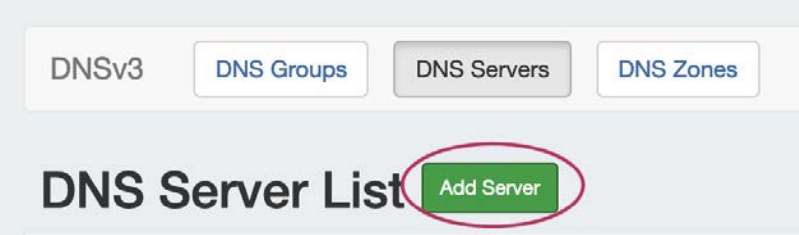
9) Push: Pushes all zones associated with the selected server.

10) Perms: Opens a shortcut to edit permissions for the selected server (Admin only).

Working with DNS Servers

Add a Server

To create a new server, start from the **DNS** Tab, select the **DNS Servers** sub menu. Then, click the "Add Server" button next to "DNS Server List".

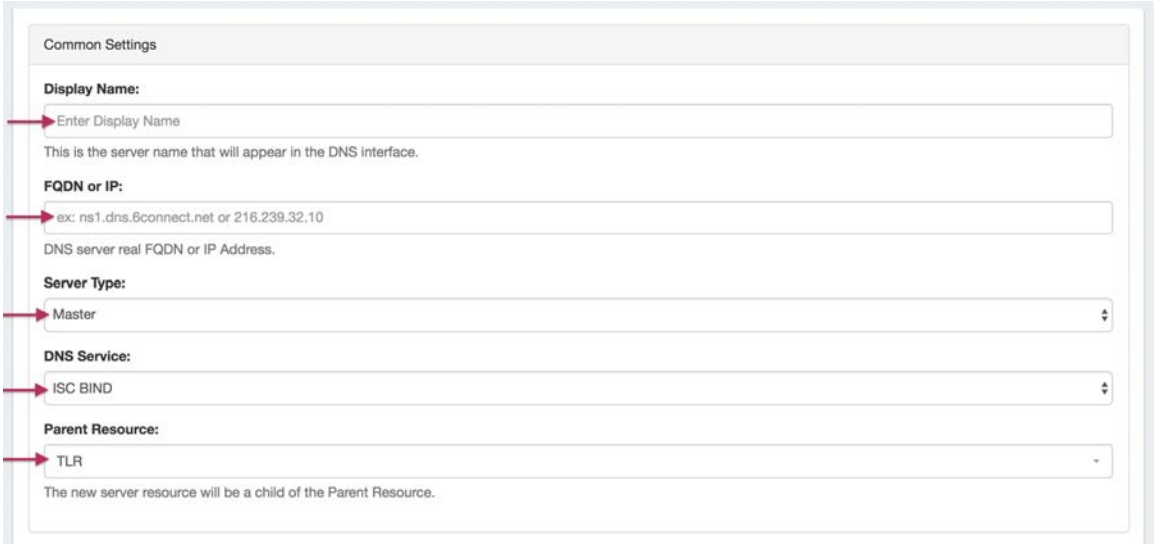


This will open the "Server Settings" page.

Server Settings

1) Set Server Common Settings

In the "Common Settings" section of Server Settings, enter the new server's Display Name (the name that will appear on the ProVision interface), the FQDN / IP, server type, service type, and desired parent Resource (may be left at the default Top Level Resource).



Display Name: Name you want the server to display.

FQDN or IP: The FQDN or ip address of the DNS server.

Default: Specify if the server should be added to new zones by default or not.

Server Type: Specify if the server is a master or slave. Different configuration files are created master vs. slave on the Bind, PowerDNS /Bind, and Secure64 platforms.

DNS Service: Select the DNS service type (ISC Bind, Secure64, KnotDNS, etc).

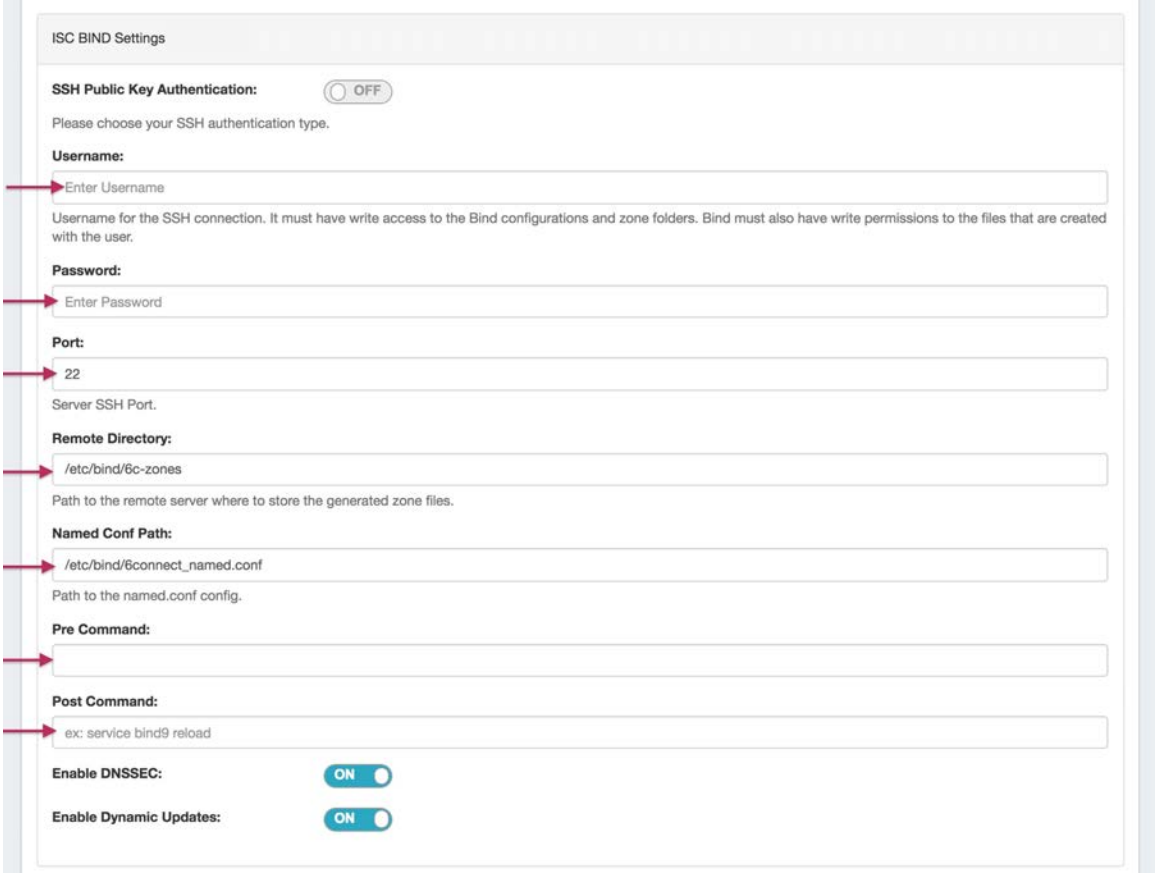
Parent Resource: Select the ProVision resource to be the "parent" of the server - typically TLR (Top Level Resource), but may be a lower level resource such as a Customer or Location. The parent resource selection is the basis of access permissions for the server.

2) Set Server Specific Settings

The next section is entering server service-type specific settings. The options visible in this section will depend on the "DNS Service" type chosen under "Common Settings".

Here, we see the fields for ISC BIND server settings. Enter the server Username, Password, Port, Remote Director, Named Conf. Path, and Pre /Post Command (if desired). Your fields may vary for other server types.

For SSH Public Key Authentication, DNSSEC, and Dynamic Option updates, click on the ON / OFF toggle to select "ON" or "OFF" for each as needed.



SHH Public Key Authentication: If applicable, toggle "On" or "Off"

Username: Login/username for the target DNS server. The specified account needs to be valid, and have write permission to the remote directory and execute permission for any pre/post commands.

Password: Password for the target account. All passwords are stored encrypted in the database.

Port: Port to contact the target server on. This is port used for SSH on Bind and Secure64 server types.

Remote Directory: The target directory to transfer zone files to on the DNS system.

Named Conf Path: The path to other zones on the Bind systems.

Pre Command: Any valid system command on the target DNS system. This command will be run before any files are transferred.

Post Command: Any valid system command on the target DNS system. This command will be run after any files are transferred. For example, on a Bind system you would need to run "rndc reload" to reload the zones.

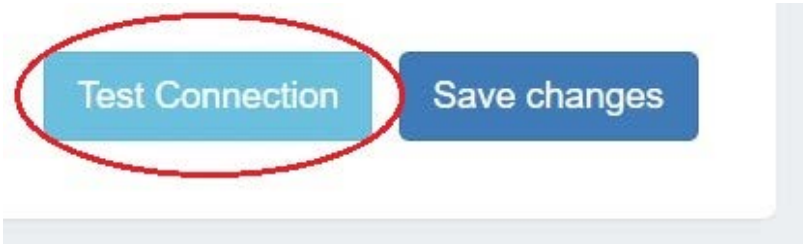
Enable DNSSEC: If available for the server type, toggle to "On" or "Off". See Configuring DNSSEC for additional information.

Enable Dynamic Updates: Toggle to "On" or "Off", if the server allows dynamic updates.

Some DNS Server types use subscription services or outside accounts, in which case you may instead be prompted to provide account credentials, API keys, API secret, or other vendor-specific fields to connect to the service.

After entering the server-specific settings in this section, you can click the "Test Connection" button at the bottom right of the page to test the server connection and authentication.

The "Test Connection" button will attempt to login to the target system and write to the target directory.



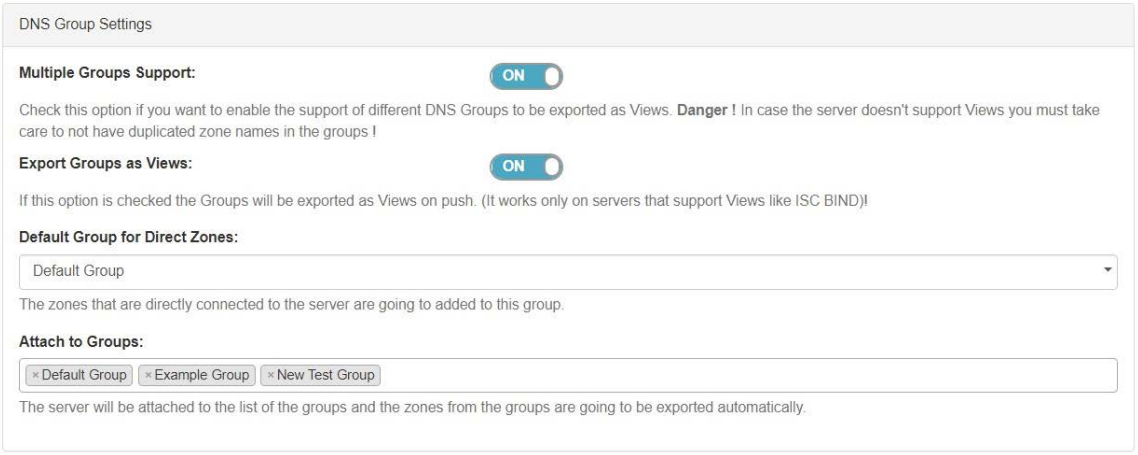
A window will pop up showing a success or failure response.

If any failures are encountered, an error will be written with some detail. If the test is successful, the word "Success!" will show verifying that files can be transferred. This does not test if the user can execute pre/post commands. This needs to be checked manually.



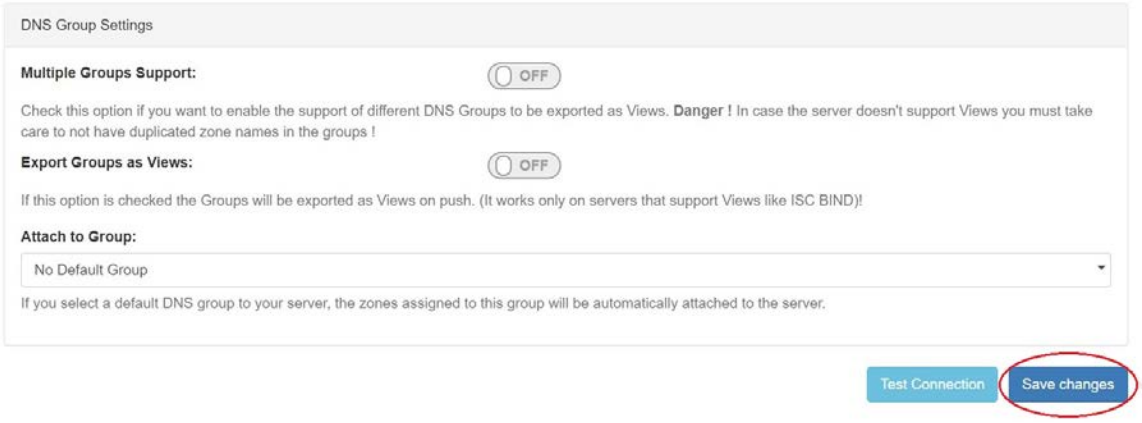
3) Set DNS Group Settings for Server

In the last section, select whether to enable Multiple Groups Support for exporting Groups as View (click to toggles ON / OFF), and select a default Group, if desired, to be associated with the server. Zones assigned to the selected Group will automatically be attached to the server.



4) Save Changes

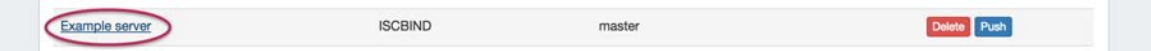
Save your changes when done! Just click the "Save Changes" button at the bottom right of the page.



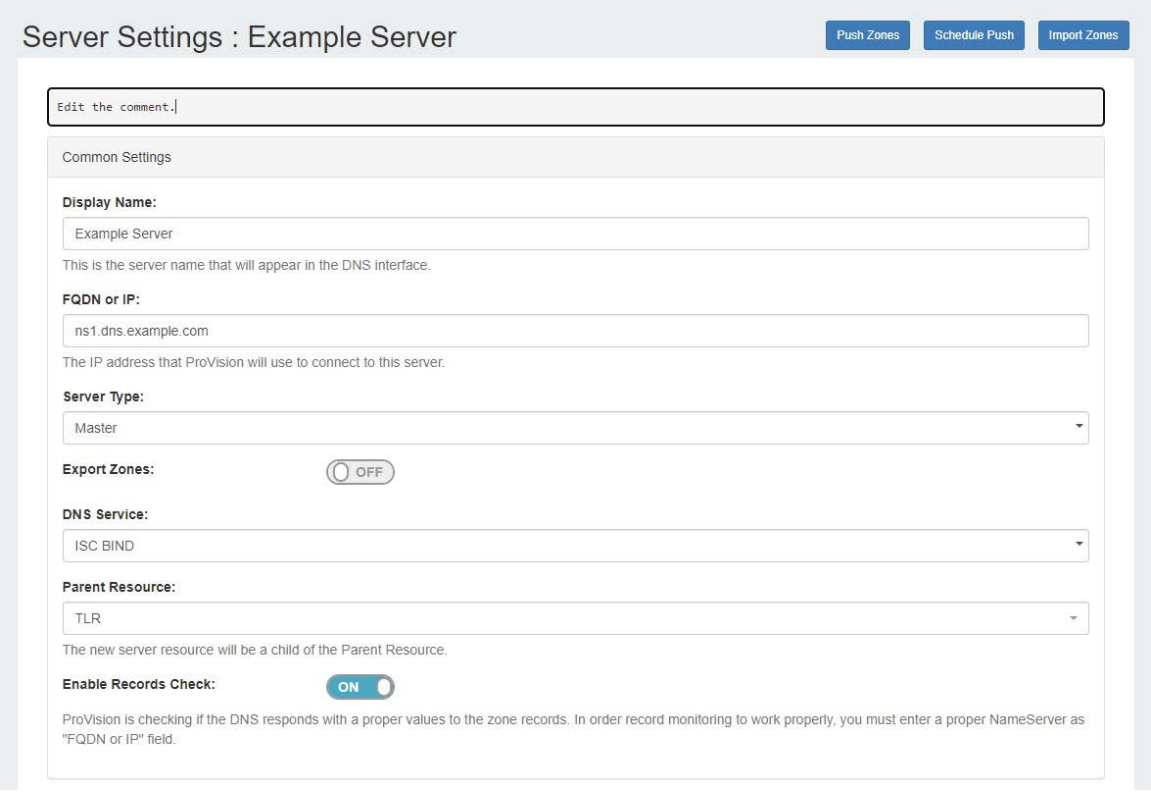
The new server will now be added to the DNS Servers list. These settings may be changed at any time by selecting the server from the server list and editing the information.

Edit Servers

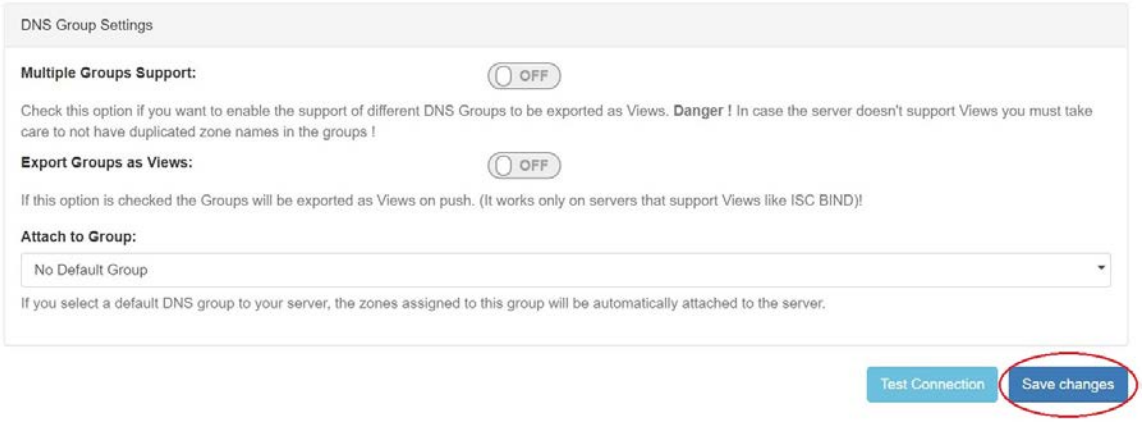
Edit an existing server by clicking once on the server name in the DNS Servers list.



The "Server Settings" page will open.



Click inside the field that you want to change, type your changes, and then click "Save Changes" at the bottom of the page.



Review Zones Connected to a Server

There are two ways that zones may be connected to a DNS server:

1) Directly connected, by attaching the zone to a server from the View Zone page.

or,

2) Connected by a Group that has been set as the default DNS Group for the server, selected under "DNS Group Settings".

Both are able to be viewed on the DNS Server Settings page.

To view either, open the Server Settings page for the server by clicking on the server name in the DNS Servers list.

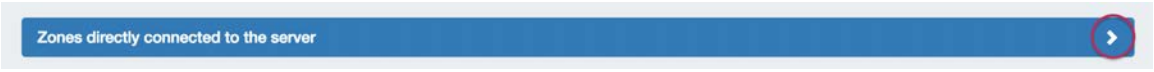
Edit an existing server by clicking once on the server name in the DNS Servers list.



The "Server Settings" page will open.

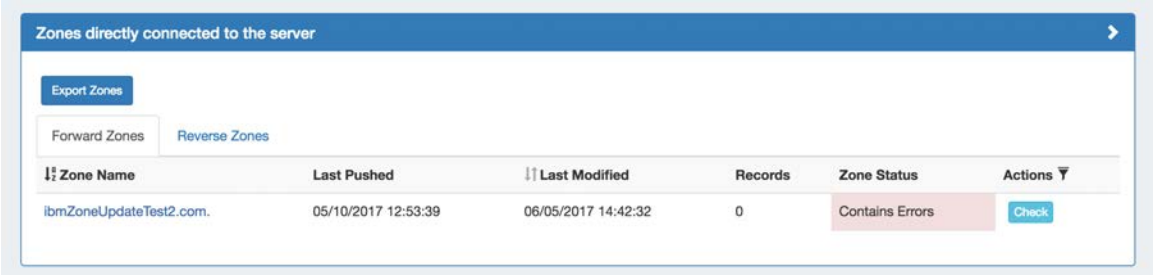
Zones Directly Connected to the Server

Scroll to the bottom of the page, and open the module titled "Zones directly connected to the server" by clicking on the expansion arrow.



A zone list will show the zone(s) that have been directly connected to this server.

Here, you may browse through forward and reverse zones by selecting the "Forward Zones" or "Reverse Zones" tabs, sort the list by Zone Name or Last Modified, open the zone's page by clicking on the name, or check the zone's status by clicking the "Check" button.

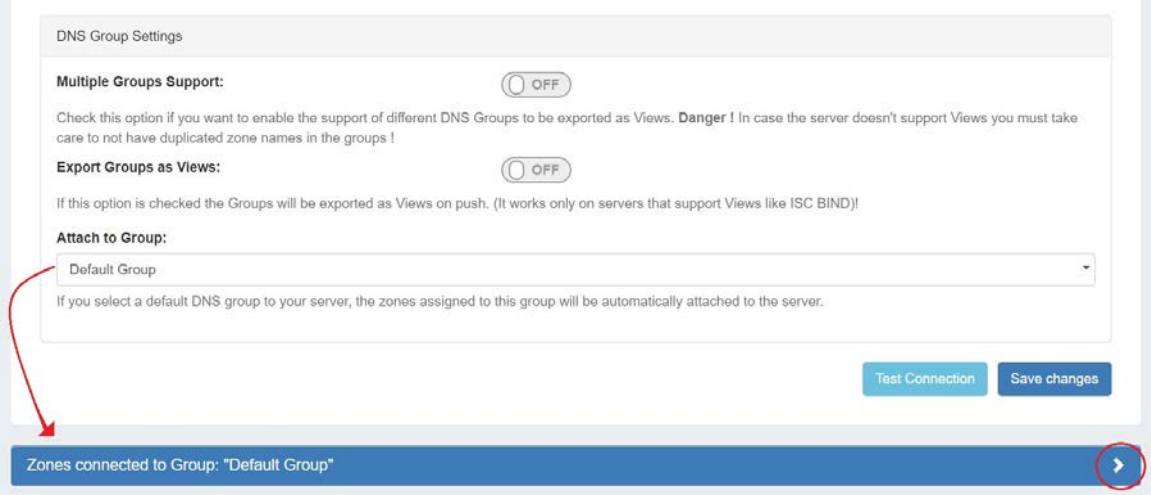


Zones may be exported by clicking the "Export Zones" button.

Zones Connected via a Group

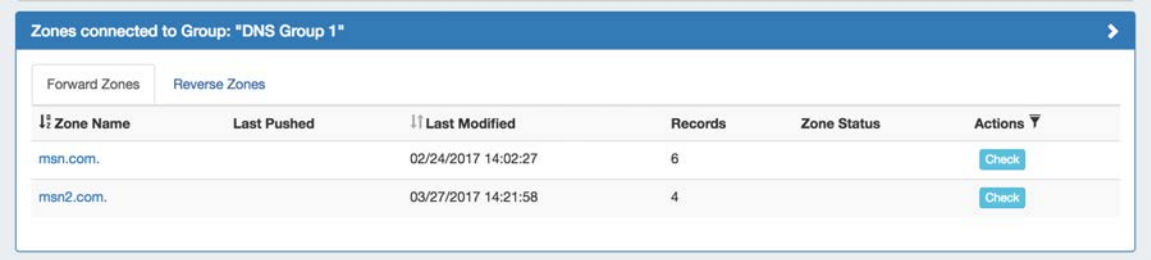
If a default Group has been selected under "DNS Group Settings" for the server, Zones under that Group will be connected to the server and able to be viewed on the Server Settings page.

Scroll to the bottom of the page, and open the module titled "Zones connected to Group '(Group Name)' " by clicking on the expansion arrow.



A zone list will show the zone(s) that connected to this server via a selected Group.

Here, you may browse through forward and reverse zones in that Group by selecting the "Forward Zones" or "Reverse Zones" tabs, sort the list by Zone Name or Last Modified, open the zone's page by clicking on the name, or check the zone's status by clicking the "Check" button.



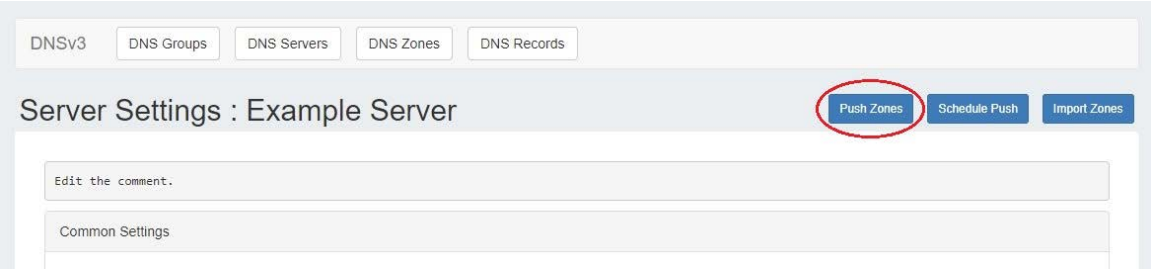
Pushing a Server

Manual Push

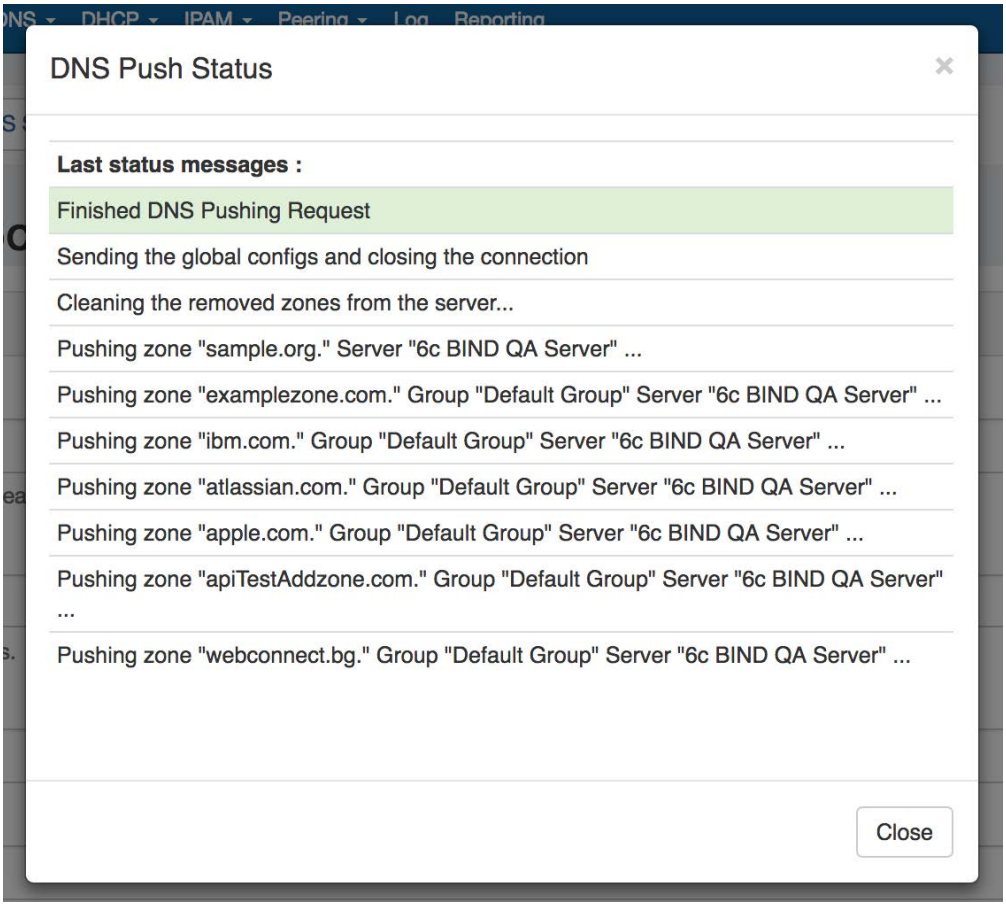
Manually pushing all zones on a server may be done directly from the DNS Server list. Under the "Actions" section of the Server List, click the "Push" button for the desired server.



Pushing may also be done while in the Server Settings page. While in the Server Settings page, click the "Push Zones" button at the top right of the page.



A "DNS Push Status" box will appear, showing the status of each zone as it is pushed. Once all zones have been pushed successfully, a green status message of "Finished DNS Pushing Request" will appear. At this point, the push is complete and the window may be closed.

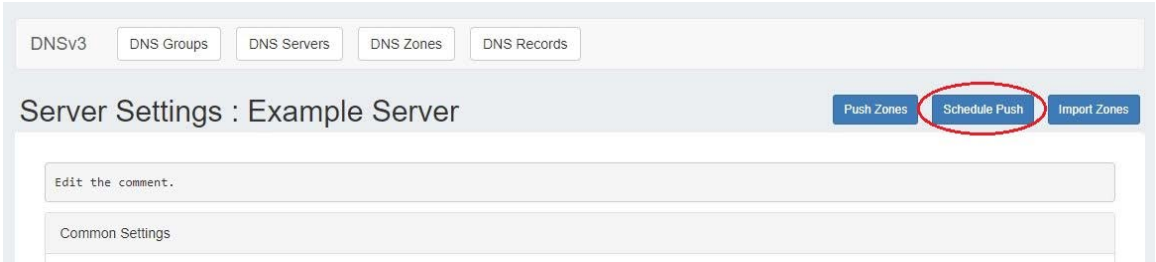


Scheduled Push

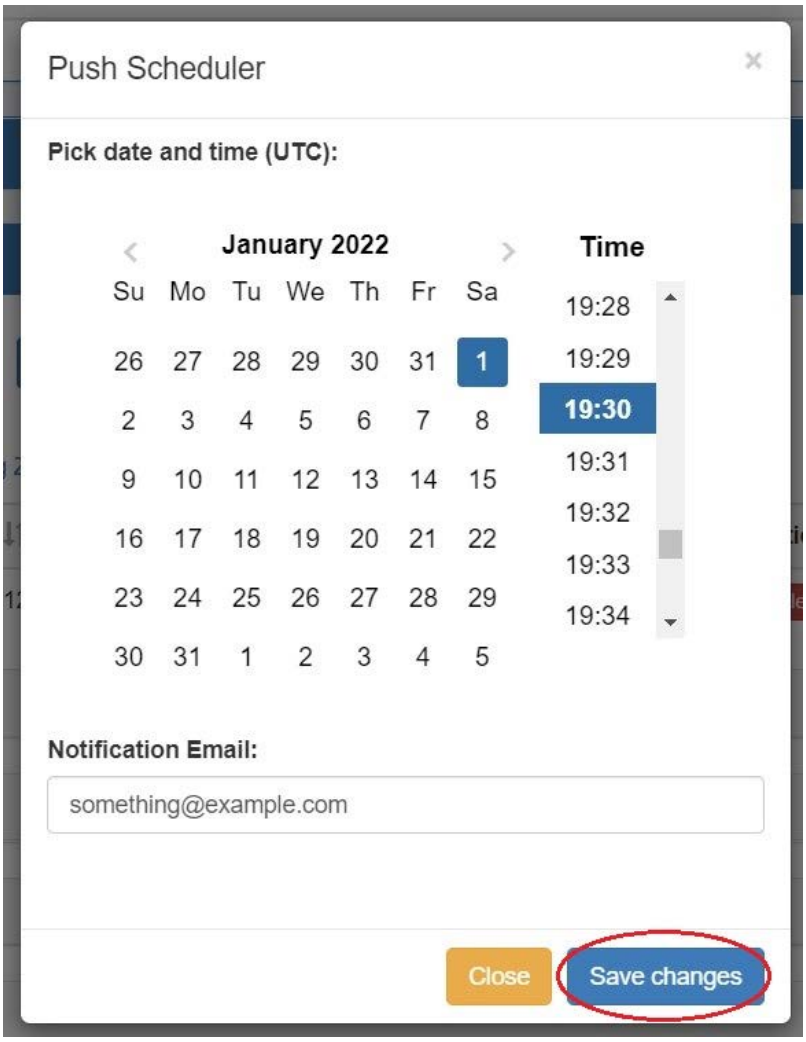
DNS server pushes may be scheduled from either the Admin Area **Scheduler** Tab, or from within the DNSv3 Server Settings page. Scheduled pushes require Admin access.

For information on scheduling a push from the **Scheduler** Tab, see Scheduler Tab documentation.

To schedule a push from a server's Settings page, open the Server Settings page for the desired server, and click on the "Schedule Push" button.

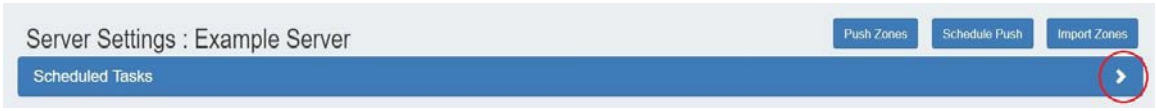


The Push Scheduler dialog will open. Click on the calendar on the left to select a date for the push, set the desired push time on the right, enter a notification email address, and then click "Save Changes".

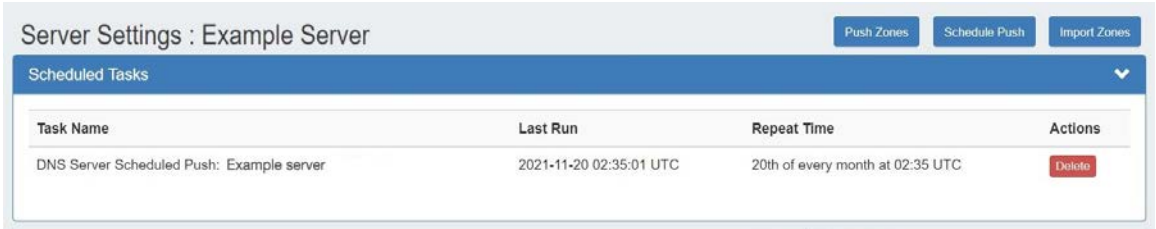


Once a schedule push has been created, a "Scheduled Tasks" module will appear at the top of the Server Settings page.

Click on the expansion arrow for the module to open and view the tasks.



Scheduled pushes for the server will be listed in the "Scheduled Tasks" module, and may be viewed or deleted (by clicking the "Delete" button under "Actions").



If necessary, the Scheduled Push may be edited from the **Scheduler** Tab in the Admin area of ProVision. See the Scheduler Tab for information on editing scheduled tasks.

Delete a Server

Delete a server by clicking the "Delete" button under the "Actions" section of the Server List for the desired server.



Additional Information

For additional information on working in DNS, see the following sections:

- Configuring ISC BIND Support
- Configuring PowerDNS Support
- Configuring Secure64 Support
- Configuring Split Horizon and Views
- Configuring DNSSEC
- Import DNS Zones
- DNS Tab

Configuring ISC BIND Support

Configuring ISC BIND Support

- Getting Started
- Adding a BIND Server
  - Server Settings
    - 1) Set Server Common Settings
    - 2) Set Server Specific Settings
    - 3) Set DNS Group Settings for Server
    - 4) Save Changes

Additional Information

Getting Started

BIND Version Compatibility

BIND 9 Support is officially supported. Please note that as of May 24, 2018, ISC implemented a different release numbering scheme. See https://kb.isc.org/docs/aa-00896 for information on ISC's Software Support Policy and Version Numbering.

Previously new feature development releases were tagged as "alpha" and "beta", leading up to the first stable release for a given development branch, which always ended in ".0".

Now, however, BIND has adopted the "odd-unstable/even-stable" release numbering convention. There will be no "alpha" or "beta" releases in the 9.13 branch, only increasing version numbers. So, for example, what would previously have been called 9.13.0a1, 9.13.0 a2, 9.13.0b1, and so on, will instead be called 9.13.0, 9.13.1, 9.13.2, etc.

The first stable release from this development branch will be renamed as 9.14.0. Thereafter, maintenance releases will continue on the 9.14 branch, while unstable feature development proceeds in 9.15.

You will need a user who can log in to the DNS server and make changes to the directory in which the zones are being stored. Additionally, it is often useful for this user to have the ability to restart the DNS server. The login and password for this user will be required to configure this server on the DNS Admin page.

6connect Zone files are written out in the following format:

/path/to/zone/directory/viewName/zoneFirstLetter/zonefile.zone

If no views are configured, or if views are expressly disabled, then the default viewName "6connectGeneric" is used. The zoneFirstLetter is the first letter of the zone name, so the subdirectory 'microsoft.com.zone' is placed in would be /m/.

All 6connect-managed Zones are managed by a dedicated 6connect configuration file named 6connect_named.conf. This file is created to act a supplementary conf file to work in concert with any existing named.conf which might exist. To include the 6connect configuration file, edit named.conf and append the following line:

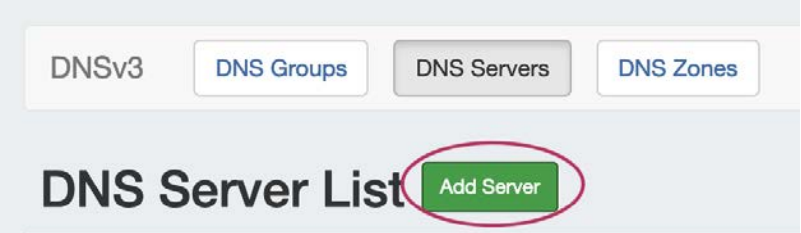
include "/path/to/conf/directory/6connect_named.conf";

You must remember to include the 6connect configuration file or none of the changes managed by 6connect ProVision will take effect!

It is also important to note that if your existing named.conf file contains zones within Split Horizon views, then the 6connect-managed zones must also be view-enabled. Likewise, if existing zones are not grouped into views, then views must be disabled on ProVision.

Adding a BIND Server

To create a new server, start from the **DNS** Tab, select the **DNS Servers** sub menu. Then, click the "Add Server" button next to "DNS Server List".

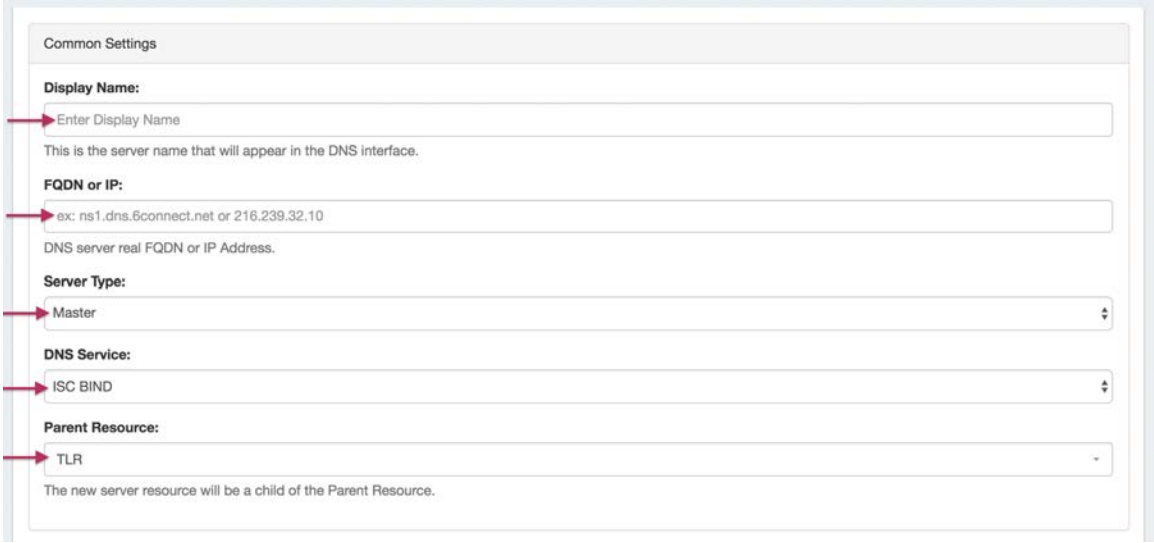


This will open the "Server Settings" page.

Server Settings

1) Set Server Common Settings

In the "Common Settings" section of Server Settings, enter the new server's Display Name (the name that will appear on the ProVision interface), the FQDN / IP, server type, service type, and desired parent Resource (may be left at the default Top Level Resource).

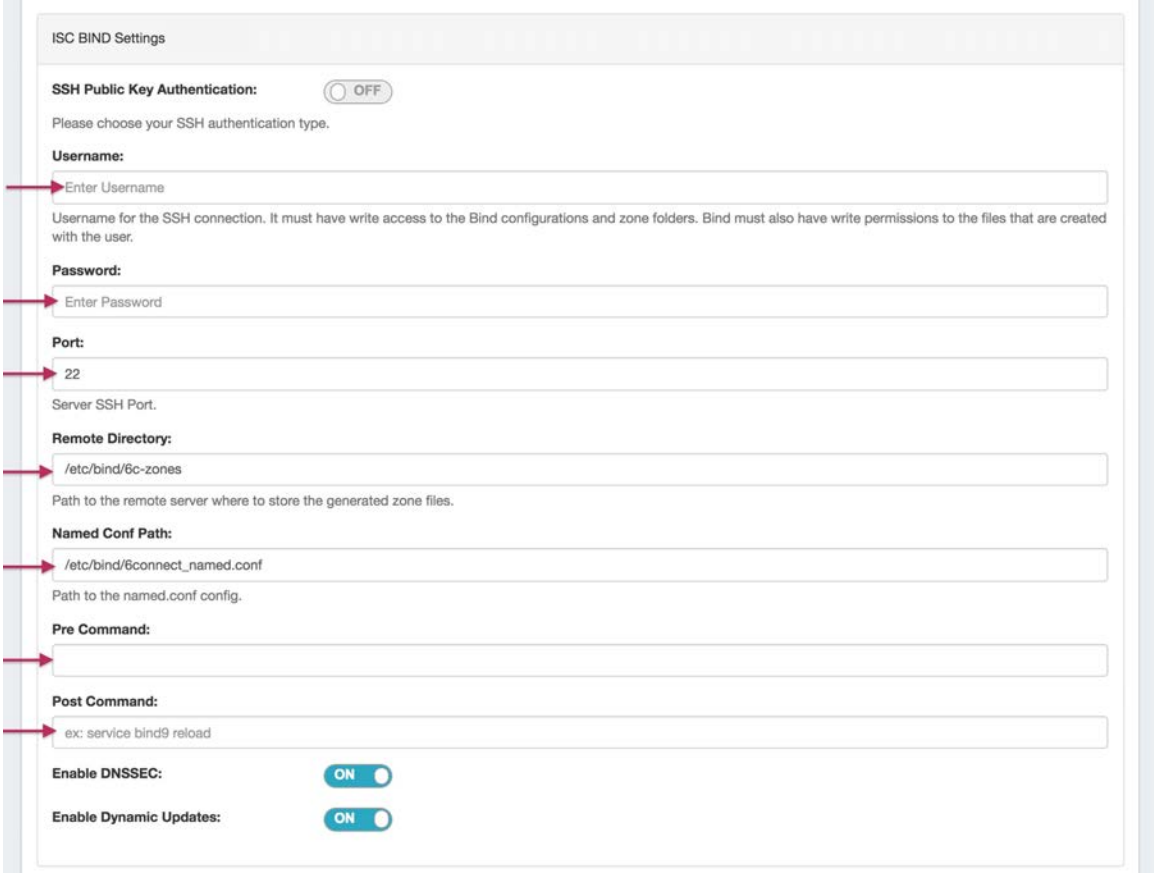


2) Set Server Specific Settings

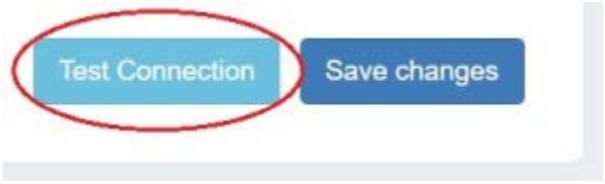
The next section is entering server service-type specific settings. The options visible in this section will depend on the "DNS Service" type chosen under "Common Settings".

Here, we see the fields for ISC BIND server settings. Enter the server Username, Password, Port, Remote Director, Named Conf. Path, and Pre /Post Command (if desired). Your fields may vary for other server types.

For SSH Public Key Authentication, DNSSEC, and Dynamic Option updates, click on the ON / OFF toggle to select "ON" or "OFF" for each as needed.



After entering the server-specific settings in this section, you can click the "Test Connection" button at the bottom right of the page to test the server connection and authentication.

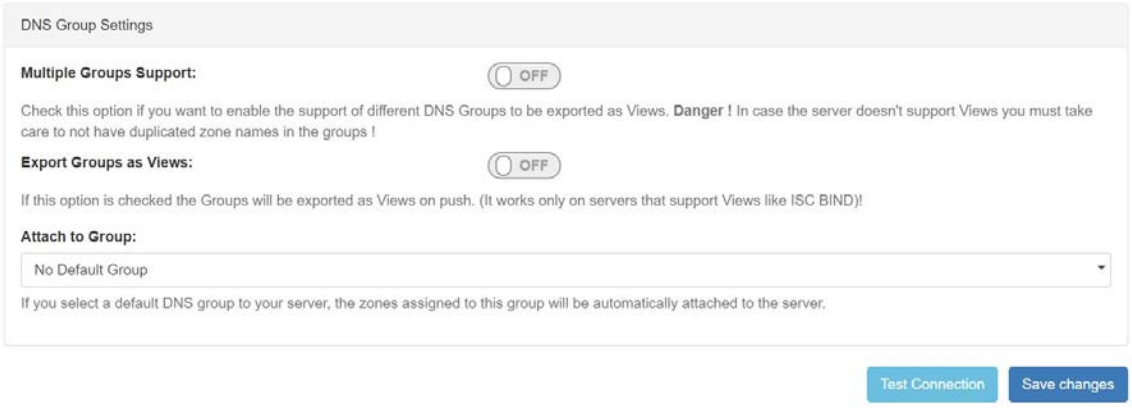


A window will pop up showing a success or failure response.



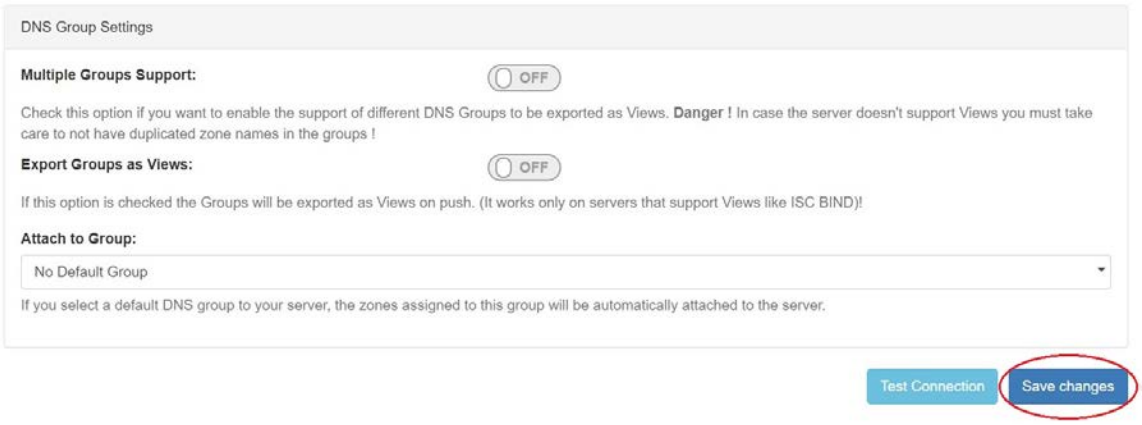
3) Set DNS Group Settings for Server

In the last section, select whether to enable Multiple Groups Support for exporting DNS Groups as Views (click to toggle ON / OFF), and select a default Group, if desired, to be associated with the server. Zones assigned to the selected Group will automatically be attached to the server.



4) Save Changes

Save your changes when done! Just click the "Save Changes" button at the bottom right of the page.



The new server will now be added to the DNS Servers list. These settings may be changed at any time by selecting the server from the server list and editing the information.

Additional Information

For additional information on working in DNS, see the following sections:

- Working with DNS Servers
- Configuring PowerDNS Support
- Configuring Secure64 Support
- Configuring Split Horizon and Views
- Configuring DNSSEC
- Import DNS Zones
- DNS Tab

Configuring PowerDNS Support

Configuring PowerDNS Support

- Environments supported
- Step 1: Add a PowerDNS Server
    - Server Settings
        - 1) Set Server Common Settings
        - 2) Set Server Specific Settings
        - 3) Set DNS Group Settings for Server
        - 4) Save Changes
- Step 2: Import PowerDNS Zones
- Step 3: Push zones to PowerDNS
- BIND Backend
- MySQL Backend

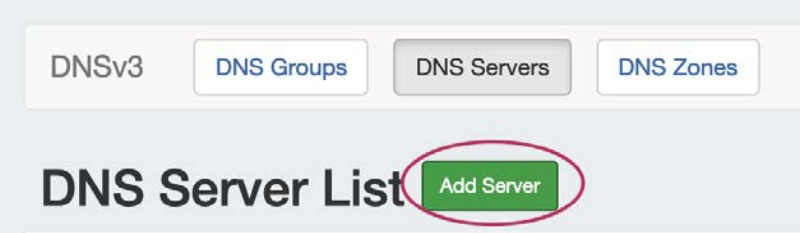
Additional Information

Environments supported

- PowerDNS version 3.0 or above on the target server(s)
- BIND or MySQL backend

Step 1: Add a PowerDNS Server

To create a new server, start from the **DNS** Tab, select the **DNS Servers** sub menu. Then, click the "Add Server" button next to "DNS Server List".

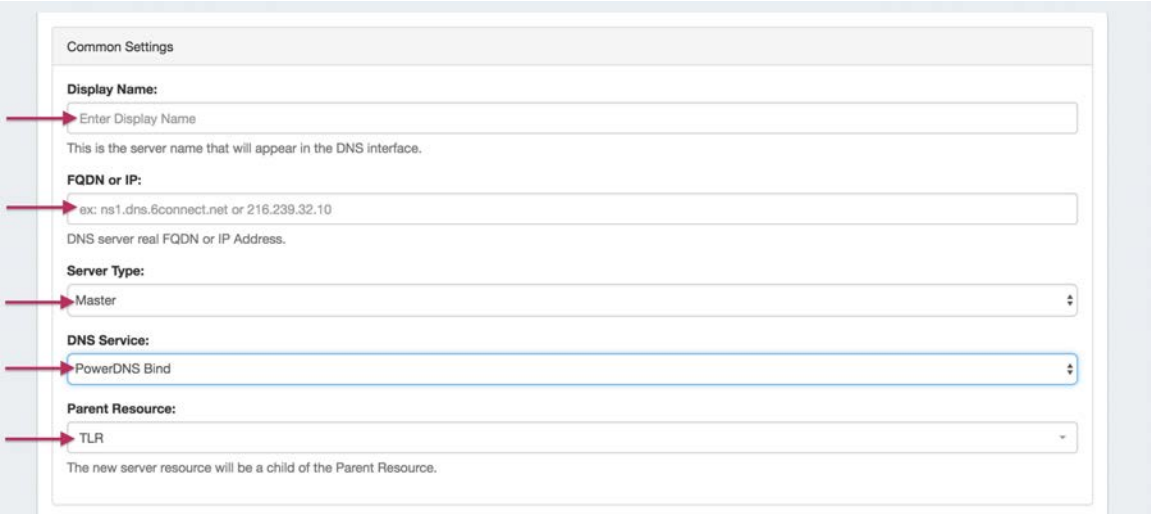


This will open the "Server Settings" page.

Server Settings

1) Set Server Common Settings

In the "Common Settings" section of Server Settings, enter the new server's Display Name (the name that will appear on the ProVision interface), the FQDN / IP, server type, DNS service type, and desired parent Resource (may be left at the default Top Level Resource). For PowerDNS servers, ensure that either "PowerDNS BIND" or "PowerDNS MySQL" is selected under DSN server type.

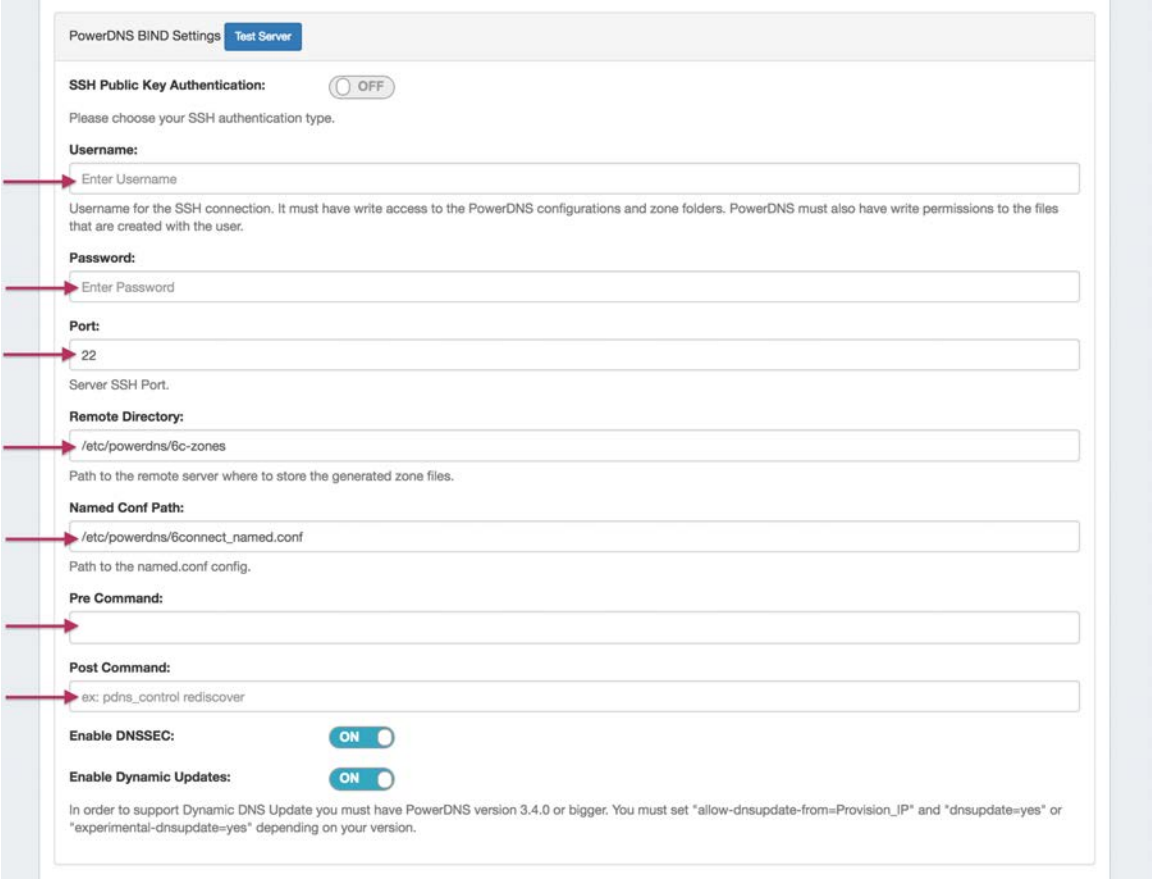


2) Set Server Specific Settings

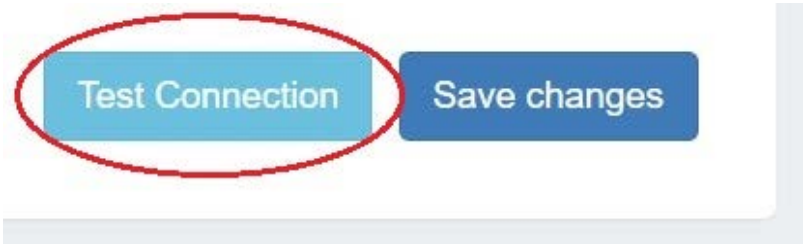
The next section is entering server service-type specific settings. The options visible in this section will depend on the "DNS Service" type chosen under "Common Settings".

Here, we see the fields for PowerDNS BIND server settings. Enter the server Username, Password, Port, Remote Director, Named Conf. Path, and Pre/Post Command (if desired). Your fields may vary for other server types.

For SSH Public Key Authentication, DNSSEC, and Dynamic Option updates, click on the ON / OFF toggle to select "ON" or "OFF" for each as needed.



After entering the server-specific settings in this section, you can click the "Test Connection" button at the bottom right of the page to test the server connection and authentication.

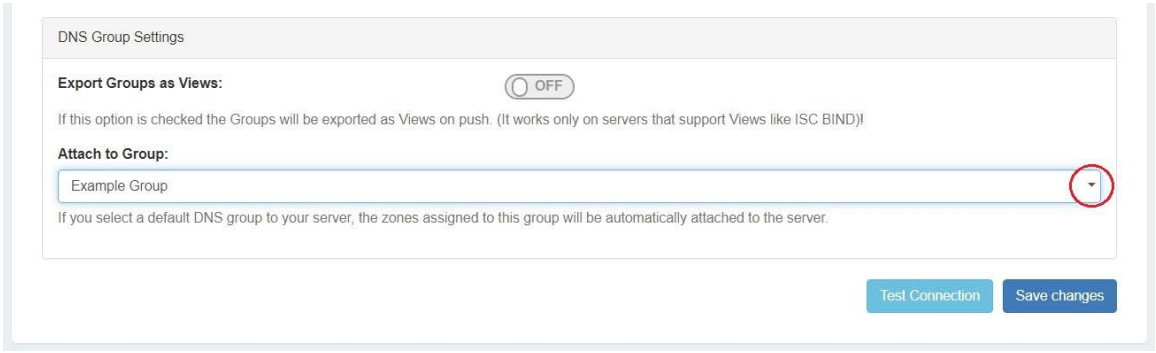


A window will pop up showing a success or failure response.



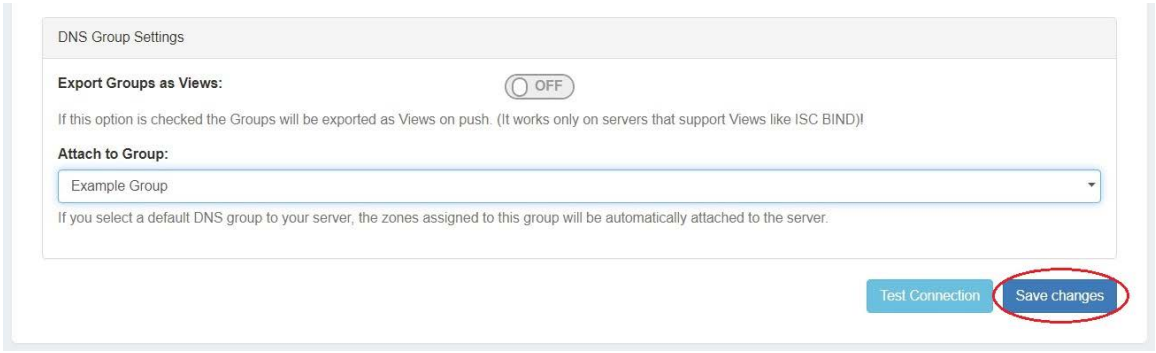
3) Set DNS Group Settings for Server

In the last section, select a default Group to be associated with the server. Zones assigned to the selected Group will automatically be attached to the server.



4) Save Changes

Save your changes when done! Just click the "Save Changes" button at the bottom right of the page.

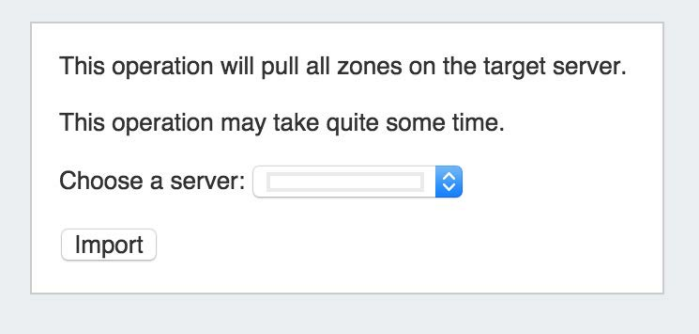


The new server will now be added to the DNS Servers list. These settings may be changed at any time by selecting the server from the server list and editing the information.

Step 2: Import PowerDNS Zones

While in the **Admin** section, navigate to the **Data Import** Tab. Select the "Power DNS Zone Import" link.

To import your data, simply choose your PowerDNS server and click "Import".



Step 3: Push zones to PowerDNS

Navigate back to the **DNS** tab, and select the "**DNS Servers**" tab.

Locate the PowerDNS server in the DNS Servers list, and then click the "Push" button under "Actions" at the end of the row.



BIND Backend

Note on SSH

The integration does not require a remote database connection, but it does require an SSH account and a writable directory. The SSH account must have access to the server. This account will also be used for DNSSEC functionality within PowerDNS.

MySQL Backend

Note on SSH

The integration requires a remote database connection, so will need a mysql user with permissions for remote administration. We highly recommend using ACLs to ensure that configuration only occurs from intended sources.

For DNSSEC functionality, you will need a standard SSH user account withing your PowerDNS user group

Please note that Views are not supported with the MySQL backend

Only BIND and MySQL backends are supported.

Additional Information

For additional information on working in DNS, see the following sections:

- Working with DNS Servers
- Configuring ISC BIND Support
- Configuring Secure64 Support
- Configuring Split Horizon and Views

- Configuring DNSSEC
- Import DNS Zones
- DNS Tab

Configuring Secure64 Support

Configuring Secure64 Support

- Step 1: Create an nsd.conf file under the root directory / of your S64 Auth server
- Step 2: Make a directory for 6connect ProVision to push zone files to on the Secure64 DNS Server
- Step 3: Setup and Configure 6connect ProVision for your Secure64 DNS Server
  - Server Settings
    - 1) Set Server Common Settings
    - 2) Set Server Specific Settings
    - 3) Set DNS Group Settings for Server
    - 4) Save Changes
- Step 4: Associate zones to your Secure64 DNS Server(s)
- Step 5: Push Zones to Secure64 Server(s)
- Step 6: Verify DNS Zone push on Secure64 Server(s)
- Step 7: Validate Zone data in Your Infrastructure

Additional Information

A note on Ports

ProVision uses port 22 to communicate with and configure Secure64 infrastructure - please ensure that this is addressed in any ACLs /firewalls

ProVision also uses port 53 to do zone checks if the DNS Module is enabled and in use. Please ensure that your Secure64 infrastructure is configured to accept DNS lookups from the ProVision server

The initial setup of the Secure64 Authoritative server is as follows:

Step 1: Create an nsd.conf file under the root directory / of your S64 Auth server

DO THIS

Make sure to add the line include: 6connect_nsd.conf to the nsd.conf file

Output/Input

```
[authdnsadmin@Secure64DNS]# cat nsd.conf
server:
ip-address: 50.198.192.141

axfr-logfile: /axfr_log/axfr.log
axfr-logfile-flush-count: 1
axfr-logfile-max-size: 100000
axfr-logfile-max-size: 10

request-logfile: /request_log/request.log
request-logfile-flush-count: 10
request-logfile-max-size: 1000000
request-logfile-max-files: 10

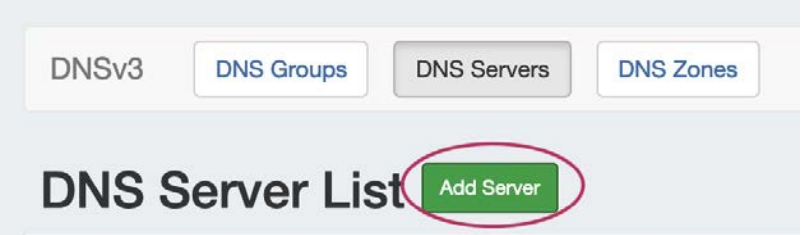
include: 6connect_nsd.conf
```

Step 2: Make a directory for 6connect ProVision to push zone files to on the Secure64 DNS Server

```
[authdnsadmin@Secure64DNS]# mkdir test12
[authdnsadmin@Secure64DNS]# ls
/:
322 2013-08-19 06:07:42 nsd.conf
<DIR> 1024 2013-08-16 17:30:12 test12
```

Step 3: Setup and Configure 6connect ProVision for your Secure64 DNS Server

To create a new server, start from the DNS Tab, select the **DNS Servers** sub menu. Then, click the "Add Server" button next to "DNS Server List".

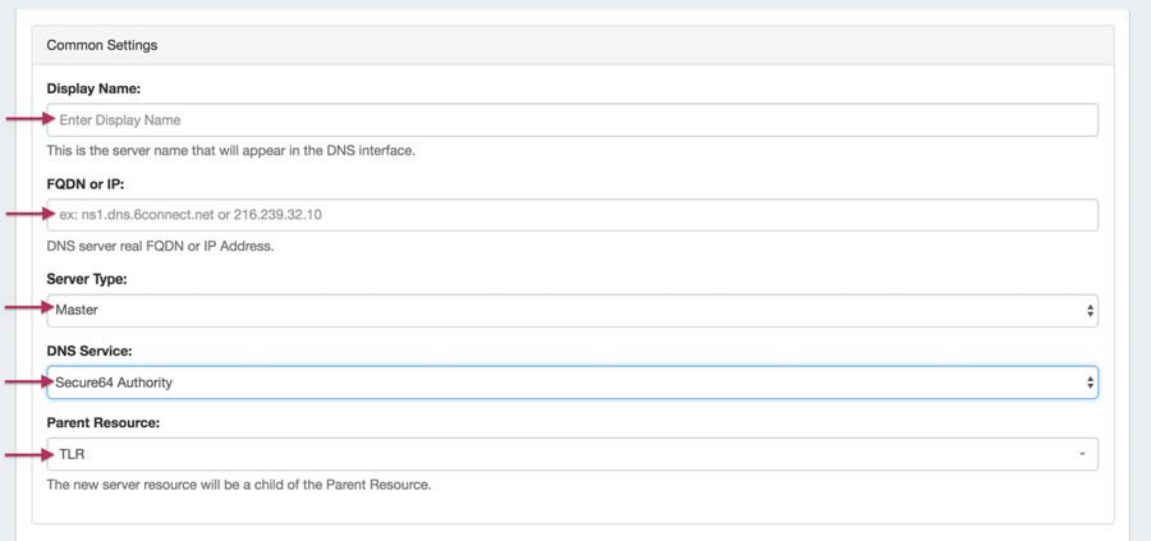


This will open the "Server Settings" page.

Server Settings

1) Set Server Common Settings

In the "Common Settings" section of Server Settings, enter the new server's Display Name (the name that will appear on the ProVision interface), the FQDN / IP, server type, DNS service type, and desired parent Resource (may be left at the default Top Level Resource). For Secure64 servers, ensure that DNS Service is set to "Secure64 Authority", "Secure64 x86 Authority", "Secure64 KNOT Authority", or "Secure64 Cache".



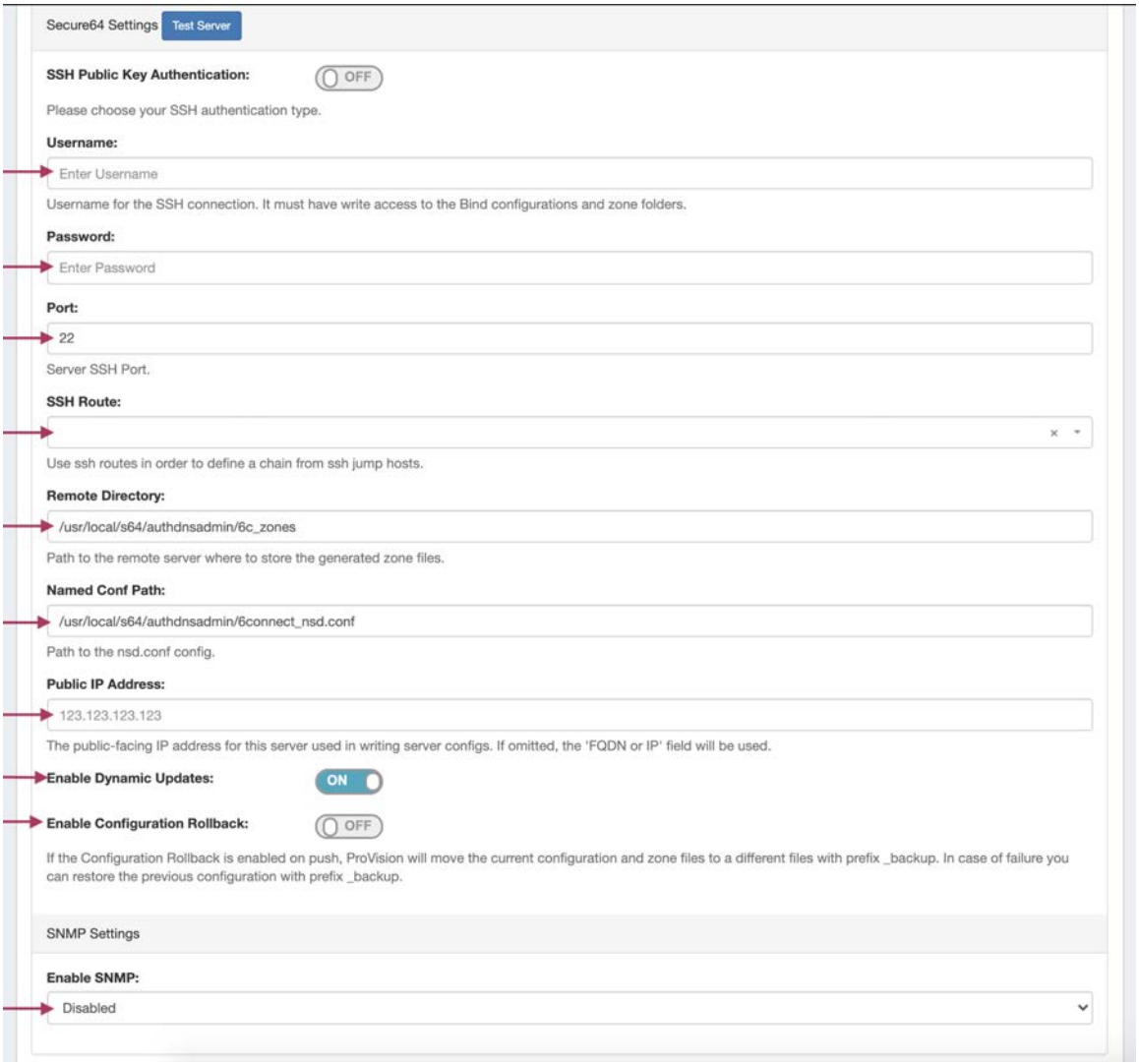
2) Set Server Specific Settings

The next section is entering server service-type specific settings. The options visible in this section will depend on the "DNS Service" type chosen under "Common Settings".

Here, we see the fields for Secure64 server settings.

Enter the server Username, Password, Port, Remote Directory, Named Conf. Path, and whether to enabled SNMP.

For SSH Public Key Authentication and Dynamic Option updates, click on the ON / OFF toggle to select "ON" or "OFF" for each as needed.



After entering the server-specific settings in this section, you can click the "Test Connection" button at the bottom right of the page to test the server connection and authentication.

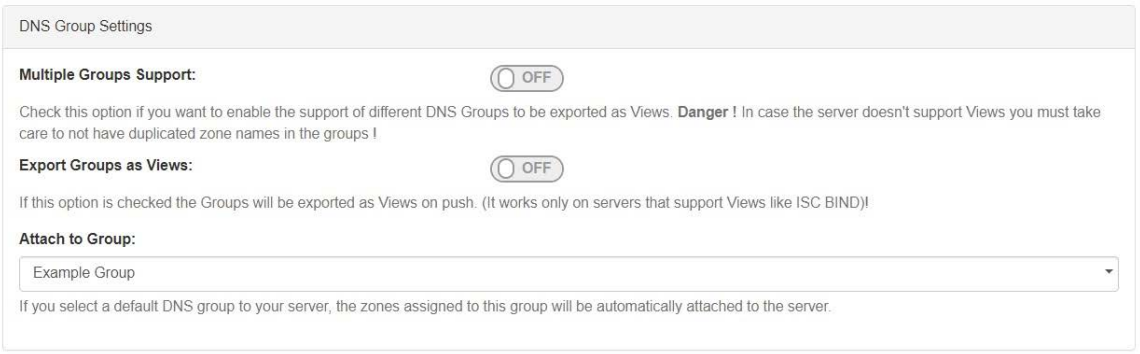


A window will pop up showing a success or failure response.



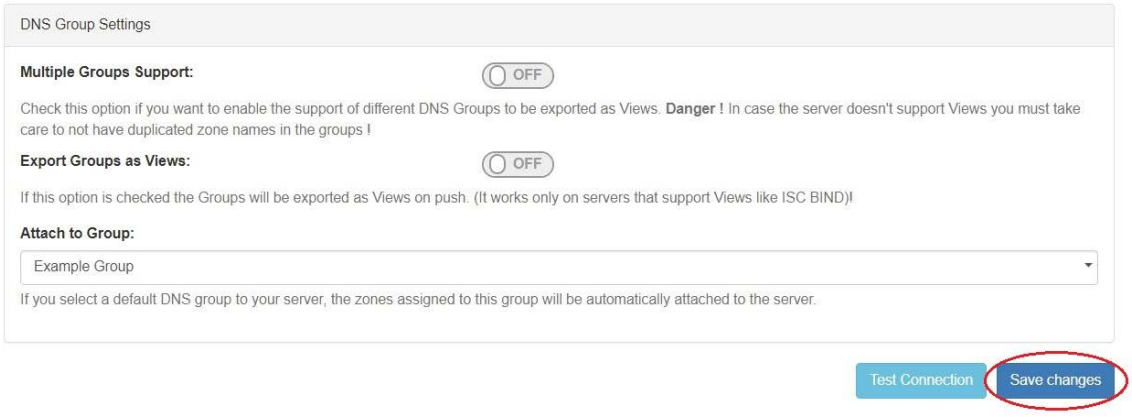
3) Set DNS Group Settings for Server

In the last section, select whether to enable support for exporting DNS Groups as Views (click to toggle ON / OFF), and select a default Group, if desired, to be associated with the server. Zones assigned to the selected Group will automatically be attached to the server.



4) Save Changes

Save your changes when done! Just click the "Save Changes" button at the bottom right of the page.

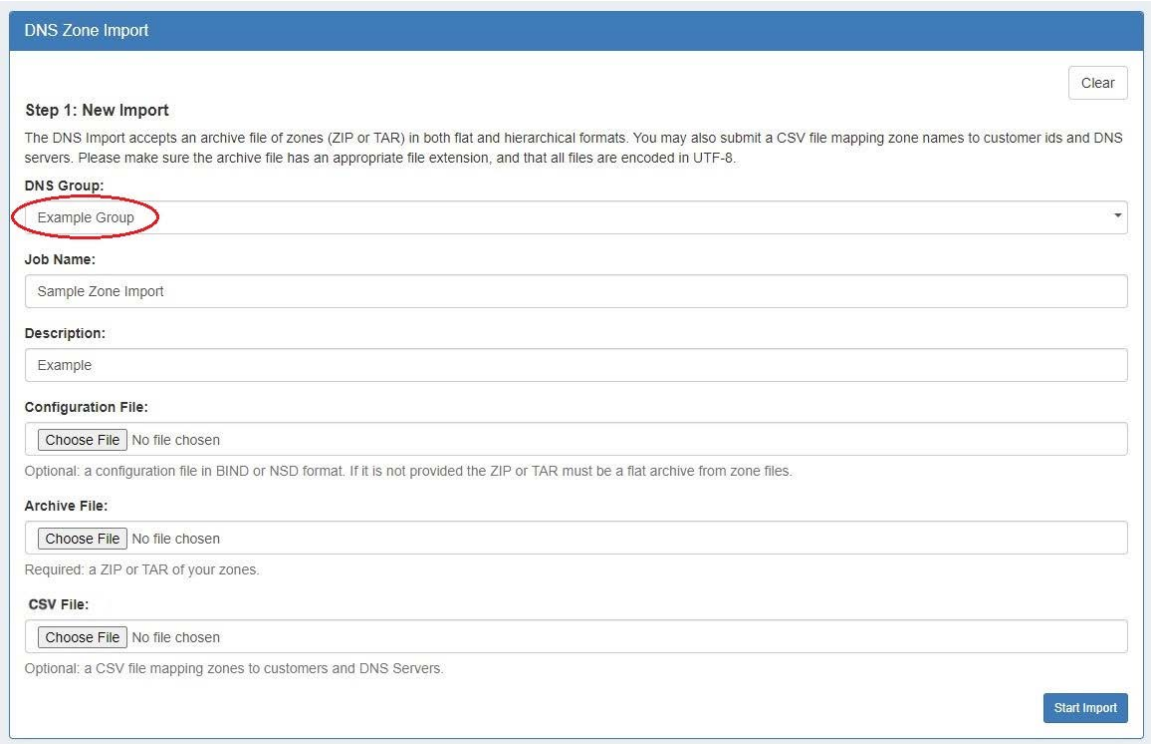


Step 4: Associate zones to your Secure64 DNS Server(s)

If a default Group was selected while setting up the S64 server, then any zones in that Group will automatically be associated with the server.

Zones may be manually added, moved, or imported into the Group - see Working with DNS Zones and Working with DNS Groups for details on associating zones with Groups.

If zones are to be imported, a DNS Group may be selected during the import process to associate with the zones.



Select the group specified as the default S64 server Group, then import the zones as described in the Import DNS Zones documentation.

OTHER Record Types

When working with DNS Zones and Records, additional record types may be manually added by selecting "Other" when adding a new record.

S64 DNS users can use record type "Other" to add "SYNTH" or "TYPE65464" type records similar to the format below:

```
$ORIGIN 30 IN TYPE65464 ${p4} PTR ${a4}.pool.example.com.
$ORIGIN 600 IN TYPE65464 ${a4} A ${a4}
$ORIGIN TYPE65464 ${p6} PTR user${a6}.my.example.com.
$ORIGIN 5 IN SYNTH user${a6} AAAA ${a6}
$ORIGIN IN SYNTH nptr-${u} NAPTR 10 20 "A" "" "" srv-${u}
$ORIGIN IN SYNTH srv-${u} SRV 10 20 1234 srv-addr-${u}
```

However, arbitrary / other record types are unable to be validated, so use with care!

Step 5: Push Zones to Secure64 Server(s)

Navigate back to the **DNS** tab, and select the "**DNS Servers**" tab.

Locate the Secure64 server in the DNS Servers list, and then click the "Push" button under "Actions" at the end of the row.



Step 6: Verify DNS Zone push on Secure64 Server(s)

The result of the Push can be checked/verified by checking the Secure64 server as follows:

Verifying Zone pushes

ssh to 50.198.192.141
Login using the designated login account and password
Enable cachednsadmin
ls

Now, verify that the "788 2013-08-21 12:35:04" 6connect_nsd.conf file now exists.

```
[authdnsadmin@eval138.secure64.com]# ls
/:
6728 2013-08-13 00:15:30 nsd.conf
8416071 2013-08-21 12:35:07 nsd.db
788 2013-08-21 12:35:04 6connect_nsd.conf
<DIR> 1024 2013-08-21 12:34:50 test12
```

You can verify the Push contents by doing a cat of the 6connect_nsd.conf

[authdnsadmin@Secure64DNS]# cat 6connect_nsd.conf

AutoGenerated by 6connect ProVision. Do not manually edit.

zone:

name: atestzone.com

zonefile: /test12/6connectGeneric/m/atestzone.com.zone

zone:

name: Testzone2.com

zonefile: /test12/6connectGeneric/m/Testzone2.com.zone

In the example above, two Zones have transferred.

To look at the contents of each zone you can cd to the proper directory /test12/6connectGeneric and find the zone files in an alphabetical directory structure as follows:

[authdnsadmin@Secure64DNS]# cd 6connectGeneric

[authdnsadmin@Secure64DNS]# cd test12

changed to test12
[authdnsadmin@Secure64DNS]# ls
/test12/:
DIR 1024 2013-08-16 19:43:21 6connectGeneric
[authdnsadmin@Secure64DNS]# cd 6connectGeneric
changed to 6connectGeneric
[authdnsadmin@Secure64DNS]# ls
/test12/6connectGeneric/:
DIR 1024 2013-08-16 17:30:13 e
DIR 1024 2013-08-16 17:30:16 m
DIR 1024 2013-08-16 18:49:21 d
DIR 1024 2013-08-16 19:43:23 s
[authdnsadmin@Secure64DNS]# cd m
changed to m
[authdnsadmin@Secure64DNS]# ls
/test12/6connectGeneric/m/:
[authdnsadmin@eval138.secure64.com]# ls
5192 2013-08-21 15:35:01 atestzone.com.zone
6758 2013-08-21 15:35:02 Testzone2.com.zone
[authdnsadmin@Secure64DNS]#

Step 7: Validate Zone data in Your Infrastructure

Finally, do a **dig** of the zones to verify the DNS configuration has been successfully deployed.

Using dig to validate your Secure64 Server installation

```
[authdnsadmin@eval138.secure64.com]# dig @50.198.192.141 atestzone.com
;  DiG SourceT 3.x  @50.198.192.141 atestzone.com
;; Got answer:
;; HEADER opcode: QUERY, status: NOERROR, id: 59591
;; flags: qr aa rd; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 0
;; QUESTION SECTION:
;atestzone.com. IN A
;; AUTHORITY SECTION:
atestzone.com. 3600 IN SOA ns1.dns.6connect.net. hostmaster.6connect.net. (2013082102 10800 3600 604800 38400 )
[authdnsadmin@eval138.secure64.com]#
```

For any questions regarding the integration of Secure64 products into 6connect ProVision, please email 6connect at support@6connect.com, or Secure64 at support@secure64.com

Changing Secure64 Server IP addresses

When you setup ProVision to communicate via SSH to a Secure64 server, a ley/fingerprint is saved to the local hosts file. If you modify the IP address, but do not clear out the hosts file, then ProVision will think this is an attack and prevent communication with the Secure64 server.

To rectify this issue, you may need to reset the host file so that a new SSH host key can be added for the IP address. To do this manually, please follow the following steps:

1) The admin needs to login to the ProVision server via SSH/CLI
2) Open the file “known” in the /tmp folder in your preferred editor (vi, etc.)
3) Delete the line in the file with the server IP/fingerprint
4) Save the changes and exit the editor

To verify the functionality - attempt to connect to the DNS Server(s) using the “Test Server” button from the ProVision GUI

If you have any issues, please contact 6connect support per your Support Agreement/Plan.

Additional Information

For additional information on working in DNS, see the following sections:

- Working with DNS Servers
- Configuring ISC BIND Support
- Configuring PowerDNS Support
- Configuring Split Horizon and Views
- Configuring DNSSEC
- Import DNS Zones
- DNS Tab

Configuring Secure64 x86

Configuring Secure64 x86 Support

- Configuring Secure64 x86 Authority Server

A note on Ports

ProVision uses port 22 to communicate with and configure Secure64 infrastructure - please ensure that this is addressed in any ACLs /firewalls

ProVision also uses port 53 to do zone checks if the DNS Module is enabled and in use. Please ensure that your Secure64 infrastructure is configured to accept DNS lookups from the ProVision server

The initial setup of the Secure64 x86 Authoritative server is as follows:

Configuring Secure64 x86 Authority Server

1. Using the terminal, SSH to the desired S64 x86 server. All the configurations and zones will be pushed in /srv/knot/6c/
2. Create new user "provision"

```
sudo useradd provision
sudo passwd provision
```

3. Create a directory called "6c" that will be used for the ProVision exports and set the permissions, so that we can push the configurations in /srv/knot/

```
sudo mkdir --mode=u+rwx,g+wrs,o-rwx /srv/knot/6c
sudo chown provision.knot /srv/knot/6c
```

4. In order to properly reload the server without asking for a password from ProVision, we must edit the sudoers file to let the user "provision" execute "sudo knotc reload" after push. So, add the following line at the end of /etc/sudoers:

```
provision ALL=(ALL) NOPASSWD: /sbin/knotc reload
```

5. Add knot to be inside the "provision" group by editing the /etc/group as follows:

```
provision:x:120:knot
```

6. Add provision to be a part of the knot group (in case knot replaces a zone), so that Provision is able to replace it again on push. So, we must once again edit /etc/group, as follows:

```
knot:x:119:provision
```

7. Configure ProVision in the S64 server and add the include directive in /etc/knot/knot.conf:

```
include: /srv/knot/6c/6c_knot.conf
```

8. Open the ProVision UI and navigate to the DNS section to add the S64x86 server. While adding server settings, you must verify that Post Command is set to “sudo knotc reload” and the configuration path to “/srv/knot/6c/6c_knot.conf”

9. An example ProVision server configuration for the S64 x86 server is shown below:

Server Settings :

Edit the comment.

Common Settings

Display Name:

Example S64 x86 Server

This is the server name that will appear in the DNS interface.

FQDN or IP:

1.2.3.4

The IP address that ProVision will use to connect to this server.

Server Type:

Master

Export Zones: ON

DNS Service:

Secure64 x86 Authority

Parent Resource:

TLR

The new server resource will be a child of the Parent Resource.

Enable Records Check: ON

ProVision is checking if the DNS responds with a proper values to the zone records. In order record monitoring to work properly, you must enter a proper NameServer as "FQDN or IP" field.

Secure64 x86 Settings Test Server

SSH Public Key Authentication: OFF

Please choose your SSH authentication type.

Username:

provision

Username for the SSH connection. It must have write access to the Bind configurations and zone folders.

Password:

••••••••

Port:

22

Server SSH Port.

SSH Route:

Use ssh routes in order to define a chain from ssh jump hosts.

Remote Directory:

/srv/knot/6c/

Path to the remote server where to store the generated zone files.

Knot Conf Path:

/srv/knot/6c/6c_knot.conf

Path to the 6connect knot.conf config.

Public IP Address:

1.2.3.4

The public-facing IP address for this server used in writing server configs. If omitted, the 'FQDN or IP' field will be used.

Via IP Address:

123.123.123.123

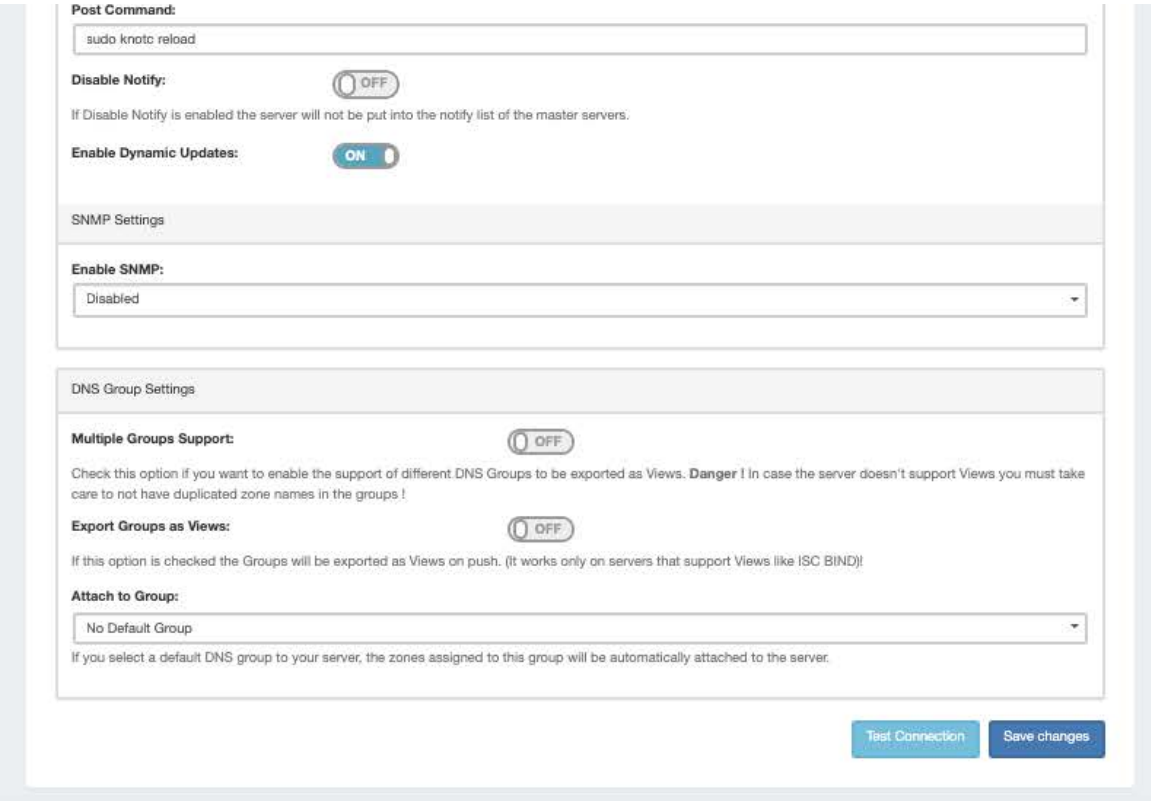
If provided the value will be placed into the "via:" configuration on the remote section.

Domain Access Tracking Path:

/srv/dns-rtsc/domain-access-tracking.csv

If the server supports domain access tracking, here you can configure the path to the csv exported file.

Pre Command:



OTHER Record Types

When working with DNS Zones and Records, additional record types may be manually added by selecting "Other" when adding a new record.

S64 DNS users can use record type "Other" to add "SYNTH" or "TYPE65464" type records similar to the format below:

```
$ORIGIN 30 IN TYPE65464 ${p4} PTR ${a4}.pool.example.com.
$ORIGIN 600 IN TYPE65464 ${a4} A ${a4}
$ORIGIN TYPE65464 ${p6} PTR user${a6}.my.example.com.
$ORIGIN 5 IN SYNTH user${a6} AAAA ${a6}
$ORIGIN IN SYNTH nptr-${u} NAPTR 10 20 "A" "" "" srv-${u}
$ORIGIN IN SYNTH srv-${u} SRV 10 20 1234 srv-addr-${u}
```

However, arbitrary / other record types are unable to be validated, so use with care!

Configuring Route53 Support

Configuring Route53 Support

- Getting Started
- Adding a Route53 Server to ProVision
  - Server Settings
    - 1) Set Server Common Settings
    - 2) Set Route53 Server Specific Settings
    - 3) Set DNS Group Settings for Server
    - 4) Save Changes

Additional Information

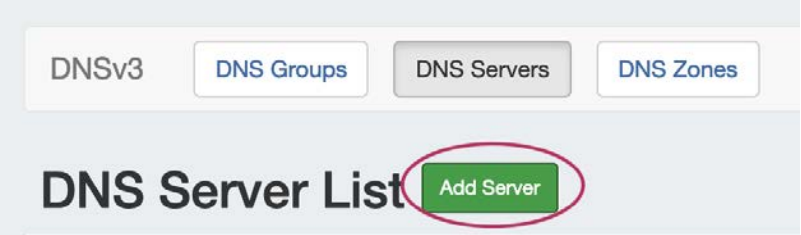
Getting Started

To use the Route53 connector, you must have Route53/AWS account set up and be able to provide the API Key, API Secret, and API Region provided to your Route53 account. For information on setting up a Route53 account, learning resources, or FAQ, see https://aws.amazon.com/route53/ .

To add a new DNS Server in ProVision, you must be logged in as an Admin-level user.

Adding a Route53 Server to ProVision

To create a new server, start from the **DNS** Tab, select the **DNS Servers** sub menu. Then, click the "Add Server" button next to "DNS Server List".



This will open the "Server Settings" page.

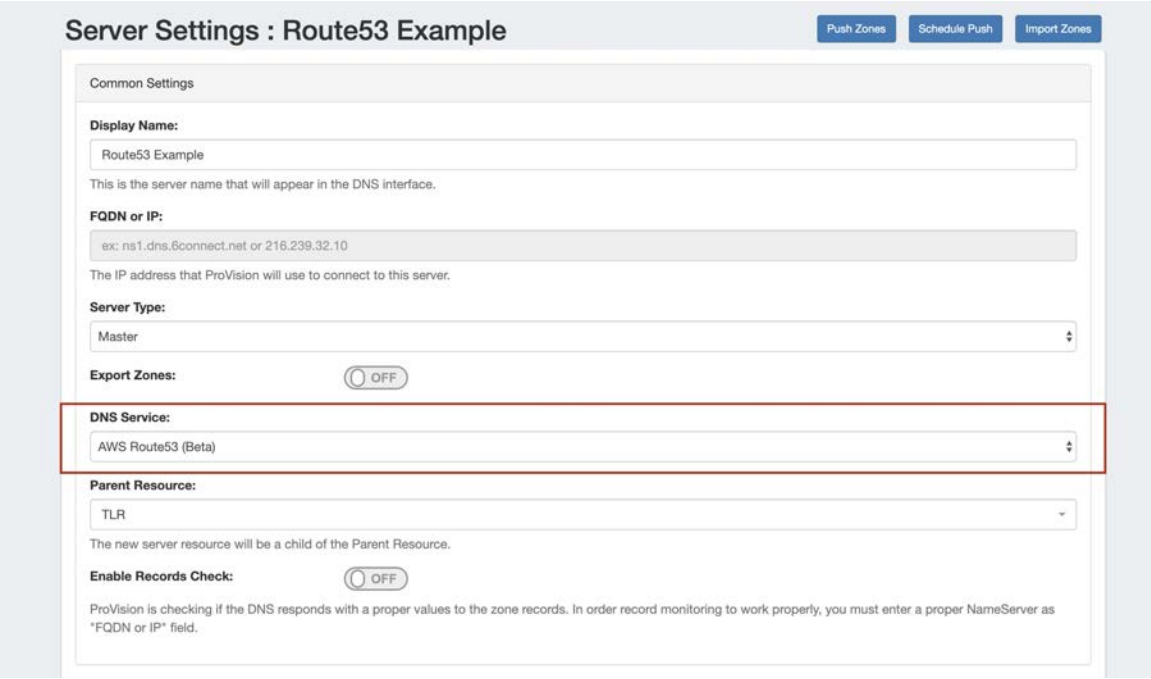
Server Settings

1) Set Server Common Settings

In the "Common Settings" section of Server Settings, enter a Display Name for the new Route53 server, *skip FQDN / IP* , and select Server Type.

Under "DNS Service", select the "AWS Route53 (Beta) connector. The FQDN field will automatically be disabled, and AWS/Route53 specific settings will be enabled in the next section.

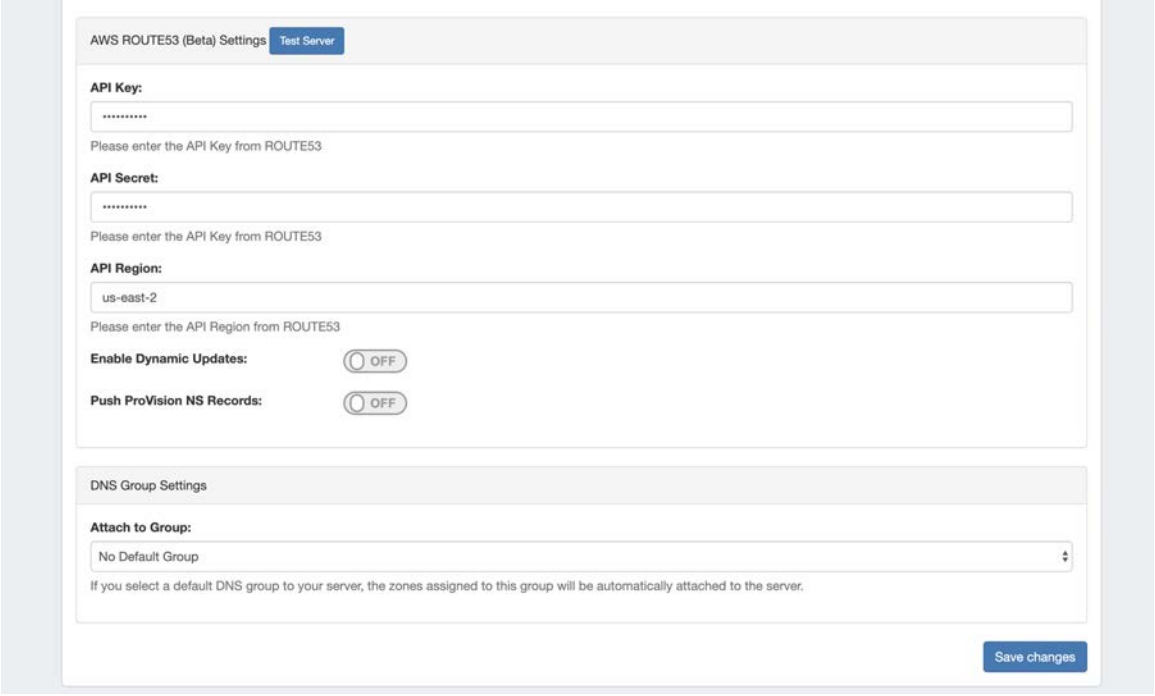
If desired, adjust the other available settings in this section, then scroll down.



2) Set Route53 Server Specific Settings

The next section is entering server service-type specific settings. The options visible in this section will depend on the "DNS Service" type chosen under "Common Settings".

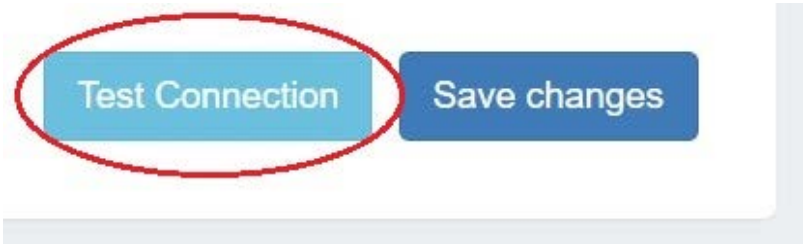
Under the section for **AWS Route53 (Beta) Settings**, enter the API Key, API Secret, and API region provided to you for the AWS/Route53 account.



Enter additional Dynamic Updates, NS Records, and Group settings if desired, then click "Save Changes".

For information on working in the rest of ProVision's DNS system, see DNS Tab, DNS Administration, andWorking with DNS Servers.

After entering the server-specific settings in this section, you can click the "Test Server" button at the bottom right of the page to test the server connection and authentication.

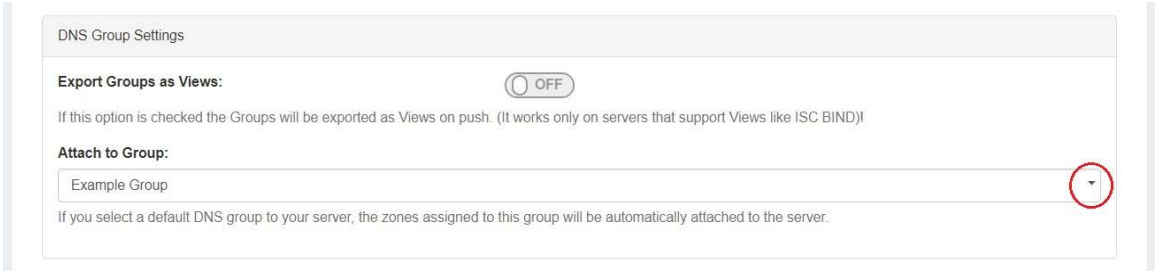


A window will pop up showing a success or failure response.



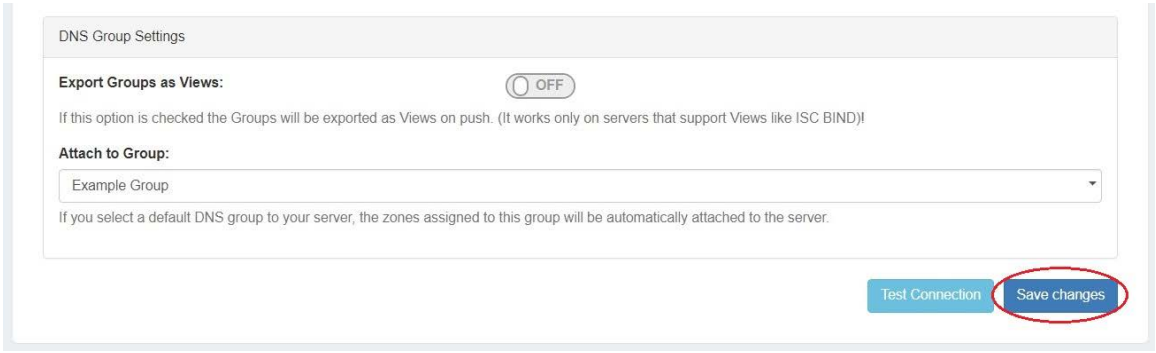
3) Set DNS Group Settings for Server

In the last section, select a default Group to be associated with the server (optional). Zones assigned to the selected Group will automatically be attached to the server.



4) Save Changes

Save your changes when done! Just click the "Save Changes" button at the bottom right of the page.



Additional Information

For additional information on working in DNS, see the following sections:

- Working with DNS Servers
- Configuring PowerDNS Support
- Configuring Secure64 Support
- Configuring Split Horizon and Views
- Configuring DNSSEC
- Import DNS Zones
- DNS Tab

Configuring Split Horizon and Views

Configuring ACL Views

ProVision's ACL module applies the specified network lists to the in the named.conf for zones inside the group and the servers that belongs to the group, when exporting the group or zone.

- Create an ACL View
- Edit an ACL
- Delete an ACL
- Add an existing ACL to another Group

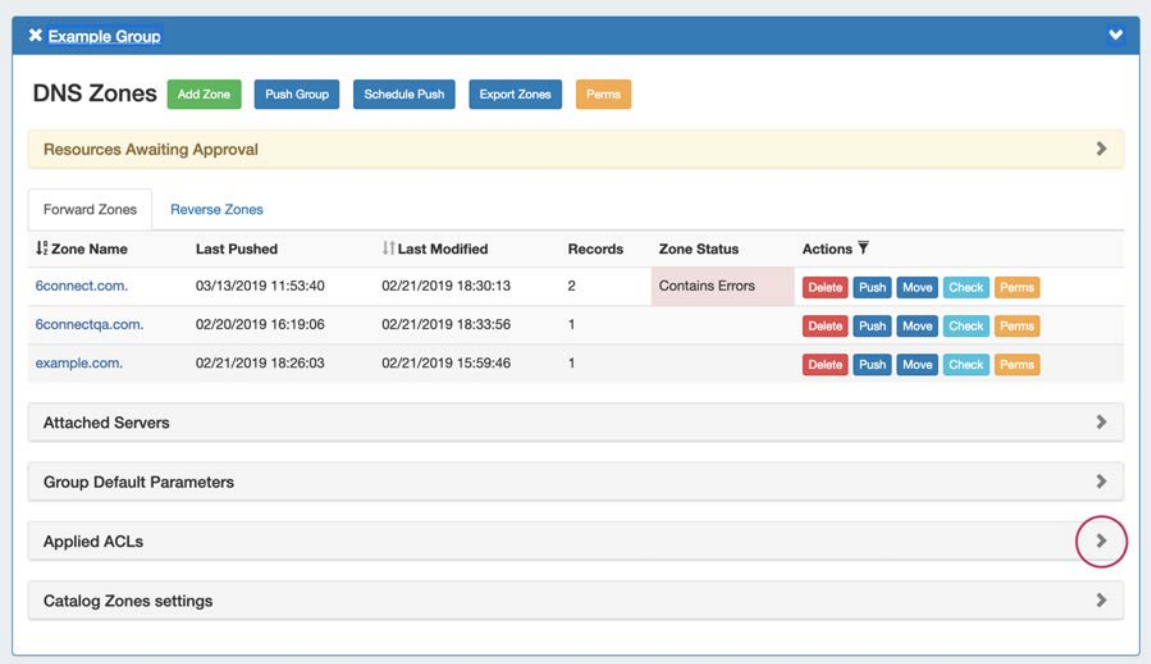
Additional Information

> **WARNING**
>
> If you see a view named "_6connectDefault" - DO NOT DELETE IT.

Create an ACL View

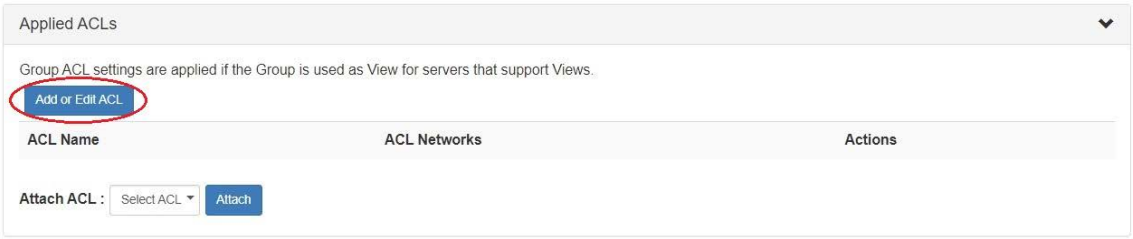
ACL views may be created under each DNS Group, accessed from the **DNS** tab **DNS Groups** sub-tab.

Expand the Group that you want the view applied to, and then expand the section "Applied ACLs" by clicking on the expansion arrow to the right of the section name.

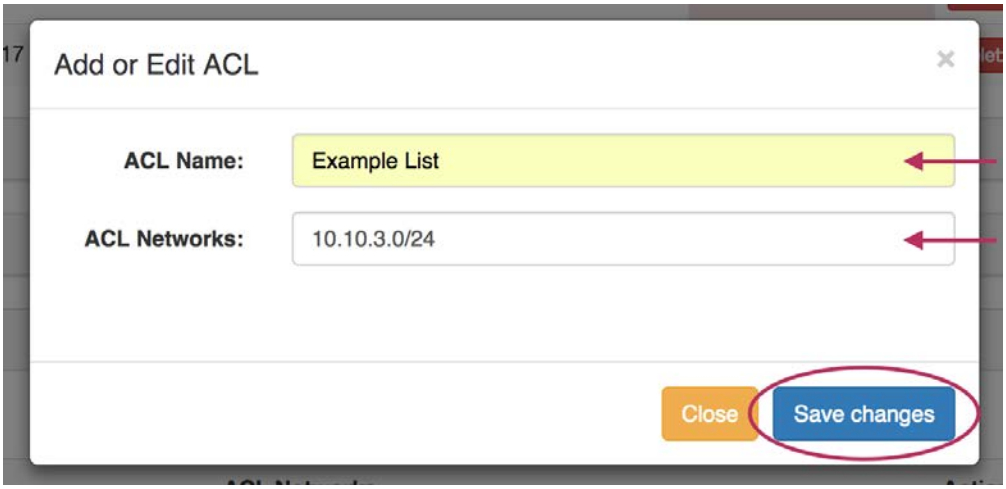


If ACLs already exist, they will be shown under this section.

To add a new list, click the "Add or Edit ACL" button.



If no ACLs currently exist, the dialog will only show inputs for ACL Name and ACL Networks - enter a Name and Network and click "Save Changes".

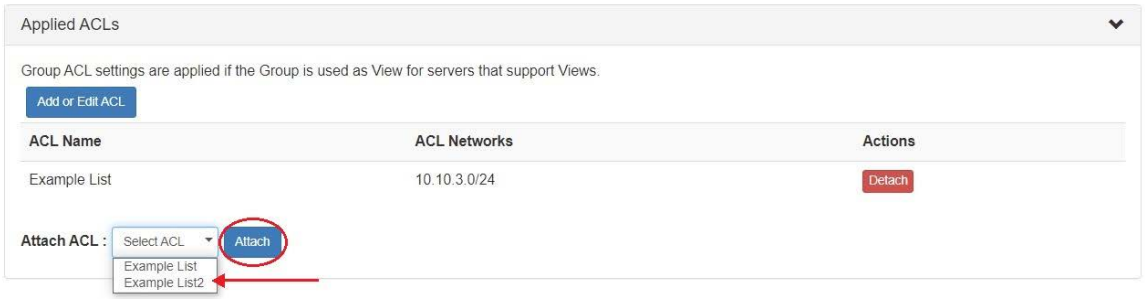


If previous ACLs exist, a "Create or Edit" selector will be be available.

Since we are creating a new ACL, just keep this at the default value ("Create New ACL"), and enter in the Name and Network(s) for the new ACL. Separating multiple CIDRs with a comma (,).



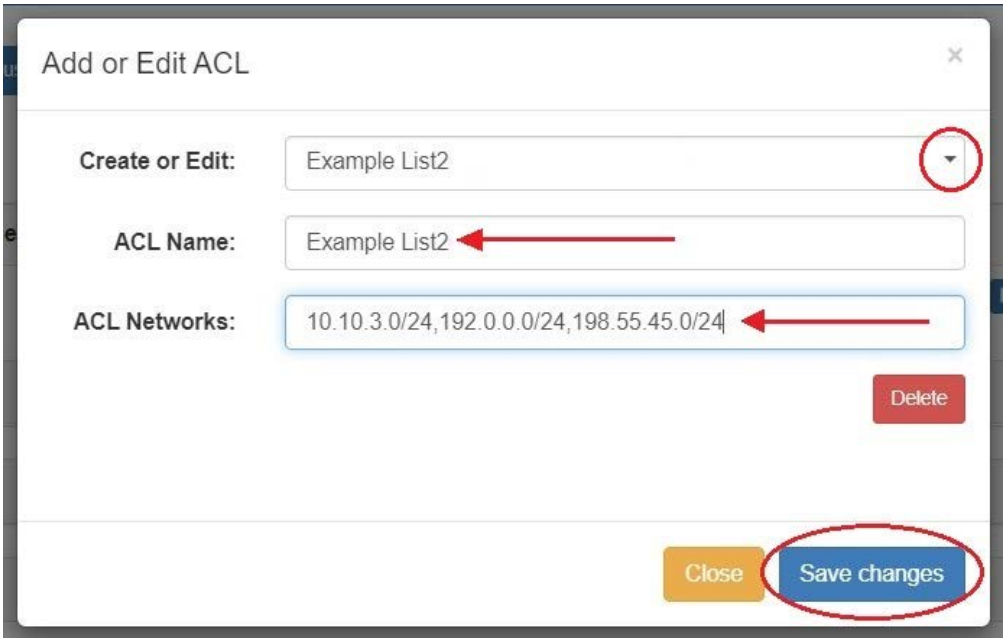
When done, save the ACL by clicking "Save changes". The new ACL will be added to the Group's "Attach ACL" list. Choose the ACL from the dropdown and click "Attach".



Edit an ACL

ACLs may be edited similarly to how they are created. Click the "Add or Edit ACL" button under the "Applied ACLs" module for the DNS Group.

Select the ACL you wish to edit from the "Create or Edit" selector. Then, edit the Name or Network fields as desired.



When done, click "Save Changes".

Detach an ACL from a Group

Detaching an ACL removes it from the Group, but the ACL will still exist in ProVision for re-use in other Groups.

To detach an ACL, expand the "Applied ACLs" section under the desired Group, and click on the "Detach" button under the "Actions" column.

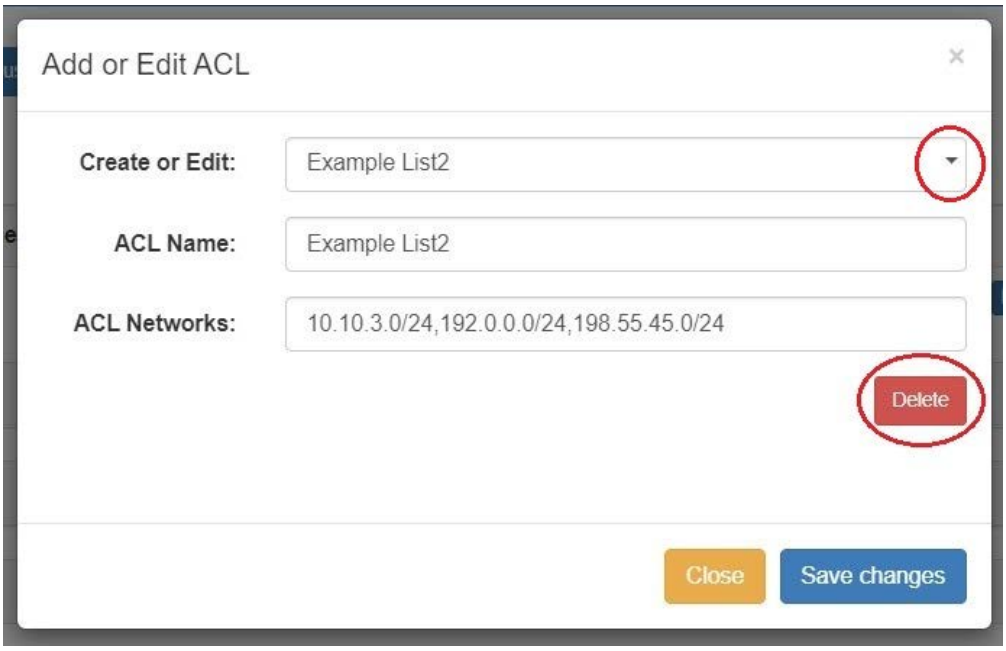


The ACL will be removed from under the Group, but will remain in other Groups it exists under, as well as be selectable from the "Add ACL" window and "Attach ACL" dropdown.

Delete an ACL

ACLs may be deleted through the "Edit ACL" interface. Click the "Add or Edit ACL" button under the "Applied ACLs" module for the DNS Group.

Select the ACL you wish to delete from the "Create or Edit" selector. Then, click the red "Delete" button under the Networks field.



The ACL will be permanently deleted, and will no longer show under any Groups to which it has been attached, nor show in the "Existing ACLs" list.

Add an existing ACL to another Group

Existing ACLs may be added to as many Groups as desired. If ACLs already exist in ProVision, clicking the "Add or Edit ACL" button will give an additional option to "Create New".

To select a previously created ACL, select it from the "Attach ACL" dropdown and click "Attach".



Additional Information

For additional information on working in DNS, see the following sections:

- Working with DNS Servers
- Configuring ISC BIND Support
- Configuring PowerDNS Support
- Configuring Secure64 Support
- Configuring DNSSEC
- Import DNS Zones
- DNS Tab

Configuring DNSSEC

Configuring DNSSEC

- Enable DNSSEC for a Server (ProVision GUI)
- Enable DNSSEC for a Zone (ProVision GUI)
  - Enabling DNSSEC (for a single zone)
  - Update Registrar and Confirm
- For BIND server(s)
- For Secure64 and PowerDNS

Additional Information

Enable DNSSEC for a Server (ProVision GUI)

DNSSEC may be enabled on a per-server basis in the ProVision DNS Server Settings.

Navigate to the DNS Tab, and select the **DNS Servers** section.

Find the desired server in the DNS Server List, and then click on the server name to open the settings for that server.



In the server settings page, scroll to the bottom of the second section, containing server-specfic settings.

Near the bottom of the section is a toggle to "Enable DNSSEC" for the server; click the toggle to the "ON" position.



Enable DNSSEC for a Zone (ProVision GUI)

DNSSEC may be enabled on a per-zone basis in the ProVision Zone Advanced Settings.

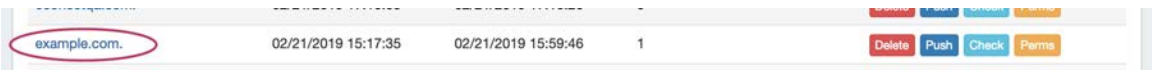
Before you enable DNSSEC for a zone, make sure that do the following:

- Make sure DNSSEC is enabled on the DNS server(s) you will be pushing zones to (see "Enable DNSSEC for a Server", above)
- run **configTest.php** to make sure that your directories/permissions are correct
- Set external server for Authenticated Data verification
- Create/Edit a zone - see Working with DNS Zones for additional information.
- Ensure that the zone is associated with a DNS server(s)

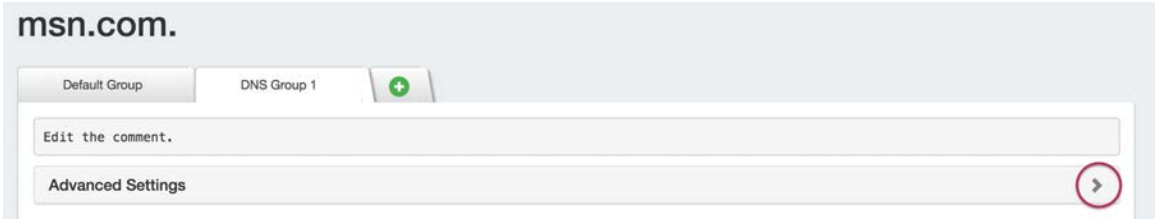
Enabling DNSSEC (for a single zone)

Navigate to the DNS Tab, and select the **DNS Groups** section.

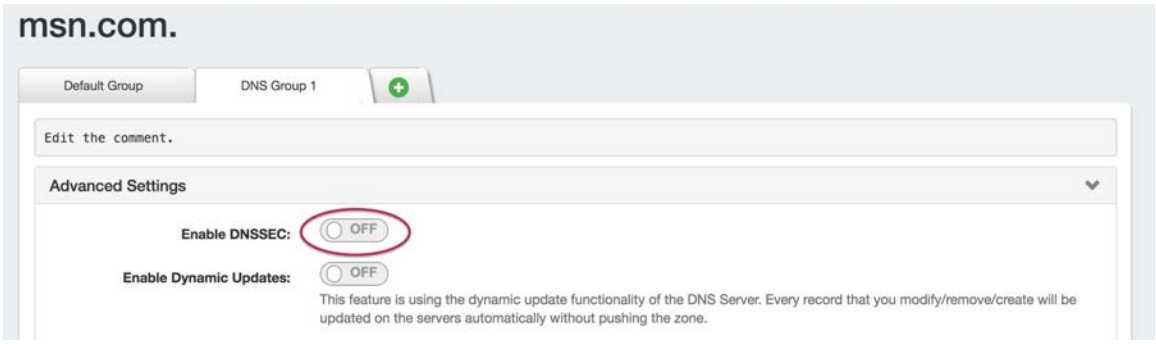
Find the desired Group and Zone in the Groups List, and then click on the zone name to open the details for that zone.



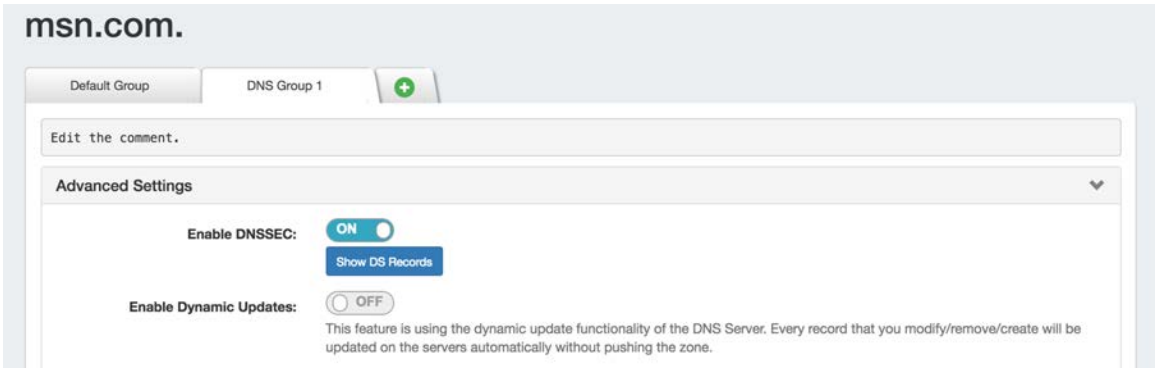
The view zone details page will open. Expand the zone details section "Advanced Settings" by clicking on the expansion arrow.



At the top of the "Advanced Settings" section will be a toggle to "Enable DNSSEC". Click the toggle to enable to the ON position.

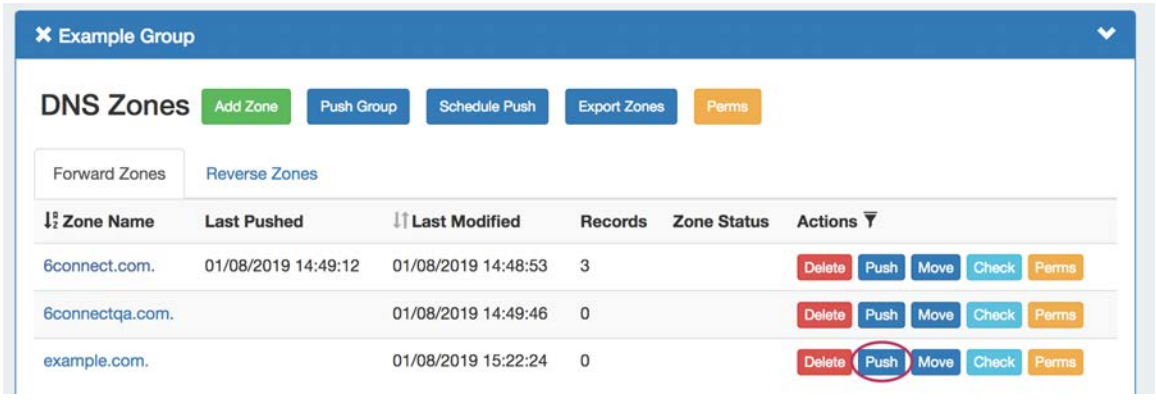


Once enabled, the toggle will show as "ON", and a "Show DS Records" button will appear. At this point, no records exists, so clicking "Show DS Records" will result in a message telling you so.



In order for DS Records to be created, the zone must be successfully pushed. Push the zone, Group, or Server containing the zone successfully and DS records will be created (see Working with DNS Zones and Working with DNS Groups for details on how to schedule and push zones).

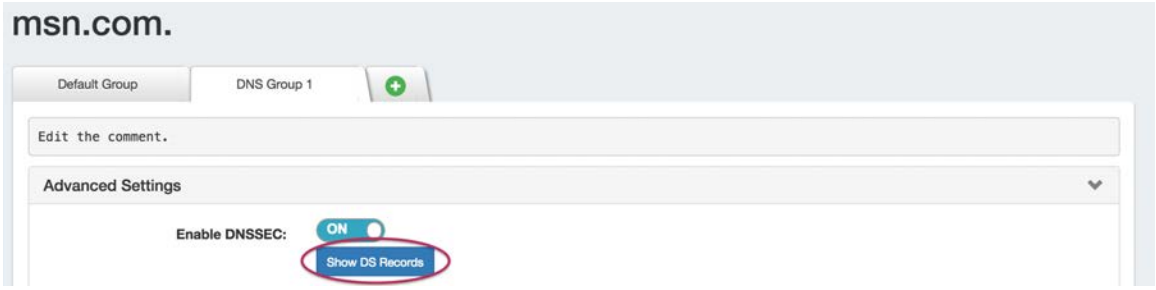
To quickly push just a single zone, go back to the DNS Groups section, and click on the "Push" button for the zone.



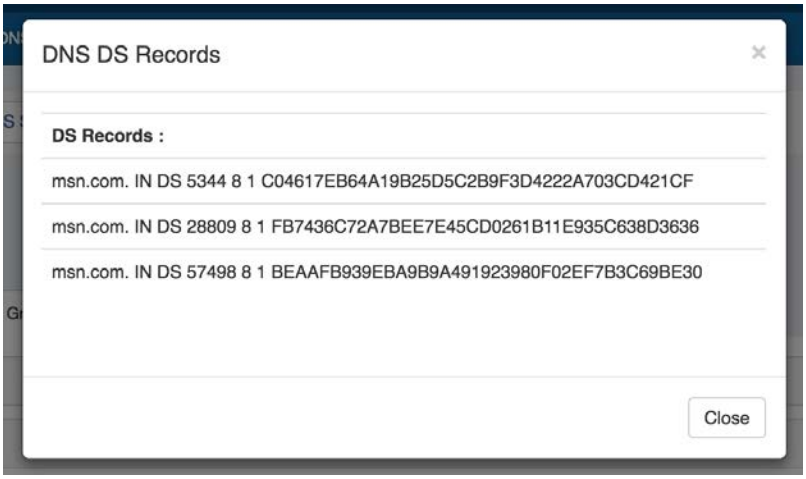
If successfully pushed, a green "Finished DNS Pushing Request" message will appear.



At this point, you will now have DS records available in the view zone details - Advanced Settings section. Open Advanced Settings for the zone and click on the "Show DS Records" button.



The DS records will be shown in a pop-up. Note these values for Registrar confirmation.



Update Registrar and Confirm

Once DS records have been created in ProVision, you will need to update and confirm the Zone Registrar:

- Upload these values to your Zone Registrar, obtained from the "Show DS Records" button
    - DS Record #, Key Tag, Algorithm, Digest Type, Digest
- Confirm values are saved at the Zone Registrar
- External sites
    - http://dnssec-debugger.verisignlabs.com/
    - http://dnsviz.net/

For BIND server(s)

To enable DNSSEC on BIND9 you need to modify **named.conf.options** with following parameters in the **options { }** section:

```
dnssec-enable yes:
dnssec-validation yes:
dnssec-lookaside auto;
```

These parameters may already be enabled in some Linux distributions by default, so please confirm before making changes.

Your DNSSEC implementation may need other options for your environment - please contact support@6connect.com if you have ny

Please note that you will need to restart the BIND service after these changes.

For Secure64 and PowerDNS

DNSSEC Signatures

In this scenario, 6connect ProVision uses the DNSSEC signing functions of the respective environment we write the zones to. We are evaluating how to properly integrate DNSSEC functions to ProVision for these platforms. Please contact support@6connect.com if you have feedback or specific questions.

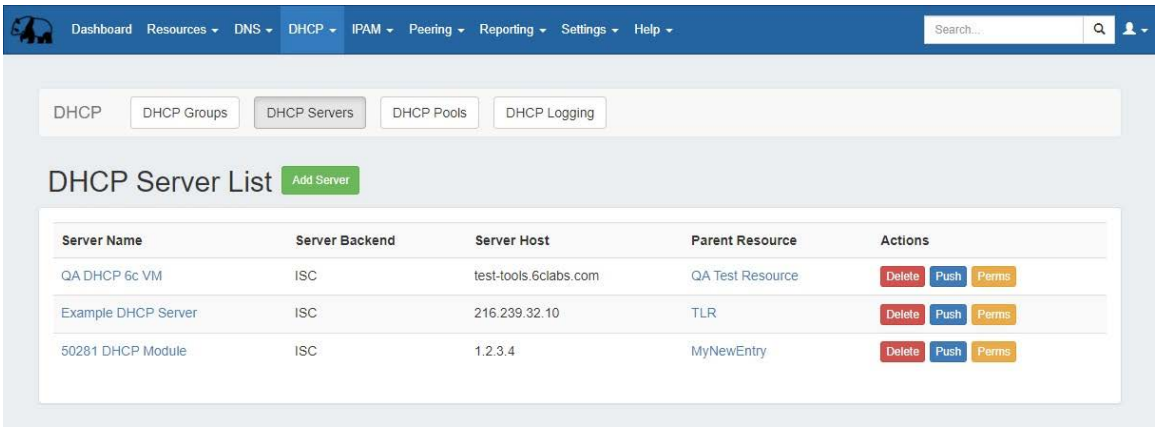
Additional Information

For additional information on working in DNS, see the following sections:

- Working with DNS Servers
- Configuring ISC BIND Support
- Configuring PowerDNS Support
- Configuring Secure64 Support
- Configuring Split Horizon and Views
- Import DNS Zones
- DNS Tab

DHCP Administration

DHCP Administration



DHCP Administration is primarily handled under the **DHCP** tab **DHCP Servers** sub-tab.

The **DHCP Servers** tab contains functions for adding, updating, and managing DHCP servers as well as scheduling server tasks.

Users with resource "read" permissions may view DHCP Server information, however only those with either Admin permissions or granted group-level server permissions can manage DHCP server creation, edits, and deletion.

Additional DHCP Admin tasks occur in other ProVision areas, and not all management tasks require Admin-level permissions - some only require appropriate resource permissions on the DHCP Groups, Zones, and servers involved. See additional sections on this page for more detailed information:

- DHCP Overview
- DHCP Permissions
    - Permission Shortcut Button ("Perms")
    - DHCP Approvals
    - DHCP Administrative Tasks
- Manage DHCP Servers
- DHCP Pool Pushes
    - Manual DHCP Pushes:
    - Scheduled DHCP Pushes:
- Additional Information:

DHCP Overview

The **DHCP** Tab organizes the DHCP system into a more unified and accessible interface, combining both admin and non-admin DHCP tasks together under the **DHCP** tab.

DHCP pools are gathered under DHCP Groups and servers are attached to those Groups. Pools, attached servers, and failovers are managed at a per-Group level.

Users can then view and manage Groups, individual pools, failover values, attach servers, and perform pushes all on the same page.

DHCP Permissions

Users with resource "read" permissions may view DHCP Server information, however only those with either Admin permissions or granted group-level server permissions can manage DNS server creation, edits, and deletion.

In order for a user to work with DHCP Groups, Pools, and servers, they must have User Group permissions for:

- One or more Parent Resources under which the DHCP Group and DHCP Pools will be associated (it can be a specific resource, or the all-encompassing "TLR")
- IPAM permissions sufficient to access and manage the desired blocks from which to assign DHCP Pools
- Permissions on the specific DHCP Server(s) in order to attach, detach, and push.

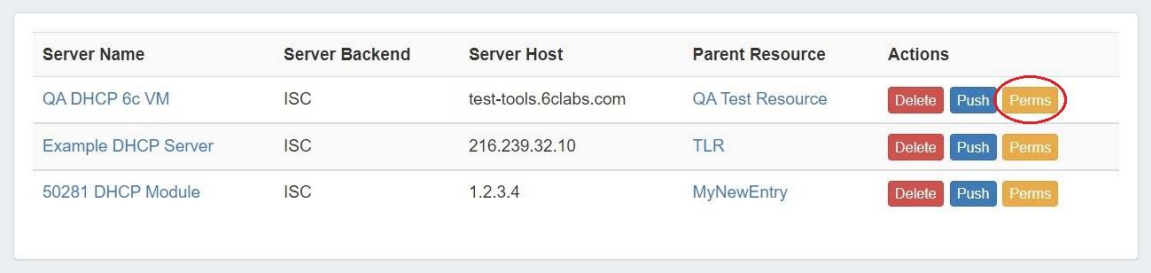
Creation and management of DHCP servers, as well as scheduled DHCP pushes, are Admin-only tasks.

Permission Shortcut Button ("Perms")

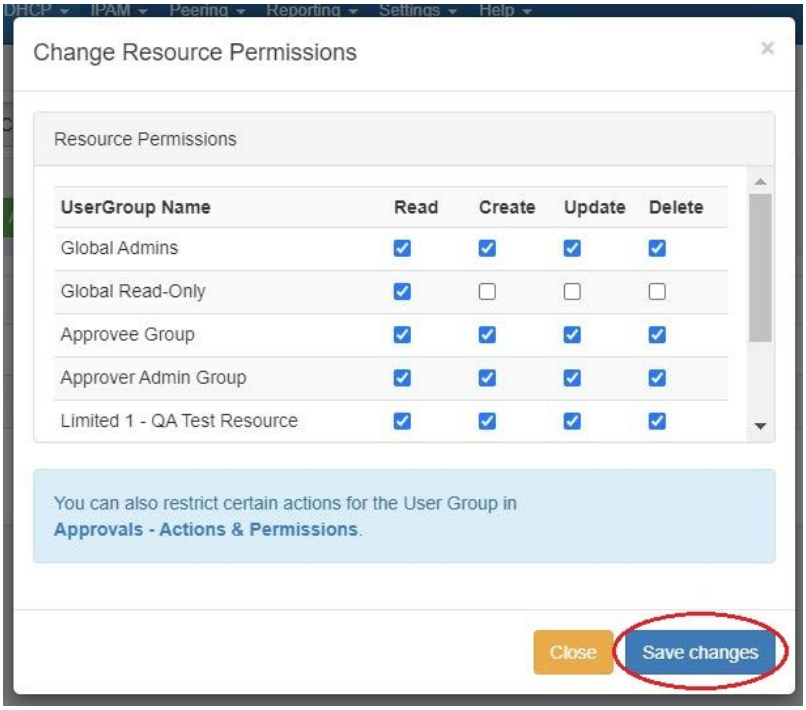
On the DHCP Server List a shortcut permissions button ("Perms") is available, accessible only to Admin users.

This permissions button allows for direct, point-of-use permissions adjustments to DNS Servers for permission groups. It uses the same CRUD permissions and groups available in the Admin Users tab, but removes the need to remember and search for the DHCP item name.

To open the Change Resource Permissions module, click on the "Perms" Button for any DHCP server.



Edit the CRUD permissions for any ProVision user group by clicking the checkbox for the desired group and permission type. When done, click "Save Changes".



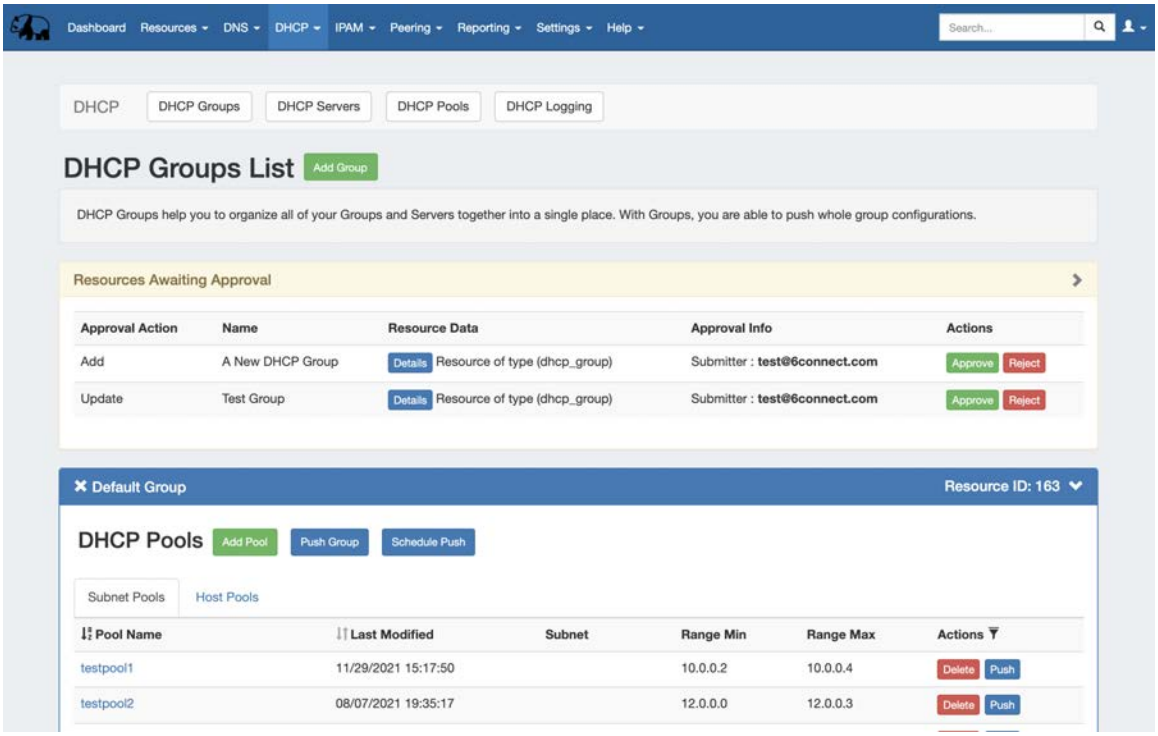
The permission changes will be also be reflected in the Admin **User** tab Group settings.

DHCP Approvals

The Approvals module stores and queues DHCP actions made by selected User Groups, and sends those actions to a Pending Changes list for administrative review. Later, an administrator (or combination of administrators) can approve or reject these stored actions.

Approvals is primarily set up and managed via the Admin **Approvals** Tab. See the Approvals Tab for details on setting up and using Approvals from the Administrative viewpoint.

In the **DHCP** Tab, a "Resources Awaiting Approval" module will display near the top of DHCP Groups, DHCP Servers, DHCP Pools Lists, and DHCP Pool pages, if a change has been submitted on that page that is pending approval.



Users who submitted a change for approval will see the details of their change request in this module.

Admin users with permissions to approve or reject the request will have the option to Approve or Deny the change.

DHCP Administrative Tasks

Admin-only tasks in DHCP include scheduling pushes, and creating / managing DHCP servers.

These tasks may be accessed in the following areas:

- Scheduling DHCP Pushes:
    - May be set up from the Scheduler Tab or,
    - Set by server from the DHCP Servers page, or
    - Set by DHCP Group from the DHCP Groups page, or
    - Set by individual pool from the Pool Details page
- Managing DNS Servers: The DHCP Servers page

Tasks such as working with pools, DHCP Groups, editing Group Settings, attaching servers to Groups, and manually pushing pools do not require ProVision Admin permissions.

Instead, these tasks simply require that the user be included in a User Group that has appropriate permissions (either direct, or inherited) on the Parent Resources, DHCP Groups, and servers involved.

Manage DHCP Servers

Adding, configuring, and managing DHCP Servers occurs in the Admin-only **DHCP Servers** page under the **DHCP** Tab.

Supported DHCP server service types include:

- ISC DHCP
- Cisco Prime Network Registrar

For detailed information on adding, editing, and deleting DHCP Servers, see Working with DHCP Servers.

DHCP Pool Pushes

In the DHCP module, pools may be pushed manually or scheduled for a future time, and may be performed for a single pool, all pools in a DHCP Group, or a full DHCP server.

Scheduling DHCP pushes requires administrative access, but manual pushes only require permissions on the DHCP Group / Parent Resource, and the server(s) attached.

Manual DHCP Pushes:

Manual DHCP pushes may be performed from the following locations in ProVision:

- Single Pool: From the DHCP Groups pool list "Push" button.
- Single Pool: From the DHCP Pool Details page "Push Now" button.
- Group: From the DHCP Groups list "Push Group" button.
- Server: From the DHCP Servers list "Push" button.
- Server: From the DHCP Server Settings page "Push Pools" button.

For details on performing pushes in the above areas, see the following sections:

- Working with DHCP Groups
- Working with DHCP Pools
- Working with DHCP Servers

Scheduled DHCP Pushes:

Scheduled pushes may be performed from the following locations in ProVision:

- May be set up from the Scheduler Tab for a DHCP Group or server
- Set by server from the DHCP Servers page, or
- Set by DHCP Group from the DHCP Groups page, or
- Set by individual pool from the Pool Details page

Additional Information:

For more information on DHCP Administrative tasks, see the following sections:

- Working with DHCP Servers

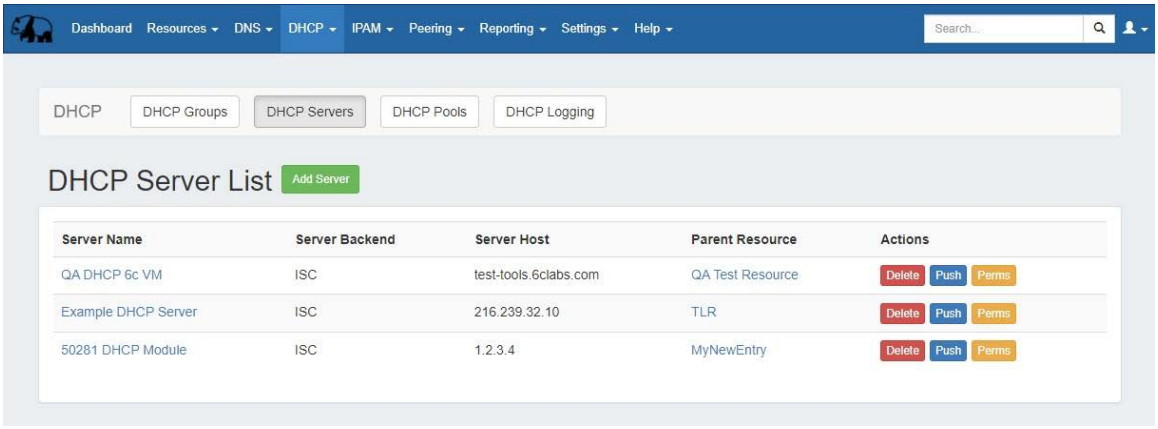
For non-admin level tasks, see:

- DHCP Tab
- Working with DHCP Groups
- Working with DHCP Pools
- Working with DHCP Gadgets

Working with DHCP Servers

DHCP Servers

The DHCP tab combines server management, group organization, and pool management together under a single tab.

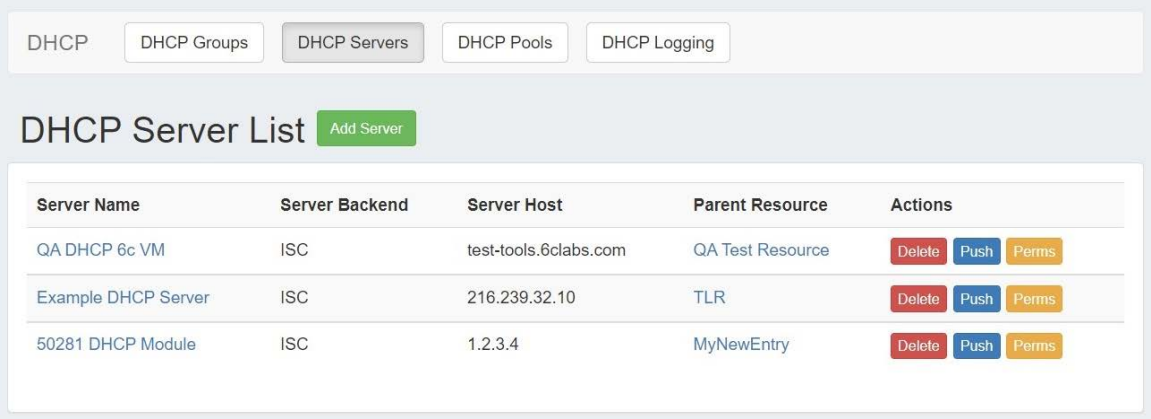


The **DHCP Servers** tab contains functions for adding, updating, and managing DHCP servers as well as scheduling server tasks.

Users with resource "read" permissions may view DHCP Server information, however only those with either Admin permissions or granted group-level server permissions can manage DHCP server creation, edits, and deletion.

- DHCP Servers
  - DHCP Server List Interface
- Working with DHCP Servers
  - Add a Server
    - Server Settings
      - 1) Set Server Common Settings
      - 2) Set Server Specific Settings
      - 3) Set Advanced Server Settings
      - 4) Set DHCP Group Settings for Server
      - 5) Save Changes
  - Edit Servers
  - Review Pools Connected to a Server
    - Pools Directly Connected to the Server
    - Zones Connected via a Group
  - Pushing a Server
    - Manual Push
    - Scheduled Push
  - Review Pushed / Unpushed Configurations
  - Scan a Server
  - Delete a Server
- Additional Information

DHCP Server List Interface



1) Add Server Button: Opens a dialog for creating a DHCP server.

2) Server List:

3) Server Name: Name of the DHCP server. Click to open server details.

4) Server Backend: The DHCP Service backend type for the server. Available types are ISC and CPNR.

5) Server Host: The server host.

6) Parent Resource: The resource set as the Parent for the server.

7) Actions: The actions that may be performed on each server:



8) Delete: Deletes the server from ProVision.

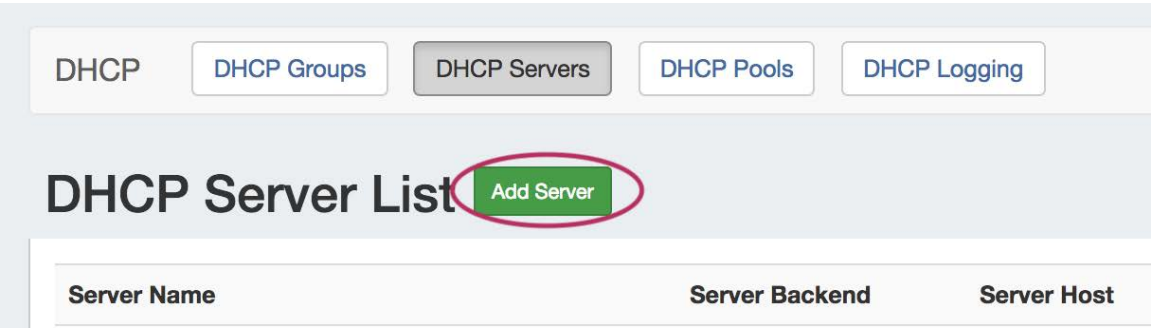
9) Push: Pushes all pools associated with the selected server.

10) Perms: Opens a shortcut to edit permissions for the selected server (Admin only).

Working with DHCP Servers

Add a Server

To create a new server, start from the **DHCP** Tab, select the **DHCP Servers** sub menu. Then, click the "Add Server" button next to "DHCP Server List".

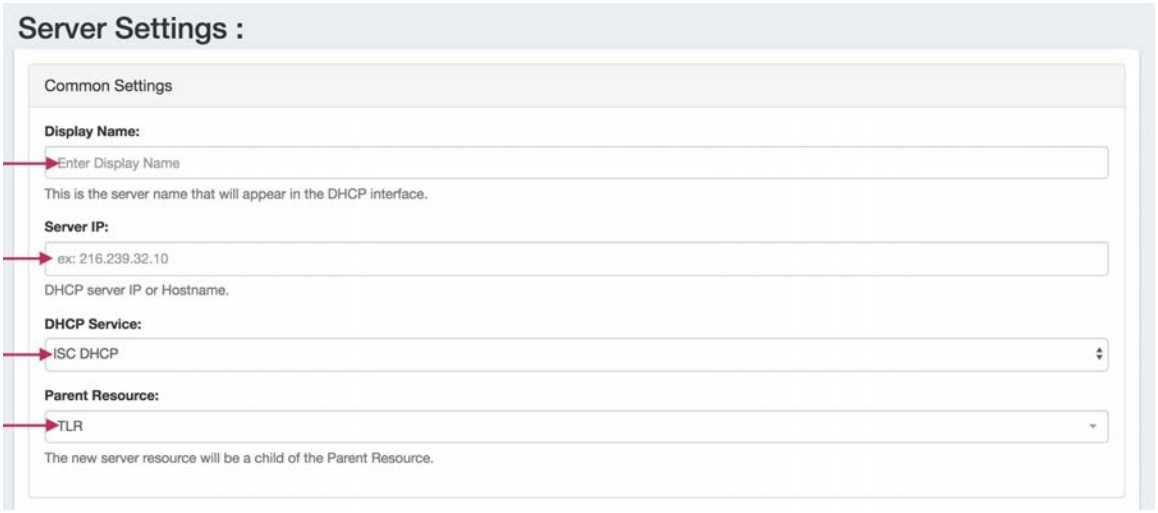


This will open the "Server Settings" page.

Server Settings

1) Set Server Common Settings

In the "Common Settings" section of Server Settings, enter the new server's Display Name (the name that will appear on the ProVision interface), the FQDN / IP, server type, service type, and desired parent Resource (may be left at the default Top Level Resource).



Display Name: Name you want the server to display.

Server IP: The IP or Hostname of the DHCP server.

DHCP Service: Select the DHCP service type - ISC DHCP, or Cisco Prime Network Registrar (CPNR).

Parent Resource: Select the resource to be the "parent" of the server - typically TLR (Top Level Resource), but may be a lower level resource such as a Customer or Location. The parent resource selection is the basis of access permissions for the server.

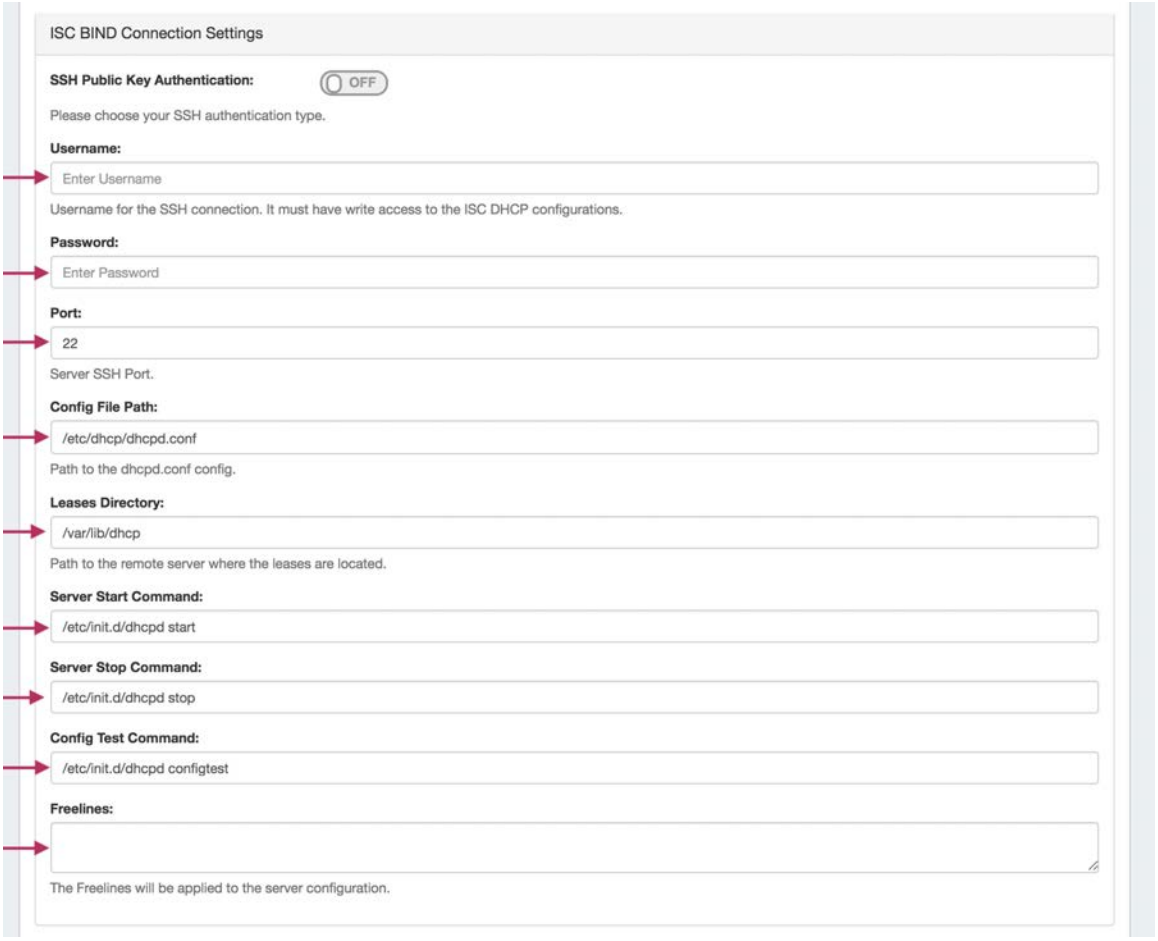
2) Set Server Specific Settings

The next section is entering server service-type specific settings. The options visible in this section will depend on the "DHCP Service" type chosen under "Common Settings".

Here, we see the fields for ISC DHCP server settings. Enter the server Username, Password, Port, Leases Directory, Server Start / Stop Commands, Server Test Command and Freelines (if desired).

Your fields may vary for other server types.

For SSH Public Key Authentication, click on the ON / OFF toggle to select "ON" or "OFF" as needed.

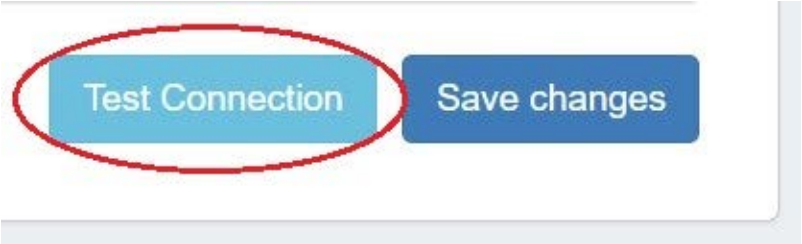


3) Set Advanced Server Settings

If desired, Advanced Settings for the DHCP Server may be entered. Toggle "Authoritative Server" to "On" or "Off", and fill in the fields for Routers, Domain Name Servers, Domain Name, Default Lease Time, Max Lease Time, Local Port, or Log Facility.



After entering the server-specific settings in this section, you can click the "Test Connection" button at the bottom right of the page to test the server connection and authentication.



A success or failure response will pop up.



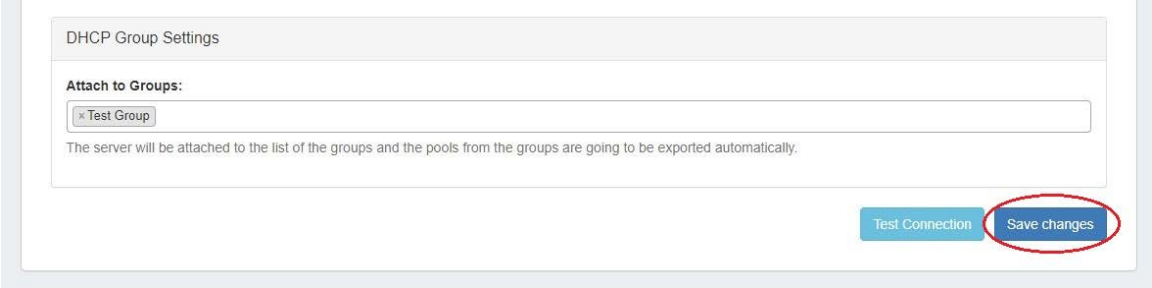
4) Set DHCP Group Settings for Server

In the last section, select whether to attach the server to an existing DHCP Group. Pools assigned to the selected Group will automatically be attached to the server.



5) Save Changes

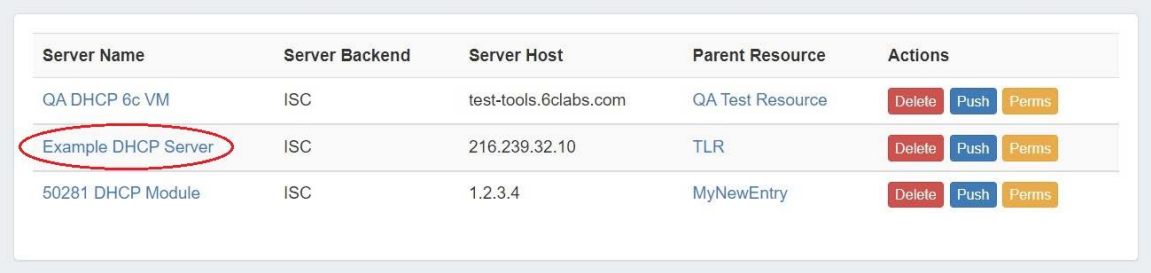
Save your changes when done! Just click the "Save Changes" button at the bottom right of the page.



The new server will now be added to the DHCP Servers list. These settings may be changed at any time by selecting the server from the server list and editing the information.

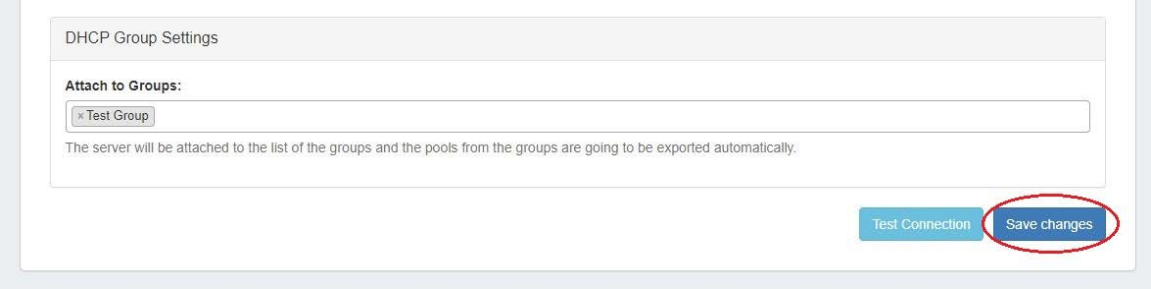
Edit Servers

Edit an existing server by clicking once on the server name in the DHCP Servers list.



The "Server Settings" page will open.

Click inside the field that you want to change, type your changes, and then click "Save Changes" at the bottom of the page.



Review Pools Connected to a Server

There are two ways that pools may be connected to a DHCP server:

1) Directly connected, by attaching the pool to a server from the Pool Details page.

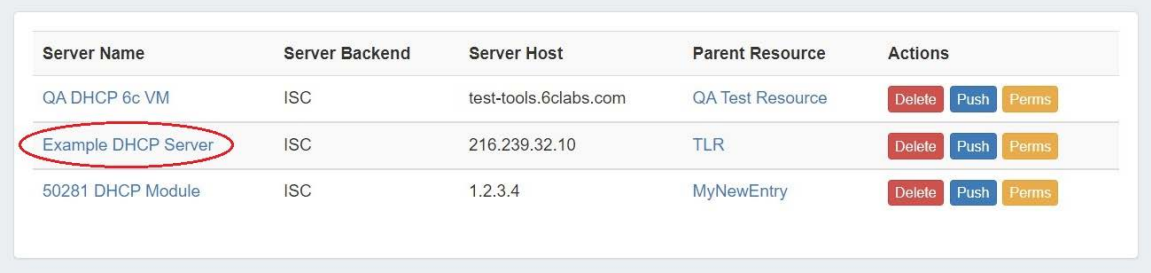
or,

2) Connected by a Group that has been set as the default DHCP Group for the server, selected under "DHCP Group Settings".

Both are able to be viewed on the DHCP Server Settings page.

To view either, open the Server Settings page for the server by clicking on the server name in the DHCP Servers list.

Edit an existing server by clicking once on the server name in the DHCP Servers list.



The "Server Settings" page will open.

Pools Directly Connected to the Server

Scroll to the bottom of the page, and open the module titled "Pools directly connected to the server" by clicking on the expansion arrow.



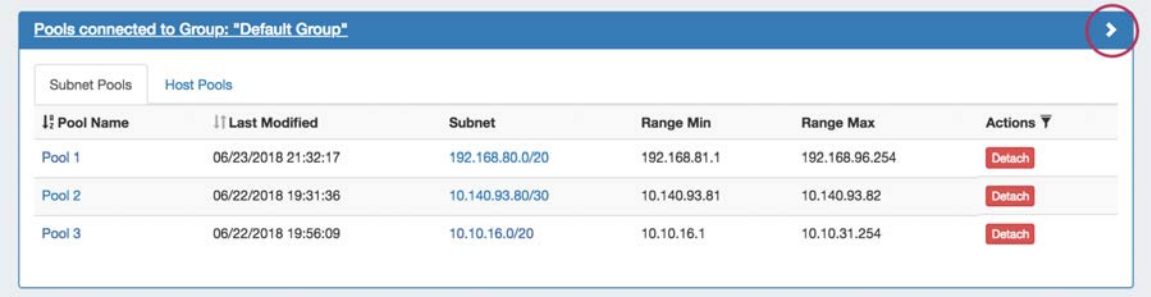
A pool list will show the pool(s) that have been directly connected to this server.

Here, you may browse through subnet and host pools by selecting the appropriate tabs, sort the list by Pool Name or Last Modified, or open the Pool Details page by clicking on the name.

Zones Connected via a Group

If a default Group has been selected under "DHCP Group Settings" for the server, pools under that Group will be connected to the server and able to be viewed on the Server Settings page.

Scroll to the bottom of the page, and open the module titled "Pools connected to Group '(Group Name)' " by clicking on the expansion arrow.



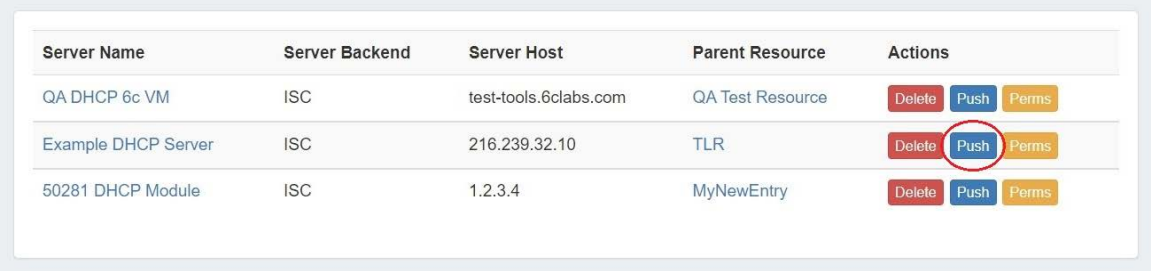
A pool list will show the pool(s) that have been directly connected to this server.

Here, you may browse through subnet and host pools by selecting the appropriate tabs, sort the list by Pool Name or Last Modified, or open the Pool Details page by clicking on the name.

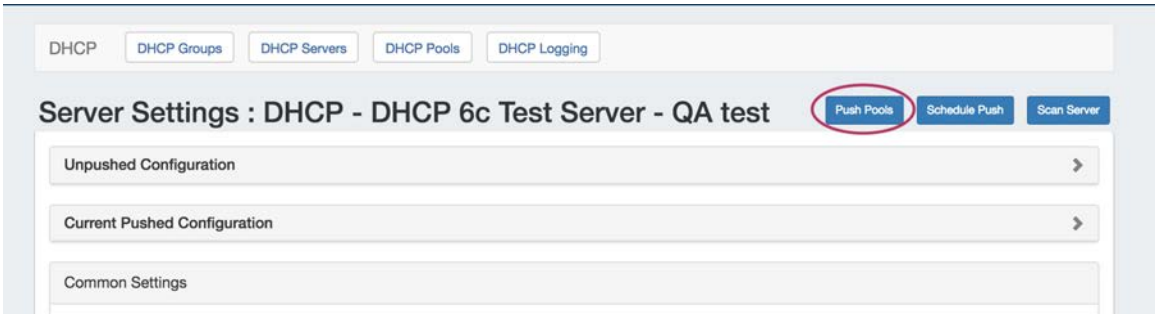
Pushing a Server

Manual Push

Manually pushing all pools on a server may be done directly from the DHCP Server list. Under the "Actions" section of the Server List, click the "Push" button for the desired server.



Pushing may also be done while in the Server Settings page. While in the Server Settings page, click the "Push Pool" button at the top right of the page.



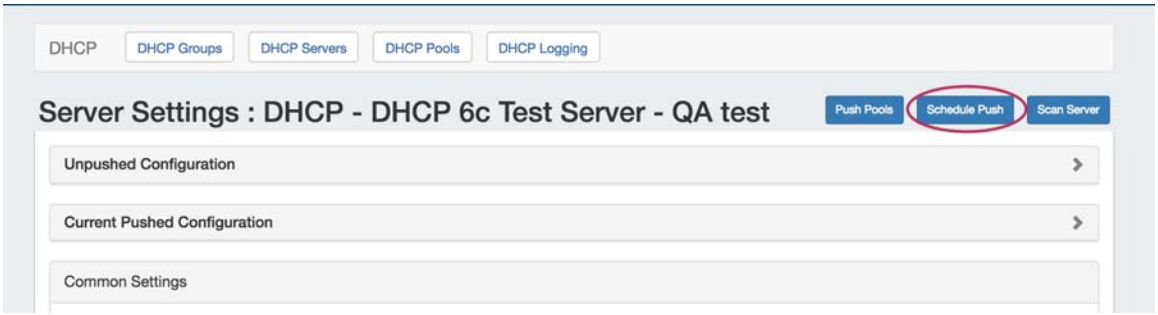
A "DHCP Push Status" box will appear, showing the status as the server is pushed. Once all pools have been pushed successfully, a green status message of "Finished DHCP Pushing Request" will appear. At this point, the push is complete and the window may be closed.

Scheduled Push

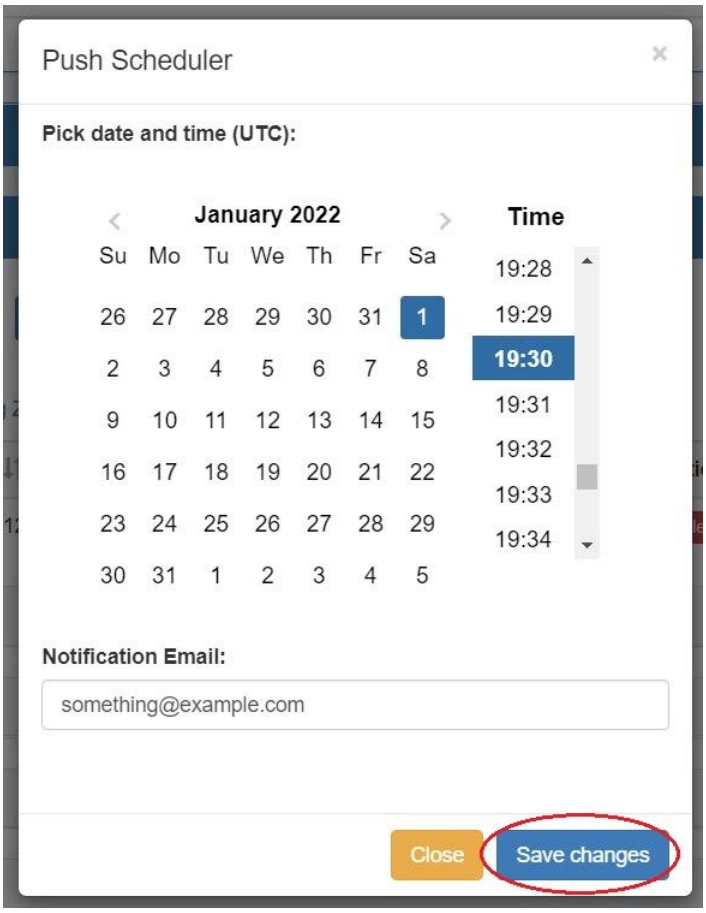
DHCP server pushes may be scheduled from either the Admin Area **Scheduler** Tab, or from within the DHCP Server Settings page. Scheduled pushes require Admin access.

For information on scheduling a push from the **Scheduler** Tab, see Scheduler Tab documentation.

To schedule a push from a server's Settings page, open the Server Settings page for the desired server, and click on the "Schedule Push" button.

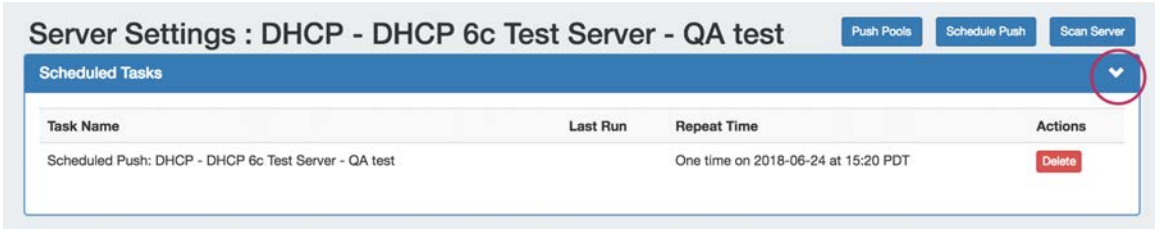


The Push Scheduler dialog will open. Click on the calendar on the left to select a date for the push, set the desired push time on the right, enter a notification email address, and then click "Save Changes".



Once a schedule push has been created, a "Scheduled Tasks" module will appear at the top of the Server Settings page.

Click on the expansion arrow for the module to open and view the tasks. Scheduled tasks may be deleted by clicking the "Delete" button under "Actions".



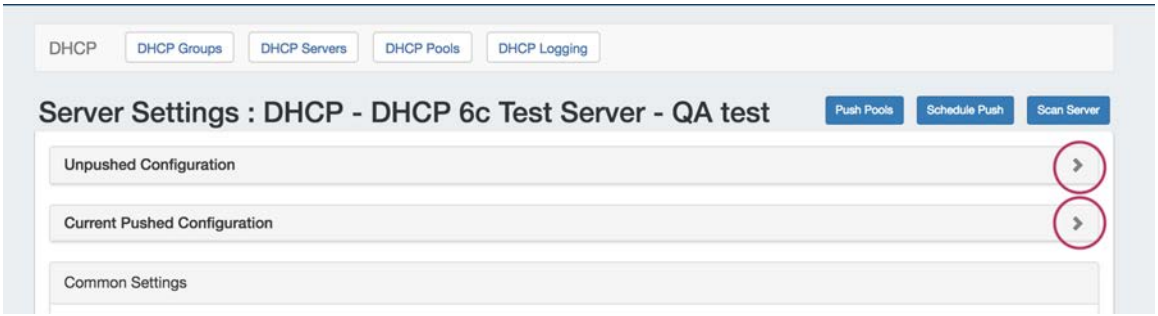
If necessary, the Scheduled Push may be edited from the **Scheduler** Tab in the Admin area of ProVision. See the Scheduler Tab for information on editing scheduled tasks.

Review Pushed / Unpushed Configurations

After a server has been created, unpushed edits may be viewed under the "Unpushed Configurations" module in Server Settings.

After a push, the most recent pushed configuration may be viewed under the "Current Pushed Configuration" module in Server Settings.

To open either, click the expansion arrow for the module on the top right of the header.



The Unpushed Configuration module will show the edits made to the configuration since the last successful push, and the user, time, and date of the change.

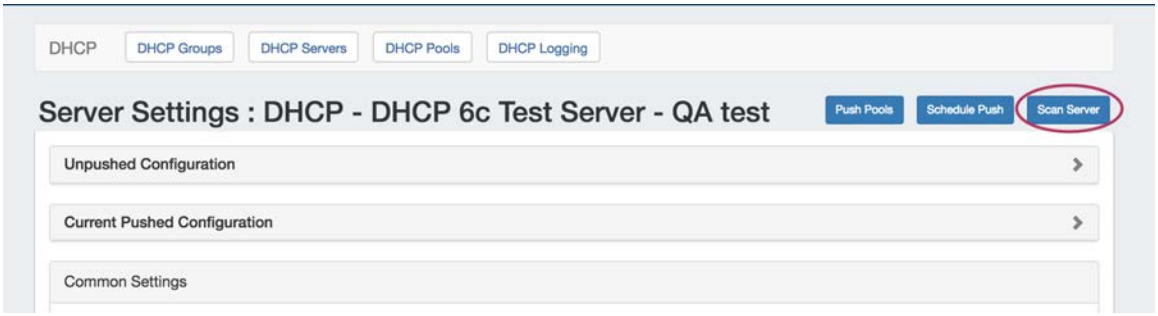


In Current Pushed Configuration, you may search for a specific line by entering a term in the search bar and hitting the "Enter" key - the config will jump to the appropriate line for review.



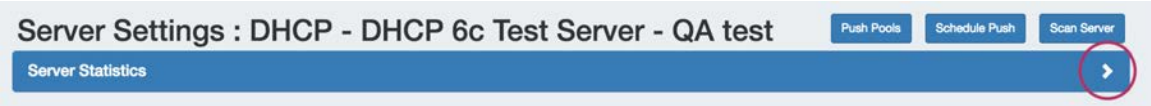
Scan a Server

Scan a DHCP Server by clicking the "Scan Server" button at the top of the Server Settings page.



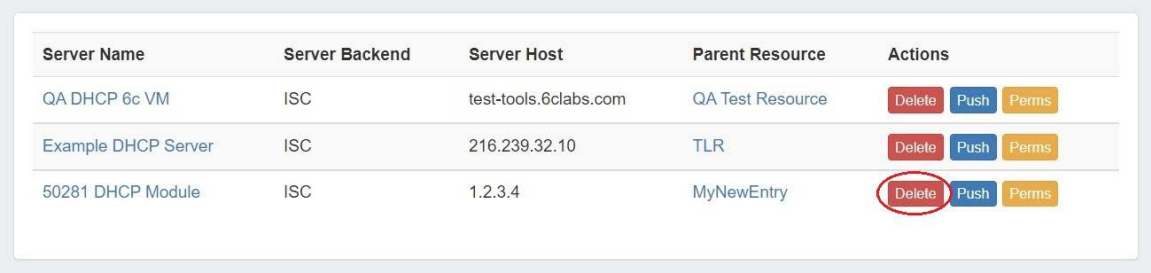
When complete, a "Server Statistics" module will appear. Expand the module, and if the server permissions allow, the scanned statistics will show in the module.

If permissions or directory location fails during the scan, an error message will show instead.



Delete a Server

Delete a server by clicking the "Delete" button under the "Actions" section of the Server List for the desired server.



Additional Information

For more information on working with DHCP, see the following areas:

- DHCP Tab
- Working with DHCP Groups
- Working with DHCP Pools
- Working with DHCP Gadgets

Importing Your Data

Preparing for Data Import

Before importing your data into ProVision, there are a few steps we recommend in order to make the import process as smooth as possible:

- Step 1: Normalize your Data
- Step 2: Prep your Data
- Step 3: Import your Data

Data Import Overview: Which Import Tool Should I Use?
- Resource Import
- Peering Import
- IP Import
- DNS Import
- Import Templates
- Additional Information

Step 1: Normalize your Data

Prior to importing your data, there is a key step of Data Normalization to ensure that information is accurate. If you need assistance with parsing your data prior to importing, 6connect can help with our Data Analyst service, just email us at support@6connect.com for more information. You can also use off the shelf tools like Microsoft Excel, MySQL, or Google Refine if you intend to take on the task of data cleanup in house.

Common normalization steps required for imports include:

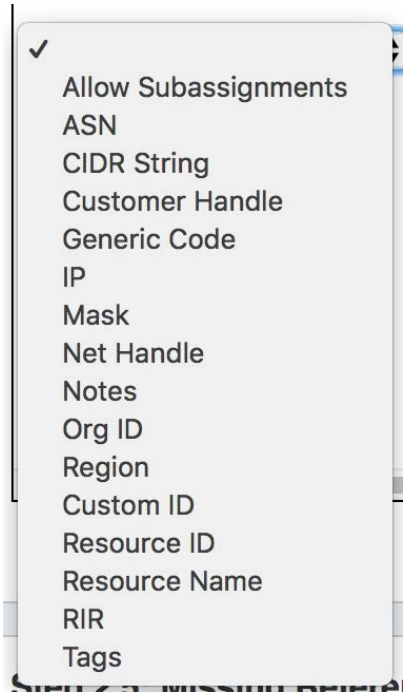
- Remove any empty rows in the data range
- Remove any empty columns in the data range
- Remove stray data from inside and outside the data range, such as:
  - notes, comments, and placeholder text as field values, when not set as their own data column
  - nested secondary information located in additional rows under a primary record
- Ensure proper data formatting
  - Check for data formatting errors - a common issue is leading zeros being dropped from a ZIP field when a file is opened. Re-specify format as needed.
  - Ensure each field has consistent formatting for values
- Ensure unique values for primary identifiers, such as Resource Name and ID Fields

> **Data Encoding Format**
>
> To ensure correct importing of any special characters, make sure to use UTF-8 encoding for your CSV file!

Step 2: Prep your Data

You can download data import templates from the Dashboard Tab or Data Import Tab. We recommend that you open the CSV import templates and get familiar with the data fields that you can import into the platform.

- **For Company information** you can import relevant data including mailing/billing address information as well as ARIN specific SWIP fields, and specific DNS servers.
- **For Contact information** you can import contact records assigned to a given company. We support typical fields for this data including name, multiple email fields, phone numbers as well as timezone and role (roles can be customized from the IPAM Admin tab).
- **For IP Block information** you can import the following fields:

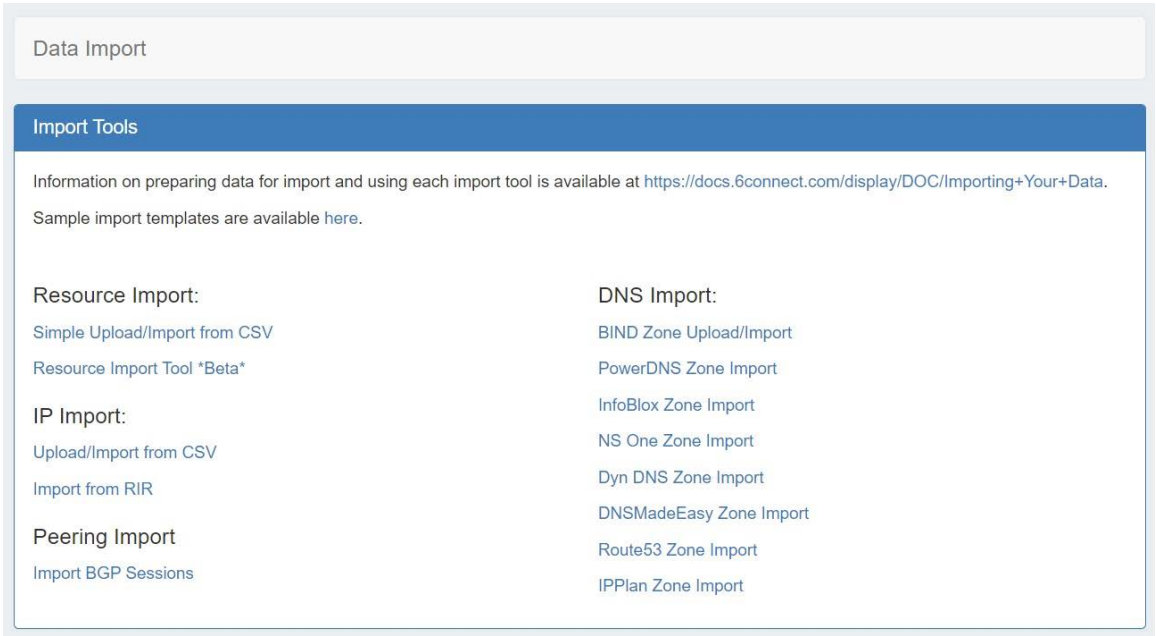


Allow Subassignments option

When importing the field "Allow Subassignments" - the parameters accepted are "TRUE", "1", "Y", "yes"

Step 3: Import your Data

Get to the Data Import Tab from the Admin button to import your data. For larger data import runs, feel free to contact support at any time for assistance.

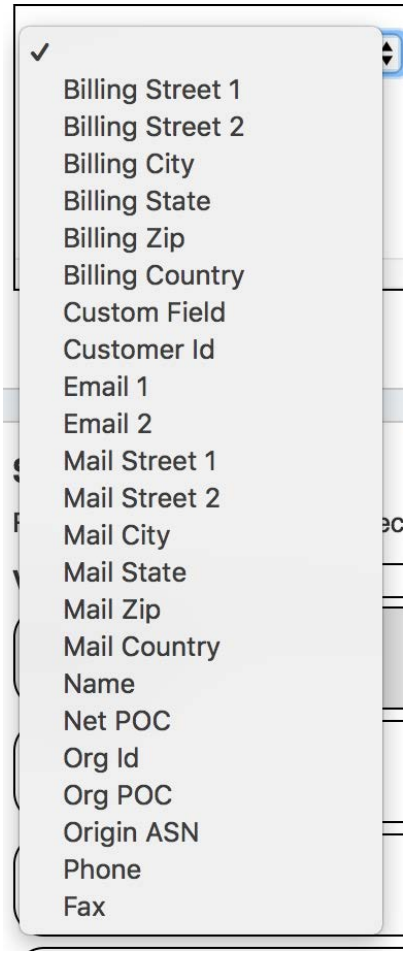


Data Import Overview: Which Import Tool Should I Use?

Resource Import

Simple Upload / Import from CSV: Use this tool if you have a simple .csv file of customer / contact information, such as name, address, billing address, phone numbers, POC, etc. See Resource Import from CSV for more details.

This tool supports the following fields:



For Resource Import from .csv, the following fields are REQUIRED:

- Name (Unique Resource / Customer Name)
- Customer ID (Unique non-name identifier)

All other fields are optional.

Resource Import Tool: The Resource Import tool is designed for importing .csv files for any resource type (company, physical devices, contacts, customers, etc), and allows for customized headers through integrating ProVision's customizable sections and fields. It also allows for data editing within the tool. Use the Resource Import Tool if you have resource data that does not fit under the Simple Upload / Import from CSV field options, and can equate that data to an existing or newly created Section.

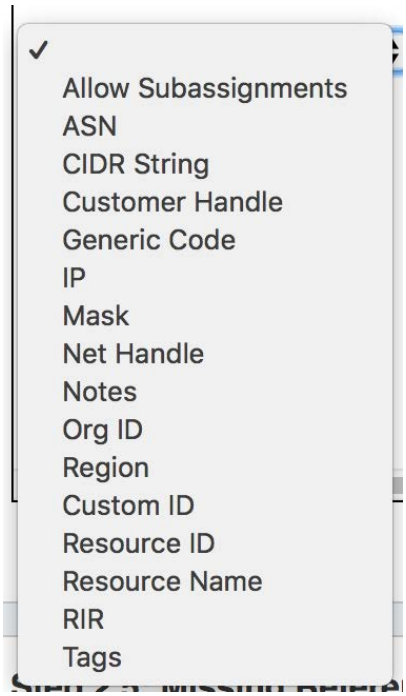
> **Additional Information**
>
> A tutorial / walkthrough for this tool is available at the Resource Import Tool page.

Peering Import

Import BGP Sessions: This section imports peering sessions from a selected exchange and router. Routers must be created prior to using this importer. See Peering Routers and Importing Sessions for additional information.

IP Import

Upload / Import from CSV: Use this tool if you have a .csv file of IP block information, such as CIDR, mask, ASN, RIR, etc.
This tool supports the following fields:



For IP Import from .csv, the following fields are REQUIRED:

- CIDR String OR both IP and mask
- RIR OR a selected default RIR

All other fields are optional.

Import from RIR: This tool automatically lookups your ARIN or RIPE information based on the IP address you are connected to. Once it identifies the blocks assigned to your company, you can import both 1918 aggregates as well as public IP space from ARIN and RIPE. See Import Aggregate Blocks for more detail on this tool.

DNS Import

The following DNS Import options are available from the Data Import tab:

BIND Zone Upload / Import: Imports DNS zones using the named.conf configuration file tied to the zones you are uploading, a .zip or .tar file of the zones themselves, and an optional .csv file mapping zones to customers and DNS Servers. This is the simplest and most commonly used import method. Refer to Import DNS Zones for more information.

PowerDNS Zone Import: This tool is available after configuring a PowerDNS server with a MySQL backend. The PowerDNS Import connects to the selected server and imports all zones.

InfoBlox Zone Import: Imports DNS zones using a provided Host, Username, and Password. The InfoBlox import pulls all zones on the InfoBlox LOCAL grid and adds them to a designated Group. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

NS ONE Zone Import: Imports DNS zones using a NS One API Key. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

Dyn DNS Zone Import: Imports DNS zones using a Dyn DNS Customer Name, Username, and Password. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

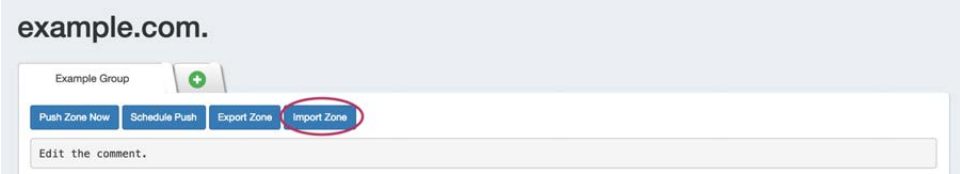
DNSMadeEasy Zone Import: Imports DNS zones using a DNSMadeEasy API Key and API Secret. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

IPPlan Zone Import: Imports DNS zones using IPPlan MySQL database options. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

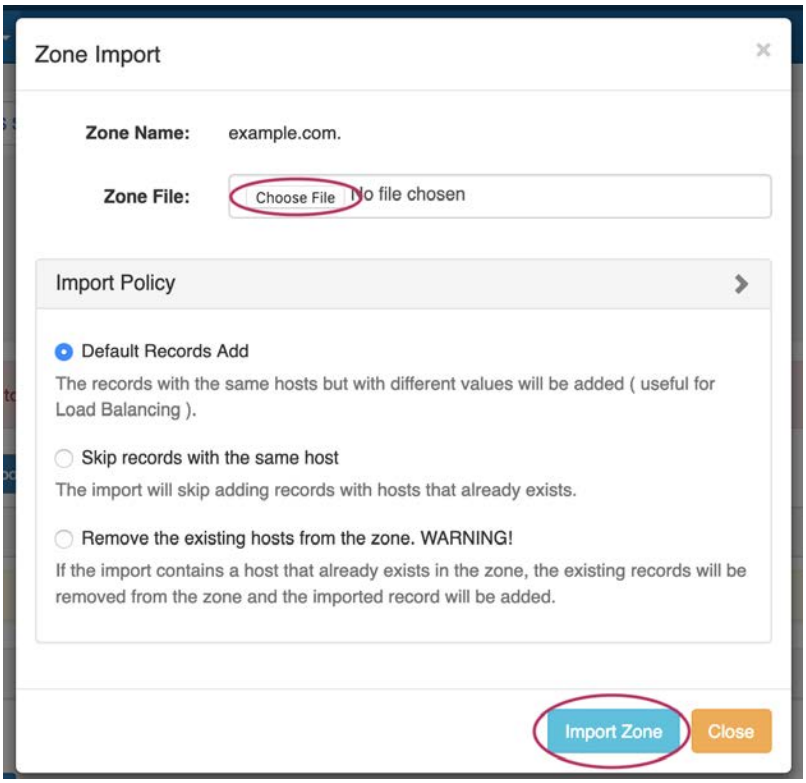
Additional DNS import options may be available on a per-zone or per-server level, accessed from the DNS Tab:

DNS Zone Import: This tool is available on a zone's "View Zone" page, and allows the user to import additional zone/record information into an existing ProVision zone by uploading a zone file (.zone).

- From the View Zone page, a zone file (.zone) may be imported into a ProVision zone to populate record data. Click "Import Zone".



A Zone Import dialog box will open. Next to **Zone File:**, click "Choose File" and select your .zone file to import. Then, select an import policy to follow.



When done, Click "Import Zone".

Import Templates

Import template sample files are available for selected ProVision import tools. A link is provided for a download page, both here and on the Data Import Tab.

These may be viewed as an example of .csv setup for their respective importers, or used for tutorials.

They are:

All Import Samples - Links to the CSV import templates page of the documentation, showing all available import template .csv files.

IP Import Sample File - Download the IP-import-sample_v1.csv file from the import templates page linked above, used in the IP Import: Upload / Import from CSV Tool.

Customer Sample Import - Download the customer-import-sample.csv file from the import templates page linked above, used in the Resource Import: Simple Upload / Import from CSV Tool.

Additional Information

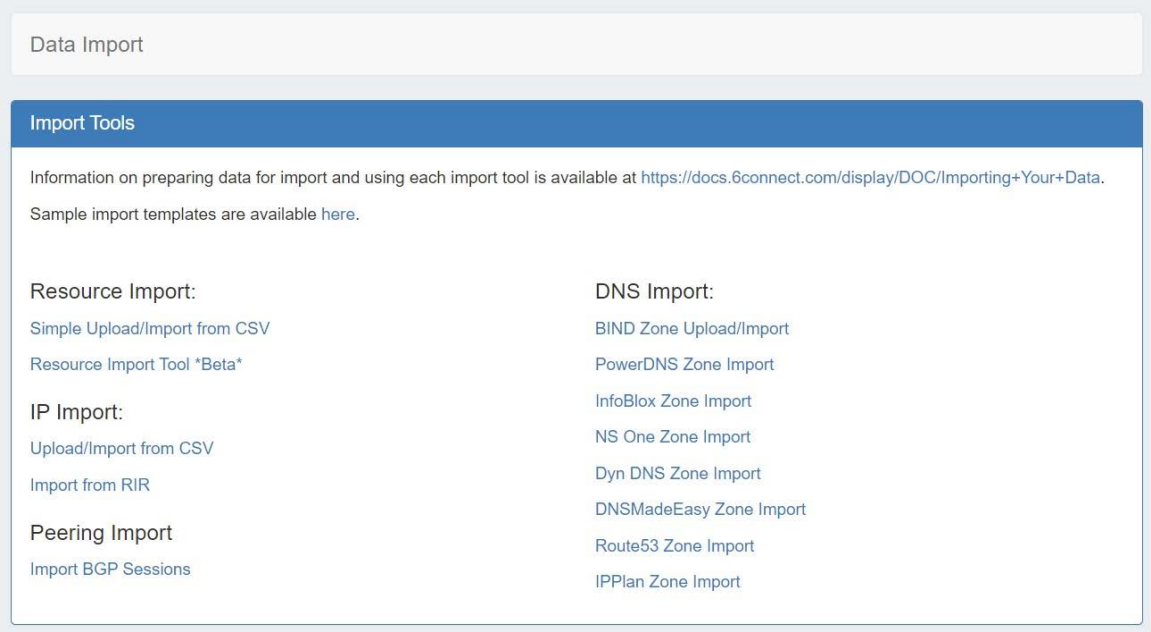
For more details, see:

- Resource Import from CSV
- Resource Import Tool
- Import Peering Sessions
- IP Import from CSV
- Import Aggregate Blocks
- Import DNS Zones

Resource Import from CSV

Simple Upload / Import from CSV

The Simple Upload / Import from CSV tool is used if you have a simple .csv file with customer / contact information, such as Name, Address, Billing Address, Phone numbers, POC, etc. It is accessed from the **Data Import Tab** from the **Admin** section of ProVision.



To import your customer / contact information, follow the following steps:

- Before you Begin: Prepare your Data for Import
- Step 1: Create a new Resource / Customer Import Job
- Step 2: Define Columns
- Step 3: Reviewing Data
- Additional Information

Before you Begin: Prepare your Data for Import

The Simple Upload / Import from CSV tool requires only a .csv file for importing.

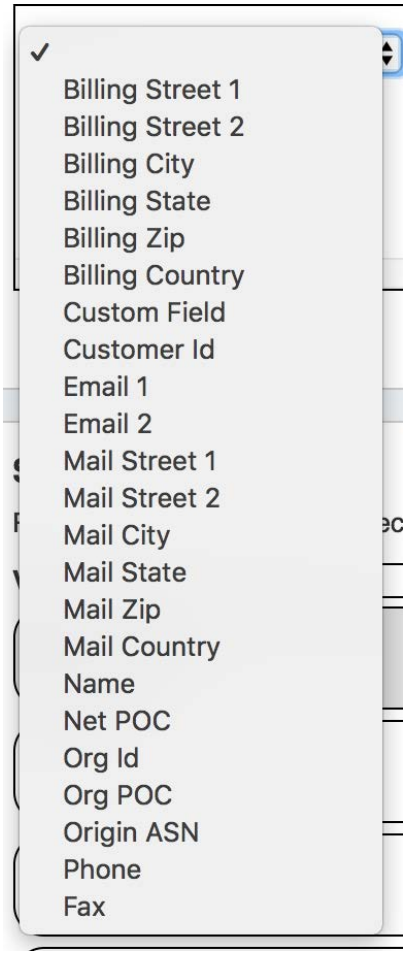
Be sure to review "Preparing Data for Import" on the Importing your Data page before you begin. Verify that your .csv is correctly parsed and cleanly formatted with your customer/contact information (using your choice of the available field list shown below), and is UTF-8 encoded for best results.

Be sure to check that your data is cleaned up with the following steps:

- Remove any empty rows in the data range
- Remove any empty columns in the data range
- Remove stray data from inside and outside the data range, such as:
  - notes, comments, and placeholder text as field values, when not set as their own data column
  - nested secondary information located in additional rows under a primary record
- Ensure proper data formatting
  - Check for data formatting errors - a common issue is leading zeros being dropped from a ZIP field when a file is opened. Re-specify format as needed.
  - Ensure each field has consistent formatting for values
- Ensure unique values for primary identifiers, such as Resource Name and ID Fields

> **Data Encoding Format**
>
> To ensure correct importing of any special characters, make sure to use UTF-8 encoding for your CSV file!

This Resource Import from .csv tool supports the following fields:



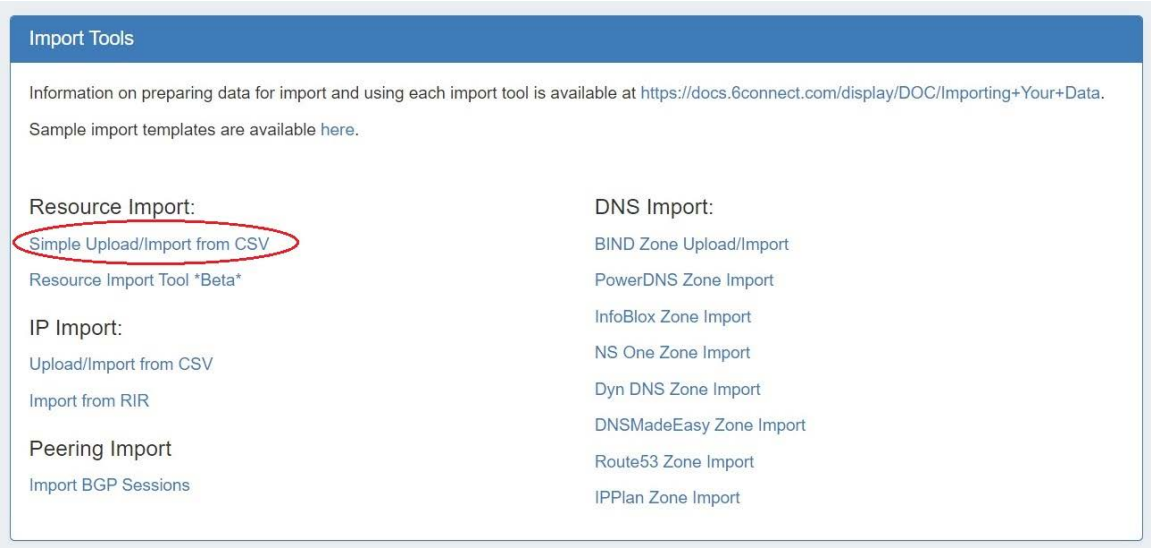
Note: the following fields are REQUIRED:

- Name (Unique Resource / Customer Name)
- Customer ID (Unique non-name identifier)

All other fields are optional.

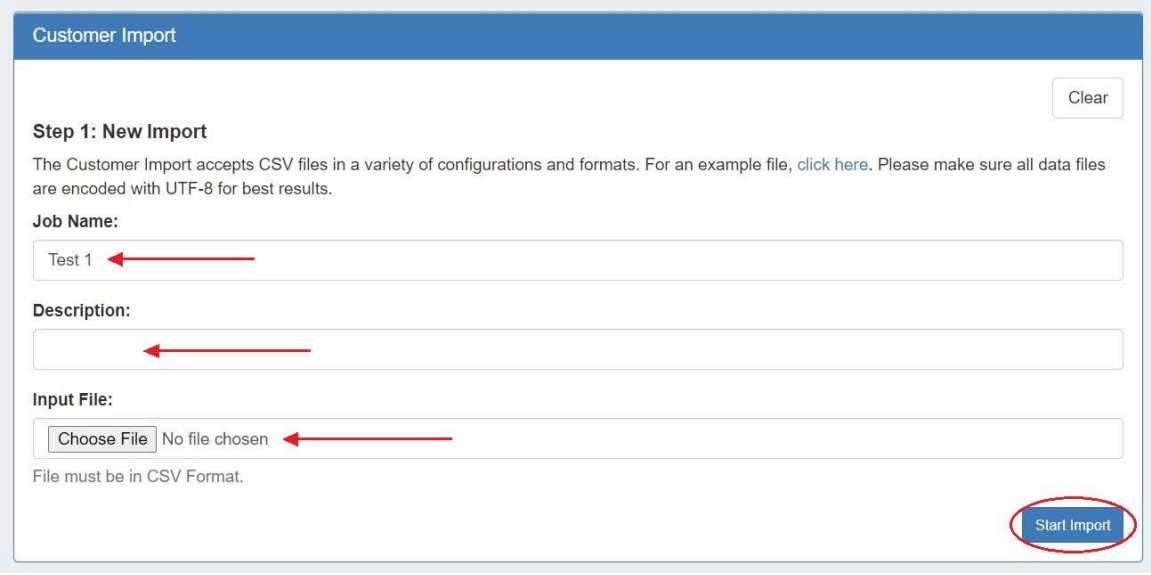
Step 1: Create a new Resource / Customer Import Job

Navigate to the Data Import Tab from the Admin button. Select "Simple Upload / Import from CSV" under "Resource Import".



Create a Job Name and Description for the import. This is especially useful to keep track of progress in cases the data arrives from multiple sources, or will require multiple stages of manual review.

Select the .csv file that you prepared above by selecting the "Choose File" button, and browsing to the correct file location. Then hit "Start Import".



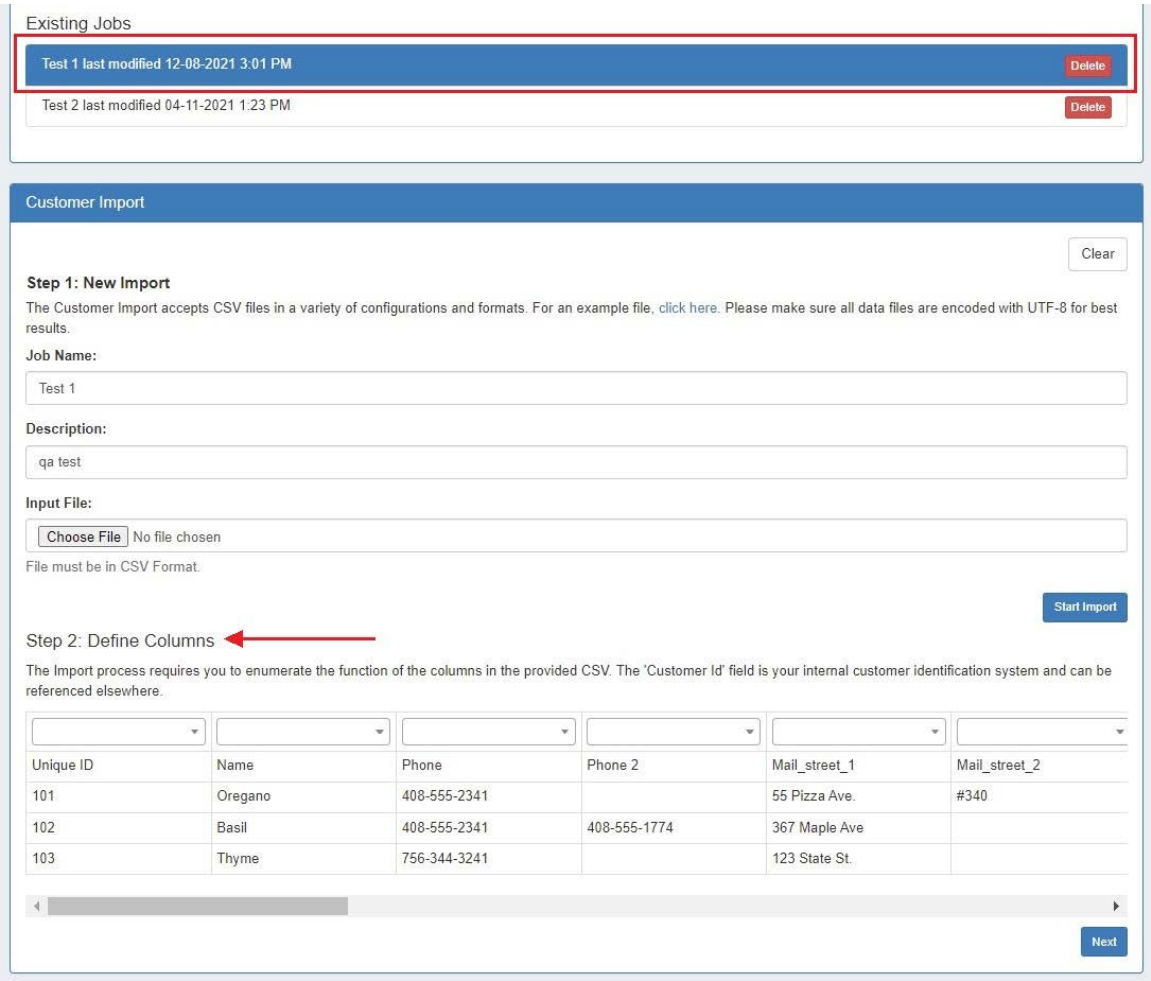
Working with Large or Multiple Data Sets

Although you cannot add new files to an existing job, for jobs with multiple sources for data (which may have different formatting), you can simply create separate jobs and descriptions for each source - no need to manually combine the data into one file before importing. The Import tool's mapping and editing functions will allow for the data to be reconciled in ProVision.

For large data sets where multiple stages of manual review might be needed, you can create a new job using the same set of data files in order to work in parallel on a different portion of the data.

After importing, the new job will appear under the "Existing Jobs" section.

To continue working with this job, select it from the list (by clicking on the link) and the next step ("Define Columns") will appear at the bottom of the page.



Step 2: Define Columns

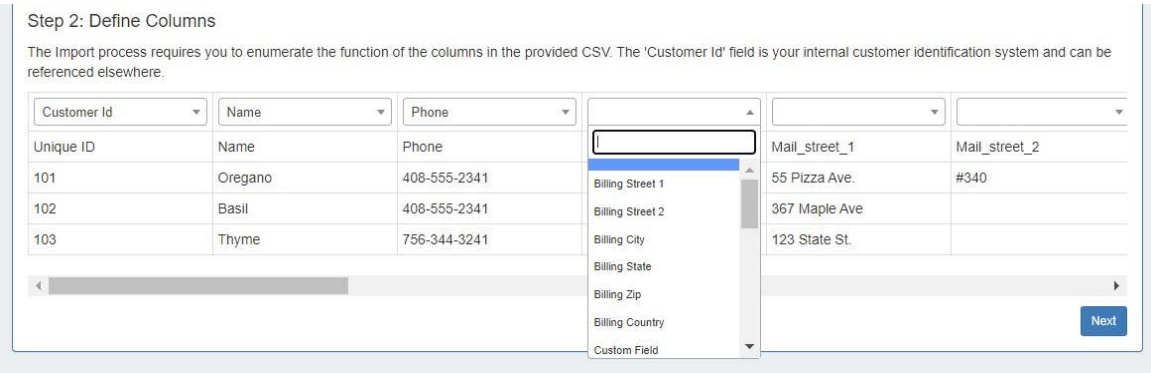
Using the dropdown menu above each data field, select the appropriate definition for each of the imported columns. **Phone** and **Fax** may have multiple columns associated with the data. Other columns which do not apply under the available definitions should be left as blank, and will be skipped during the upload process.

Note: the following fields are REQUIRED:

- Name (Unique Resource / Customer Name)
- Customer ID (Unique non-name identifier)

Make sure that you have defined all desired fields by using the scroll bar below your data to view additional columns.

When completed, hit "Next".



Step 3: Reviewing Data

After supplying the file and defining columns, a review step is provided. Records with errors will show as color coded, and can be filtered to be viewed by All, Valid, Warnings, Invalid, or Ignored.

From here, the records can be edited or ignored. Select "Ignore" for records that you do not wish to import at this time. Records that are Ignored or Invalid will automatically be skipped.

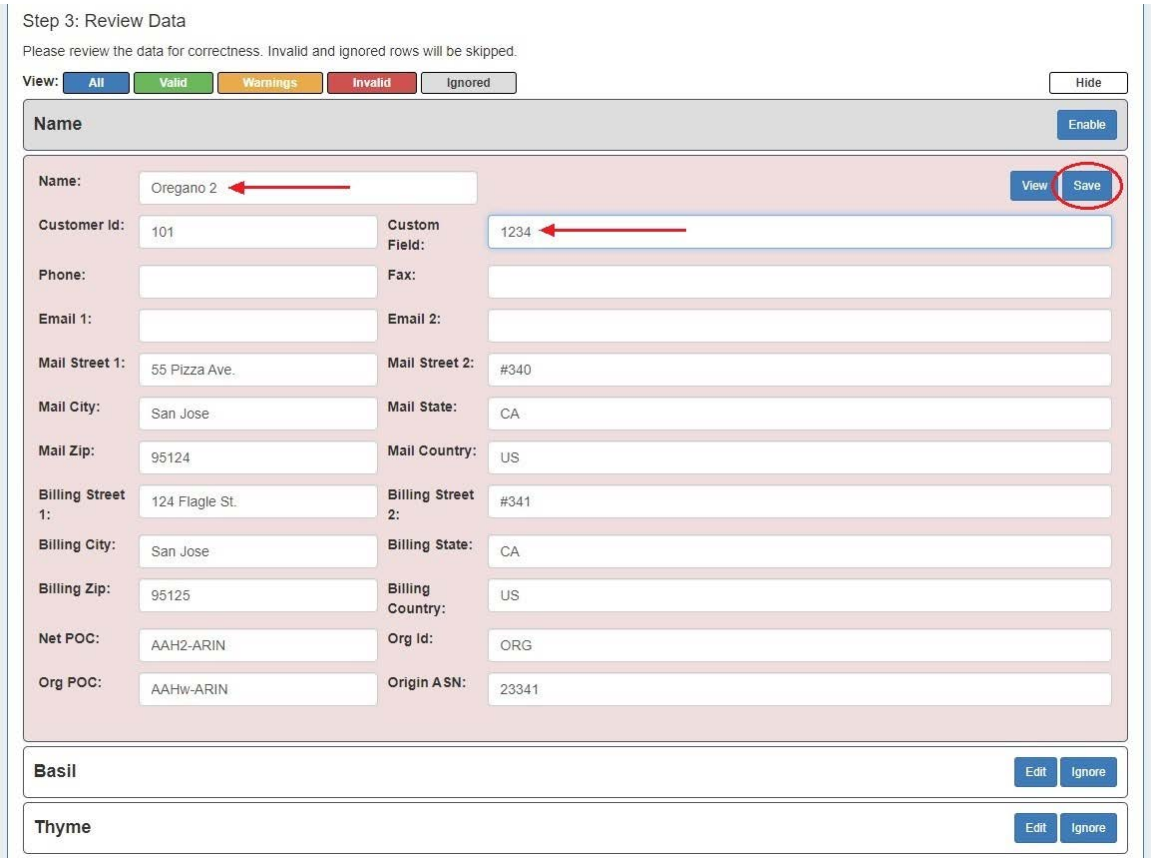
Header Rows

If your .csv has a header row as the first line, that row will be shown as the first record in review data as well. Simply click "Ignore" on the first record to disregard the row.

For rows with an "Invalid" or "Warning" status, you may wish to edit the record to change information to a valid option.



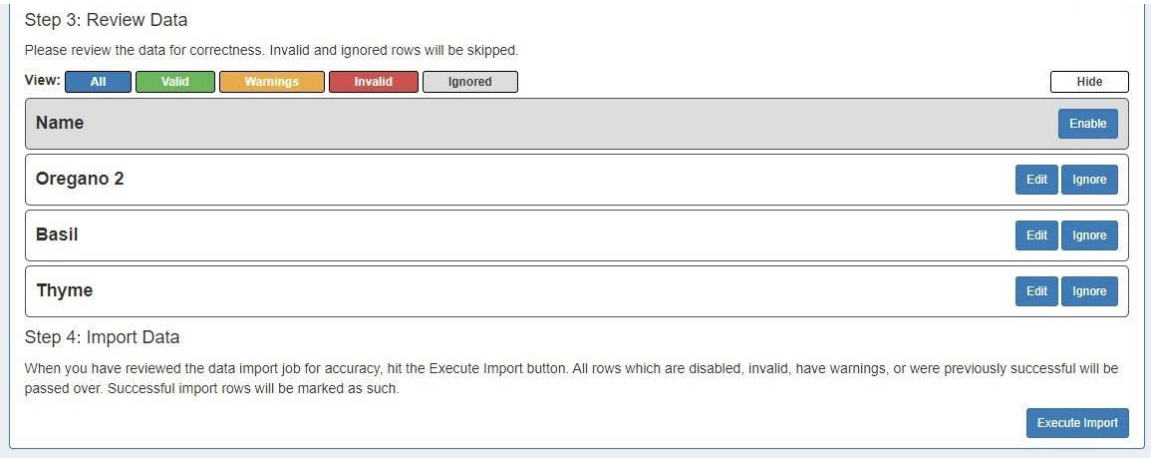
Hitting the "Edit" button for the record provides options to change or add information for available fields.



In this example, as "Name" was the invalid field, it has been updated to a unique value. The "Custom Field" value has been added as well.

After making the desired edits, hit "Save".

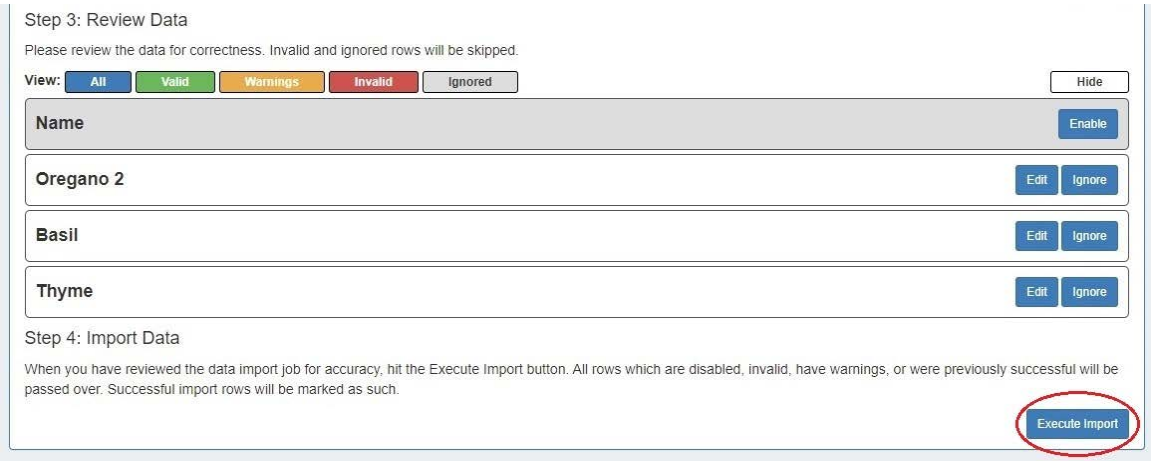
The data record will be re-checked for validity, and will have a white background if it is now valid for import.



After data has been reviewed for accuracy, you may execute the import.

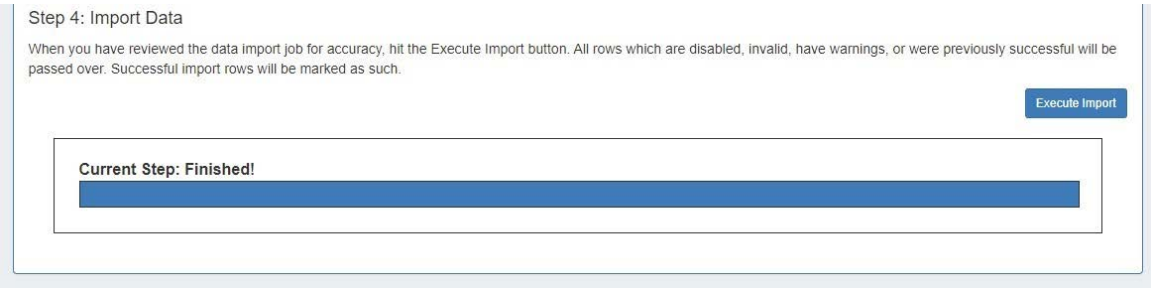
Step 4: Execute Import

When the review step is completed, hit the "Execute Import" button.



A progress bar will appear to and display the records as they are imported.

When the bar reaches 100%, and displays "Current Step: Finished!" the import is complete, and you may leave the page.



Additional Information

For more import options, see:

- Resource Import Tool
- Import Peering Sessions
- IP Import from CSV
- Import Aggregate Blocks
- Import DNS Zones

Resource Import Tool

Importing Resources

- The Resource Import Tool
- Before You Begin
- Opening the Resource Import Tool
    - The Resource Import Tool UI
- Resource Importer Walkthrough

The Resource Import Tool

The Resource Import Tool (in beta) allows you to import resource data from a .csv file into ProVision. In the Resource Import Tool, you can open one or more user-created .csv spreadsheets, perform basic editing functions if needed, associate the data to a specific Section, and correlate the data columns to specific Section Fields.

In ProVision, since Resources can be any desired entity, and Sections can be anything from "customers" to "firewalls" to "racks", you have total flexibility in what type of data to import with the Resource Importer to meet your specific company needs. Check out Working With Resources, Customizing Sections, and Customizing Fields for more details on how to fit these elements to your business.

Before You Begin

There are a few items that you will need have set up prior to using the Resource Importer Tool. Ensure that you have:

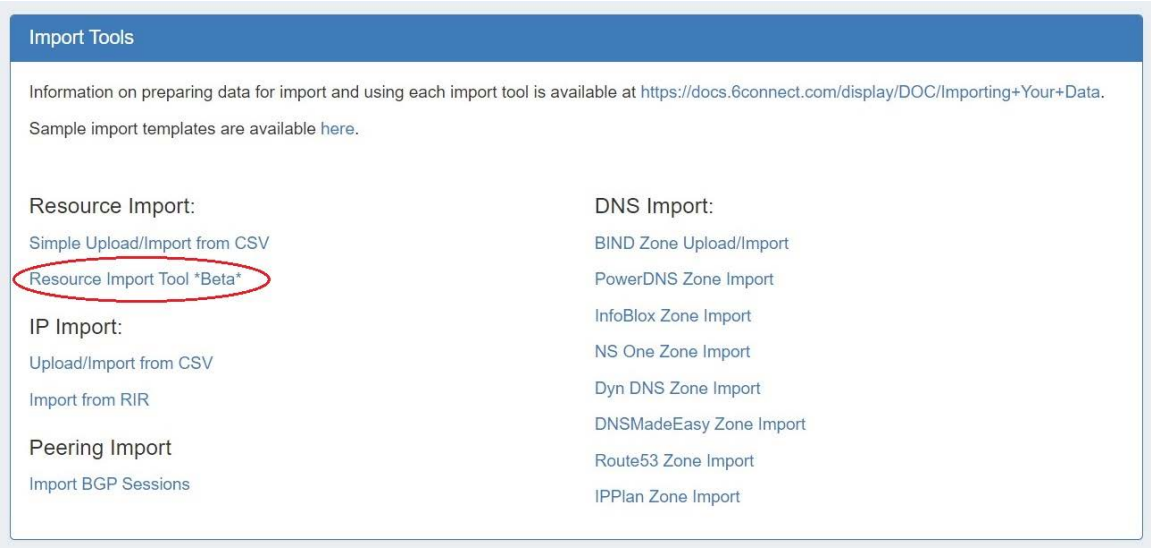
- The .csv document you wish to import saved with UTF-8 encoding. Windows, Mac, and Linux type .csv files are supported.
- A header row for the data in the .csv.
- The .csv file should be "clean", that is, only contain the data to be imported and a header row for that data.
- A Section created in ProVision with fields that correlate to the import data. For example, if you wish to import a list of contact information, there will need to be a Section in ProVision created for "Contacts", with fields such as "First Name", "Last Name", "email address", "Phone number", and so on. To create a new Section, or edit an existing Section, refer to Working With Resources, Customizing Sections, and Customizing Fields.

> If the above preconditions are not met, the Resource Importer Tool may not be able to correctly read the .csv file or complete the import. Verify UTF-8 .csv encoding, a clean dataset with a header row, and that an appropriate Section exists in ProVision prior to import.

> **Best Practice**
>
> To ensure a fast and straightforward resource import, best practice is to verify ahead of time that your .csv data is correct and contains all the necessary column information for the Section. This includes a top-level Name and Unique ID, as well as a column per Section field. Data edits and column adjustments can be performed inside the Resource Importer Tool if necessary, but will require additional time and steps.

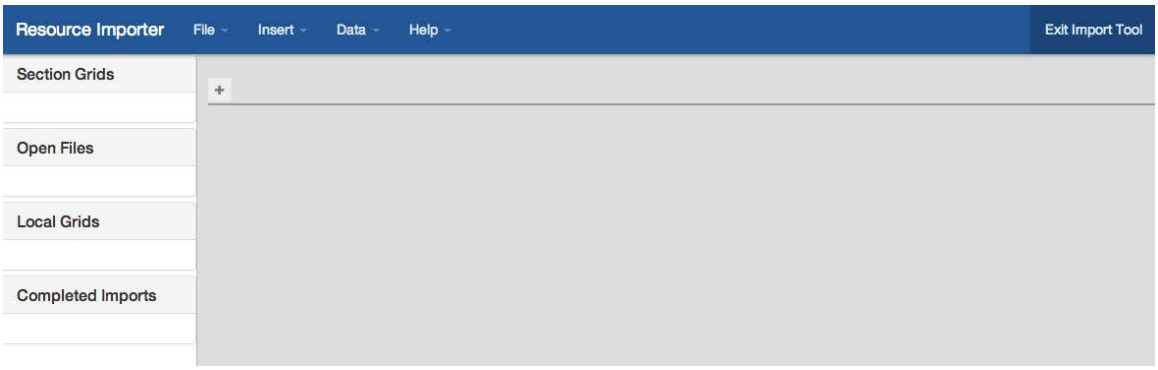
Opening the Resource Import Tool

To open the Resource Import Tool, navigate to the Data Import Tab from the Admin button to import your aggregate blocks. Select "Resource Import Tool" under "Resource Import".



The Resource Import Tool UI

When you first open the Resource Importer, you will be given the option to view a short on-screen guide to using the tool. After stepping through the guide and/or exiting out of it, the tool will look like this:



On the top are standard menu options of "File", "Insert", and Data" and "Help". Under those menus, you may see greyed-out functions listed. Those functions are items under development, or not available to use at the current Importer step.

On the left side of the screen is a listing of currently opened files:

Sections Grids lists grids currently open that were created from a ProVision Section

Open Files lists the current user created .csv spreadsheets that are open

Local Grids lists any grids that were created in the tool itself, instead of opened from an external file

Completed Imports show imports which have been completed and imported into ProVision

If, at any time, you need to leave the Resource Importer Tool, select the "Exit Import Tool" in the top right corner of the screen, and you will be taken back to the ProVision Dashboard.

Exiting the Resource Importer Tool prior to completing the import process will result in the current open grids being discarded.

Resource Importer Walkthrough

For a step by step walkthrough of the Resource importer, continue on to the Resource Importer Walkthrough , which shows how to import a sample contact list and perform minor editing tasks.

- Step 1 Upload your .csv data file
- Step 2 Open a Template Grid from an existing Section
- Step 3 Reorder .csv columns to match the Section Grid column order
- Step 4 Edit Data as Needed
- Step 5 Drag rows from the .csv Grid to the Section Grid
- Step 6 Import into ProVision

Resource Importer Walkthrough - Step 1

Importing Resources

Before You Begin

Ensure that you are familiar with the overview and "Before you Begin" requirements listed on the Resource Import Tool page.

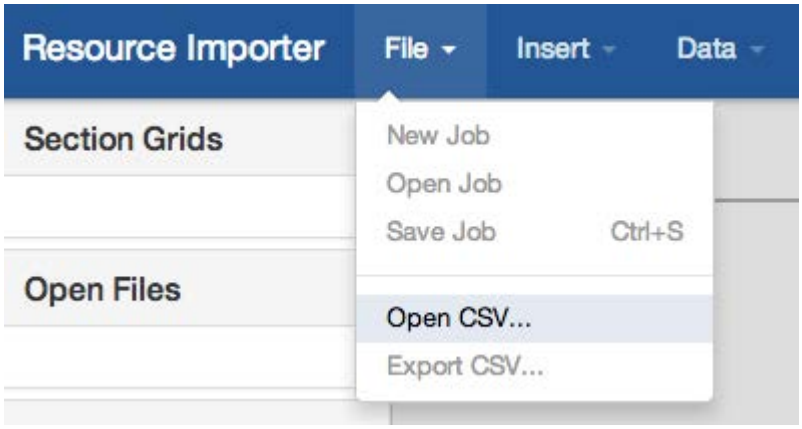
For this tutorial, we will be using the Contact Import Sample .csv available on the Import Templates page as an example, and associating it to an existing Section called "Contact" having the fields: First Name, Last Name, Email, 2nd Email, Phone, 2nd Phone, Mobile Phone, Role, and Time Zone. To create this Section, or edit an existing Section, refer to Working With Resources, Customizing Sections, and Customizing Fields.

In order to illustrate the abilities of the Resource Importer to edit data and adjust for formatting issues, the Contact Import Sample .csv is used intentionally leaving a few less-than-ideal conditions (much like you may encounter in real life) such as leaving typos, having an extra data column, and missing a needed column. If you follow the "Before you Begin" requirements and "Best Practice" notes, however, you may be able to skip any editing or column adjustment steps.

When you are ready to begin, open the Resource Importer and proceed to Step 1.

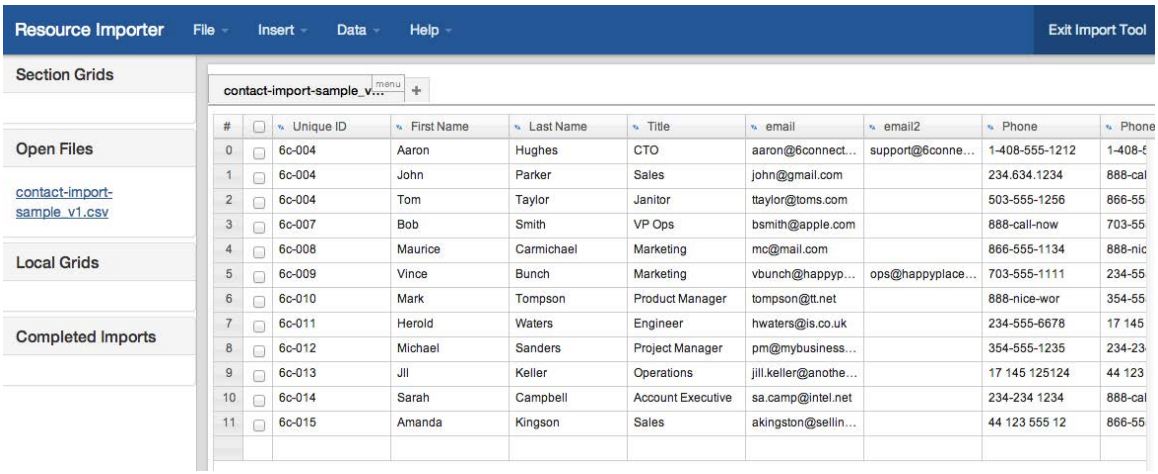
Step 1: Upload your .csv data file

Under the "File" Menu, select "Open .csv". Browse to and select your UTF-8 encoded data file.





After hitting "OK", your file should be visible in the workspace, as well as listed under "Open Files" like this:



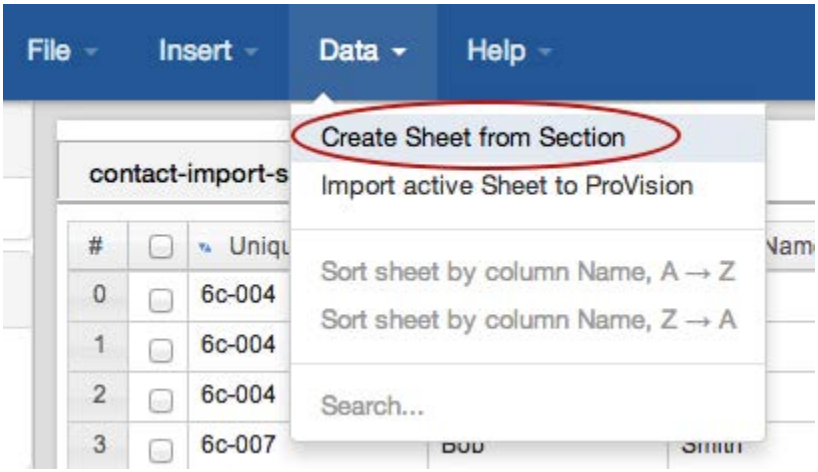
After opening your .csv grid, proceed to Step 2 - Open a template grid from an existing Section

Resource Importer Walkthrough - Step 2

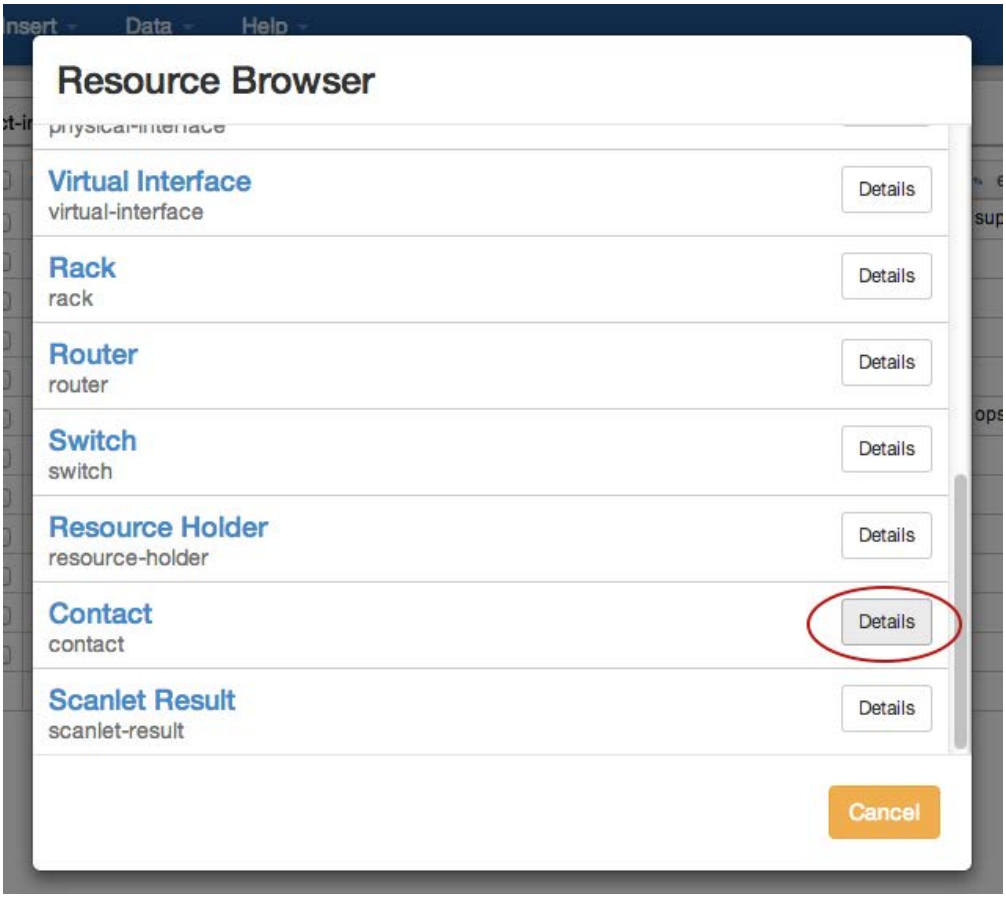
Importing Resources

Step 2: Open a Template Grid from an existing Section

Under the "Data" menu, select "Create Sheet from Section".

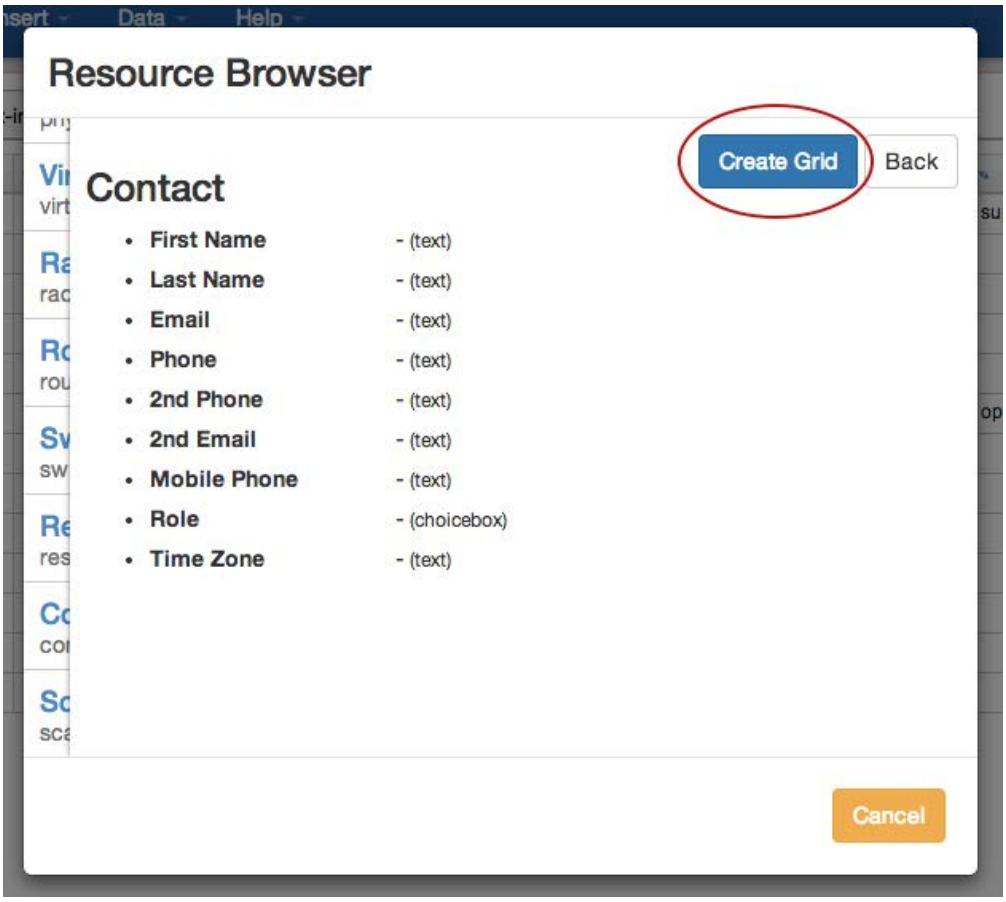


The Resource Browser will pop up, showing the list of Sections currently available in Provision. Clicking on the "Details" button will show the fields for that Section.

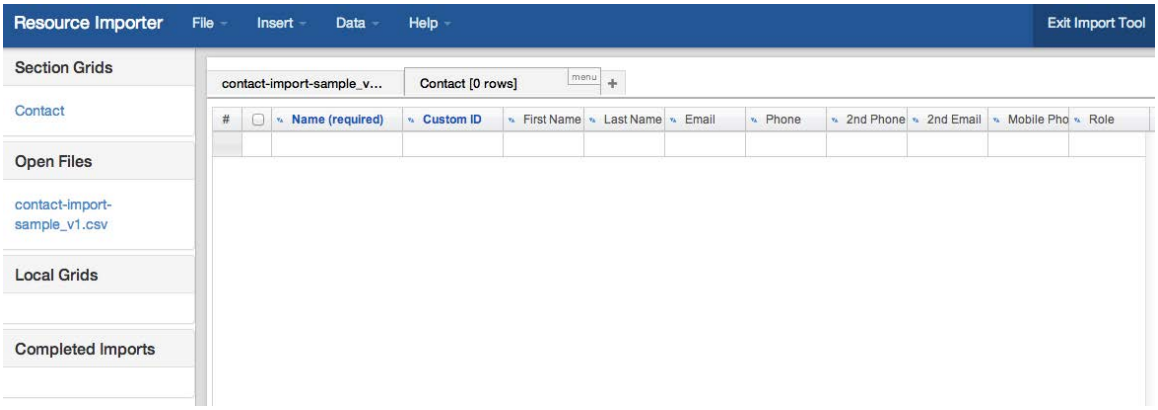


Verify that the Section and available fields match the type of data you are trying to import. In this case, the Section "Contact" has the fields that correlate to our spreadsheet data.

Select "Create Grid" to create a grid based off this Section.



When the Section Grid has been created, required fields will show in blue font with (required) after the header, in this case, "Name" is a required field. The "Custom ID" field is metadata allowing for a unique ID to be associated with each entry, but is not necessary for a successful import. The remainder of the headers directly match the Section's fields.



After you have opened your Section Grid, proceed to Step 3: Reorder .csv columns to match the Section Grid

Resource Importer Walkthrough - Step 3

Importing Resources

Step 3: Reorder .csv columns to match the Section Grid column order

One of the most important steps is to reorder the columns from the .csv data to match the order of the Section Grid headers - think of the importer as copying and pasting the csv data into the "Contact" Section grid- we want to ensure that the data is under the correct headers!

Click on the column header to Drag and Drop to the desired location:



#		Unique ID	Last Name	First Name
0	☐	6c-004	Hughes	Aaron
1	☐	6c-004	Parker	John
2	☐	6c-004	Taylor	Tom
3	☐	6c-007	Smith	Bob

Click back and forth between the tabs to verify the column order, then click on a header and drag and drop into the desired order. This moves not only the header, but also the data below it.

Common Column Editing Questions

What if just my column headers are in the wrong place?

What if I have too many / too few columns in my .csv to match the Section Grid?

If you see any of these issues, proceed to Step 4 - Edit data as needed.

Otherwise, if your columns match up perfectly and none of the data needs editing, skip to Step 5 - Drag rows to the Section Grid

Resource Importer Walkthrough - Step 4

Importing Resources

Step 4: Edit data as needed

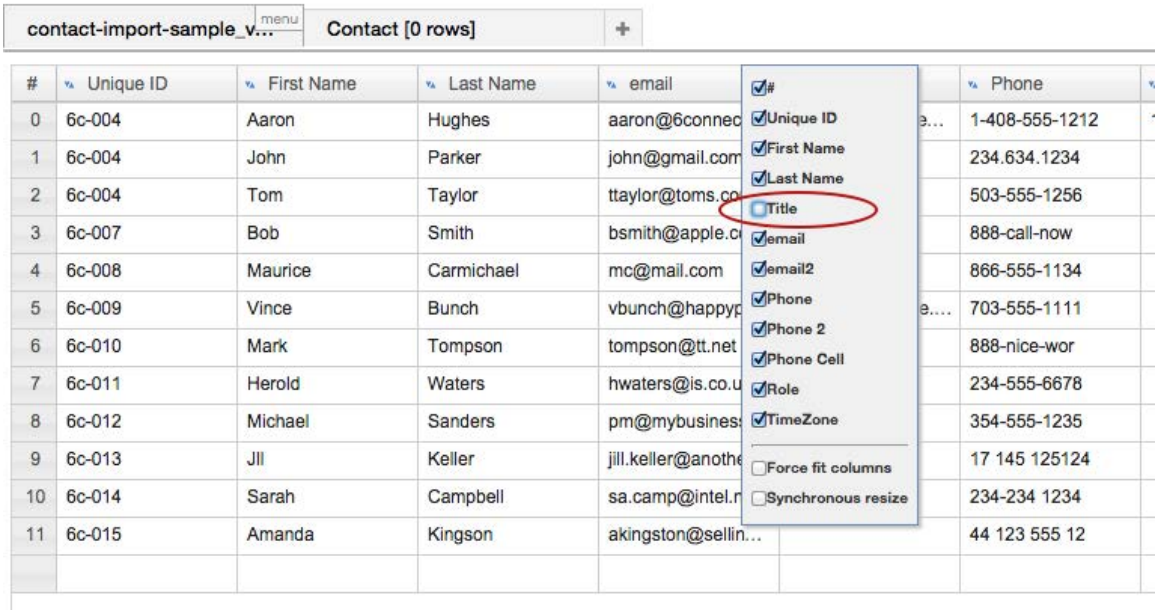
As you may have noticed in Step 3, with this example we have a couple of columns that don't quite match up to the Section Grid. The "Title" column in the .csv data is an additional column we are not tracking in our Section. Also, although we have a "First Name" and "Last Name", we are missing a data column for the top-level "Name" required in the Section Grid.

Common Editing Questions:

- What if I have too many / too few columns in my .csv to match the Section Grid?
- What if I see a typo in the .csv data?
- What if just my column headers are in the wrong place?

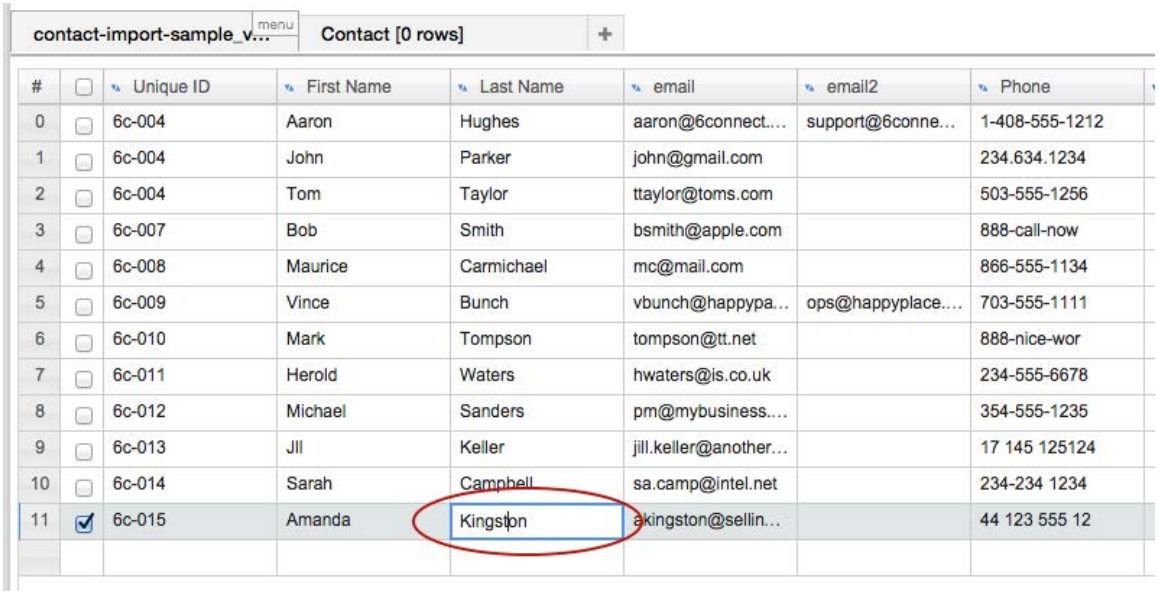
To Hide Extraneous Column Information:

Right click on a header and deselect the check box for the column you wish to hide. In this case, we want to hide "Title".



To Edit Data in the Resource Importer

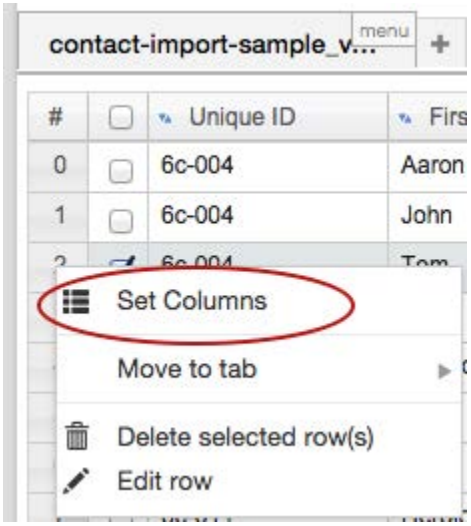
Data in the grids can be edited directly by clicking on the cell(s). In our example, we can see that "Amanda Kingson" should really be "Amanda Kingston". Let's fix that! Click in the cell, type in the edit you wish to make, and then click outside of the cell to exit edit mode. To edit a full row of data, you can right click on the row, select "Edit" row, and make multiple changes in the form box.



If a column header is over the wrong data:

If just the header is in the wrong spot (doesn't match the data below it), you can move just the column header in the Resource Importer, without moving the data below it.

1) Right click on a row of the grid to edit and select "Set Columns":



2) In the "Change Column Header" dialog box, drag and drop the column header(s) into the desired order. Remember, this only moves the headers, not the data below them! Then, hit "OK".



If your .csv data is missing a data column needed for the Section grid:

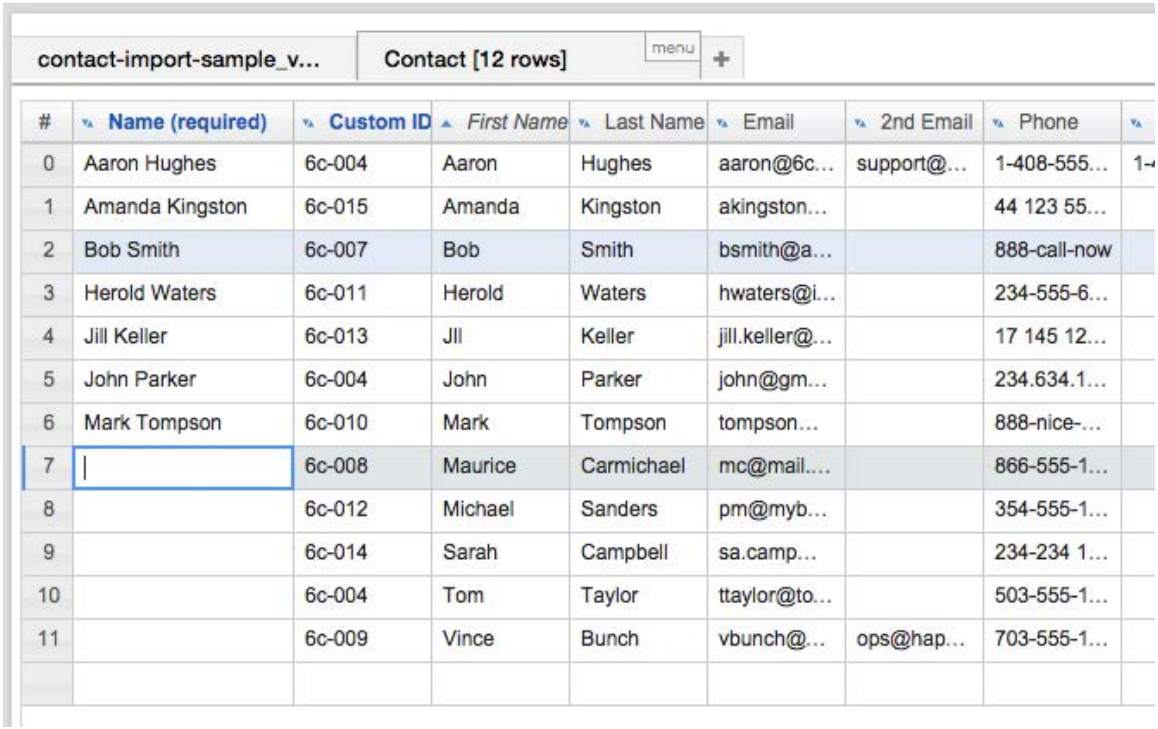
In our case, the .csv data is missing the required "Name" column for the Section grid. Think of the "Name" as the information you would want to search for in Provision. We wouldn't want to search just for "Bob" or "Smith" when looking down a list of names, so under the "Name" column, we need to see the full first and last names, like "Bob Smith".

Currently, our options to fix this are:

1) Edit the .csv directly in your spreadsheet program: (Recommended) Simply revise the .csv to include another column for "Name", and re-open the .csv in the importer. The benefit to this method is your .csv file will be set up as a template for future imports.

Or:

2) In the Resource Importer, temporarily hide the extra column in the Section Grid: Make the columns between the .csv and the Section Grid match exactly by temporarily hiding the column (in this case, "Name") in the Section Grid, proceed to move the data into the Section grid (see Step 5), then unhide the "Name" column and manually add the data as needed prior to completing the import.



#	Name (required)	Custom ID	First Name	Last Name	Email	2nd Email	Phone	
0	Aaron Hughes	6c-004	Aaron	Hughes	aaron@6c...	support@...	1-408-555...	1-
1	Amanda Kingston	6c-015	Amanda	Kingston	akingston...		44 123 55...	
2	Bob Smith	6c-007	Bob	Smith	bsmith@a...		888-call-now	
3	Herold Waters	6c-011	Herold	Waters	hwaters@i...		234-555-6...	
4	Jill Keller	6c-013	Jll	Keller	jill.keller@...		17 145 12...	
5	John Parker	6c-004	John	Parker	john@gm...		234.634.1...	
6	Mark Tompson	6c-010	Mark	Tompson	tompson...		888-nice-...	
7		6c-008	Maurice	Carmichael	mc@mail....		866-555-1...	
8		6c-012	Michael	Sanders	pm@myb...		354-555-1...	
9		6c-014	Sarah	Campbell	sa.camp...		234-234 1...	
10		6c-004	Tom	Taylor	ttaylor@to...		503-555-1...	
11		6c-009	Vince	Bunch	vbunch@...	ops@hap...	703-555-1...	

When edits and adjustments are complete, move to Step 5 - Drag rows to the Section Grid

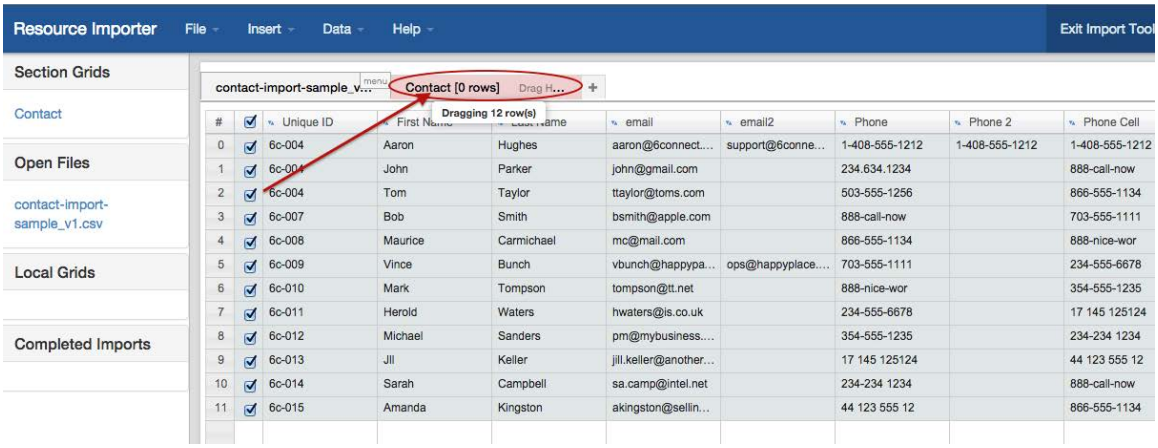
Resource Importer Walkthrough - Step 5

Importing Resources

Step 5: Drag rows from the .csv Grid to the Section Grid

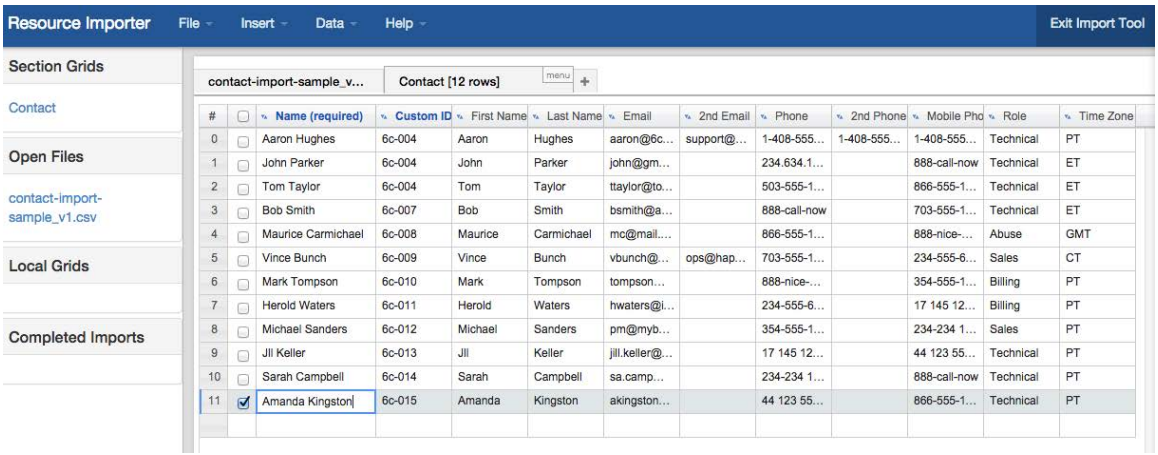
Once you have set the columns to match exactly between the .csv Grid and the Section grid, it's time to pull in the data from one to the other.

Simply click the checkboxes for the rows you wish to import (or use the "Select all" checkbox at the top), click anywhere on the row, and drag & drop onto the Section Grid tab ("Contact"). The tool will tell you how many rows you are moving as you drag them.



Click on the "Contact" tab when you are done, and you will now see your data in there, instead of the original .csv.

If you had to hide columns in the Section Grid prior to moving the .csv data, verify that all columns are visible and the required data filled in. In this case, we filled in the "Name" Column that was missing in the original .csv.



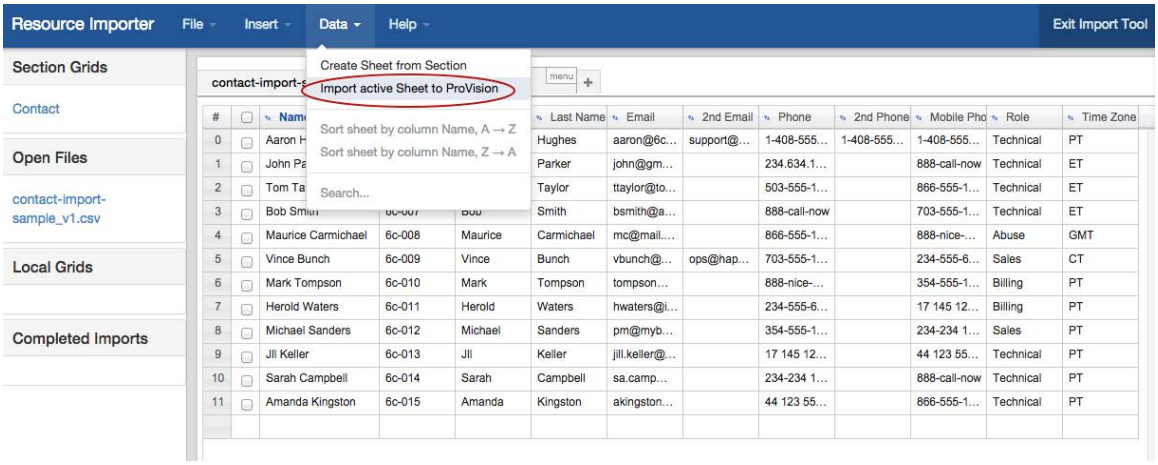
After moving your data into the Section grid, proceed to Step 6 - Importing.

Resource Importer Walkthrough - Step 6

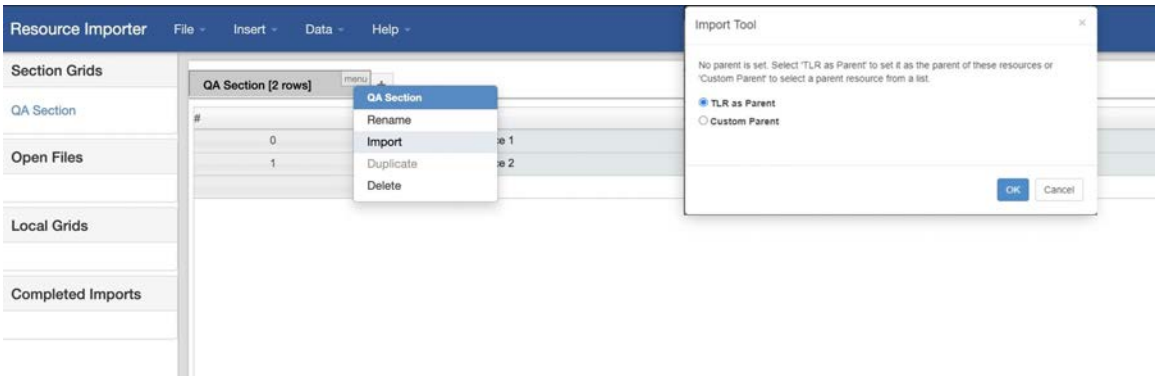
Importing Resources

Step 6: Import into ProVision

When all of the data is under the Section Grid tab, and any required field data filled in, you can import the data into Provision! From the Data menu, select "Import active Sheet into ProVision".



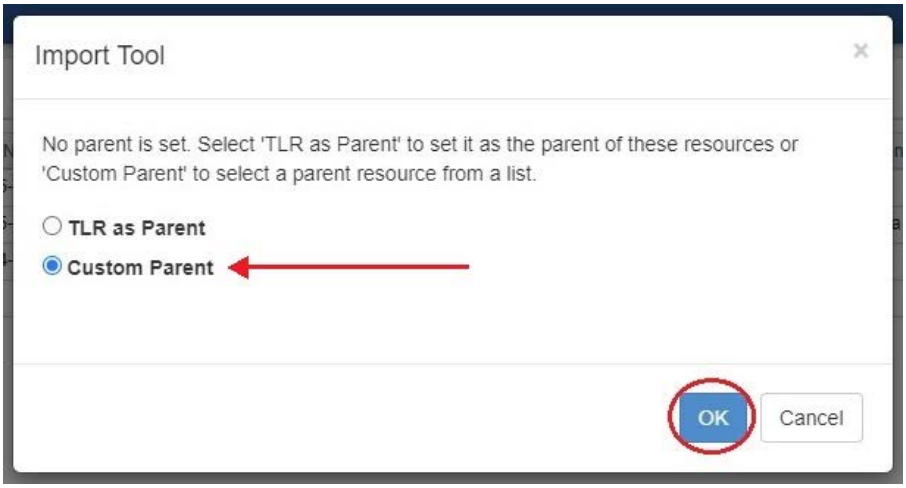
You may also click directly on the grid menu and select "Import".



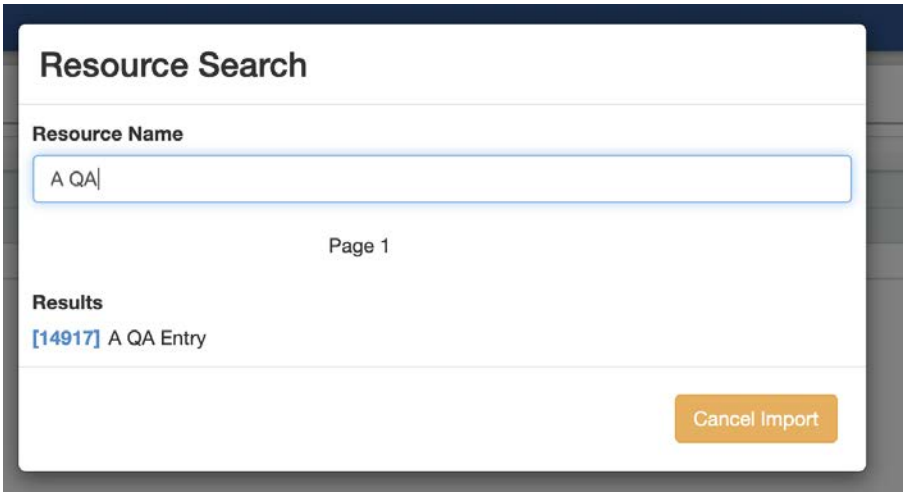
Select Parent Resource

After initiating the import, a dialog box will ask if you would like to assign TLR as the parent resource for the imported items - if so, click "OK".

If you would like to specify a different resource to use as the parent, select the "Custom Parent" option and click "OK".



A "Resource Search" form opens, allowing you to search for a resource. To select the parent resource, click on the ID number (blue link) of the desired resource. You may also cancel the import, if needed.



You will see an import progress bar. Once complete, you data will be in provision, filled into the Section fields for your chosen Resource.



From here, you may review or edit the imported resources from the Resources Tab or Resource Entry page.

Additional Information

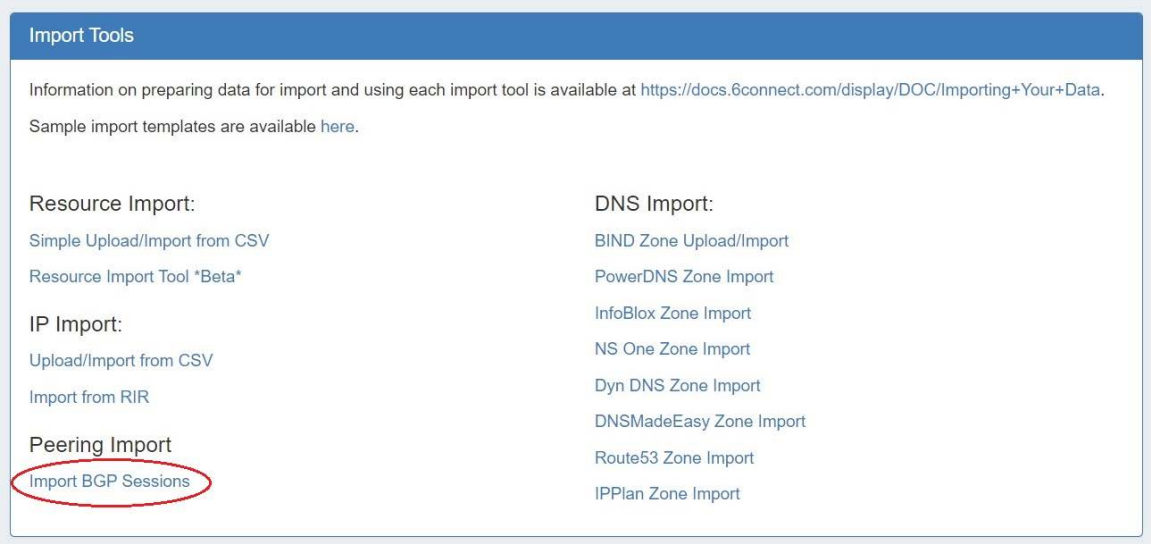
For more information on working with resources or importing, see:

- Resources
- Working with Entries

- Resource Import from CSV
- Resource Import Tool

Import Sessions

Importing BGP Sessions



Importing peering sessions requires Admin-level permissions, and is accessible only from the Admin section of ProVision.

From the Admin section of ProVision, navigate to the **Data Import Tab.** Under Peering Import, select **Import BGP Sessions.** This will take you to the Peering Import section of ProVision.

- Standard BGP Session Import
  - Before You Begin
  - Load Router Sessions
  - Edit Sessions (Optional)
  - Select Groups and Sessions
- Importing with Router File Connectors
  - Step 1
  - Step 2
  - Step 3
  - Via APIv2
- Additional Information

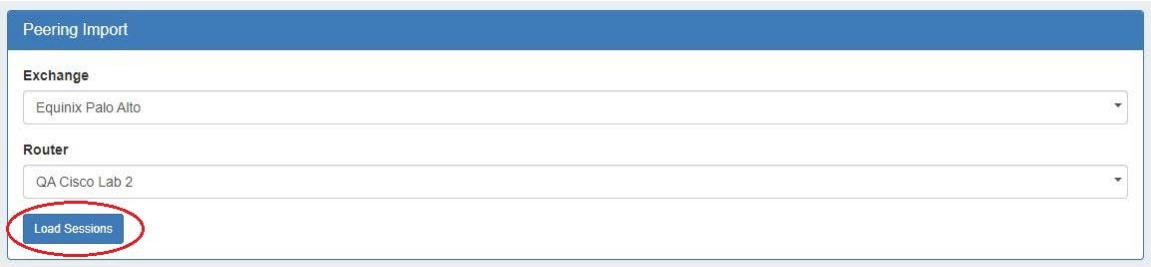
Standard BGP Session Import

Before You Begin

Before attempting a session import, ensure that the applicable exchange and router have been added into ProVision. See Peering Exchanges and Peering Routers for details.

Load Router Sessions

First, select the desired exchange and router. Routers with Logical Systems information will show up as the router name with the Logical System info in parenthesis (e.g. "Juniper (test)"). Then click "Load Sessions".



Peer Group and Sessions will then display below your selections.

Edit Sessions (Optional)

The available peer Groups and Sessions will display below your selected exchange and router.

If edits need to be made to the session prior to import, click on the wrench icon to open field edits.



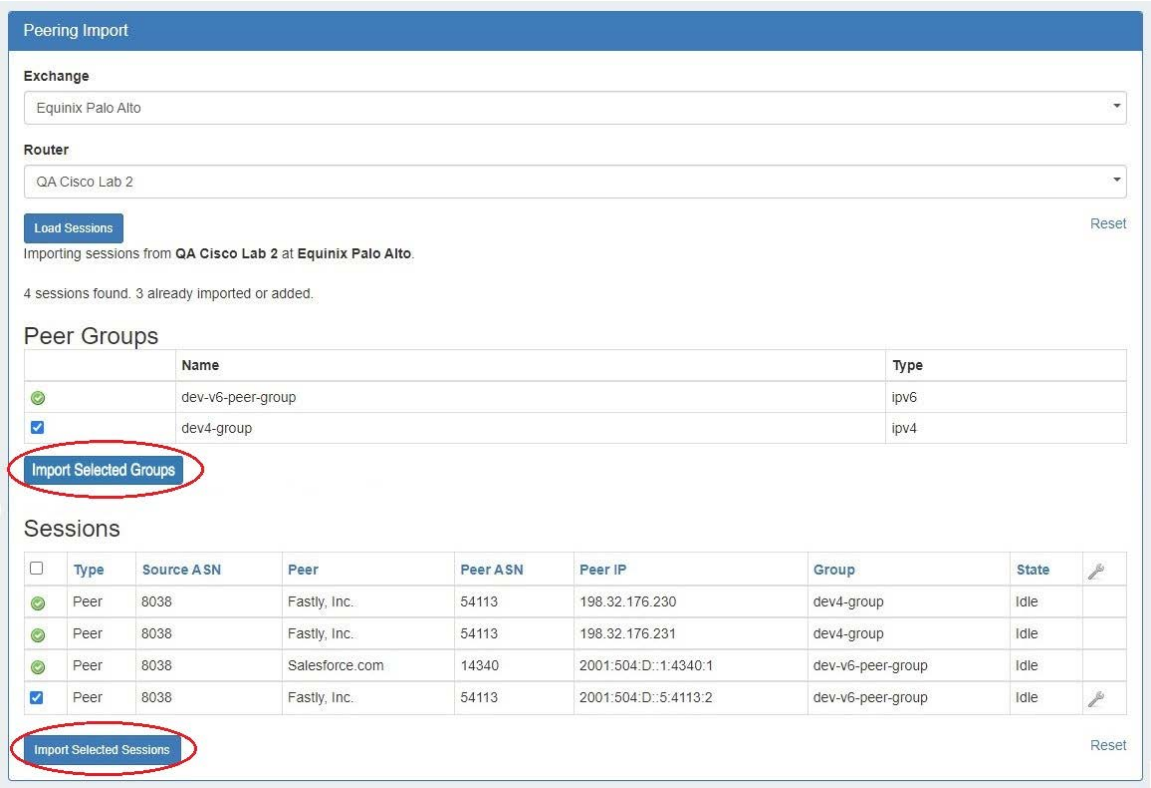
Make the changes to desired field(s), then click "Done" to save your changes and proceed to importing.



Select Groups and Sessions

Lastly, select the check box next to each Session to import (or the check box at the top to select all sessions) and click "Import Selected Sessions".

Successful imports will then display with a green check mark at the beginning of the row.



Once imported, you can manage and configure your sessions from the Peering Tab.

Importing with Router File Connectors

> Note: These connector types are only used for this direct data import process - do not select these for standard ProVision router /session creation, as peering management functions (config pushes, session states, etc) do not obtain a router connection while using File Connectors.
>
> *File Connectors should only be used in rare circumstances where direct router access is unavailable.*

Step 1

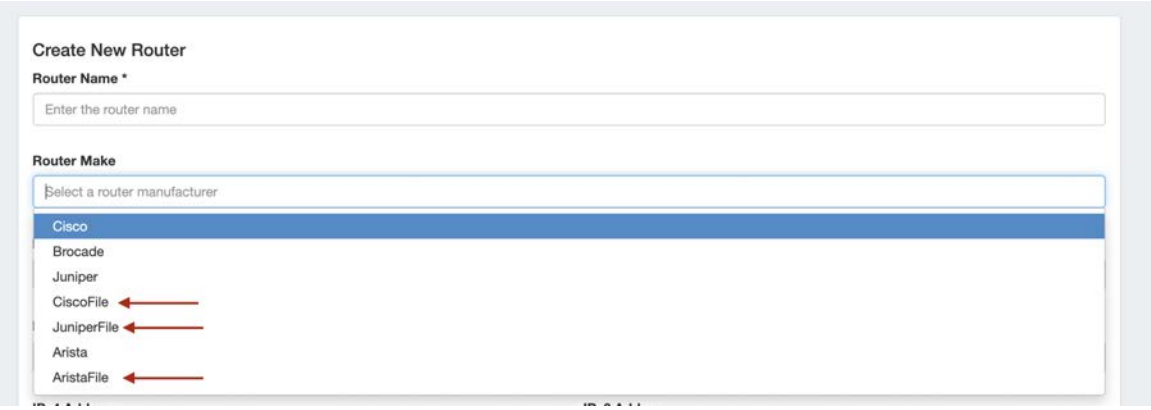
Generate a router response data text file (it should be named “cisco_router_data.txt”, “juniper_router_data.txt” or “arista_router_data.txt”) and place it in ProVision's /data directory.

To generate the router response, run the following commands:

Cisco	Juniper	Arista
terminal length 0 show bgp ipv4 unicast sum show bgp ipv4 unicast neighbor show bgp ipv6 unicast neighbor	show bgp neighbor	display xml	no-more show bgp group	display xml	no-more	terminal length 0 show ip bgp summary show ip bgp neighbors

Step 2

Create a new 'Router' in ProVision, selecting the appropriate file connector as the Router Make type - CiscoFile, JuniperFile, or AristaFile.



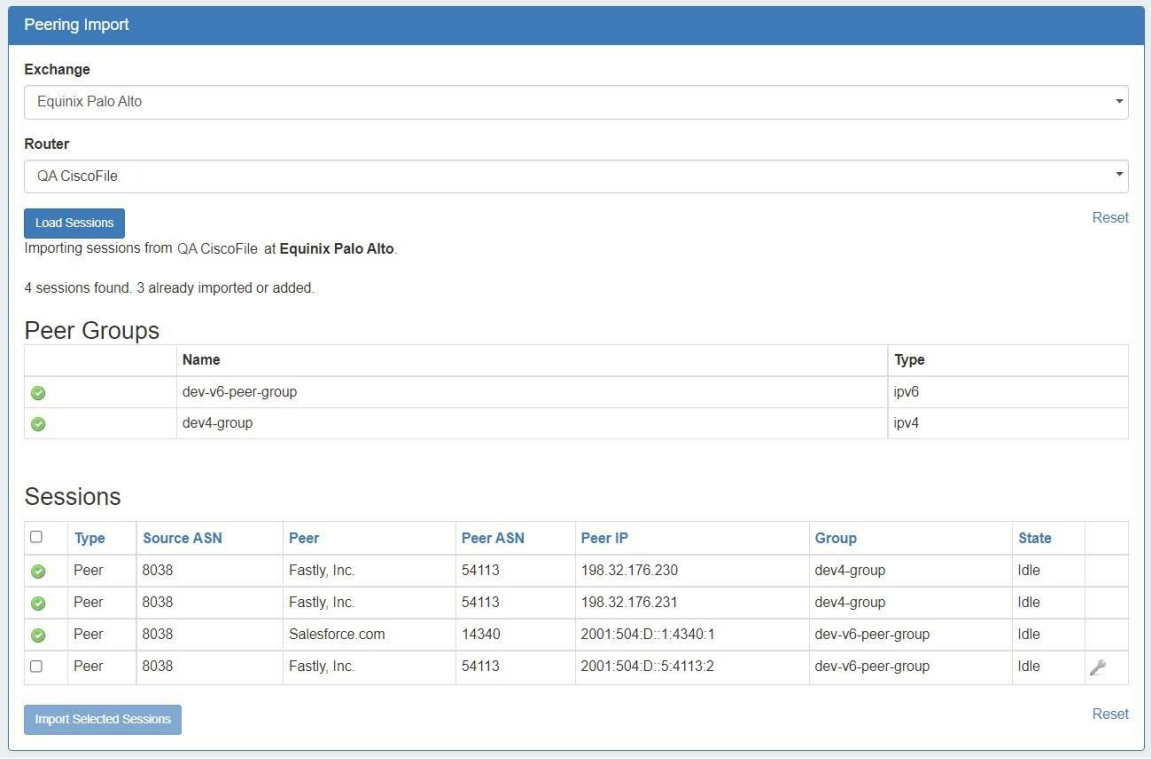
Step 3

Navigate to Admin Data Import Peering BGP Import.

Select the appropriate exchange, then the File Connector Router that you created.



Click "Load Sessions", and the sessions contained within the router data file will be available to review, select, and/or import into ProVision.



Via APIv2

The same import process may also be performed via APIv2, using the following information:

1) "router id" contained within the URL for an already-created File Connector Router

2) "ix_id" (the ID of the exchange) in the body

3) "router_response" (the output from the router) in the body

The APIv2 details can be view from ProVision swagger documentation at ['instance']/dev/swagger/spec.php?family=peering#/default/single_parse_bgp_info

Additional Information

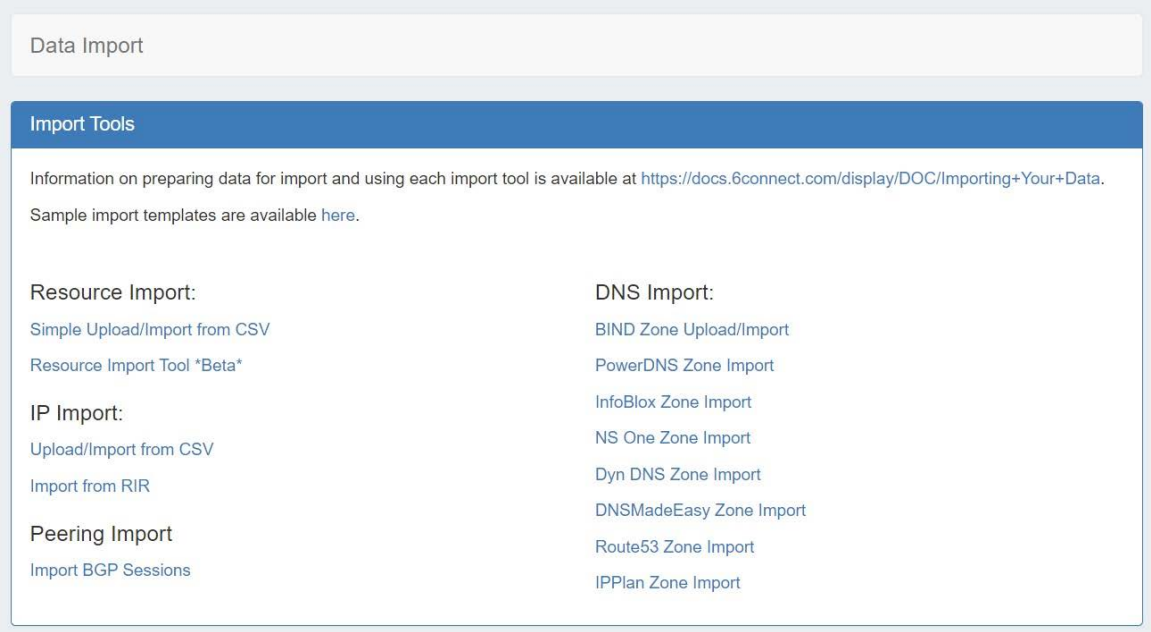
See the following areas for more information on working with Peering tasks:

- Peering
- Peering Exchanges
- Peering Routers
- Peering Sessions

IP Import from CSV

Simple Upload / Import from CSV

The Upload / Import from CSV tool is used if you have a simple .csv file with IP block information, such as CIDR, mask, ASN, RIR, etc. It is accessed from the Data Import Tab from the Admin section.



To import your IP block information, follow the following steps:

- Methodology
- Before you Begin: Prepare your Data for Import
- Import Your Data
  - Step 1: Create a new IP Import Job
  - Step 2: Define Columns
  - Step 2.5: Missing References
  - Step 3: Reviewing Data
  - Step 4: Execute Import
  - Post Import Followup
- Additional Information

Methodology

The Import from CSV tool will create Top-Level Aggregates and place blocks under those aggregates based on the following method:

First, the importer will parse through the provided data, order all blocks from largest to smallest, then attempt to split the largest block out of an existing block matching the IP space and RIR. If that fails (no larger block exists), then that block is added in the system as its own Top-Level-Aggregate. Subsequent blocks will undergo the same process.

This method ensures that your list of IP blocks does not need to be organized in any particular order.

> If your import includes a large number of small blocks (/30s, /32s), be sure you've included at least one large block which encompasses them (/24, /22). This will ensure that the smaller blocks are neatly organized under the larger block, rather than imported as their own Top-Level Aggregates.

Before you Begin: Prepare your Data for Import

The Upload / Import from CSV tool requires only a .csv file for importing.

Be sure to review "Preparing Data for Import" on the Importing your Data page before you begin. Verify that your .csv is correctly parsed and cleanly formatted with your IP block information (using your choice of the available field list shown below), and is UTF-8 encoded for best results.

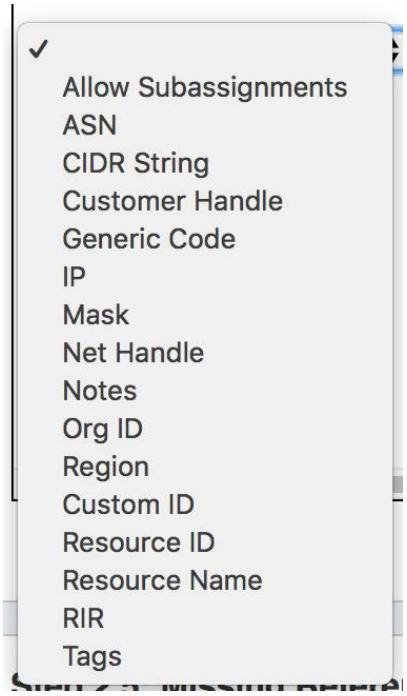
Common normalization steps required for ProVision IP imports include:

- Remove any empty rows in the data range
- Remove any empty columns in the data range
- Remove stray data from inside and outside the data range, such as:
  - notes, comments, and placeholder text as field values, when not set as their own data column
  - nested secondary information located in additional rows under a primary record
- Ensure proper data formatting
  - Check for data formatting errors - a common issue is leading zeros being dropped from a ZIP field when a file is opened. Re-specify format as needed.
  - Ensure each field has consistent formatting for values

Data Encoding Format

To ensure correct importing of any special characters, make sure to use UTF-8 encoding for your CSV file!

This tool supports the following fields:



Required Fields

For IP Import from .csv, the following fields are REQUIRED:

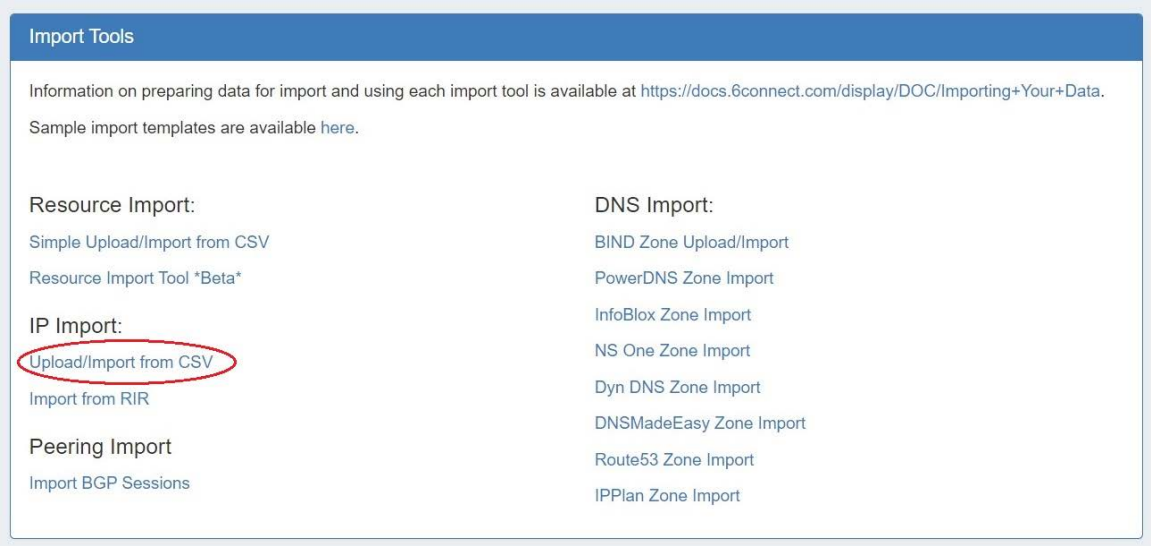
- CIDR String OR both IP and mask
- RIR OR a selected default RIR

All other fields are optional.

Import Your Data

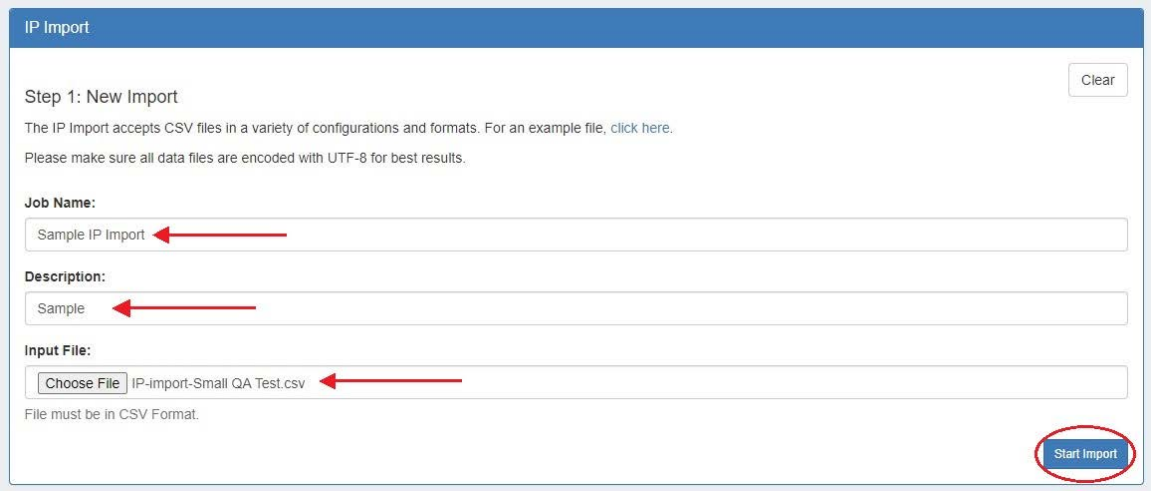
Step 1: Create a new IP Import Job

Navigate to the Data Import Tab from the Admin button. Select "Upload / Import from CSV" under "IP Import".



Create a Job Name and Description for the import. This is especially useful to keep track of progress in cases the data arrives from multiple sources, or will require multiple stages of manual review.

Select the .csv file that you prepared above by selecting the "Choose File" button, and browsing to the correct file location. Then hit "Start Import".

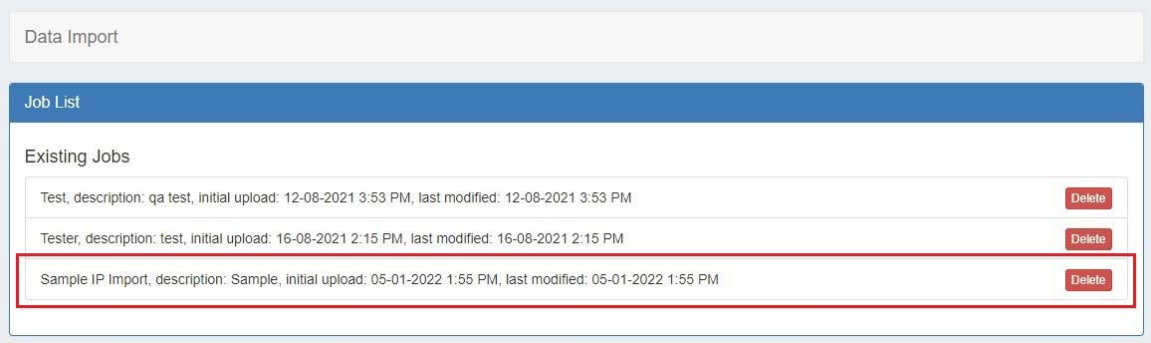


Working with Large or Multiple Data Sets

Although you cannot add new files to an existing job, for jobs with multiple sources for data (which may have different formatting), you can simply create separate jobs and descriptions for each source - no need to manually combine the data into one file before importing. The Import tool's mapping and editing functions will allow for the data to be reconciled in ProVision.

For large data sets where multiple stages of manual review might be needed, you can create a new job using the same set of data files in order to work in parallel on a different portion of the data.

After importing, the new job will appear under the "Existing Jobs" section. To continue working with this job, select it from the list (by clicking on the job name) and the next step will appear on the page.

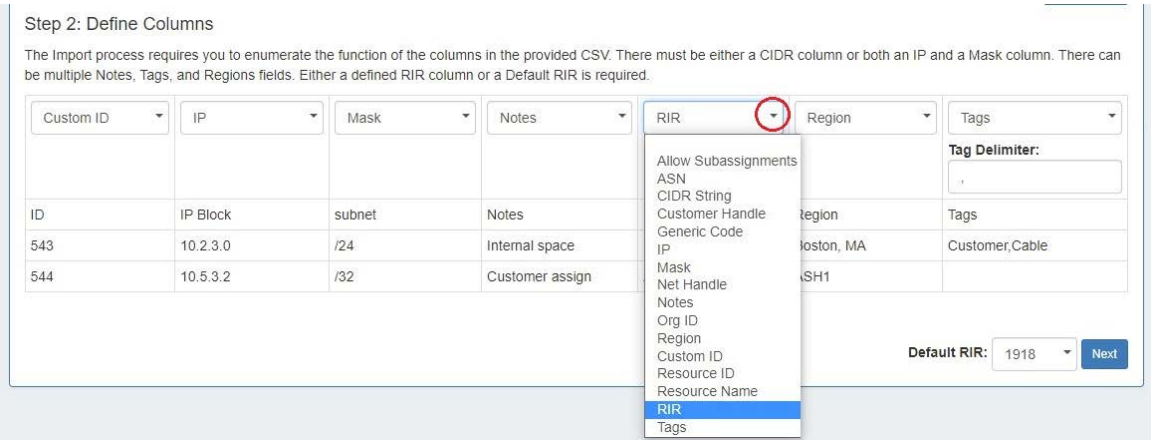


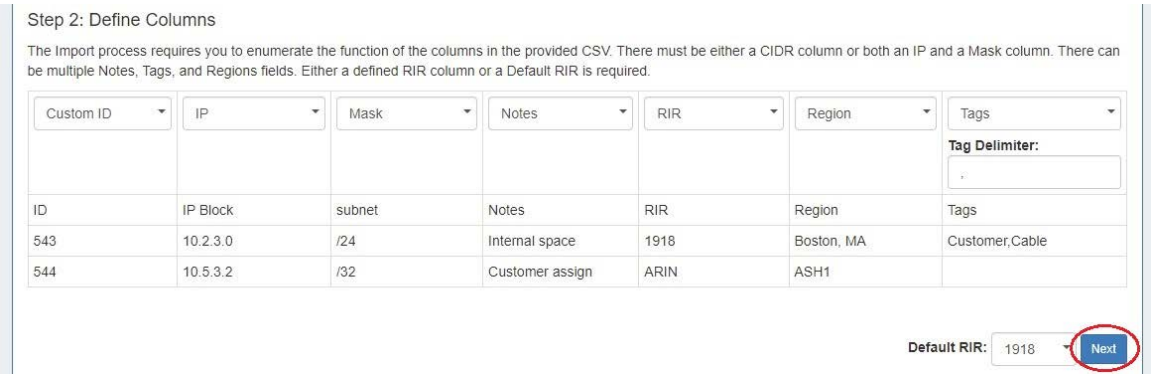
Step 2: Define Columns

Using the dropdown menu above each data field, select the appropriate definition for each of the imported columns.

- **CIDR** or **IP/mask** fields must be provided
- **Notes, Tags,** and **Regions** may have multiple columns associated with the data.
- If you do not have a defined **RIR** column, you must select a default RIR to associated the blocks to.

Other columns which do not apply under the available definitions should be left as blank, and will be skipped during the upload process.





When completed, hit "Next".

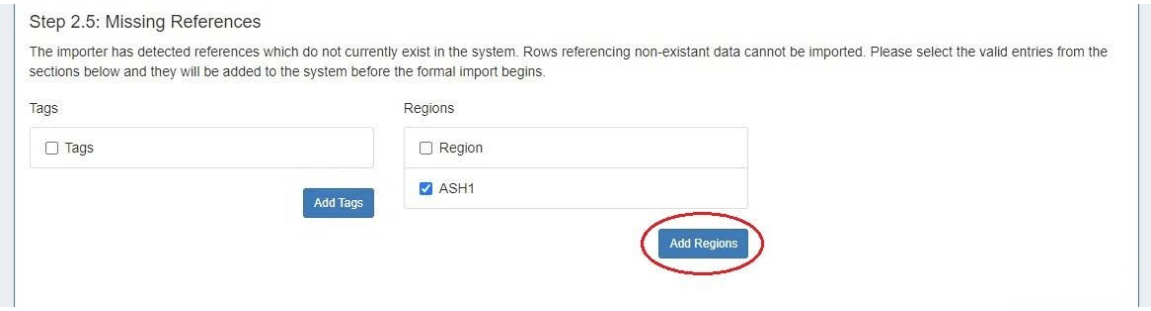
Step 2.5: Missing References

If references exist in your data that do not currently exist in ProVision (such as new tags or resources) the import tool will alert you to the missing references, and give you the option to create those references in ProVision. If you wish to add these elements, select the checkboxes next to the element and click the "Add (Element name)" button below.

Header Rows

If your .csv has a header row as the first line, that row may give information that produces a missing reference notice - such as "Tag", "Region", "Block", and so forth.

If this is the case, simply uncheck that item and add only the desired references.



In this example, we get a notification that we are missing a tag named "Tags". However, we know by looking at our data that is simply an item that was part of the header line in the .csv, so we want to bypass this step.

Step 3: Reviewing Data

After supplying the file and defining columns, a review step is provided. Records with errors will show as color coded, and can be filtered to be viewed by All, Valid, Warnings, Invalid, or Ignored.

From here, the records can be edited or ignored. Select "Ignore" for records that you do not wish to import at this time. Records that are Ignored or Invalid will automatically be skipped.

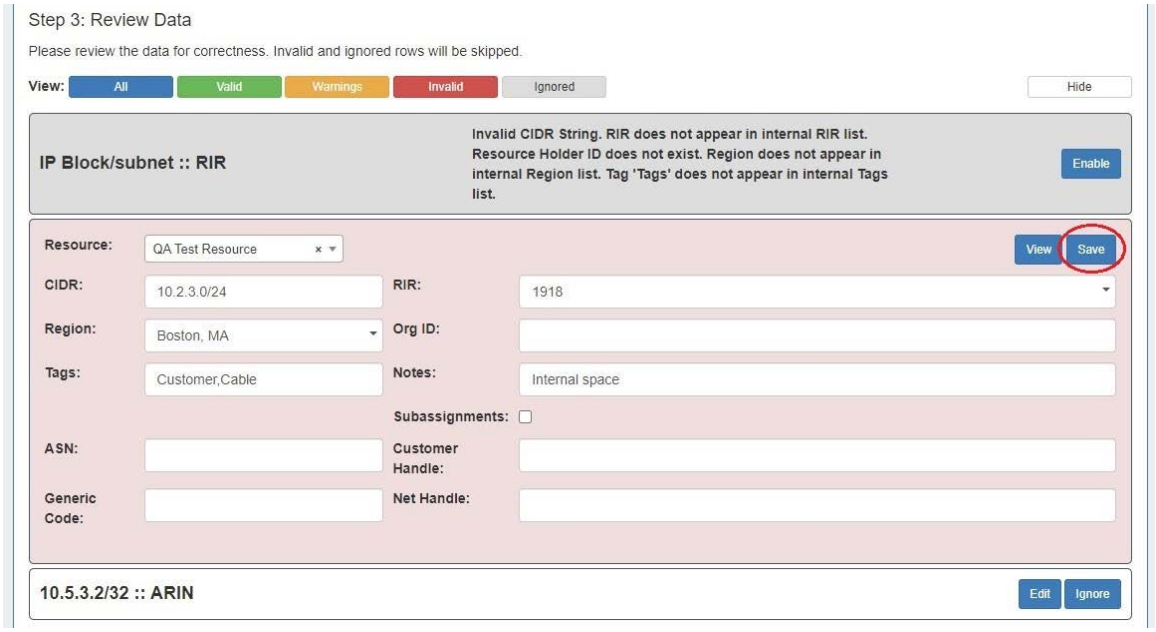
Header Rows

If your .csv has a header row as the first line, that row will be shown as the first record in review data as well. Simply click "Ignore" on the first record to disregard the row.

If warnings or invalid entries are found, you may edit the data by clicking the "Edit" button.

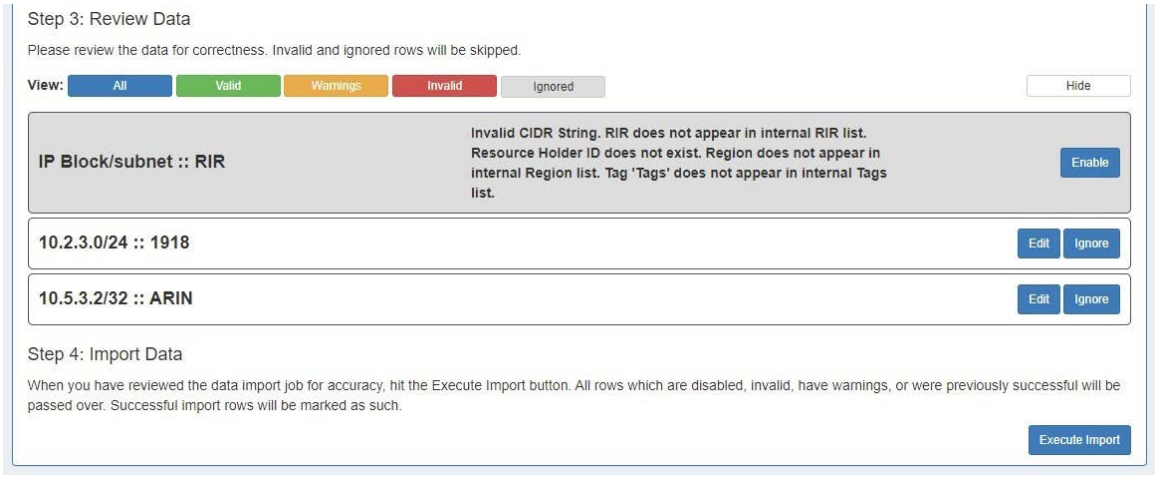


Here you can edit the invalid field, or add /change information for any other available field.



After editing, hit "Save". If the edits are valid, the background color for the data row will be white.

Continue reviewing and editing data as desired. When done, proceed to Step 4.

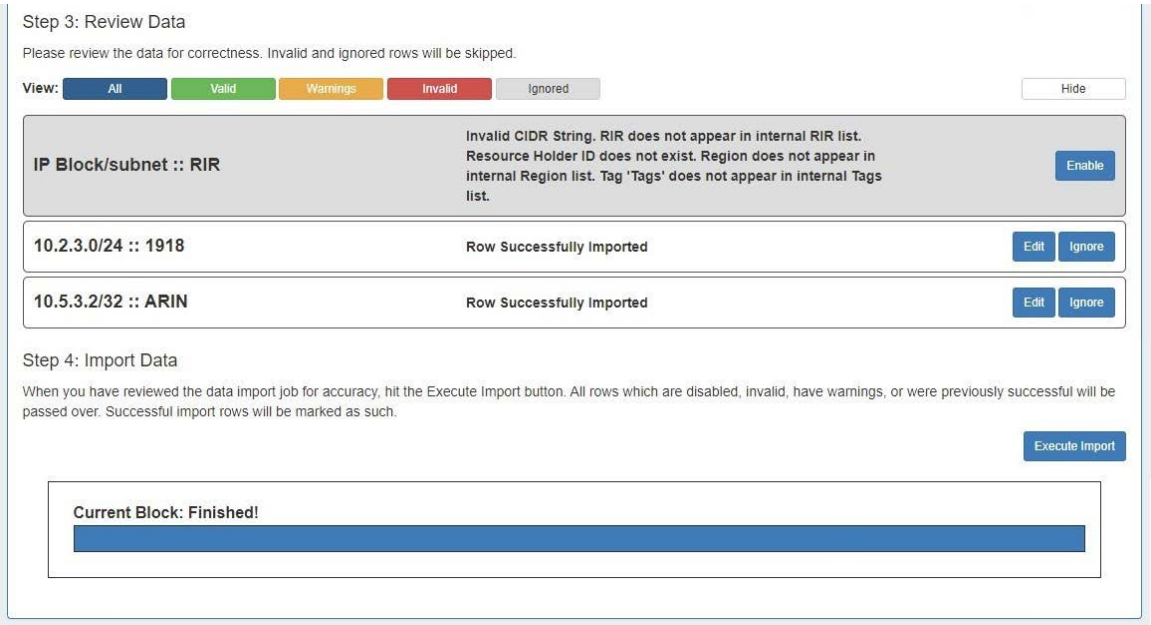


Step 4: Execute Import

When the review step is completed, hit the "Execute Import" button. A progress bar will appear to show progress and note errors if they occur.



When the bar reaches 100%, the import is complete. The Data Review section will show which data rows were successfully imported.

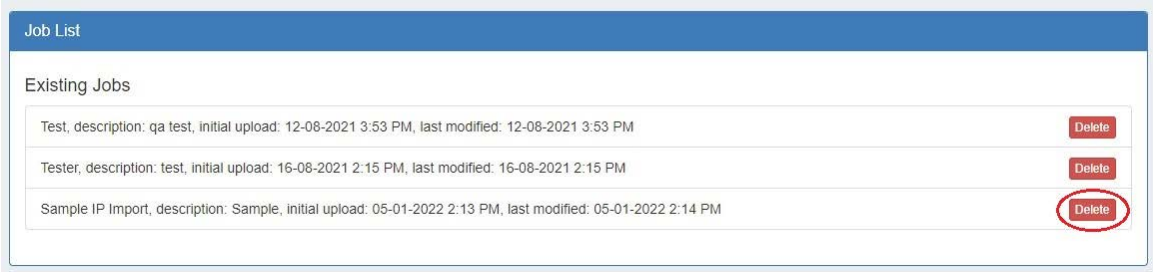


Post Import Followup

After the Import is complete, there are a few followup options for working with the import job or imported blocks. We recommend:

- Reviewing the imported blocks in the IPAM Tab, adding additional IPAM data, custom metadata, rules, or subassignments. See Working with IP Blocks and Working with IP Rules.
- If the IP Import was only partially successful or requires additional review, you may keep the import job in the "Existing Jobs" list and revise the failed / invalid blocks at a later time. Re-running the import from the same job will allow you to re-attempt import on only the previously unsuccessful / ignored / edited blocks - successfully imported and unchanged blocks will not be affected.

If the IP Import was fully successful, and you do not wish to retain the job data, the Import Job may be deleted from the "Existing Jobs" list by clicking the delete button next to the job name.



Deleting an import job is permanent and non-recoverable!

When working with large or sensitive import jobs, consider performing a backup of your instance before and after the import job as a safeguard.

Additional Information

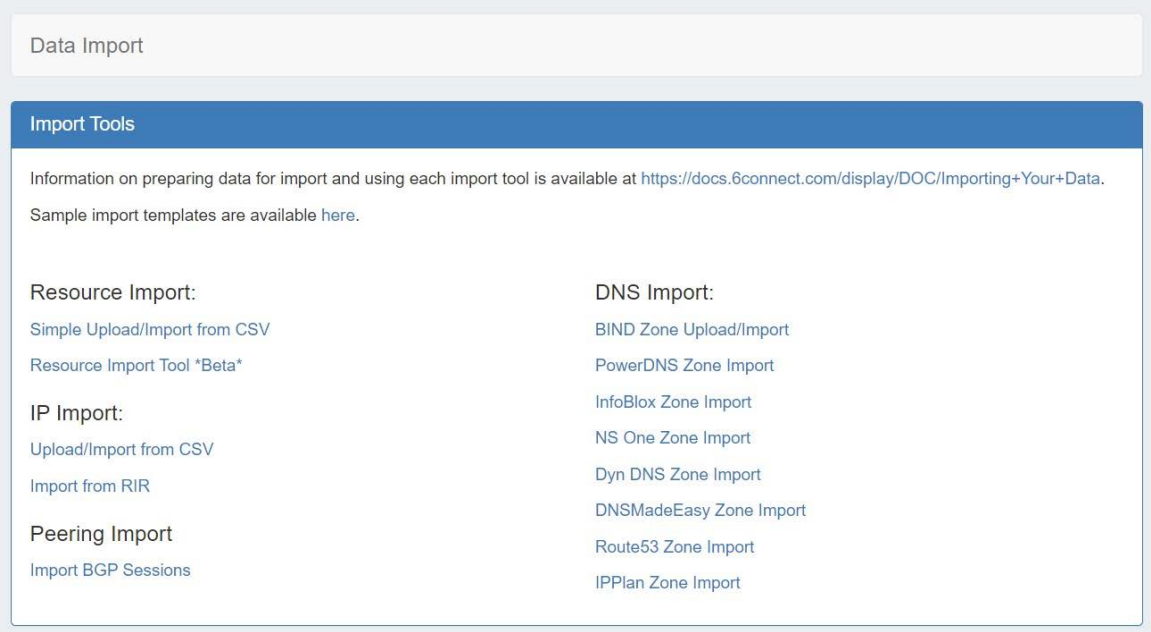
See the following areas for information on working with IPAM / IP Blocks post-import:

- IPAM Tab
- Working with IP Blocks
- Working with IP Rules
- IPAM Administration

Import Aggregate Blocks

Import Aggregates

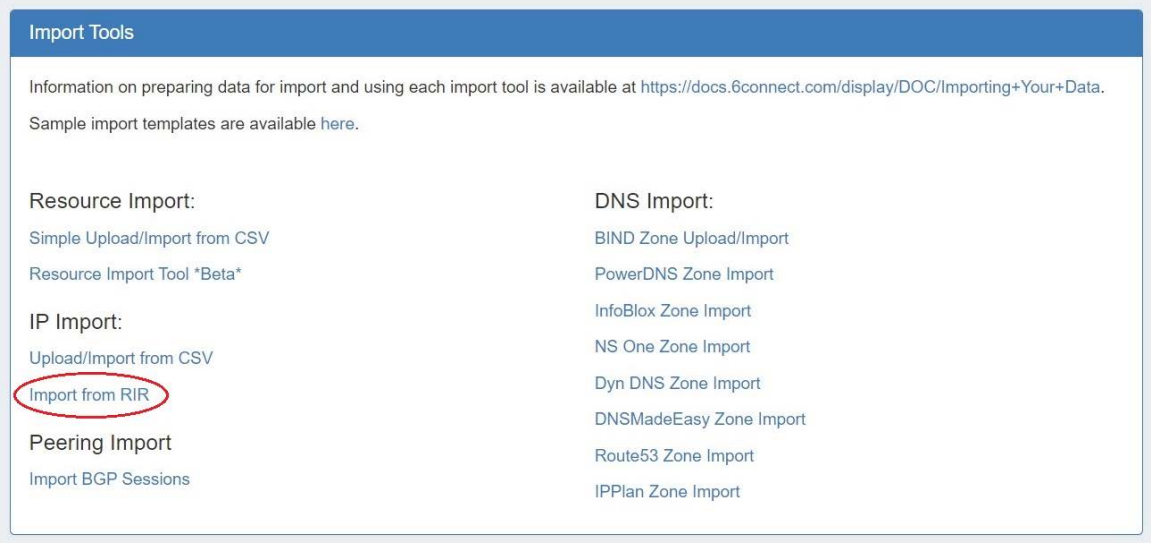
Importing blocks from your RIR source IP is available from the Data Import Tab in the Admin area of ProVision. This feature uses the RIR Org ID to identify a source IP and determine blocks assigned to your organization that are available for import.



- Import from RIR
  - Step 1: Lookup from Source IP
  - Step 2: Import your aggregate blocks
  - Step 3: Customizing Block Data
- Additional Information

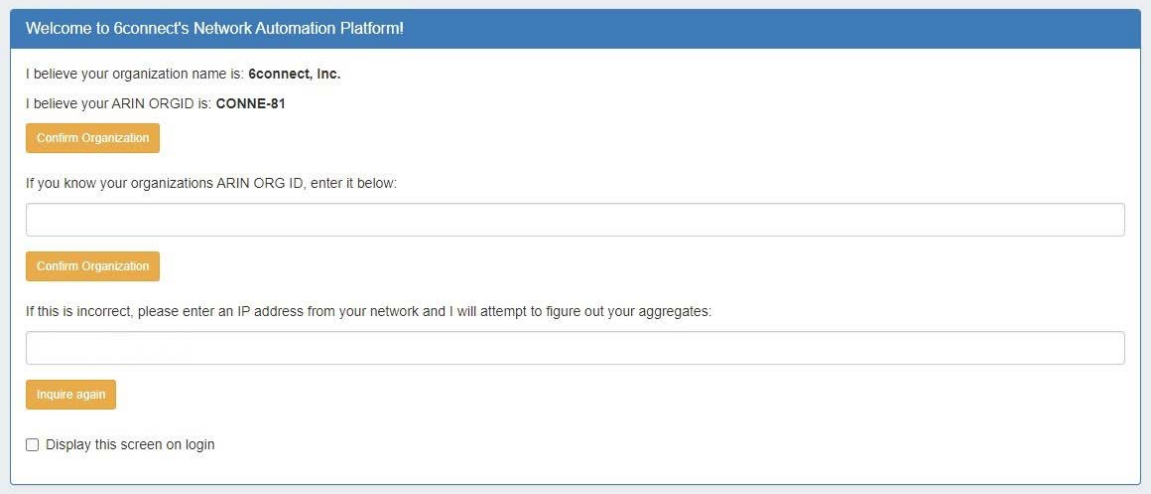
Import from RIR

From the Data Import Tab, select "Import from RIR" under "IP Import".



Step 1: Lookup from Source IP

We automatically lookup your ARIN or RIPE information based on the IP address you are connected to:

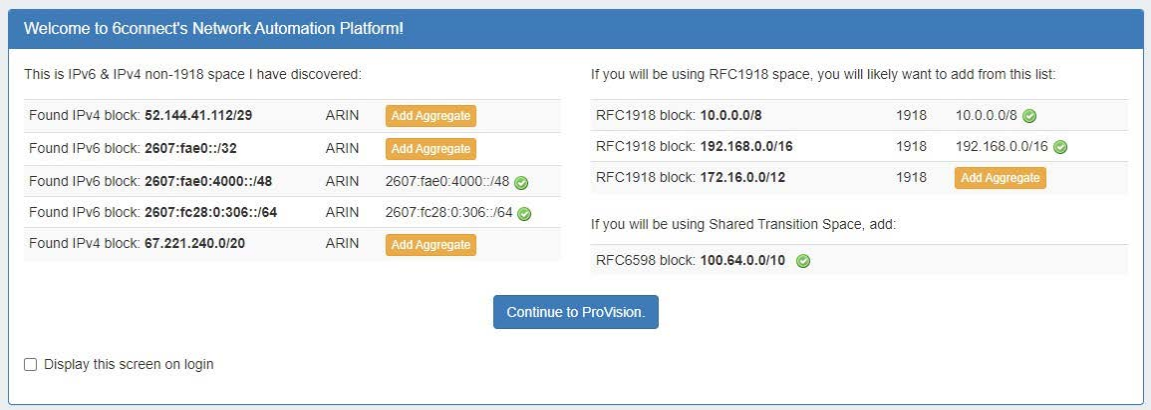


If you have another source IP that you would like to use for the lookup function, you can edit the IP and click on the "Inquire Again" button. If the organization name and ORGID are correct, then click on the "Confirm" button to go to the next screen.

Step 2: Import your aggregate blocks

Once we have identified the blocks assigned to your company, you can import the aggregates by pressing the "Add Aggregate" buttons.

This page allows you to add both 1918 aggregates as well as public IP space from ARIN and RIPE.



When done adding aggregates, hit the "Continue to ProVision" button at the bottom of the page.



You will be redirected to the IPAM tab to manage the aggregates as desired.

Step 3: Customizing Block Data

With your aggregates added, you are now ready to customize the tool and import additional data! From here, you can manage your aggregates under the IPAM tab, edit administration functions under IPAM Admin, or import resources using the Resource Import Tool.

Additional Information

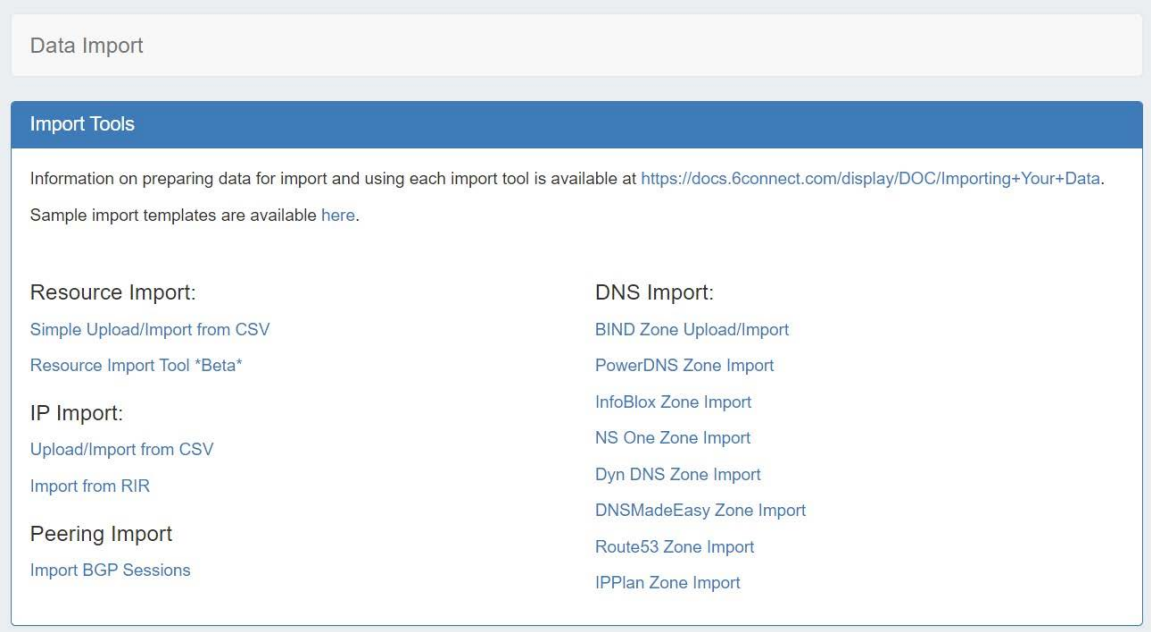
See the following areas for information on working with IPAM / IP Blocks post-import:

- IPAM Tab
- Working with IP Blocks
- Working with IP Rules
- IPAM Administration

Import DNS Zones

Importing DNS Zones

ProVision offers multiple DNS zone import options, available under the Data Import tab in the the Admin section of ProVision. Additional Import options may be available on zone or server pages.



DNS Global Import Options

ProVision offers various DNS zone import options available under the Data Import tab in the the Admin section of ProVision:

BIND Zone Import

- Imports using the named.conf configuration file tied to the zones you are uploading, a .zip or .tar file of the zones themselves, and an optional .csv file mapping zones to customers.

PowerDNS Zone Import

- Option is available after configuring a PowerDNS server with a MySQL backend. Connects to the selected server and imports all zones.

InfoBlox Zone Import

- Imports DNS zones using a provided Host, Username, and Password. The InfoBlox import pulls all zones on the InfoBlox LOCAL grid and adds them to a designated Group. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

NS One Zone Import

- Imports DNS zones using a NS One API Key. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

Dyn DNS Zone Import

- Imports DNS zones using a Dyn DNS Customer Name, Username, and Password. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

DNSMadeEasy Zone Import

- Imports DNS zones using a DNSMadeEasy API Key and API Secret. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

IPPlan Zone Import

- Imports DNS zones using IPPlan MySQL database options. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

Additional DNS import options may be available on a per-zone or per-server level, accessed from the DNS Tab:

DNS Zone Import Options (Individual)

DNS Zone / Record Import:

- This tool is available on a zone's "View Zone" page, and allows the user to import additional zone/record information into an existing ProVision zone by uploading a zone file (.zone).

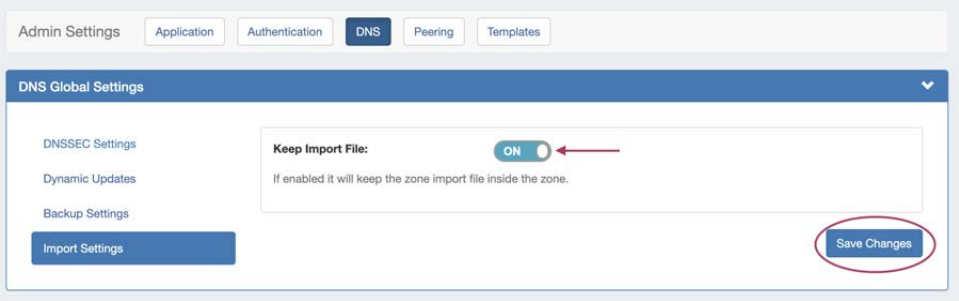
Import Zone / Import Records

A zone file (.zone) may be imported into a ProVision zone to populate record data. Note: To import the record data, the zone must already exist in ProVision - although it may be an empty placeholder zone if necessary.

Enable Saving Import Files (Admin Setting - Optional)

Before you import a zone file, you may (optionally) select to save the import file to the zone. Saving the file allows you to later re-download it directly from ProVision.

To enable saving import files, go to Admin Preferences DNS Settings sub-tab. From there, select "Import Settings" in the DNS Global Settings module.

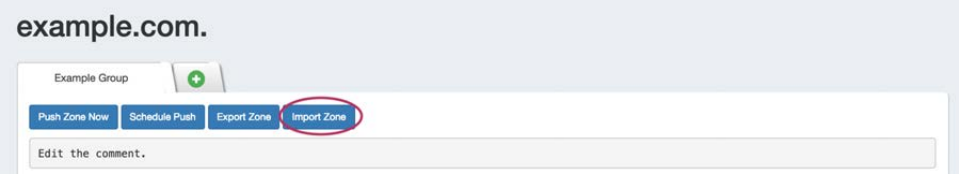


Toggle "Keep Import File" into the ON position, then select "Save Changes".

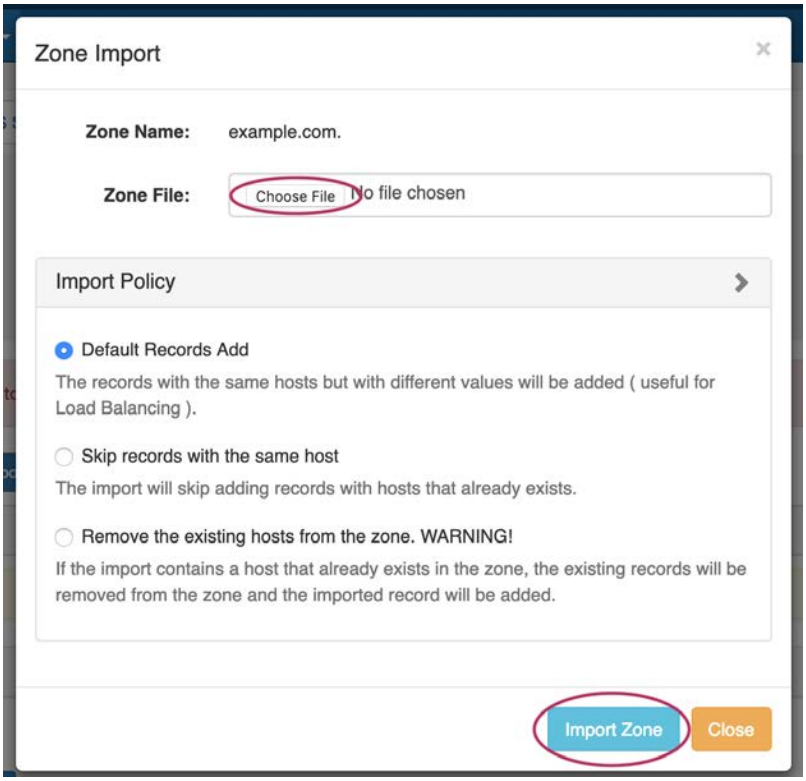
Import Zone File

To import a zone file to populate record data in ProVision, go to the View Zone page for the zone. The zone must already exist in ProVision, although it may be empty

Click "Import Zone" on the View Zone page.



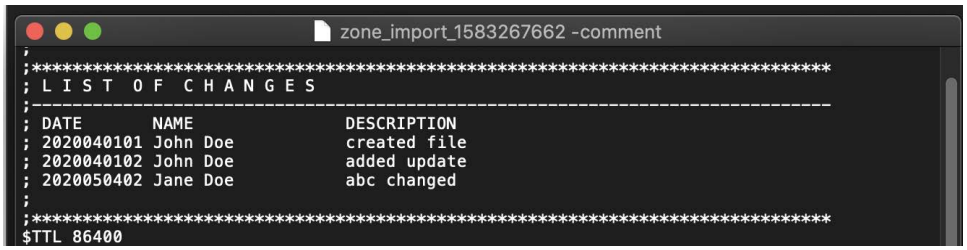
A Zone Import dialog box will open. Next to **Zone File:**, click "Choose File" and select your .zone file to import. Then, select an import policy to follow.



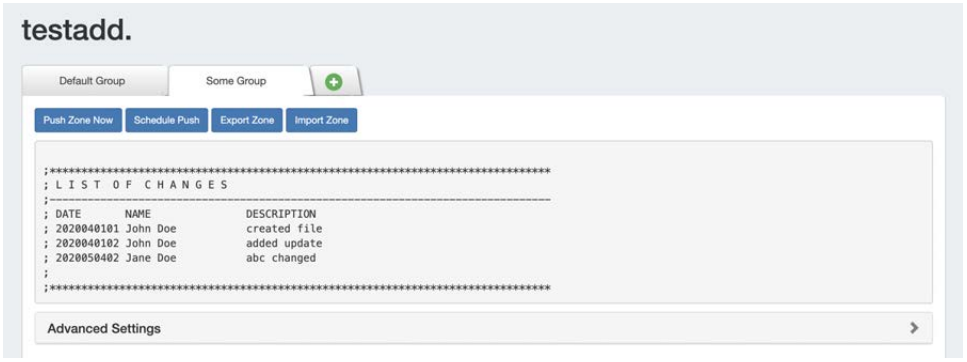
When done, Click "Import Zone".

Importing Zone file with Comments

DNS Zone Import will also import comments contained in the .zone file, such as an internal change log (as seen in the image below).



During import, these comments are added to ProVision's zone comments field:



Additional Information

Continue to the following sections for details on performing each import method:

- BIND DNS Zone Upload and Import

- PowerDNS Zone Import
- InfoBlox Zone Import
- NS One Zone Import
- Dyn DNS Zone Import
- DNSMadeEasy Zone Import
- IPPlan Zone Import

BIND DNS Zone Upload and Import

BIND DNS Zone Import

The BIND DNS Zone Upload / Import tool uses the named.conf configuration file tied to the zones you are uploading, a .zip or .tar file of the zones themselves, and an optional .csv file mapping zones to customers. The following steps are used when importing BIND DNS zones:

- Preparing your DNS Zones for Import
- Importing your DNS Zones (BIND)
  - Video Walkthrough
  - Step 1: Create a new DNS Import Job
  - Step 2: Map Data Columns (Optional)
  - Step 3: Reviewing Data
  - Step 4: Execute Import

Preparing your DNS Zones for Import

If your zone data is currently in BIND format - this is very straightforward.

There are three components for the upload process:

1) The named.conf configuration file tied to the zones you are uploading (required)

This tells the importer the Zone Name and where the zone file is written. It could be as simple as a multi-line file:

Simple DNS Config File

```
zone "my-zone.com" { type master; file "my-zone.com.zone"; };
zone "my-other-zone.com" { type master; file "my-other-zone.com.zone"; };
zone "my-third-zone.com" { type master; file "my-third-zone.com.zone"; };
```

or could be more complex like this file structure directory:

Complex DNS Config File

```
zone "my-zone.com" { type master; file "/usr/local/zones/my-zone.com.zone"; };
zone "my-other-zone.com" { type master; file "/usr/local/zones/more/my-other-zone.com.zone"; };
zone "my-third-zone.com" { type master; file "/usr/local/zones/more/even more/my-third-zone.com.zone"; };
```

This configuration file can be taken directly from the DNS server, and can be in either ISC BIND or NSD format. The system auto-detects which one is being supplied.

For a sample Simple Config: conf.conf

2) A ZIP or TAR file of the DNS zones themselves (required)

This is as it sounds - a file archive where we can find the zones and it should match the configuration file uploaded in Step 1.

> **Zone Order**
>
> These zone files can be in any order, or in sub-directories, so long as the configuration file (Step 1) correctly points to them

For a sample simple ZIP: zones.zip

3) Match CSV for assigning DNS Zones to Resources (optional)

This file allows the administrator to "assign" zone files to a given Resource. If you have Imported a group of Resources, they have Resource IDs associated with them. You can then import DNS zones and assign them to those Resource IDs. When complete, you will be able to pull up the Resource Record and see the DNS Zones associated to that Resource ID.

Sample CSV File

```
my-zone.com,test-01,fun stuff, 174.23.14.4, 174.23.14.9
my-otherzone.com,test-02,great stuff, dns1.dns.net, dns2.dns.net
even-reverse-zones.arpa,test-03,amazing stuff
```

Note the columns are the "Zone Name", the "Resource ID", "Notes", "Master Server", "Slave Server"

Importing DNS Server Linkages

When importing zones, you can use the "Master Server" and "Slave Server" columns to assign zones to specified DNS Servers. Please note that the IP address or FQDN of the DNS Server is supported in this field.

To successfully map to a DNS server, that server must already exist within Provision.

For a sample CSV: config.csv

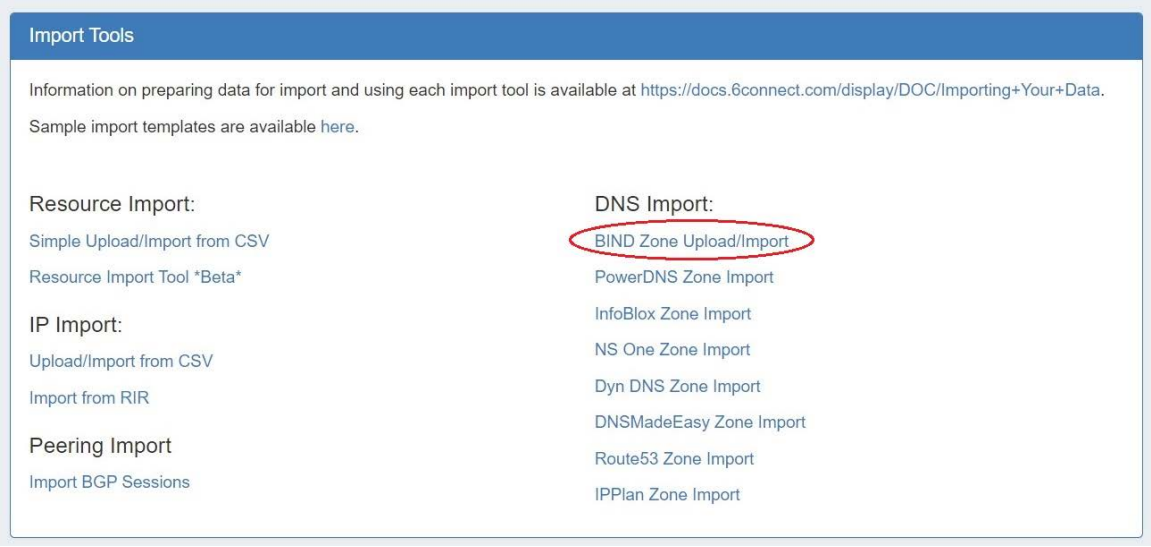
Importing your DNS Zones (BIND)

Video Walkthrough

Note: Video walkthrough is from ProVision version 5.1.x - however, import steps and descriptions still apply to current version. Updated videos are in progress!

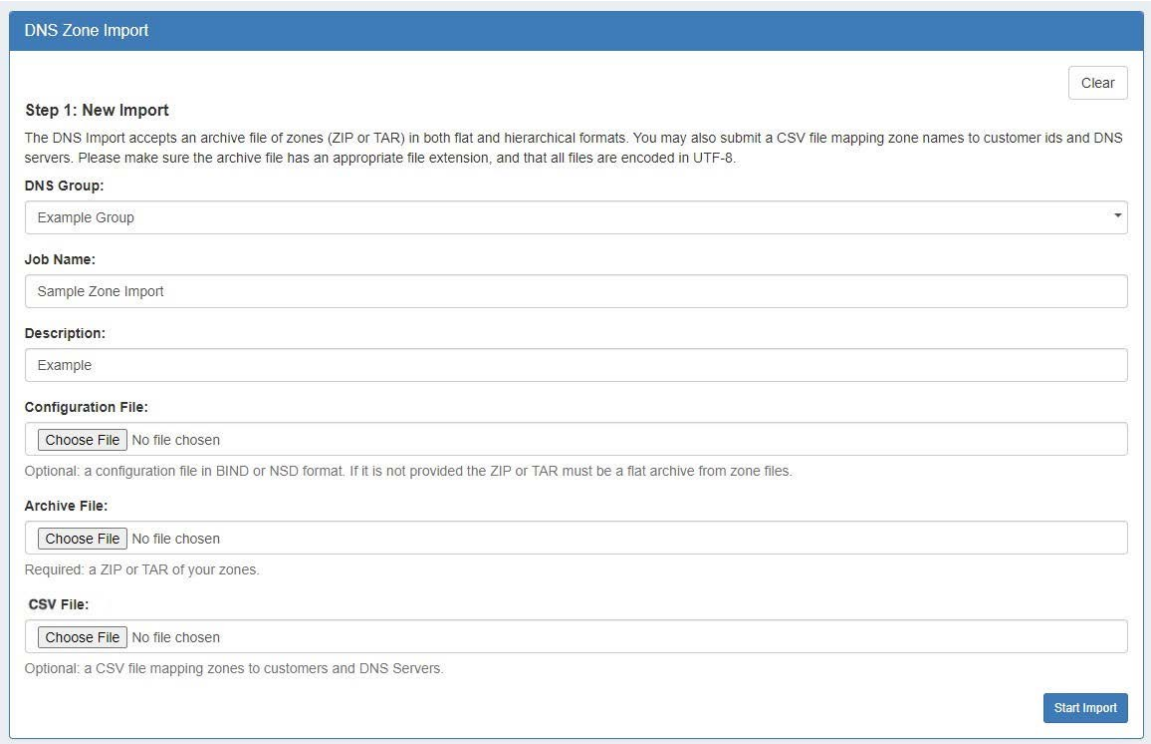
Step 1: Create a new DNS Import Job

Navigate to the Data Import Tab from the Admin button to import your data. Select "BIND Zone Upload/Import" under "DNS Import".



Under the "New Import" section, select the DNS Group under which you want the zones to be imported, then create a Job Name and Description for the import. This is especially useful to keep track of progress in cases the data arrives from multiple sources, or will require multiple stages of manual review.

Select the appropriate **Configuration File** (required if the .zip is not a flat archive file), **Archive File** (required), and **CSV File** (optional) that you prepared above by selecting the "Choose File" button(s) under each section, and browsing to the correct file location. Then hit "Start Import".

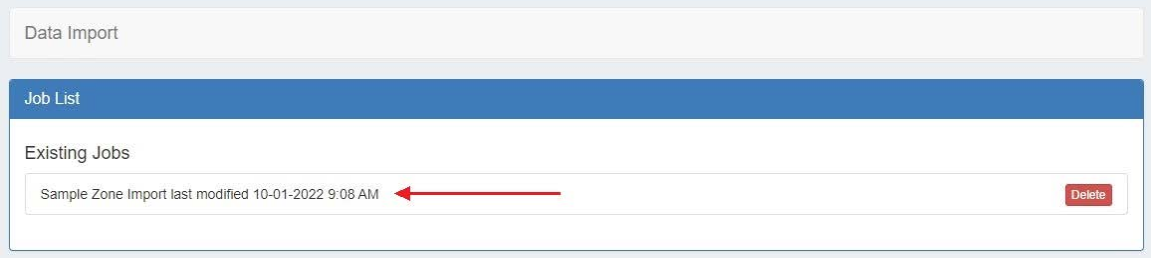


Working with Large or Multiple Data Sets

Although you cannot add new files to an existing job, for jobs with multiple sources for data (which may have different formatting), you can simply create separate jobs and descriptions for each source - no need to manually combine the data into one file before importing. The Import tool's mapping and editing functions will allow for the data to be reconciled in ProVision.

For large data sets where multiple stages of manual review might be needed, you can create a new job using the same set of data files in order to work in parallel on a different portion of the data.

After importing, the new job will appear under the "Existing Jobs" section. To continue working with this job, select it from the list and the next step will appear on the page.



Step 2: Map Data Columns (Optional)

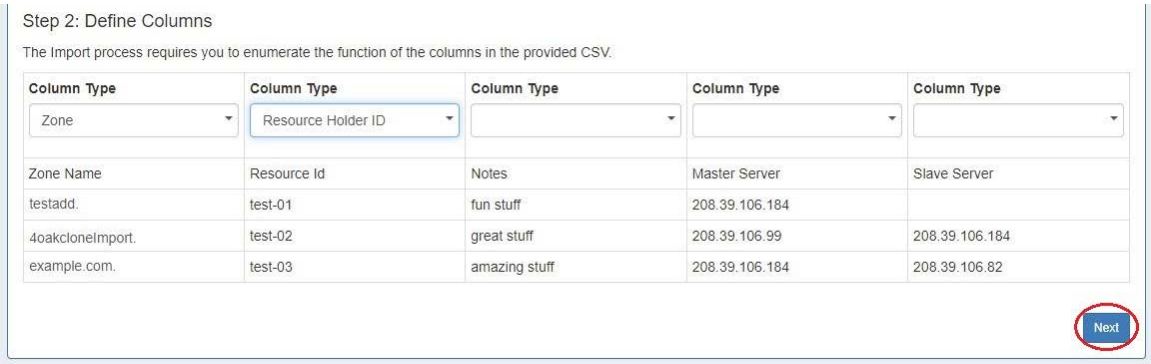
If you chose to load an optional match CSV file to assign DNS Zones to Resource, a mapping step will be available. Otherwise, proceed to Step 3: Reviewing Data.

For DNS imports, two column definitions are available: **Zone** and **Resource Holder ID**. Using the dropdown menu, select the appropriate column for the zone name and Resource Holder (customer) associated with zone. The Resource Holder ID field will be used to set the Parent Resource of the individual zone once imported.

Server associations will not be imported. Instead, the associated server will be the server attached to the selected DNS Group.

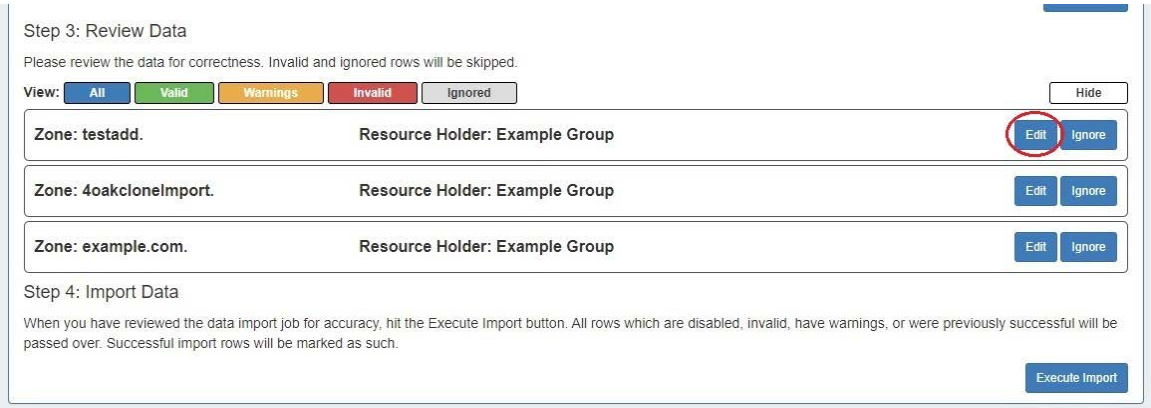
Other columns which do not apply under the available definitions should be left as blank, and will be skipped during the upload process.

When completed, hit "Next".



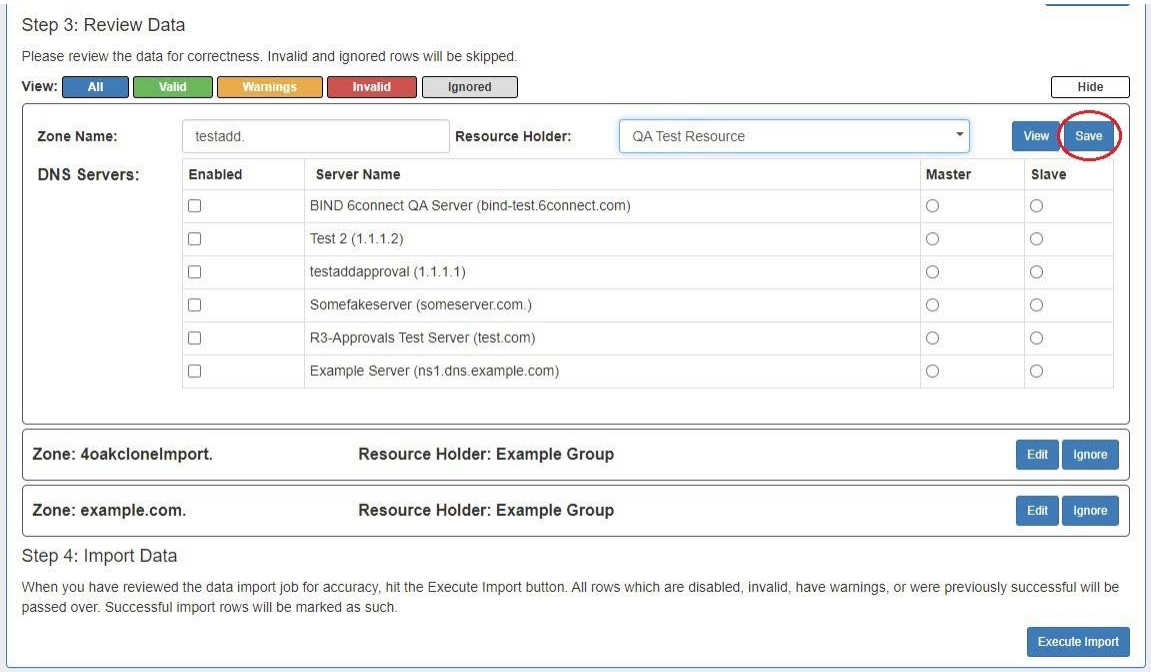
Step 3: Reviewing Data

After supplying the file set and defining columns (if applicable), a review step is provided. The configuration file is broken into individual jobs, scanned for errors, and shown by row (in batches of 100) to be reviewed. Zones with errors will show as color coded. and can be filtered to be viewed by All, Valid, Warnings, Invalid, or Ignored. From here, the zone can be edited or ignored.



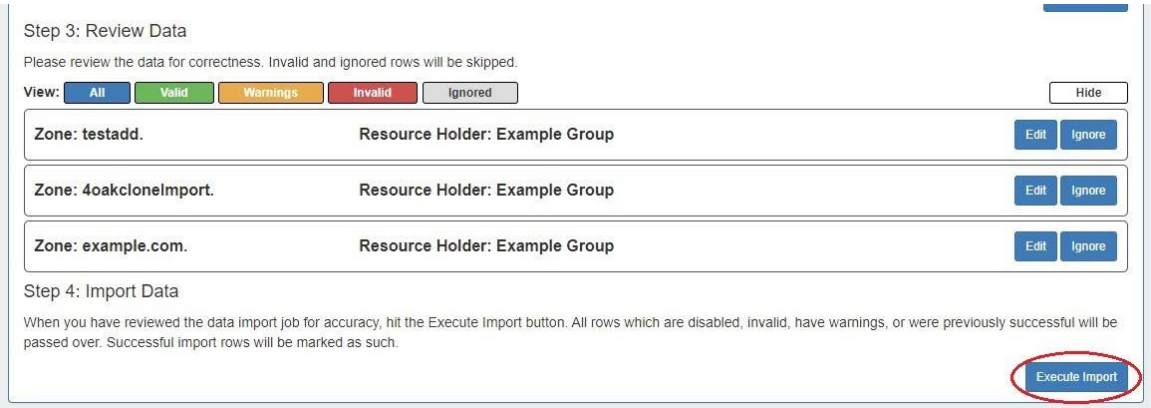
To edit the zone name or select a different Resource Holder, hit "Edit" on the zone record.

After editing, hit "Save", and continue reviewing / editing data as desired.

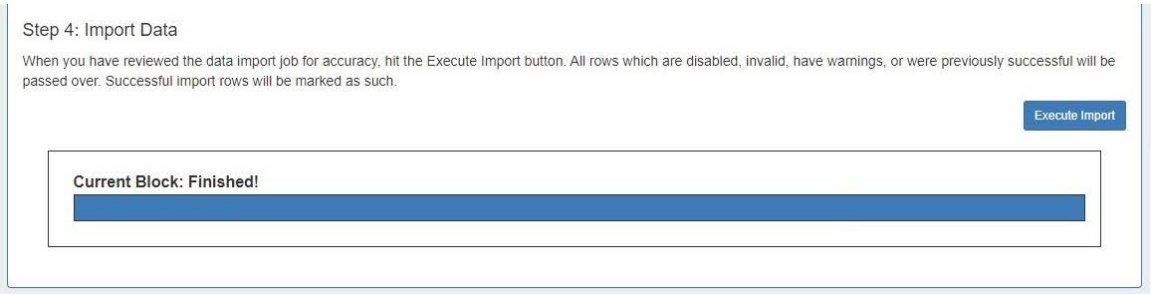


Step 4: Execute Import

When the review step is completed, hit the "Execute Import" button. A progress bar will appear to show progress and note errors if they occur.



When the bar reaches 100%, the import is complete.



PowerDNS Zone Import

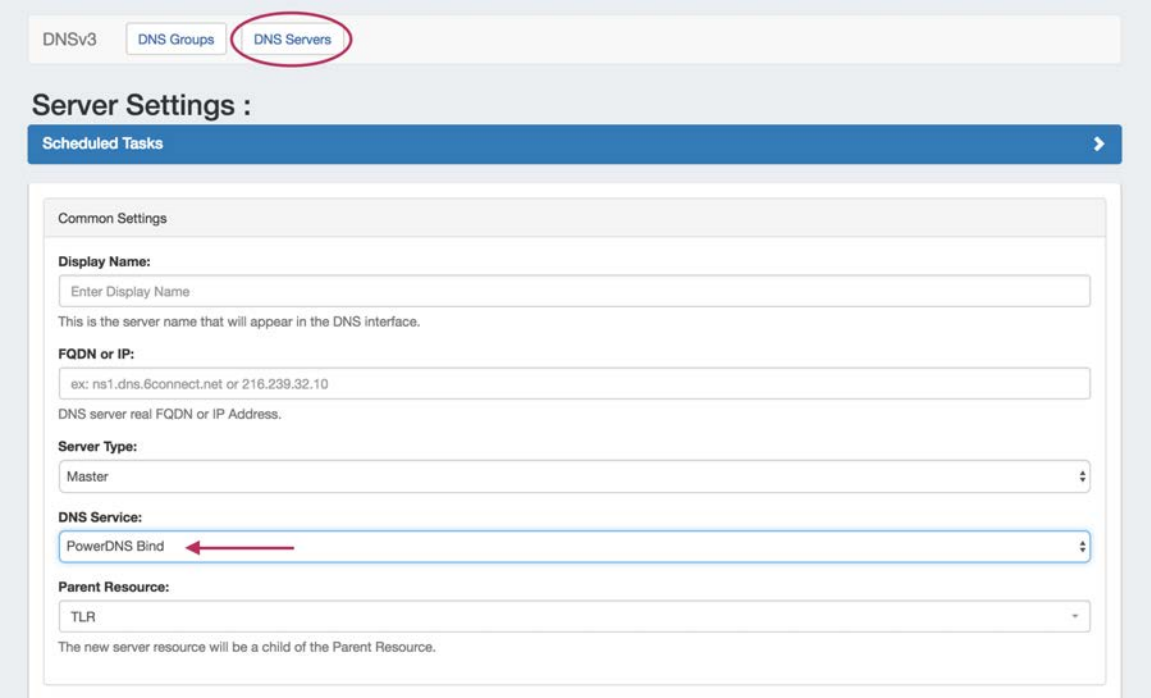
PowerDNS Zone Import

The PowerDNS Zone Import Option is available after configuring a PowerDNS server with a MySQL backend. It connects to the selected server and imports all zones.

- Step 1: Verify PowerDNS server setup
- Step 2: Import your PowerDNS zones

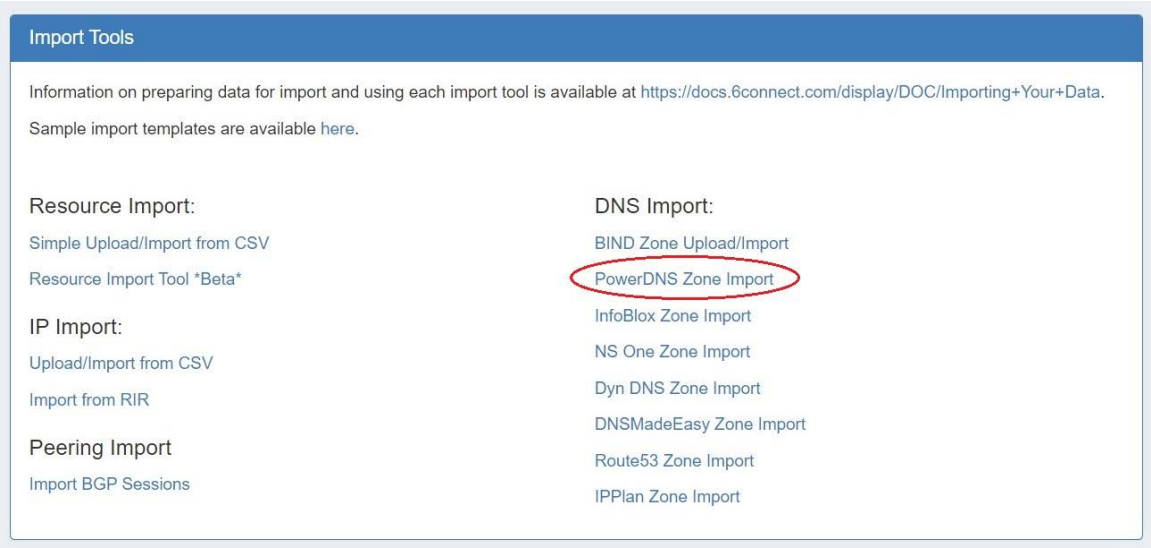
Step 1: Verify PowerDNS server setup

To import PowerDNS zones, first ensure the PowerDNS server has been set up under the DNS Tab, DNS Servers section (see: Working with DNS Servers and configuring a PowerDNS server).

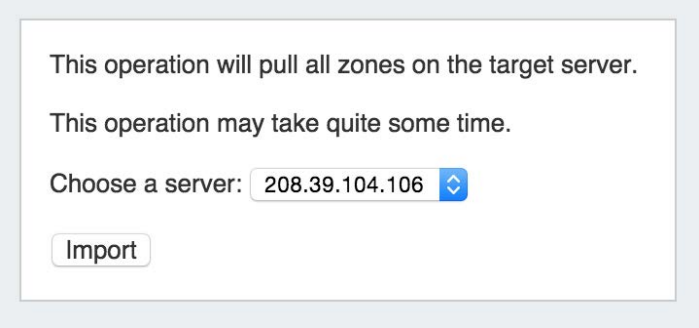


Step 2: Import your PowerDNS zones

Once server setup has been verified, navigate to the Data Import Tab in the Admin section. Select the "Power DNS Zone Import" link.



Then, to import your data simply choose your PowerDNS server and click "Import".



InfoBlox Zone Import

InfoBlox Zone Import

The ProVision Data Import InfoBlox option imports InfoBlox DNS zones using a provided Host, Username, and Password. It pulls all zones on the InfoBlox LOCAL grid and adds them to a designated DNS Group. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

> **Port Information**
>
> Infoblox Zone Import requires that port 443 (default) be enabled on the server to ensure access to the Infoblox API, unless an alternative port has been configured.
>
> For additional information, see https://docs.infoblox.com/display/BloxOneCloud/Port+Usage.

- Step 1: Verify DNS Group setup
- Step 2: Verify InfoBlox server setup
- Step 3: Import your InfoBlox zones

Step 1: Verify DNS Group setup

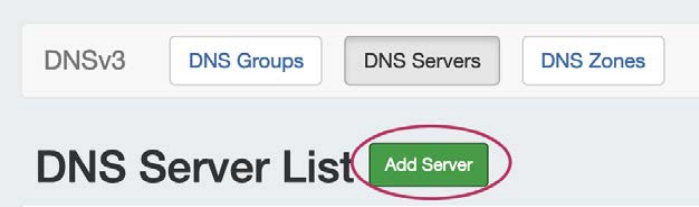
It is recommended to have a DNS Group created in advance with the proper default parameters and records to be inherited by the imported InfoBlox zones and records.

Review the existing DNS Groups in the DNS tab, and create a new DNS Group if necessary. See Working with DNS Groups for details on editing or creating DNS Groups.

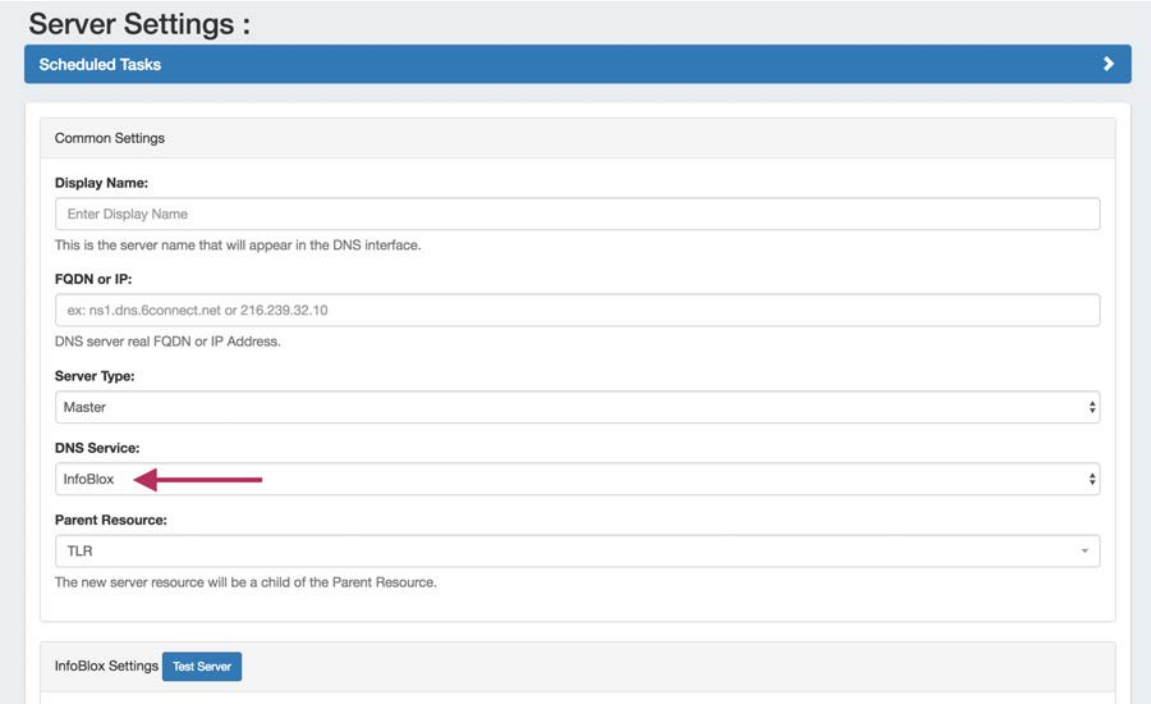
Step 2: Verify InfoBlox server setup

Although it is not strictly necessary to have the InfoBlox server created in ProVision prior to import, creating or verifying the server at this point gives you an opportunity to test the connection and attach the InfoBlox server to the DNS Group selected in step 1.

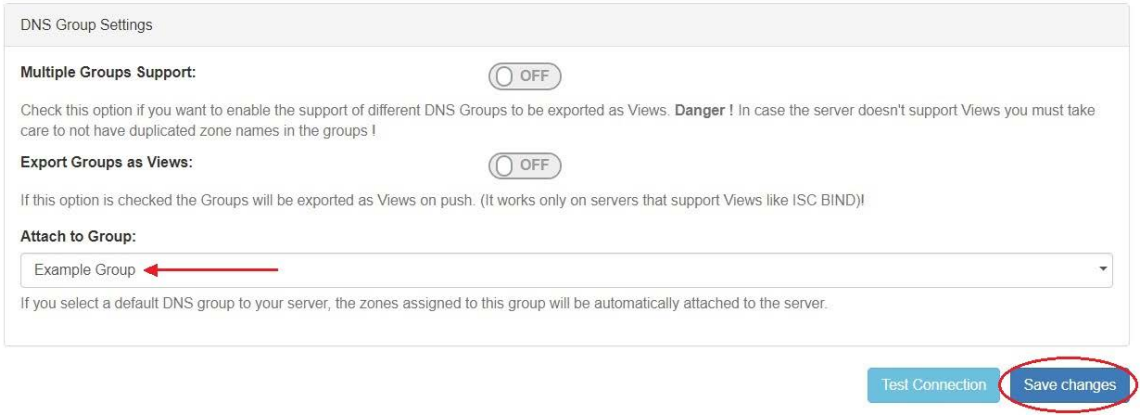
Go to the DNS Tab, DNS Servers section, and either verify that the desired server is shown in the server list, or click the "Add Server" button to create a new InfoBlox server.



If creating a new server, ensure that "InfoBlox" is selected for the DNS Service.

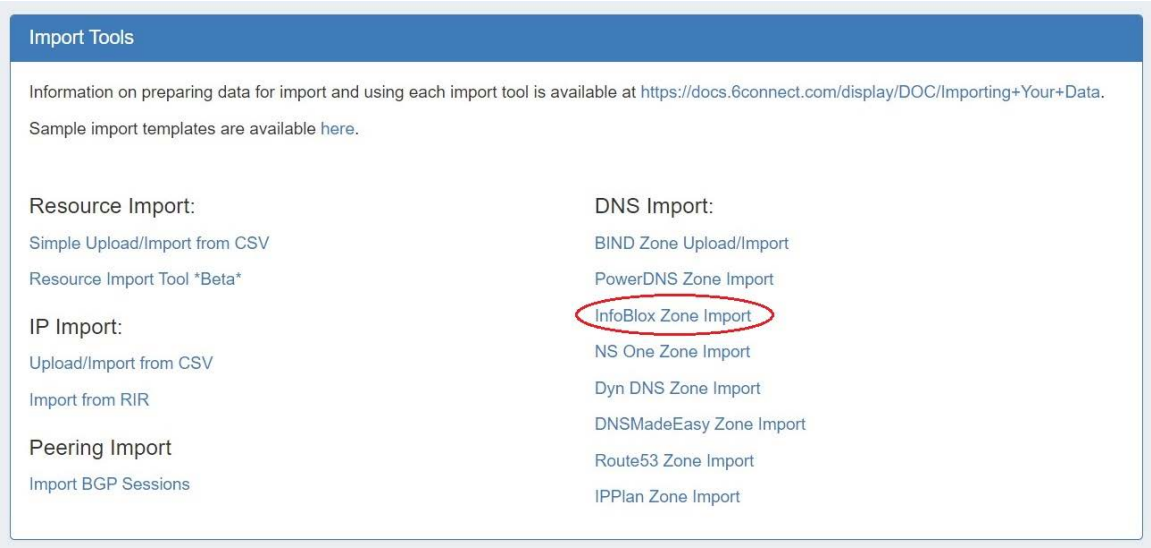


Under the "DNS Group Settings" section of the server detail page, ensure that the DNS Group from step 1 is selected as the server's Attach to Group setting, and click "Save changes".



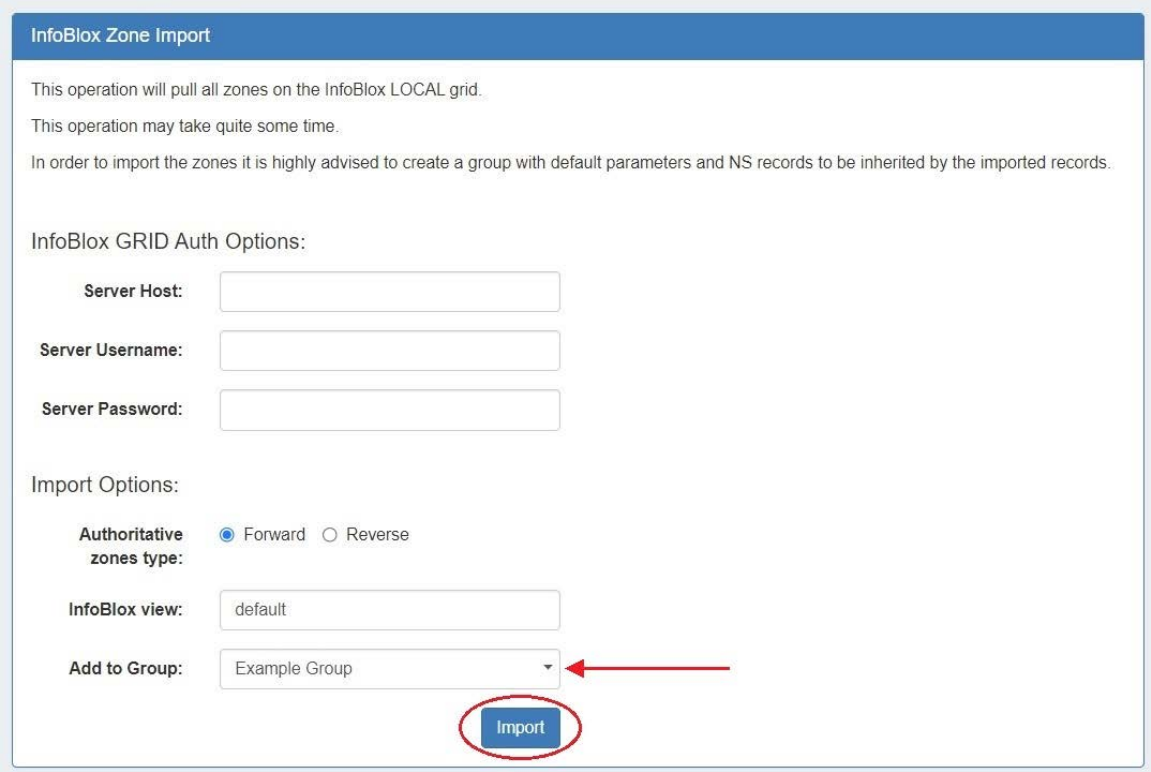
Step 3: Import your InfoBlox zones

Once server setup has been verified, navigate to the Data Import Tab in the Admin section. Select the "InfoBlox Zone Import" link.



Then, enter the InfloBlox server Host, Username, and Password. Select Forward or Reverse zone type, the InfoBlox view, and the ProVision DNS Group to add the zones to.

Once all information has been entered, click the "Import" button.



The import may take a couple of minutes. If errors occur, they will show under the Pull in Progress message.

When completed, a successful import will show a green Complete! status message.

Verify the zones by exiting the Admin area of ProVision, clicking on the DNS tab, and reviewing the zones under the Group previously selected for the import.

NS One Zone Import

NS One Zone Import

The ProVision "NS One Data Import" option imports NS One DNS zones using a provided NS One API key. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

- Step 1: Verify DNS Group setup
- Step 2: Verify NS One server setup
- Step 3: Import your zones

Step 1: Verify DNS Group setup

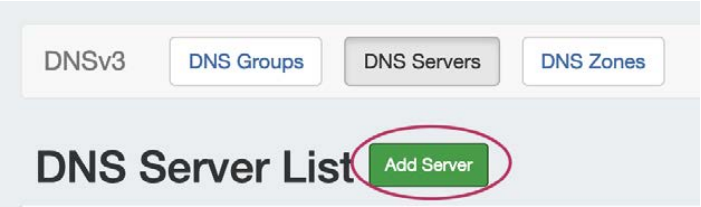
It is recommended to have a DNS Group created in advance with the proper default parameters and records to be inherited by the imported NS One zones and records.

Review the existing DNS Groups in the DNS tab, and create a new DNS Group if necessary. See Working with DNS Groups for details on editing or creating DNS Groups.

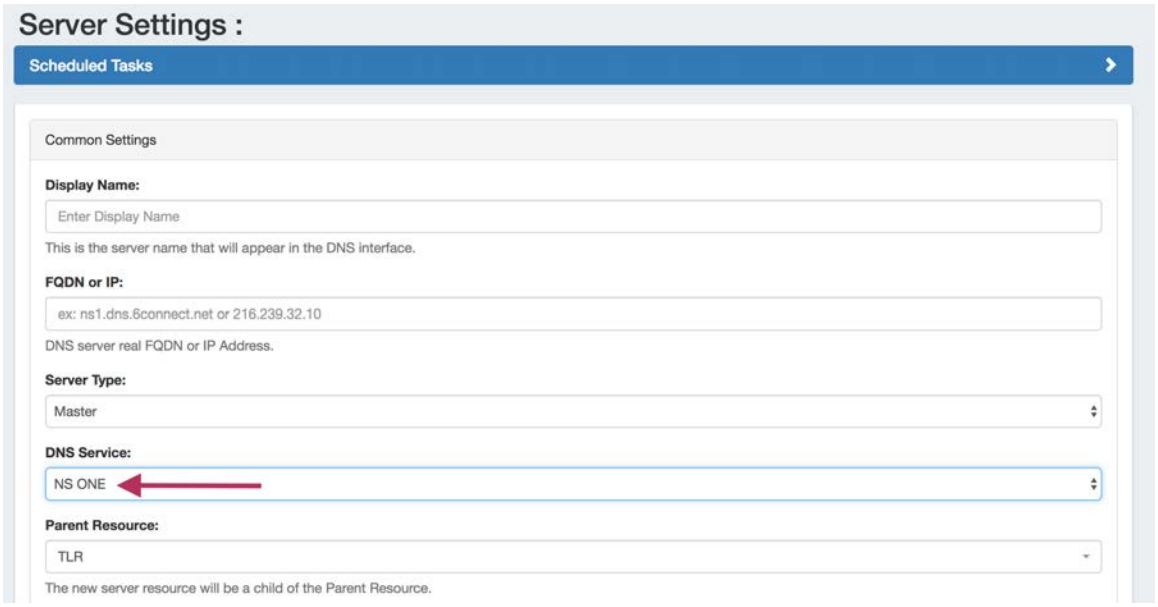
Step 2: Verify NS One server setup

Although it is not strictly necessary to have the NS One server created in ProVision prior to import, creating or verifying the server at this point gives you an opportunity to test the connection and attach the NS One server to the DNS Group selected in step 1.

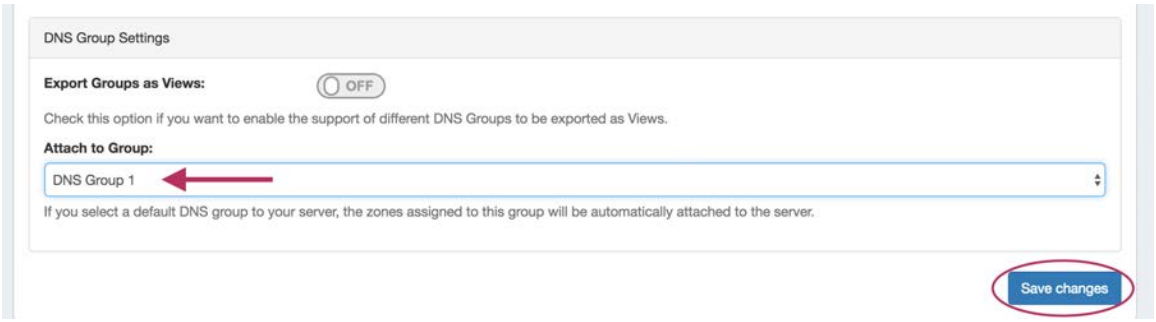
Go to the DNS Tab, DNS Servers section, and either verify that the desired server is shown in the server list, or click the "Add Server" button to create a new NS One server.



If creating a new server, ensure that "NS One" is selected for the DNS Service.

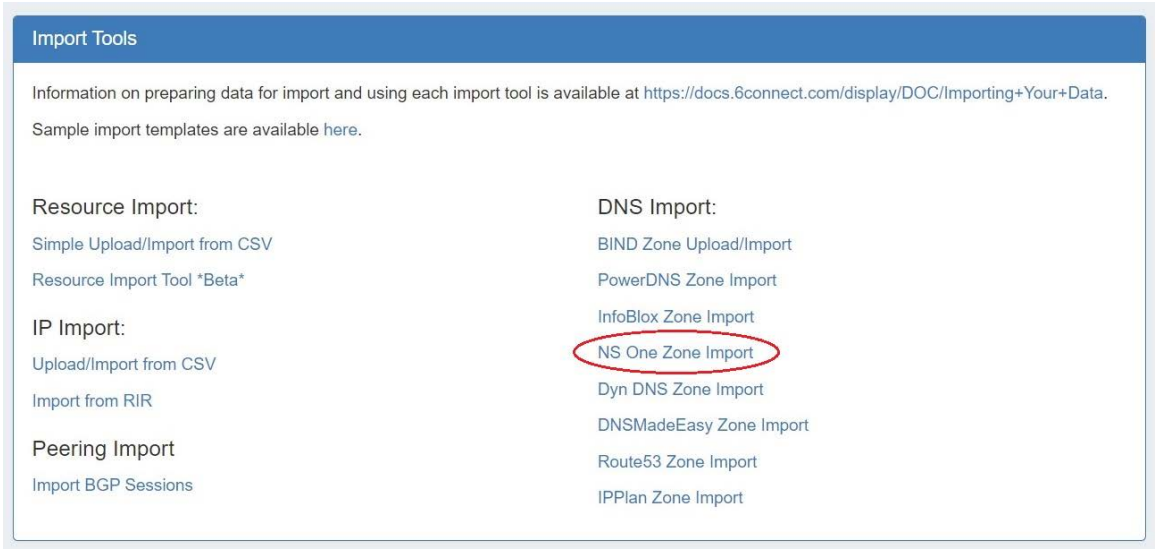


Under the "DNS Group Settings" section of the server detail page, ensure that the DNS Group from step 1 is selected as the server's Attach to Group setting, and click "Save".



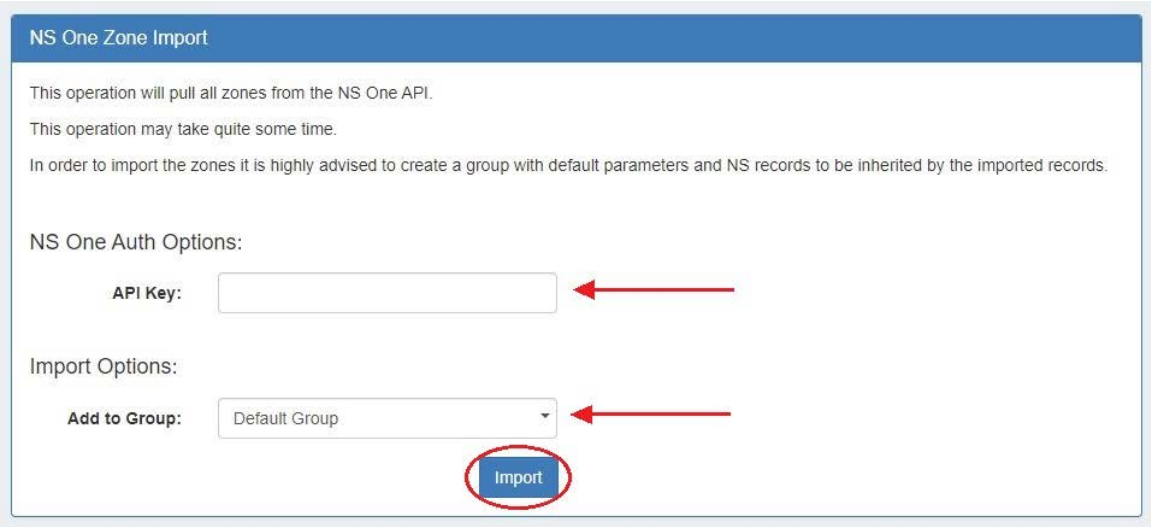
Step 3: Import your zones

Once server setup has been verified, navigate to the Data Import Tab in the Admin section. Select the "NS One Zone Import" link.



Then, enter the NS One API key and the ProVision DNS Group to add the zones to.

Once all information has been entered, click the "Import" button.



The import may take a couple of minutes. If errors occur, they will show under the Pull in Progress message.

When completed, a successful import will show a green Complete! status message.

Verify the zones by exiting the Admin area of ProVision, clicking on the DNS tab, and reviewing the zones under the Group previously selected for the import.

Dyn DNS Zone Import

Dyn DNS Zone Import

The ProVision "Dyn DNS Zone Import" option imports Dyn DNS zones using a provided Customer Name, Username, and Password. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

- Step 1: Verify DNS Group setup
- Step 2: Verify server setup
- Step 3: Import your DynDNS zones

Step 1: Verify DNS Group setup

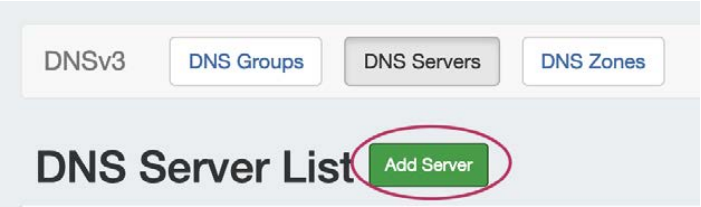
It is recommended to have a DNS Group created in advance with the proper default parameters and records to be inherited by the imported Dyn DNS zones and records.

Review the existing DNS Groups in the DNS tab, and create a new DNS Group if necessary. See Working with DNS Groups for details on editing or creating DNS Groups.

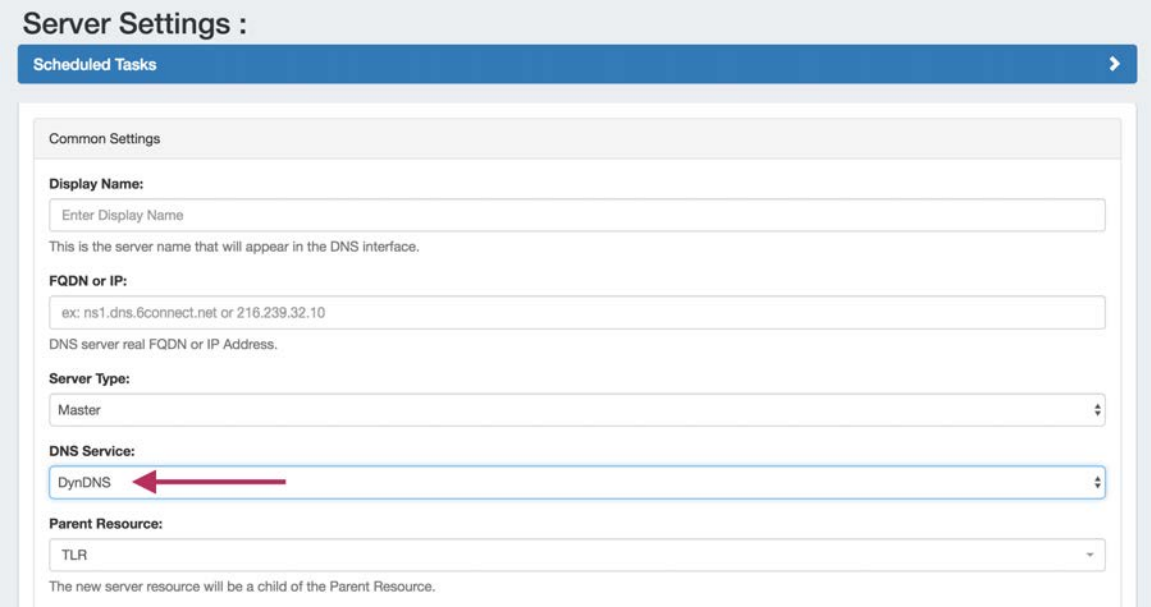
Step 2: Verify server setup

Although it is not strictly necessary to have the Dyn DNS server created in ProVision prior to import, creating or verifying the server at this point gives you an opportunity to test the connection and attach the Dyn DNS server to the DNS Group selected in step 1.

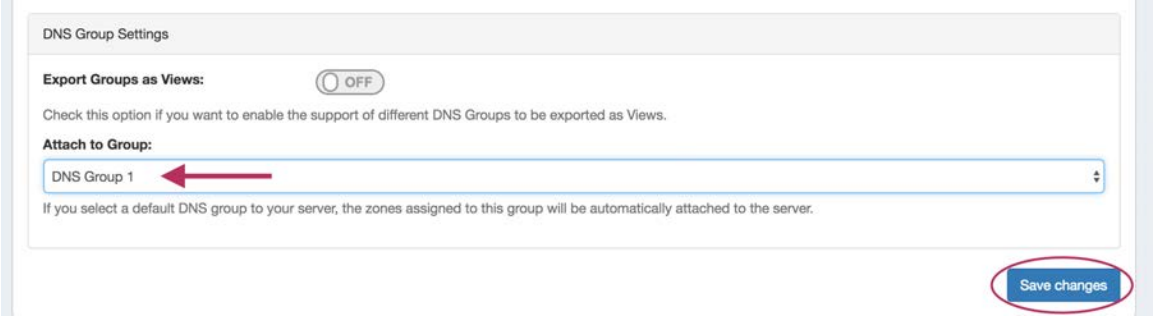
Go to the DNS Tab, DNS Servers section, and either verify that the desired server is shown in the server list, or click the "Add Server" button to create a new Dyn DNS server.



If creating a new server, ensure that "Dyn DNS" is selected for the DNS Service.

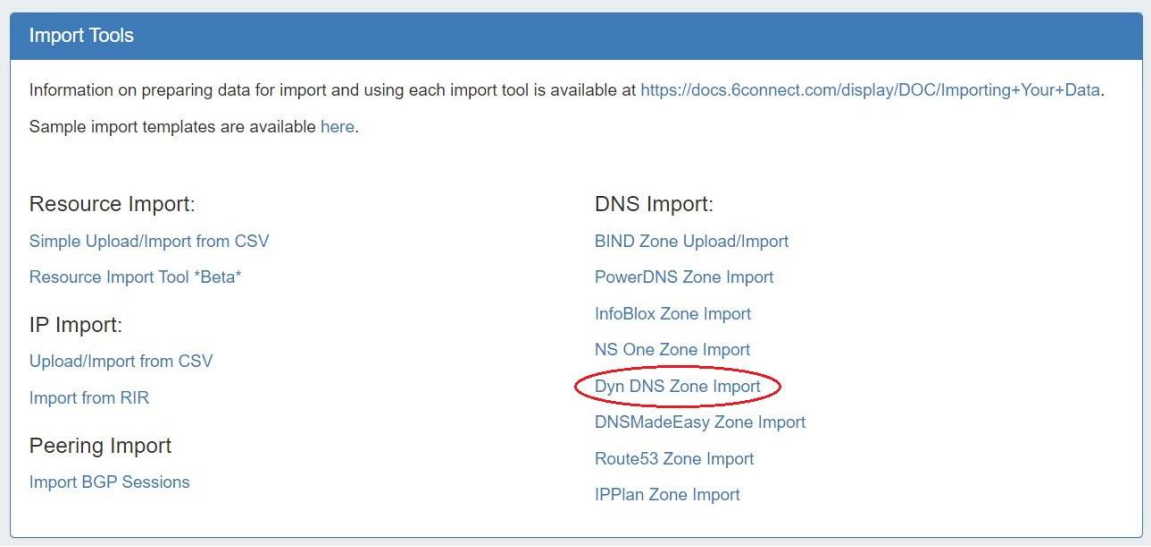


Under the "DNS Group Settings" section of the server detail page, ensure that the DNS Group from step 1 is selected as the server's Attach to Group setting, and click "Save".



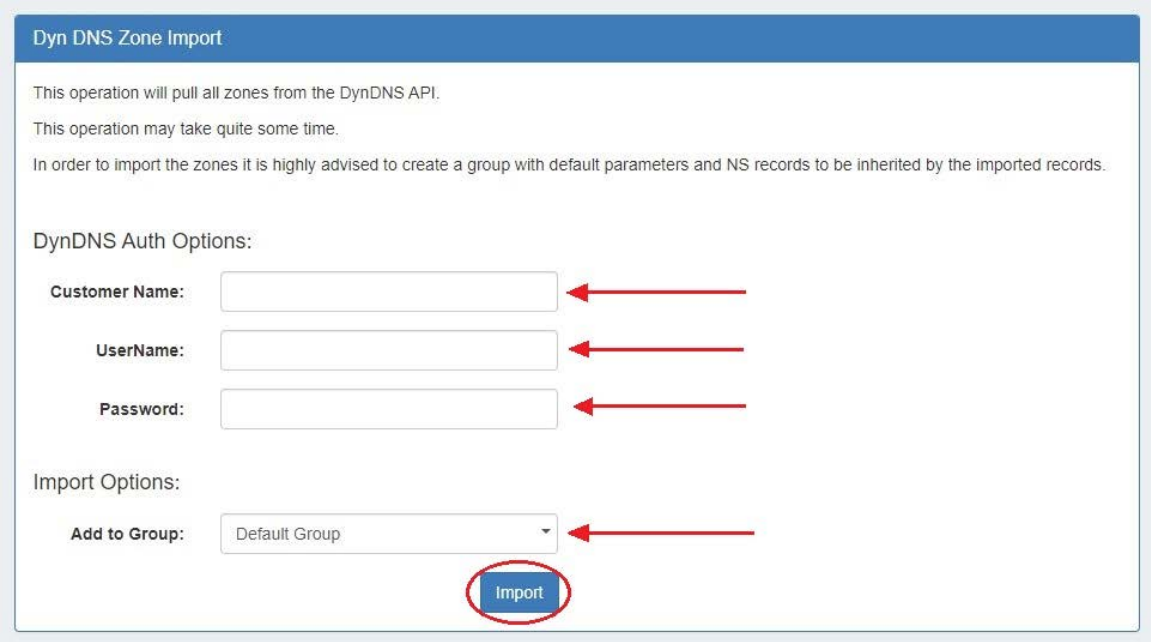
Step 3: Import your DynDNS zones

Once server setup has been verified, navigate to the Data Import Tab in the Admin section. Select the "Dyn DNS Zone Import" link.



Then, enter the Dyn DNS Customer Name, Username, and Password. Then, select the ProVision DNS Group to add the zones to.

Once all information has been entered, click the "Import" button.



The import may take a couple of minutes. If errors occur, they will show under the Pull in Progress message.

When completed, a successful import will show a green Complete! status message.

Verify the zones by exiting the Admin area of ProVision, clicking on the DNS tab, and reviewing the zones under the Group previously selected for the import.

DNSMadeEasy Zone Import

DNSMadeEasy Zone Import

The ProVision "DNSMadeEasy Zone Import" option imports DNSMadeEasy zones using a provided API Key and API Secret. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

- Step 1: Verify DNS Group setup
- Step 2: Verify server setup
- Step 3: Import your DNSMadeEasy zones

Step 1: Verify DNS Group setup

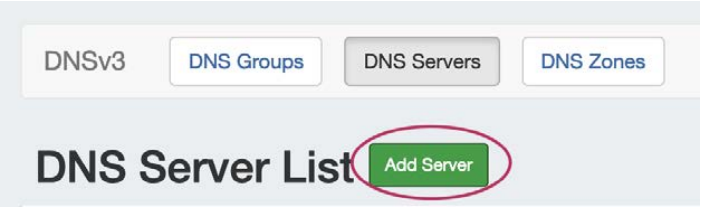
It is recommended to have a DNS Group created in advance with the proper default parameters and records to be inherited by the imported zones and records.

Review the existing DNS Groups in the DNS tab, and create a new DNS Group if necessary. See Working with DNS Groups for details on editing or creating DNS Groups.

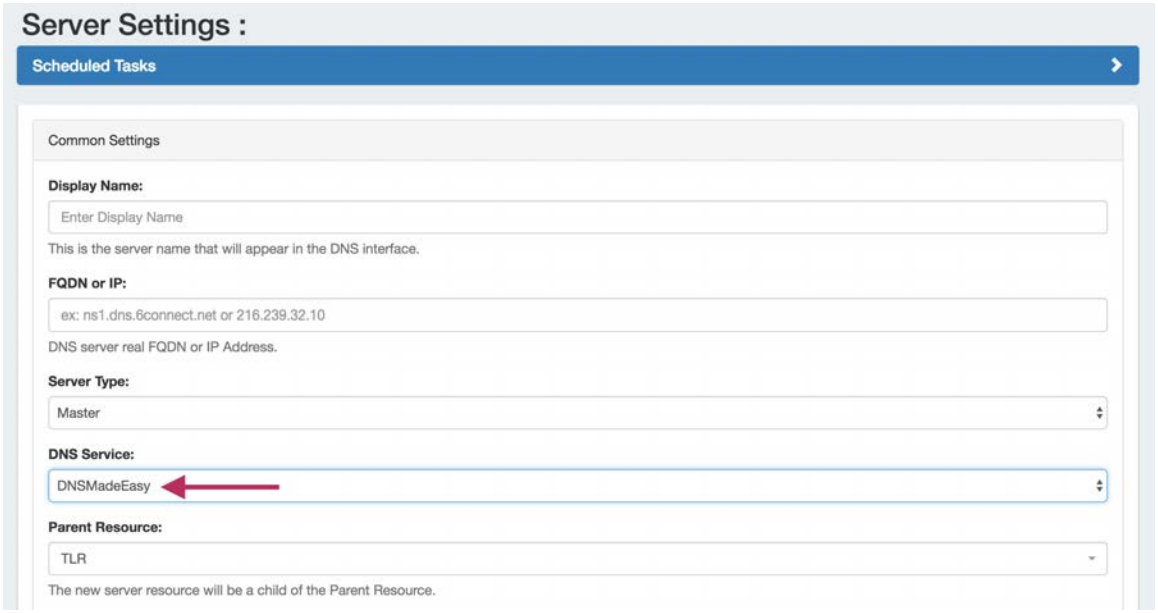
Step 2: Verify server setup

Although it is not strictly necessary to have the DNSMadeEasy server created in ProVision prior to import, creating or verifying the server at this point gives you an opportunity to test the connection and attach the DNSMadeEasy server to the DNS Group selected in step 1.

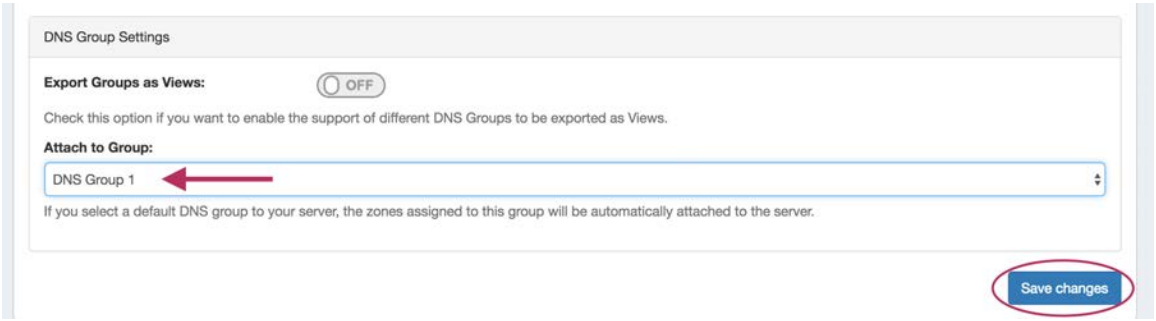
Go to the DNS Tab, DNS Servers section, and either verify that the desired server is shown in the server list, or click the "Add Server" button to create a new DNSMadeEasy server.



If creating a new server, ensure that "DNSMadeEasy" is selected for the DNS Service.

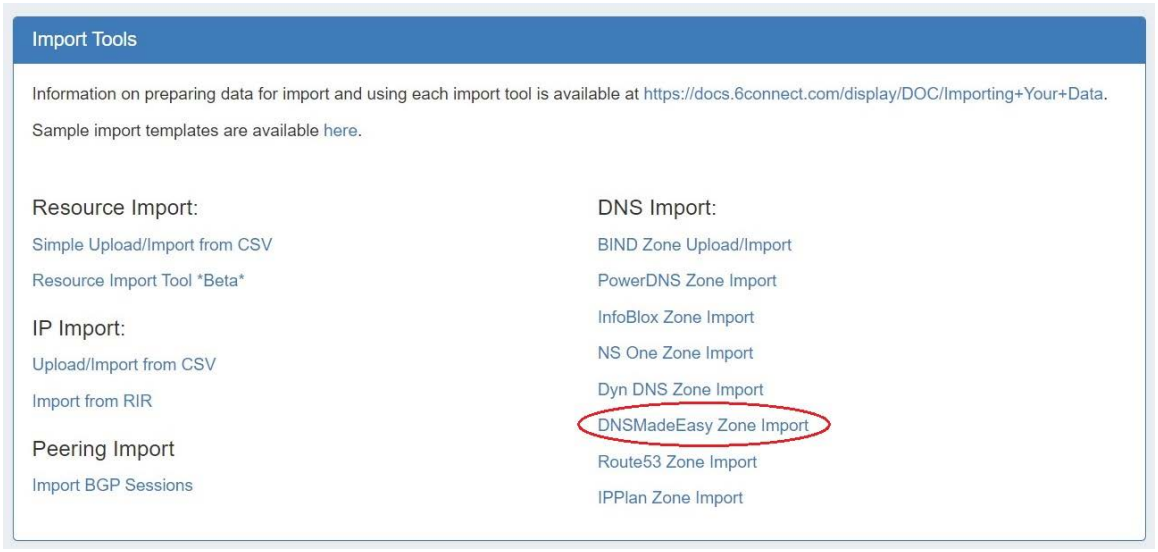


Under the "DNS Group Settings" section of the server detail page, ensure that the DNS Group from step 1 is selected as the server's Attach to Group setting, and click "Save".



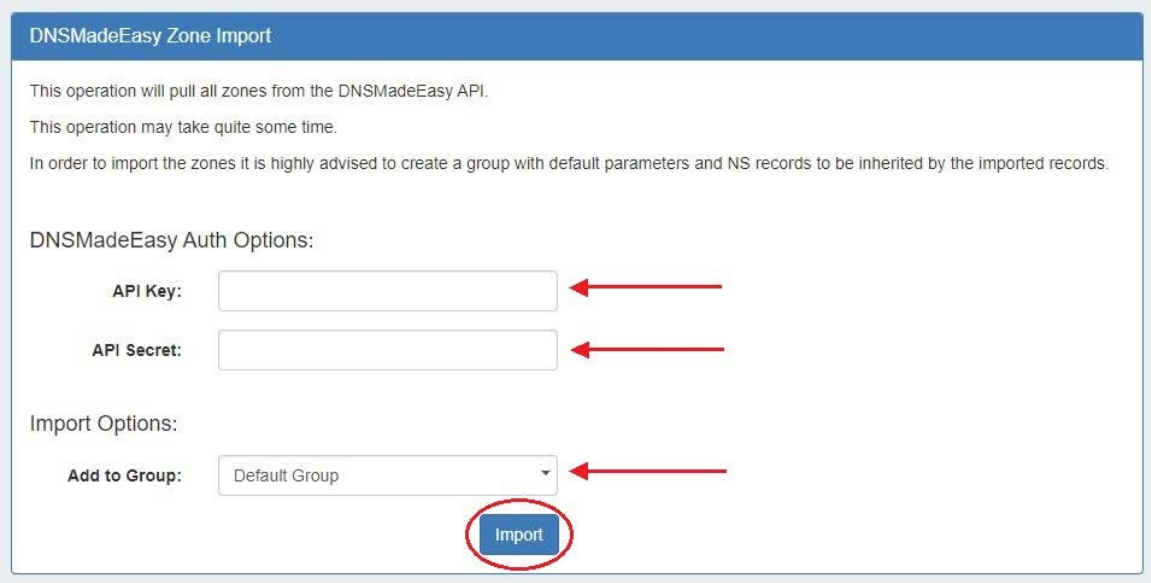
Step 3: Import your DNSMadeEasy zones

Once server setup has been verified, navigate to the Data Import Tab in the Admin section. Select the "DNSMadeEasy Zone Import" link.



Then, enter the DNSMadeEasy API Key, Secret Key, and the ProVision DNS Group to add the zones to.

Once all information has been entered, click the "Import" button.



The import may take a couple of minutes. If errors occur, they will show under the Pull in Progress message.

When completed, a successful import will show a green Complete! status message.

Verify the zones by exiting the Admin area of ProVision, clicking on the DNS tab, and reviewing the zones under the Group previously selected for the import.

IPPLAN Zone Import

IPPlan Zone Import

The ProVision "IPPlan Import" option imports IPPlan zones using provided MySQL database credentials. It is advised to create a DNS Group prior to the import with default parameters and NS records to be inherited by the imported records.

- Step 1: Verify DNS Group setup
- Step 2: Import your IPPlan zones

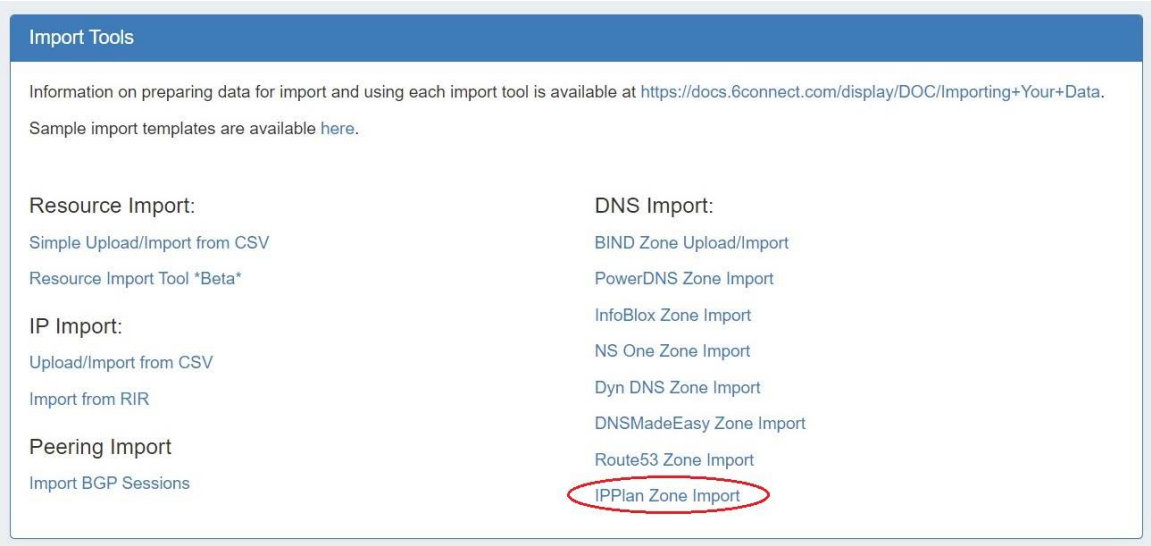
Step 1: Verify DNS Group setup

It is recommended to have a DNS Group created in advance with the proper default parameters and records to be inherited by the imported zones and records.

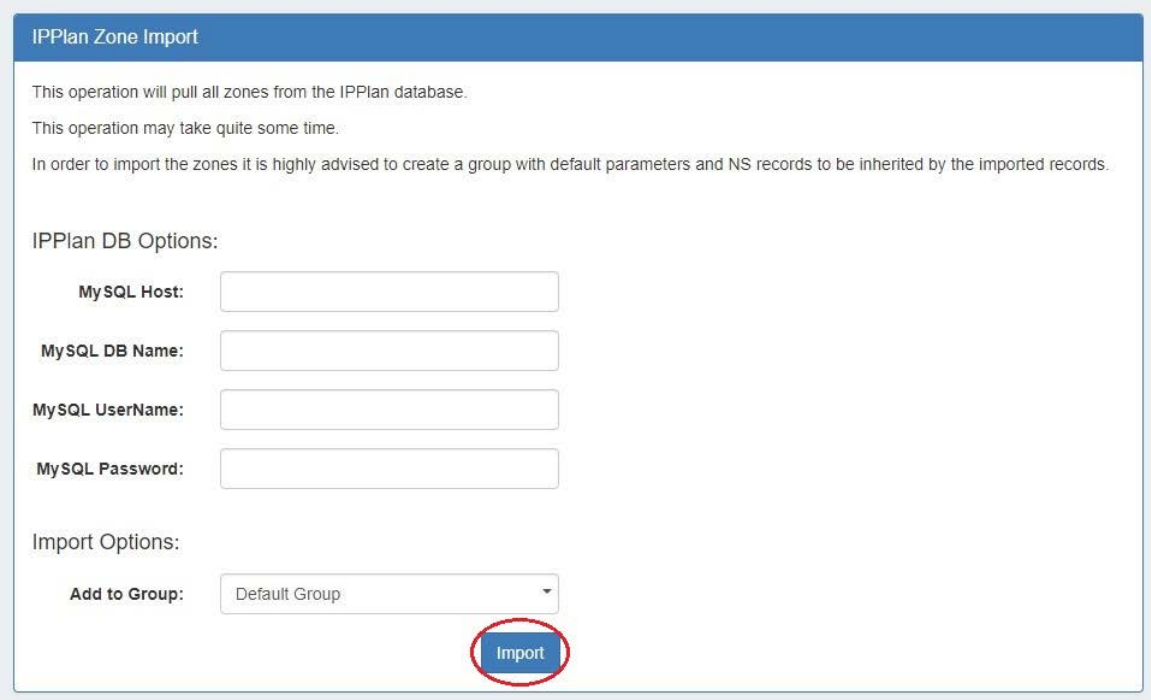
Review the existing DNS Groups in the DNS tab, and create a new DNS Group if necessary. See Working with DNS Groups for details on editing or creating DNS Groups.

Step 2: Import your IPPlan zones

Once DNS Group setup has been verified, navigate to the Data Import Tab in the Admin section. Select the "IPPlan Zone Import" link.



From there, enter the IPPLAN DB Options - Host, Database Name, MySQL Username, and MySQL Password, then select the desired DNS Group to add the zones under.



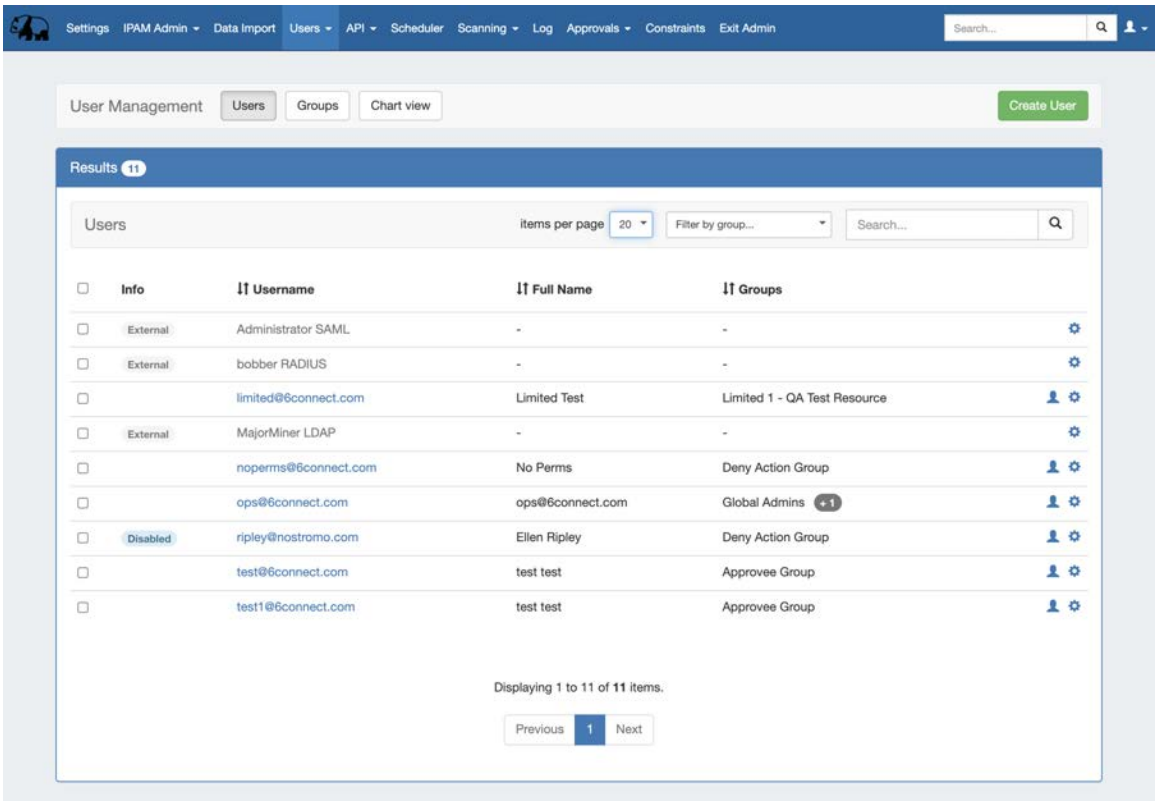
The import may take a couple of minutes. If errors occur, they will show under the Pull in Progress message.

When completed, a successful import will show a green Complete! status message.

Verify the zones by exiting the Admin area of ProVision, clicking on the DNS tab, and reviewing the zones under the Group previously selected for the import.

Users and Permissions

Users



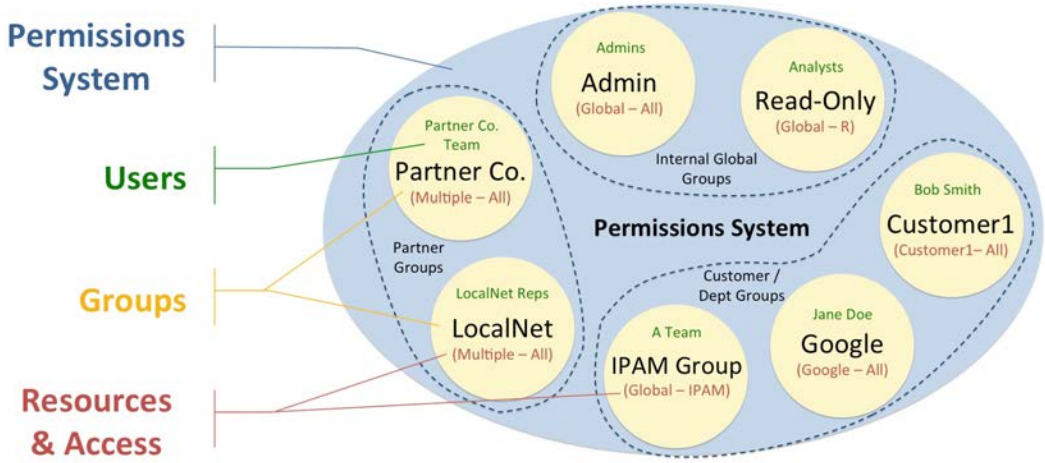
Users & Permissions is accessed from the Admin screen under the Users tab. Here, you will find tools for adding and managing permissions groups, users, and running queries for verifying a user's specific permissions.

- The Permissions Structure
- Permission Levels
  - Global Permissions
  - Resource Permissions
  - Permission Shortcut Button ("Perms Button")
  - Table of contents:

The Permissions Structure

The Permissions structure in ProVision is designed to give you as much flexibility as you need to accommodate most use cases. When mapping out the permissions structure for your organization, keep in mind who you want to access to application:

- Internal Users and Roles (Admins, Read Only, etc.)
- Partners related to multiple specific Resources/Accounts
- Customers/Departments with limited view to only their respective Resources/Accounts



In this diagram, we have created groups for each of those scenarios – we have internal groups, Partner Groups, and Customer groups. Each of these groups has access to different resources, permission levels, and users assigned to them.

The components of the Permissions System include:

Users: A User is a single login account that accesses ProVision. Users are assigned to Groups.

Groups: A Group is a set of permission conditions that apply to selected Users. Allowed modules, resources and access levels (C/R/U/D permissions) are set inside the Group.

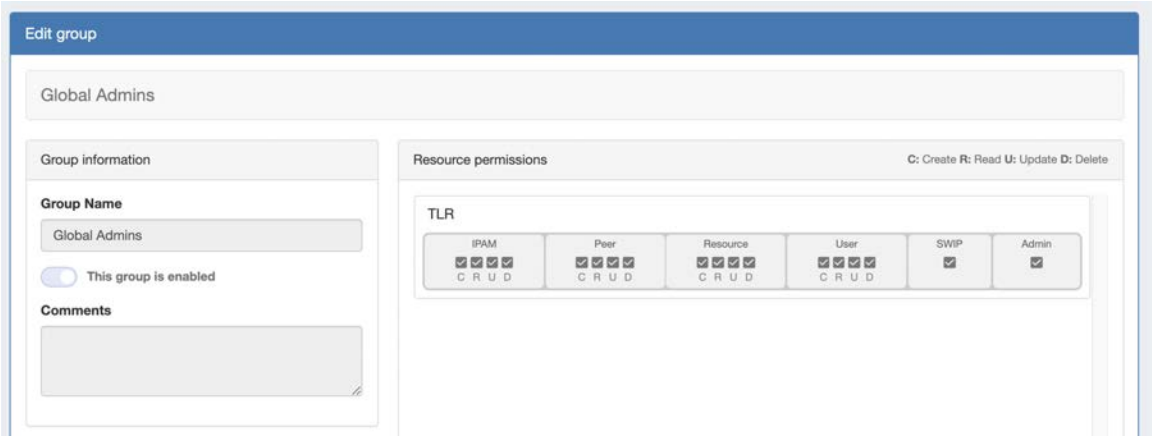
Resources & Access: Inside a Group, Resource access may be set to Global TLR (applies to all Resources), or to the specific Resource level (applies to only the selected Resources). For each Resource selected, access permissions can be set with C/R/U/D permissions under each ProVision module area (IPAM, DNS, Resource, Peering).

As a whole, this makes up the ProVision permissions system. The Permissions system allows you to fine-tune access to resource data to be as detailed as you need.

Permission Levels

Global Permissions

When you see a reference to a "TLR" - that is a "Top Level Resource". This Is the primary Resource under which all other resources fall under.



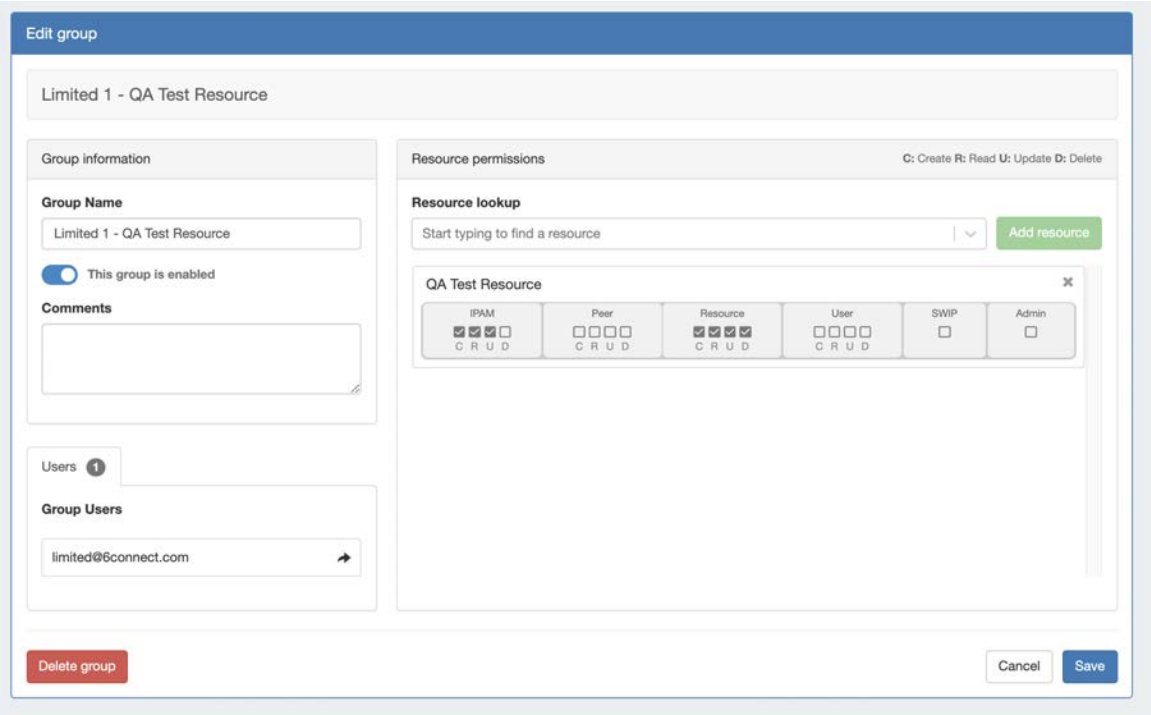
By default, all ProVision instances include a "Global Admins" group with full "TLR" permissions, and a "Global Read Only" group with only read permissions on "TLR".

Users with "Admin" access can assign/modify permissions for other users.

See Global Permissions for more details on configuring these elements.

Resource Permissions

An administrator can also set respective module and C/R/U/D permissions for a given Resource (single or multiple). These permissions fall under Groups.



A Group is configured for the selected Resource permissions, and User accounts are associated with the Group.

See Working With Users to learn how Resource Permissions are assigned.

See Resource Permissions for more details on configuring these elements.

Permission Shortcut Button ("Perms Button")

In DNS and DHCP, a shortcut permissions button ("Perms") is available on a per-item level, accessible only to Admin users.

This permissions button allows for direct, point-of-use permissions adjustments to DNS Groups, Servers, Zones, Records, and DHCP Servers.

It uses the same CRUD permissions and groups available in the Admin Users tab, but removes the need to remember and search for the DNS item name.

To open the Change Resource Permissions module, click on the "Perms" Button for any DNS item.



Edit the CRUD permissions for any ProVision user group by clicking the checkbox for the desired group and permission type.

When done, click "Save Changes". The permission changes will be also be reflected in the Admin User tab Group settings.

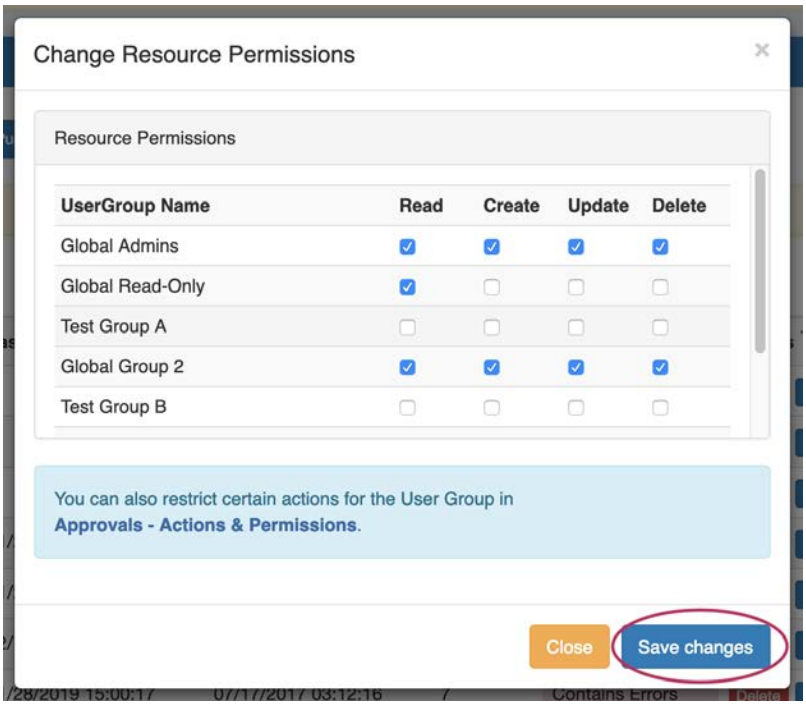


Table of contents:

- Global Permissions
- Resource Permissions
- Verifying Permissions
- Working With Users
- Working with Groups

Global Permissions

Global Permissions

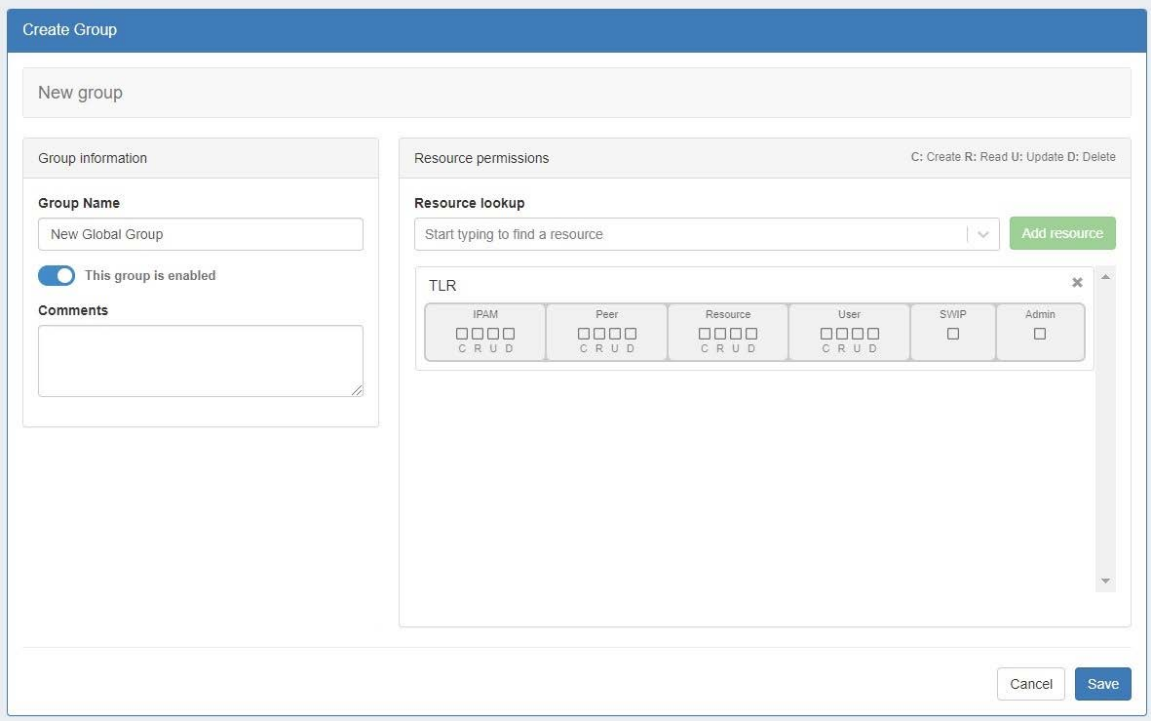
Global Permissions apply to the "TLR" or "Top Level Resource" within ProVision. By default, ProVision includes two groups with Global Permissions access - Global Admins and Global Read-Only. Initial Users are typically placed in the "Global Admins" group, and have administrative access to the entire platform. Global Read-Only users have full access to the platform, but with only read permissions. The global default groups cannot be edited or deleted.

Administration of these permissions require Administrative privileges. As an Admin, the user can then assign global permissions to groups and users. Depending on the requirement, the user can also have Resource specific permissions depending on how their group is configured.

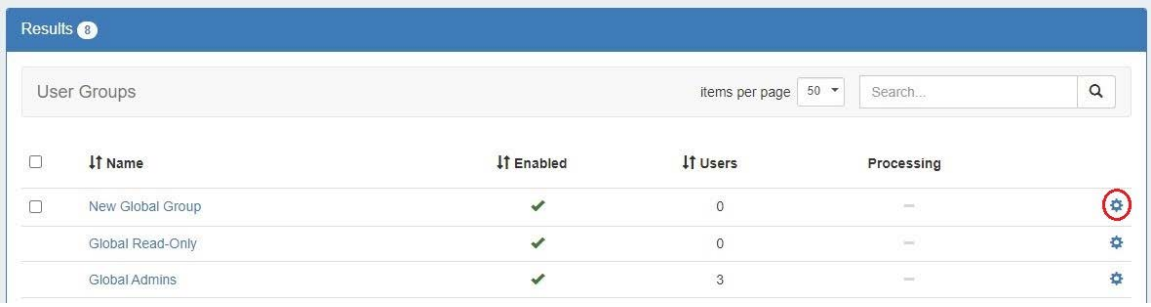
Global Permission Details

Global groups are visible under the "Groups" subtab of the Users tab. In addition to the two default Global groups, new Global groups may be created through the "Add Group" button.

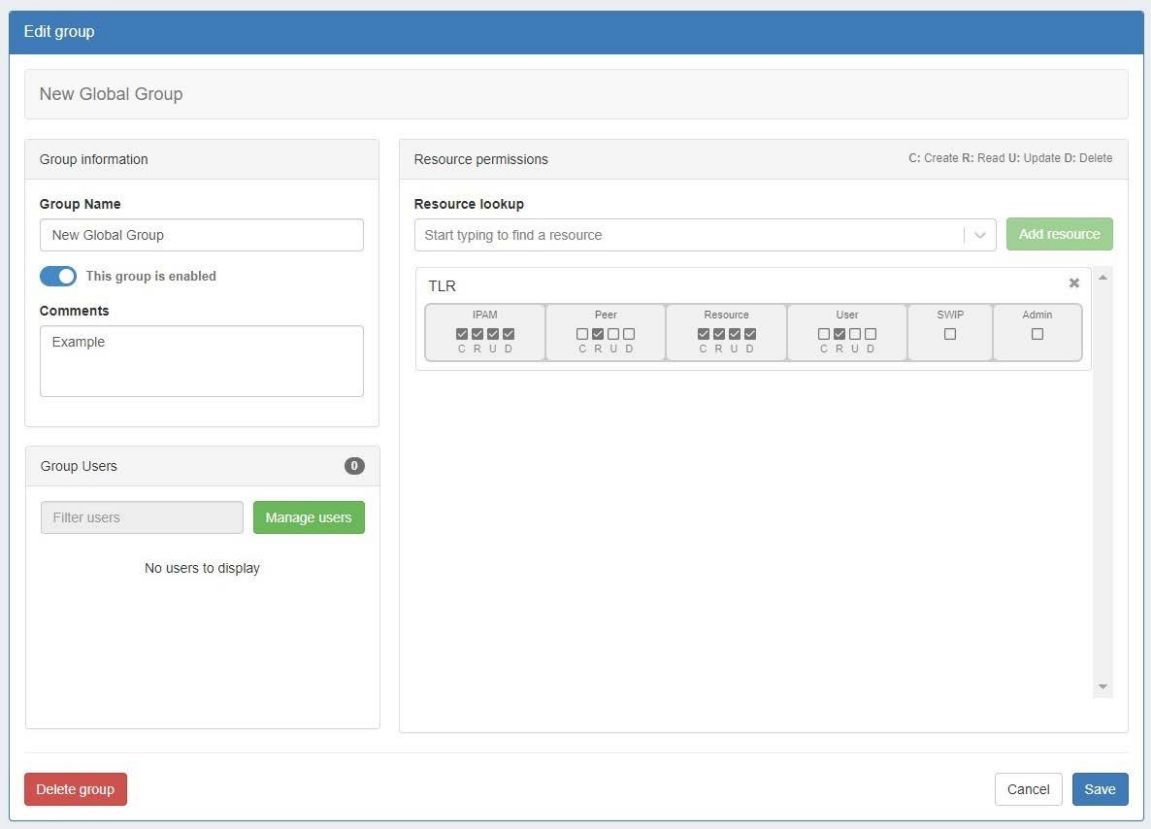
Under the resource selector, chose the "TLR" Resource ("Top Level Resource"), and then check permissions as desired.



User created global groups may also be edited just like standard groups, through selecting the Action Menu (Gear Icon), or clicking on the group name, to bring up the group information details.



Group details are the same for Global groups as for non-global groups, excepting that the resource selected is TLR (Top Level Resource). You may choose to edit the name, enable/disable the group, show or hide C/R/U/D permission details, and view users assigned to that group. Be sure to save any changes after editing.



Details on each global permission option is as follows:

Global Permission	Description
Create	Ability to create records of a certain type
Read	Ability to read records of a certain type
Update	Ability to update existing records of a certain type
Delete	Ability to delete records of a certain type

Functional Area	Description
IPAM	IP Address Management functionality - this covers the IPAM Tab in addition to the IPAM "Gadget" that can be present in Resources.
Peer	Peering functionality - covers the Peering Tab, both the Communication Manager and the Session Manager.
Resource	Resource functionality - this controls access for Resources depending on either the TLR or the individual Resource(s) selected. DNS zones, records, and servers are included as "Resources".
User	User/Group management - this controls access for User and Group functions within the administrative area for ProVision.
SWIP*	This affects the SWIP/RPSL integration for ARIN/RIPE. This way a user can either be enabled to have this capability or not.
Admin*	This controls whether a user is an administrator for the global ProVision application. Note: This does not confer any additional permissions on a per-resource level.

Additional Information

For more information on Users and Groups, see the following areas:

- Users & Permissions
- Resource Permissions
- Working With Users

- Verifying Permissions

Resource Permissions

Resource Permissions

Resource Permissions apply to designated Resources within ProVision. Rather than allowing a user full access to the ProVision platform, you can choose to limit a user's access to only certain resources or functional areas.

Administration of these permissions require Administrative privileges. As an Admin, the user can then assign resource permissions to groups and users.

Resource Permission Details

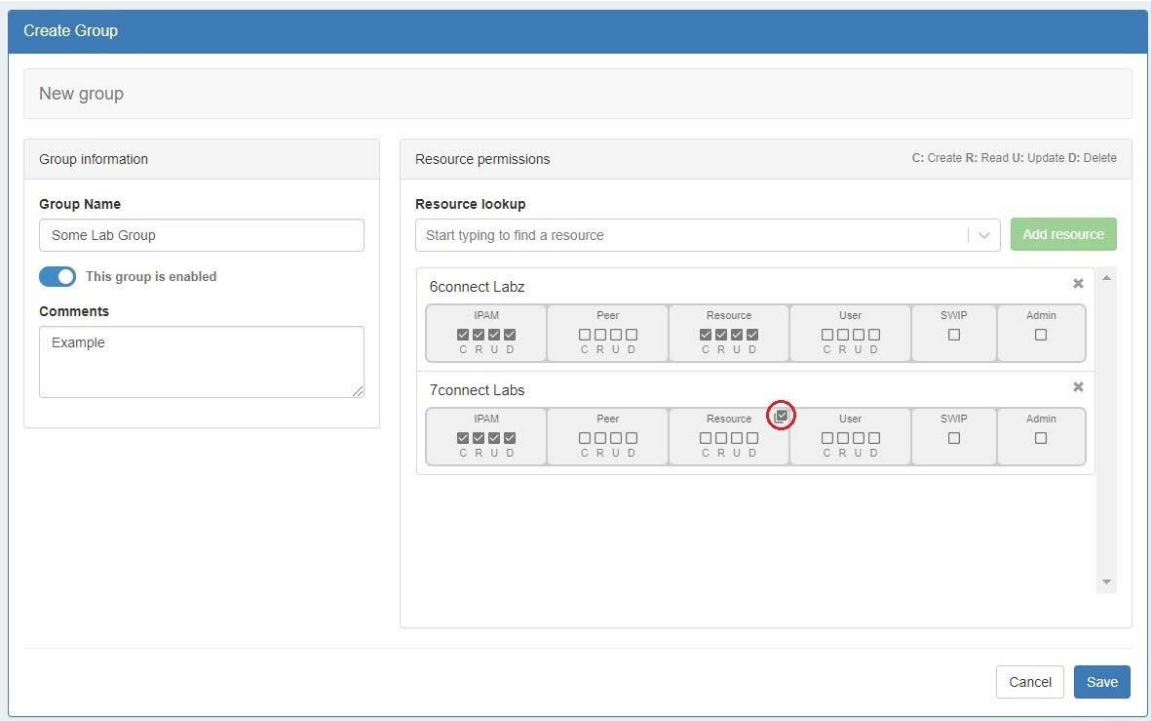
Resource Permission groups are visible under the "Groups" subtab of the Users tab. New groups may be created through the "Add Group" button in the upper right of the page.

Under the resource lookup selector, chose one or more resources for which you want to define permissions, and then check permissions as desired.

> Keep in mind when working with individual Resource permissions that tasks which require moving entities (zones, IPAM blocks, attaching servers, etc) from one resource to another, require the user to have permissions on both the originating Resource and the destination Resource.
>
> Thus, moving IP blocks from "6connect Labz" to "7connect Labs" requires the user to have IPAM and Resource permissions on both Lab resources.
>
> Similarly, attaching a DNS server to a DNS Group requires Resource permissions on both the DNS Group and the intended DNS server to attach.

Here, we show making a group called "Some Lab Group", whose users we want to be able to access two resources: 6connect Labz and 7connect Labs.

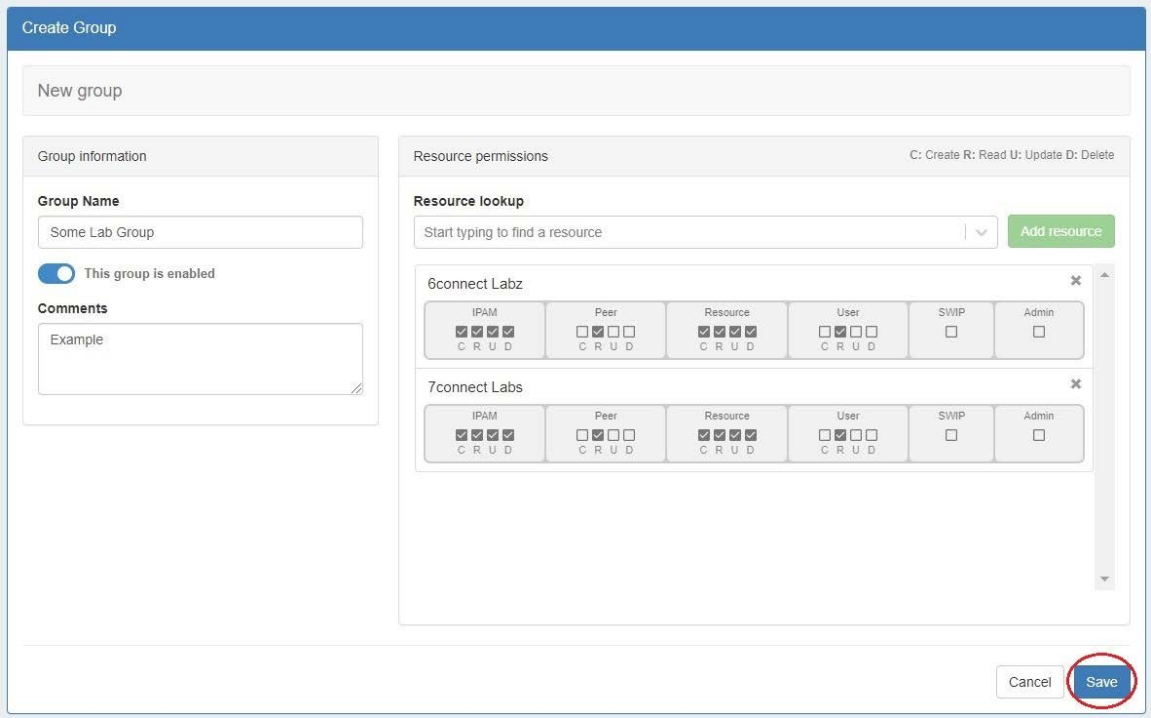
These users will be working extensively in IPAM and Resources, so we give them full access to those areas of ProVision. By clicking the checkbox in the upper corner of a permissions box you can select all the checkboxes in that section.



However, we also want them to view other information in Peering and Users, but not edit it.

Check the "R" column under Peer and User.

Lastly, hit "Save" to save our changes.



Details on each resource permission option is as follows:

Resource Permission	Description
Create	Ability to create records of a certain type
Read	Ability to read records of a certain type
Update	Ability to update existing records of a certain type
Delete	Ability to delete records of a certain type

Functional Area	Description
IPAM	IP Address Management functionality - this covers the IPAM Tab in addition to the IPAM "Gadget" that can be present in Resources.
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User	User/Group management - this controls access for User and Group functions within the administrative area for ProVision.
SWIP*	This affects the SWIP/RPSL integration for ARIN/RIPE. This way a user can either be enabled to have this capability or not.
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- Global Permissions
- Working With Users
- Verifying Permissions

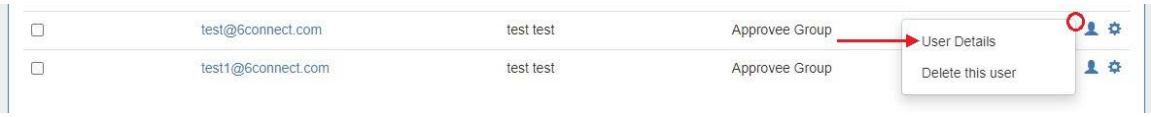
Verifying Permissions

Verifying Permissions

- Check User Permissions by Resource
- User Permissions Chart
- Additional Information

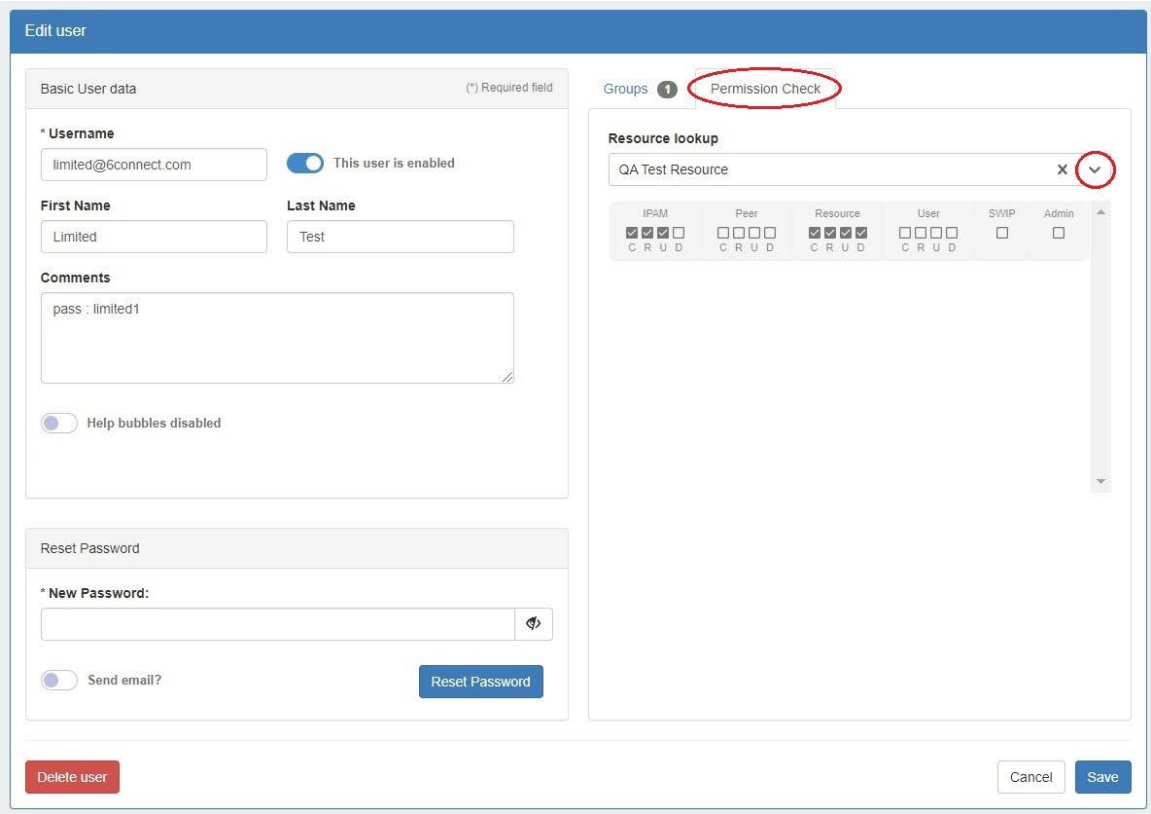
Check User Permissions by Resource

To verify the permissions of a certain user for a specific resource, open "User Details" for the user from the action menu or by clicking on their username.



On the Edit User screen, click on the "Permission Check" tab on the right, then select a Resource from the "Resource lookup" dropdown.

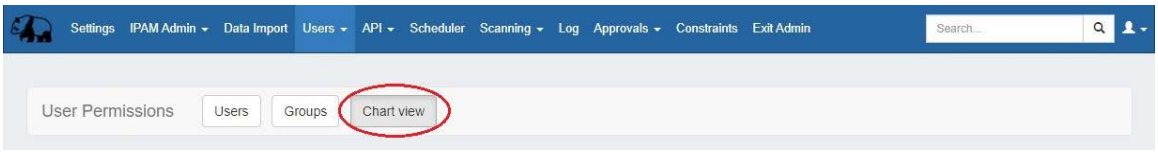
The resulting output will display the detailed permissions for that user and resource combination.



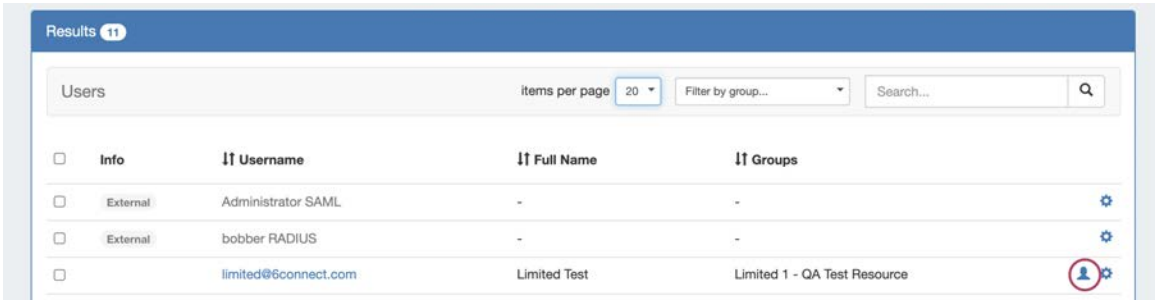
User Permissions Chart

The User Permissions Chart is accessed from the top of the Users tab page, and displays a color-coded resource permission tree for a selected user/group combination.

Click the "Chart view" sub-tab and the chart page will open.

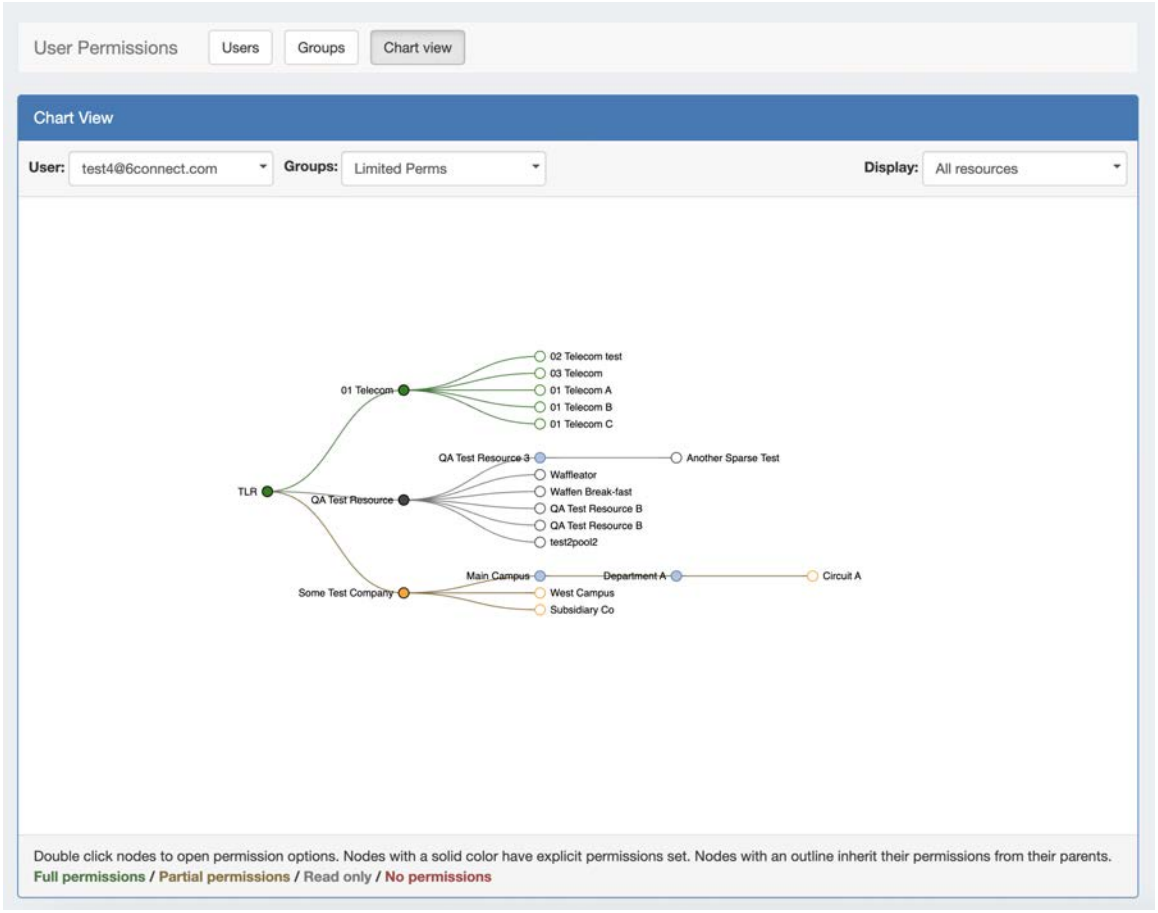


You may also access the User Permissions Chart by clicking the User icon for the user from the Users List.



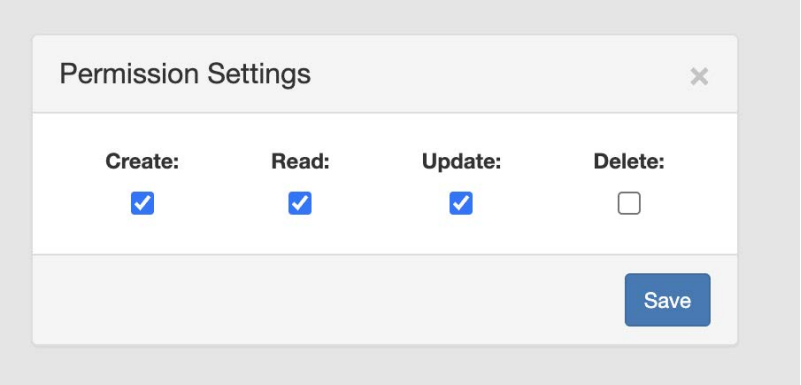
Once in Chart View, you can graphically view the permissions level of a user by selecting their user name and group from the dropdowns at the top of the chart.

The resulting chart will be color coded depending on permissions level.



Single clicking on a filled circle resource node will expand and collapse the node. You may also filter the results by selecting an option from the "Display" dropdown.

Double clicking on a resource will open up the Edit Permissions box, where CRUD permissions may be updated for allowed Resources. Check / Uncheck the desired permissions level, and click save.



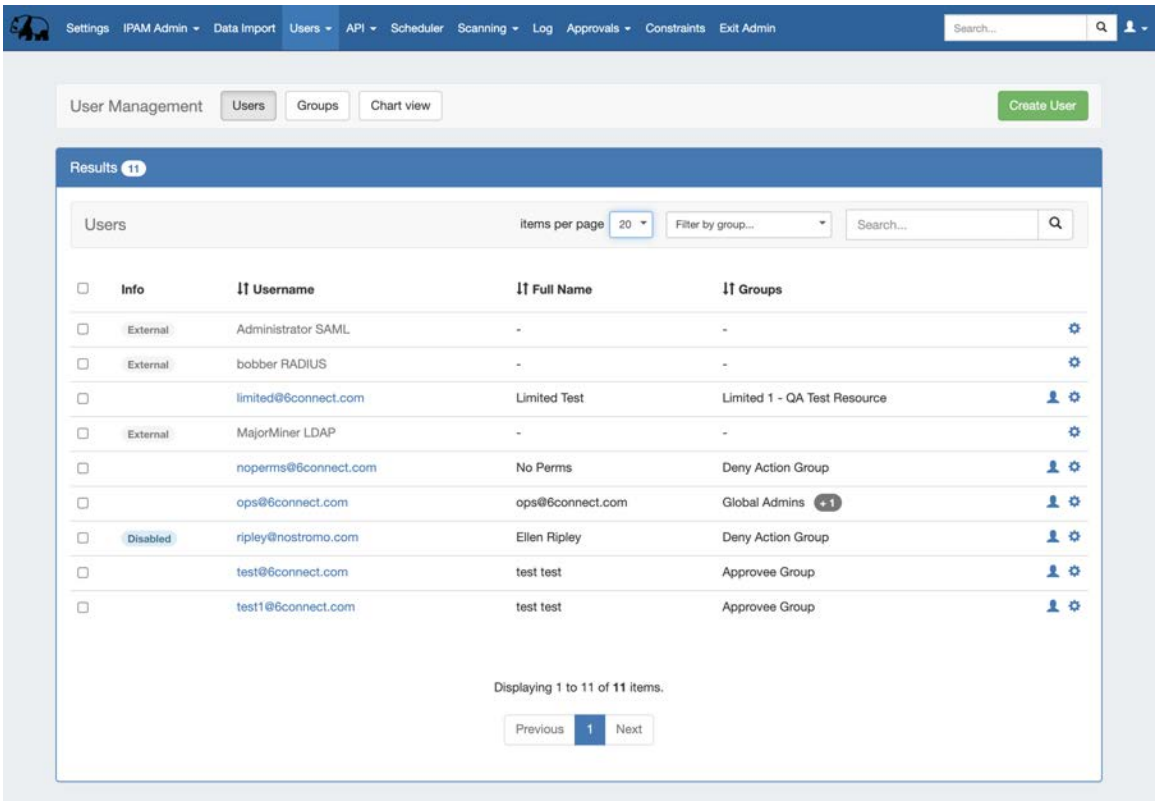
Additional Information

For more information on Users and Groups, see the following areas:

- Users & Permissions
- Global Permissions
- Resource Permissions
- Working With Users

Working with Users

Users

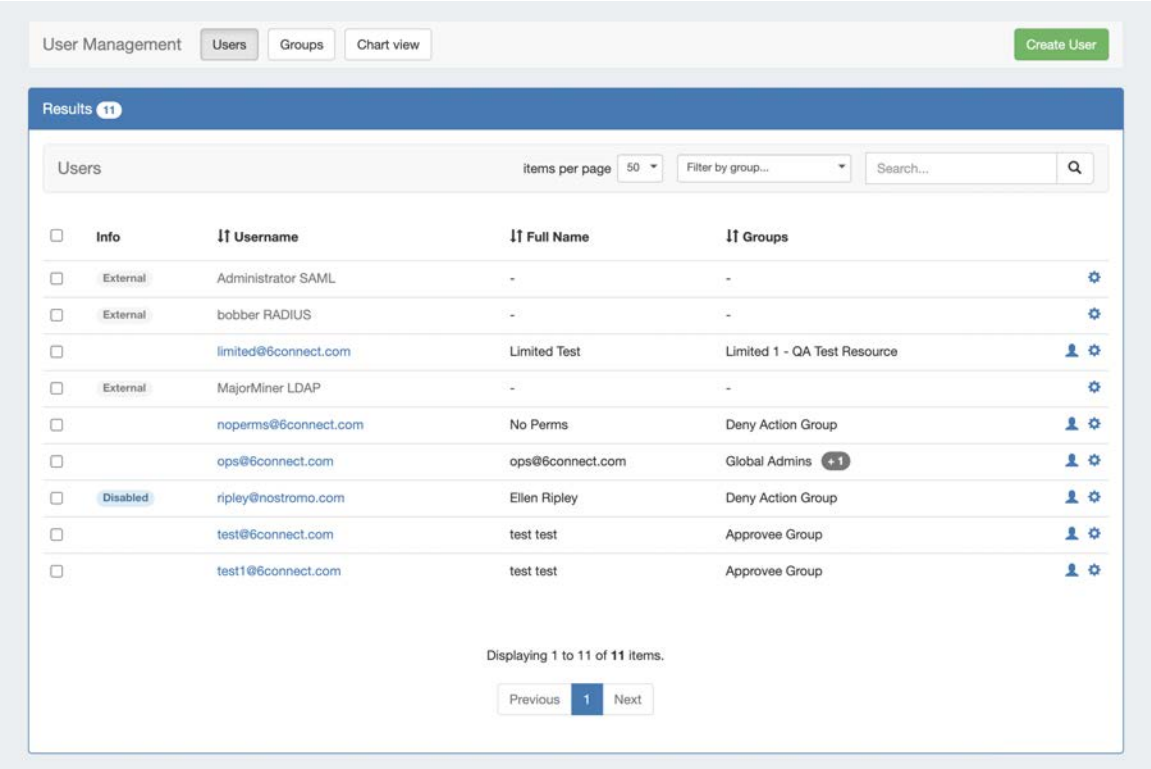


Users and Groups are managed from the Admin area of ProVision, under the Users tab. The Users tab contains three sub-tabs: **Users**, **Groups**, and **Chart View**.

- Users Overview
  - View Options:
    - Items per page
    - Sort
    - Filter by Group
    - Search
- Working with Users
  - Creating User Accounts
  - Editing User Accounts
  - Password Management
  - Delete a User
- Additional Information

Users Overview

A User is defined as a single login account that accesses ProVision. On the Users page, users may be created, edited, assigned to groups, have password information reset, or be removed.



When viewing the Users List, the following is shown:

Selection checkbox: The checkboxes on the the left side of the user may be used to multi-select users to delete

Info: An informational tag displays for External (external users are not editable) or disabled users

Username: The associated login email address for local users, or the server username for external users. Click on the username to view user details.

Full Name: The manually entered first and last name of the user

Groups: The group(s) to which the user belong - if the user belongs to multiple groups, an interactive bubble will display with the number of additional groups (+1). Click on this bubble to view all groups for the user.

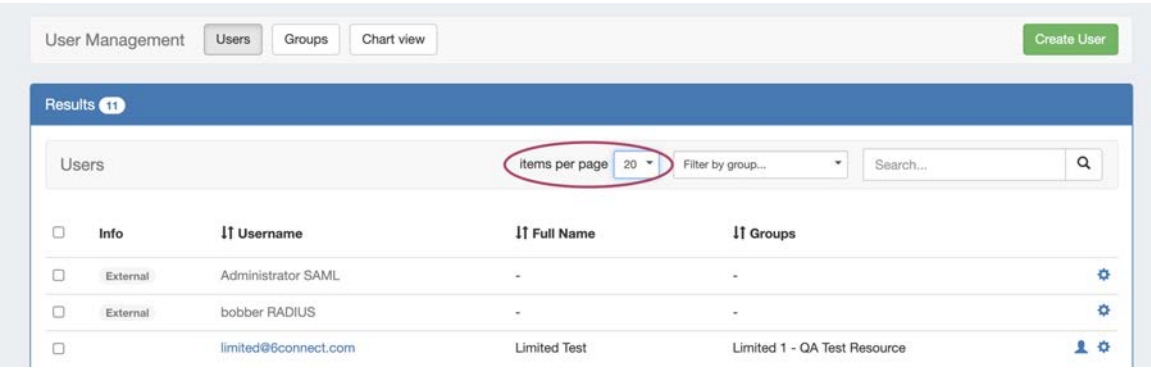
User Icon: Click for a shortcut to view the permission chart for the user. Once in the chart view, select the desired group to finalize the view

Gear Icon (Action Menu): Right Click on the gear icon (or anywhere on the user row) to open the action menu for the user

View Options:

Items per page

Select the "items per page" filter to limit the number of users displayed at one time. Any additional users will be displayed on following pages.

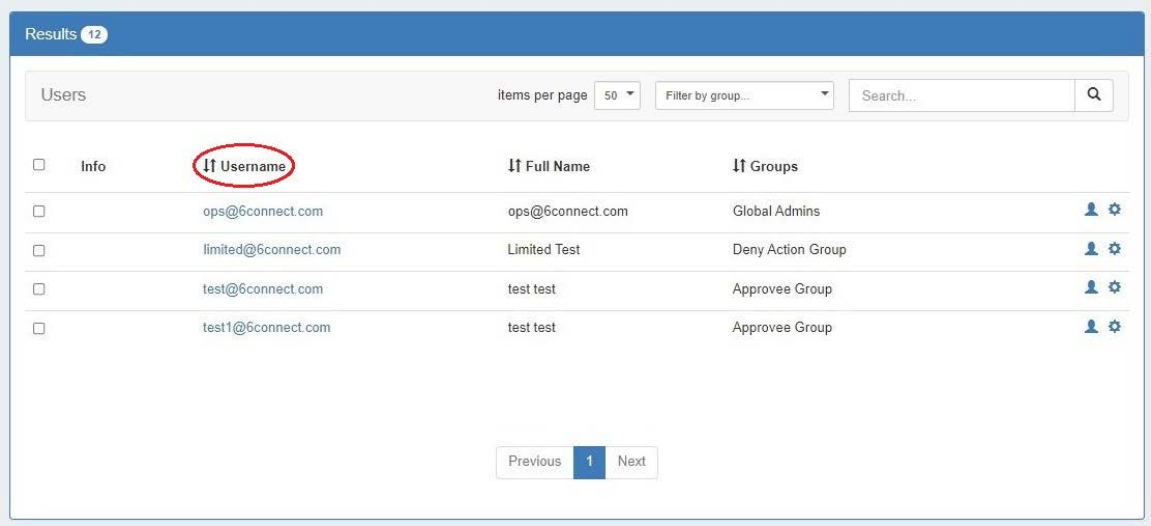


Use the page numbers and navigation arrows at the bottom of the list to view extra pages.

Sort

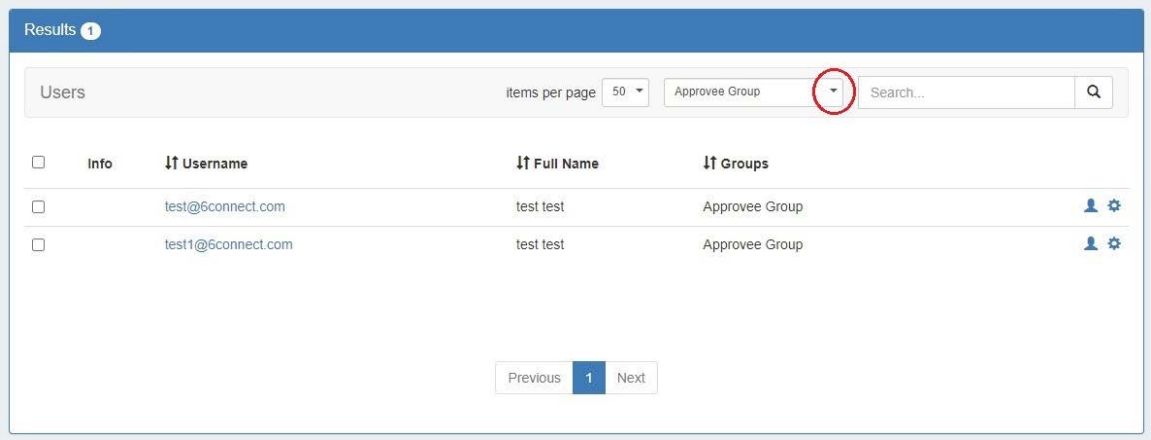
The Users list may be sorted for any column with the sort arrow icon ( ).

Click on the column name to toggle between ascending / descending order for that field.



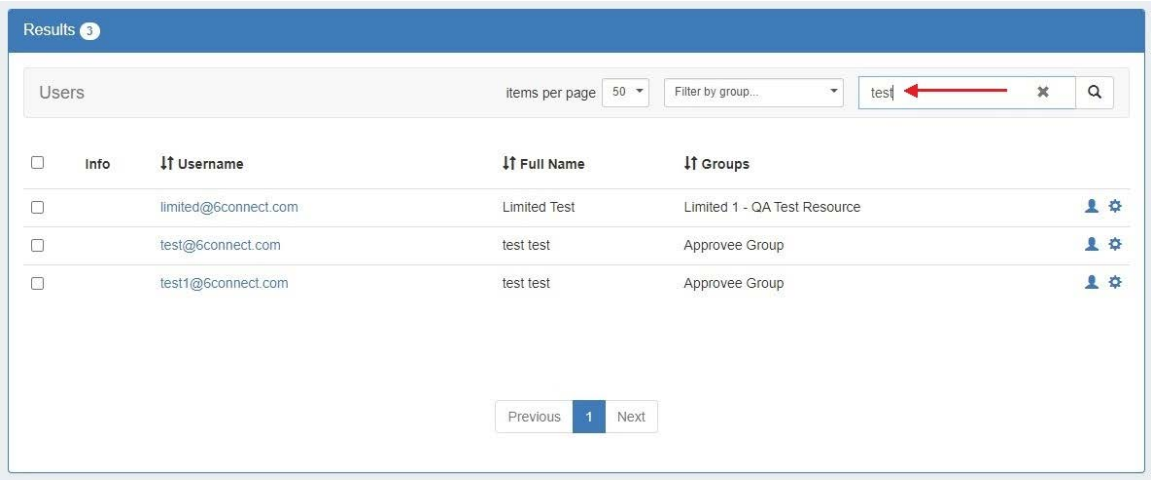
Filter by Group

Filter the Users list to only view a certain group by selecting a group from the "Filter by group" dropdown.



Search

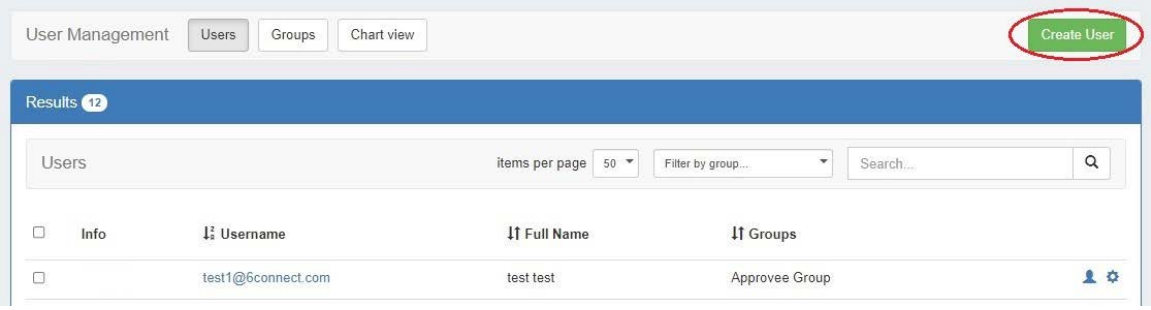
Search the list for a specific username or full name by typing all or part of either name in the search box.



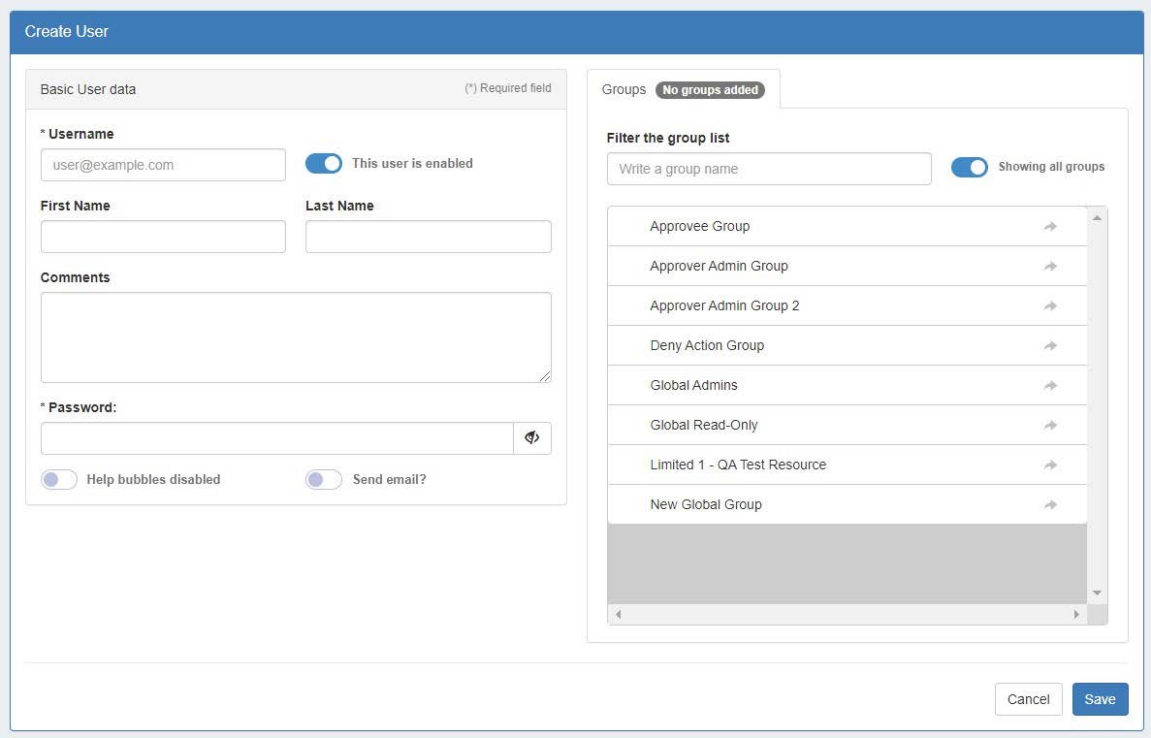
Working with Users

Creating User Accounts

Add Users by clicking on the "Create User" button at the upper right of the "Users" page. This will take you to the Create User screen.

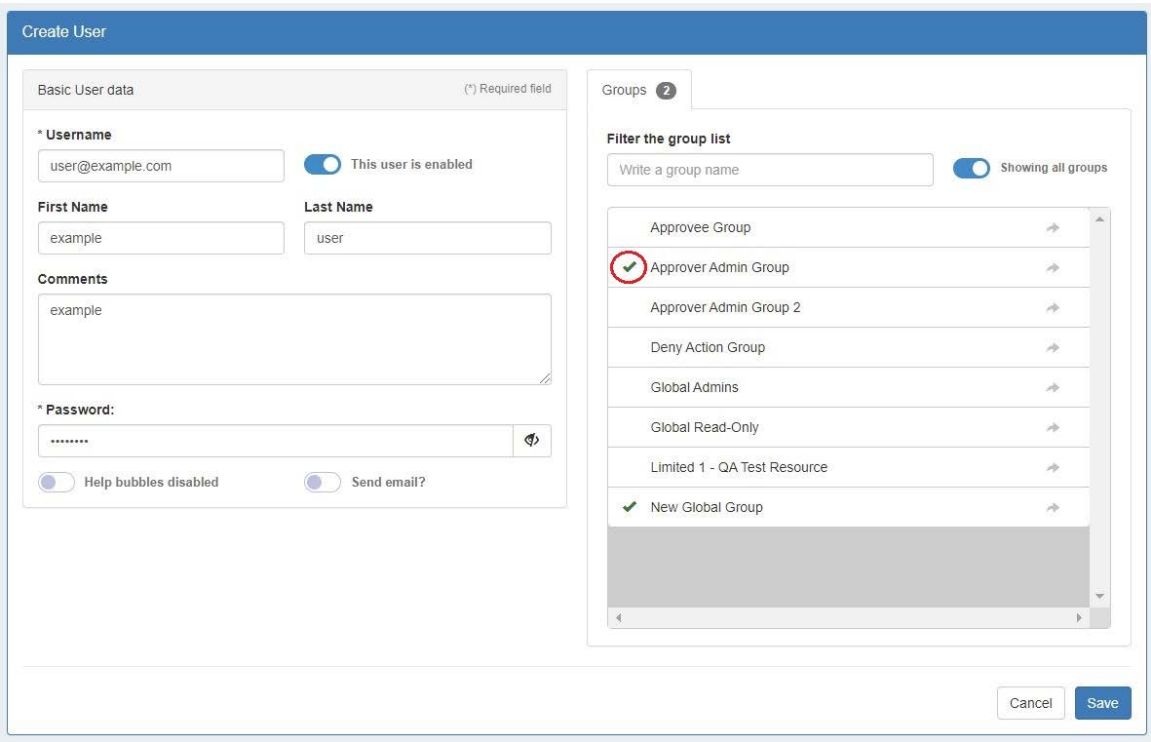


You may enter or edit the Username, First Name, Last Name, whether to enable help bubbles, and select one or more permissions groups to which to assign the user.



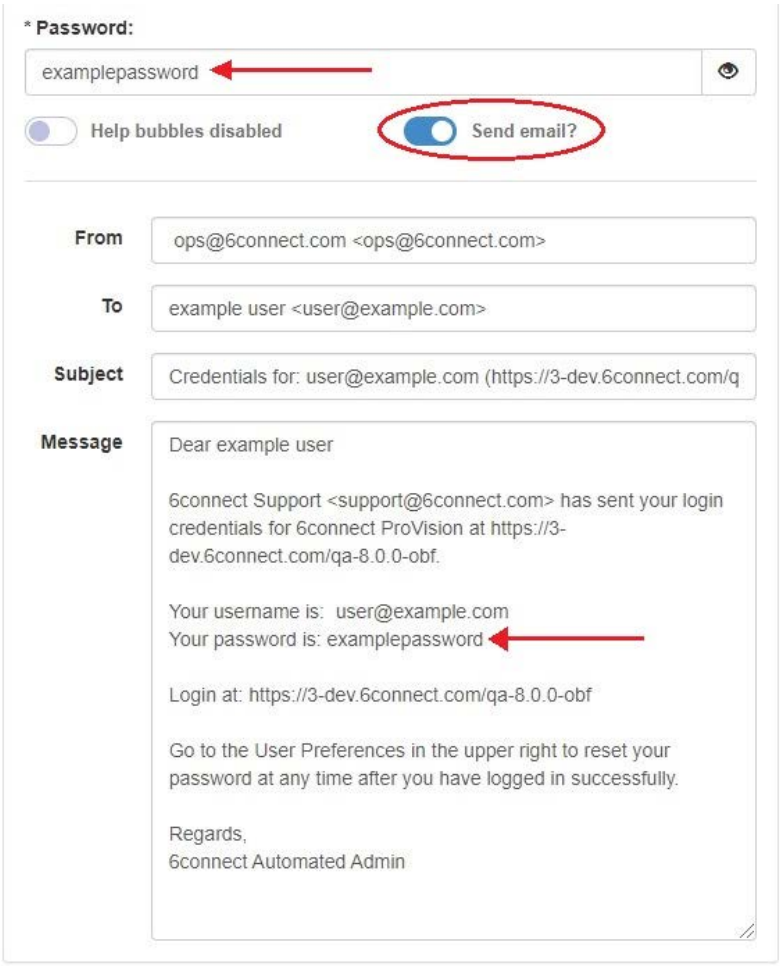
A list of existing User Groups is listed under the "Groups" tab on the right.

To assign a user to one or more groups, click on the area to the left of a group name. A green checkmark will appear when the user is successfully assigned. You can search for a specific group using the filter box above the list.



When assigning users to multiple permissions groups, be sure to review the group permission details to ensure that they do not conflict with each other!

To create a password for a new user, simply type it in the "Password" field. Click the eye icon to the right of the field to toggle visibility. You may also create a password and automatically send an email to the new user with their credentials. In the Password section, move the "Send email?" selector to the "ON" position. An email template will appear. Fill in a password for the new user and it will be added to the email template. When done click "Save" and the email will be sent.

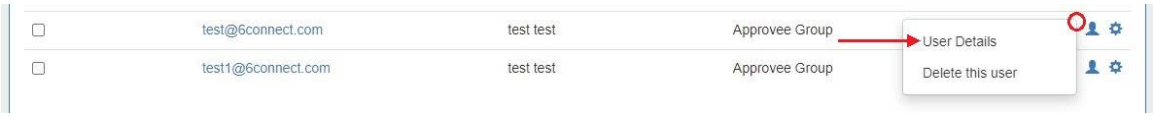


Passwords must be eight characters in length.

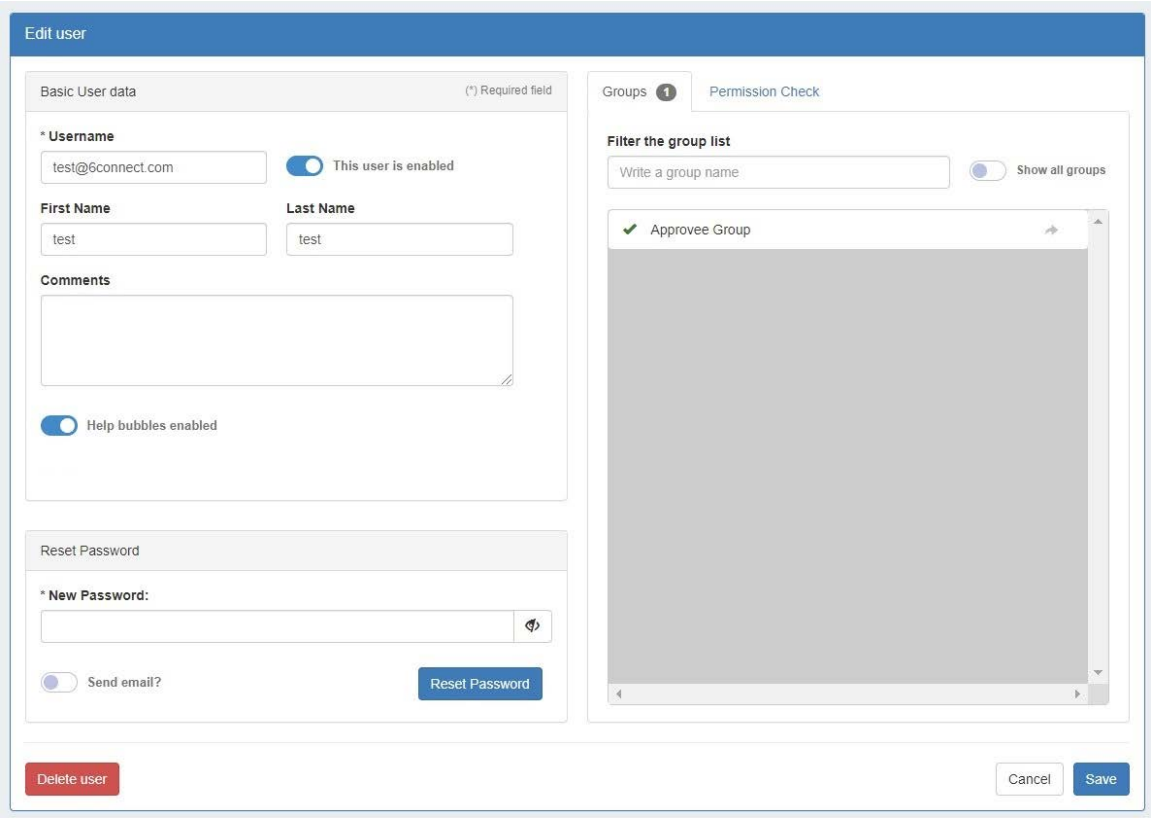
Editing User Accounts

External users may not be edited

To edit a user's information click on the Action Menu (gear icon) for the user and select "User Details" or click on the user name.



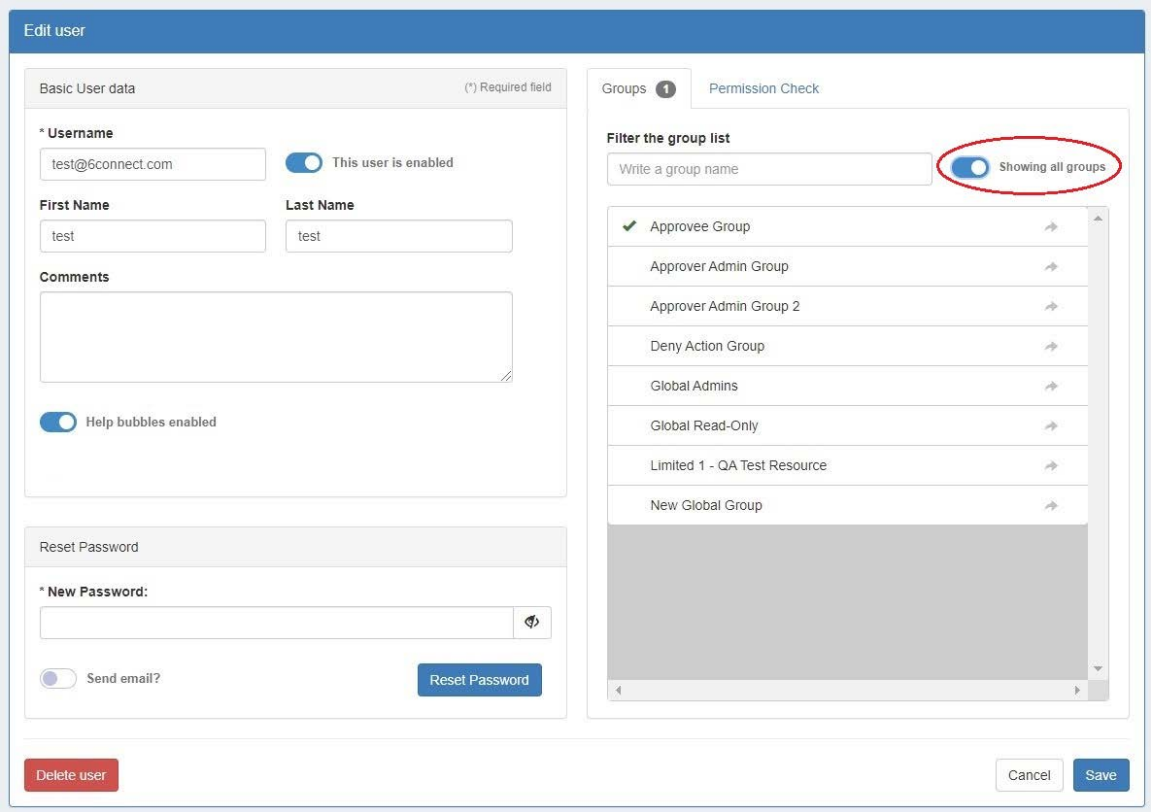
This will bring up the Edit User screen.



By default, the group list is filtered to show the group(s) to which the user is currently assigned.

In order to assign the user to another group, move the selector at the top of the group list to "Show all groups" and the list will expand to show all existing groups.

To assign a user to one or more groups, click on the area to the left of a group name. A green checkmark will appear when the user is successfully assigned. You can search for a specific group using the filter box above the list. Clicking the arrow to the right of a group name will take you to the corresponding Group Details page.



When done, be sure to save your changes by clicking "Save" at the bottom right of the page.

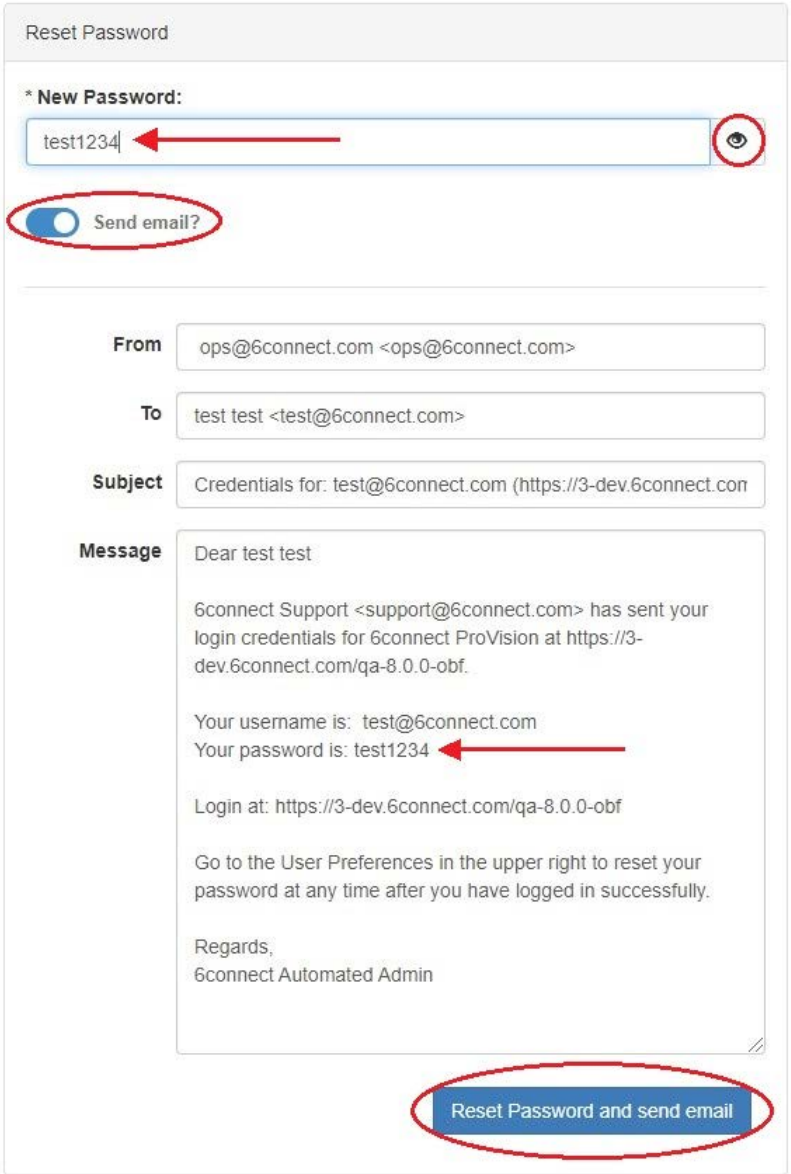
Password Management

To reset an existing user's password, simply type in a new password and hit "Reset Password". Use the eye icon to toggle field visibility.



To reset a user's password and send the credentials in an email, move the "Send email?" selector to the "ON" position and email fields will appear that may be edited as desired.

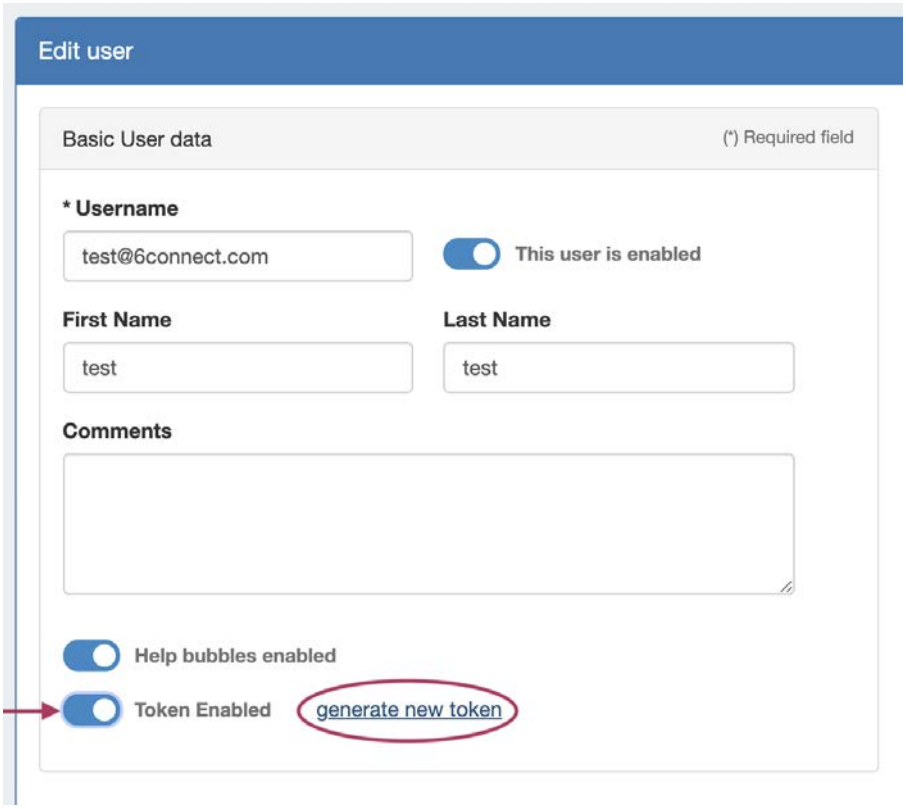
Enter a new password into the password field and it will prepopulate in the email template. When complete, hit "Reset Password and send email".



If desired, the system admin may enable login token links for users. To enable the Login Token functionality at the system level, change the 'ENABLE_TOKEN_LOGIN' in the includes/constants.php file to "true".

```
define("VLAN", "VLAN");
// User section
define('ENABLE_TOKEN_LOGIN', true);
// permissions
```

Once enabled, the option to enable tokens on a per-user level will be available under Edit User Basic User Data. Once enabled for a user, click "generate new token" for a token link to be created.

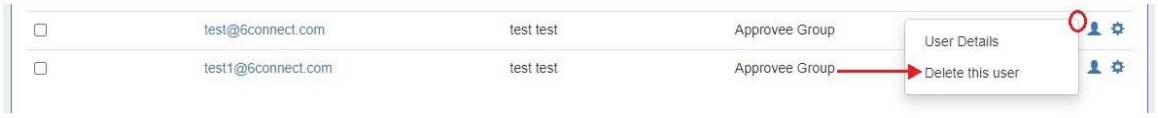


Once enabled for a user, click "generate new token" for a token link to be created.

Copy the provided URL, and save in a secure place. Token information may not be retrieved after the "Generate New Token" window is closed; a new token must be generated instead.

Delete a User

To remove a user from the Users list, click on the Action Menu (gear icon) for the user and select the "Delete this user" option.

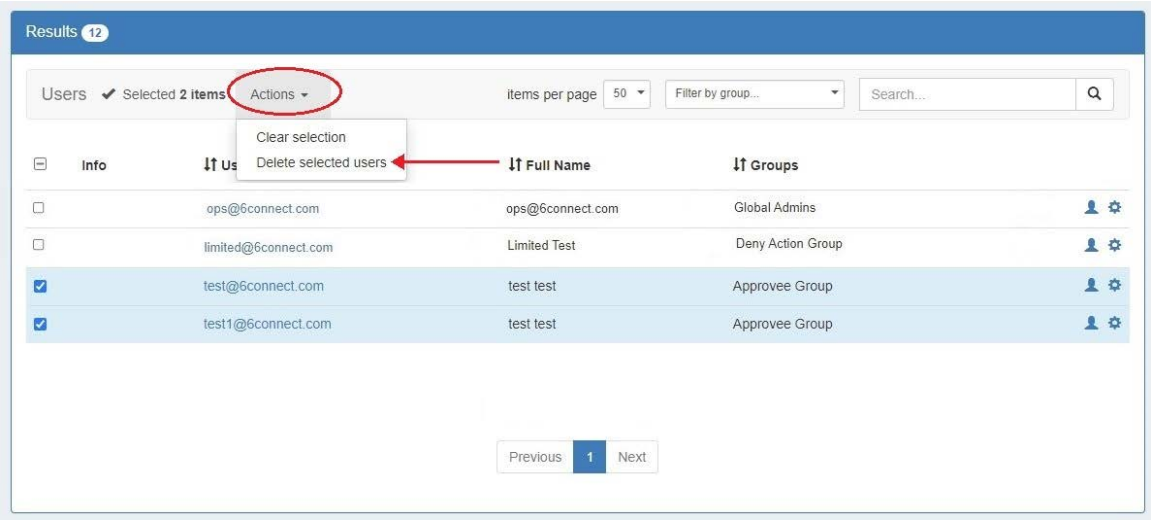


You may also delete a user from the User Details page by clicking the "Delete User" button at the bottom left of the page.



You may also select more than one user to delete.

To do so, select the checkboxes for the desired users, then under the "Actions" menu at the top of the list, select "Delete selected users".



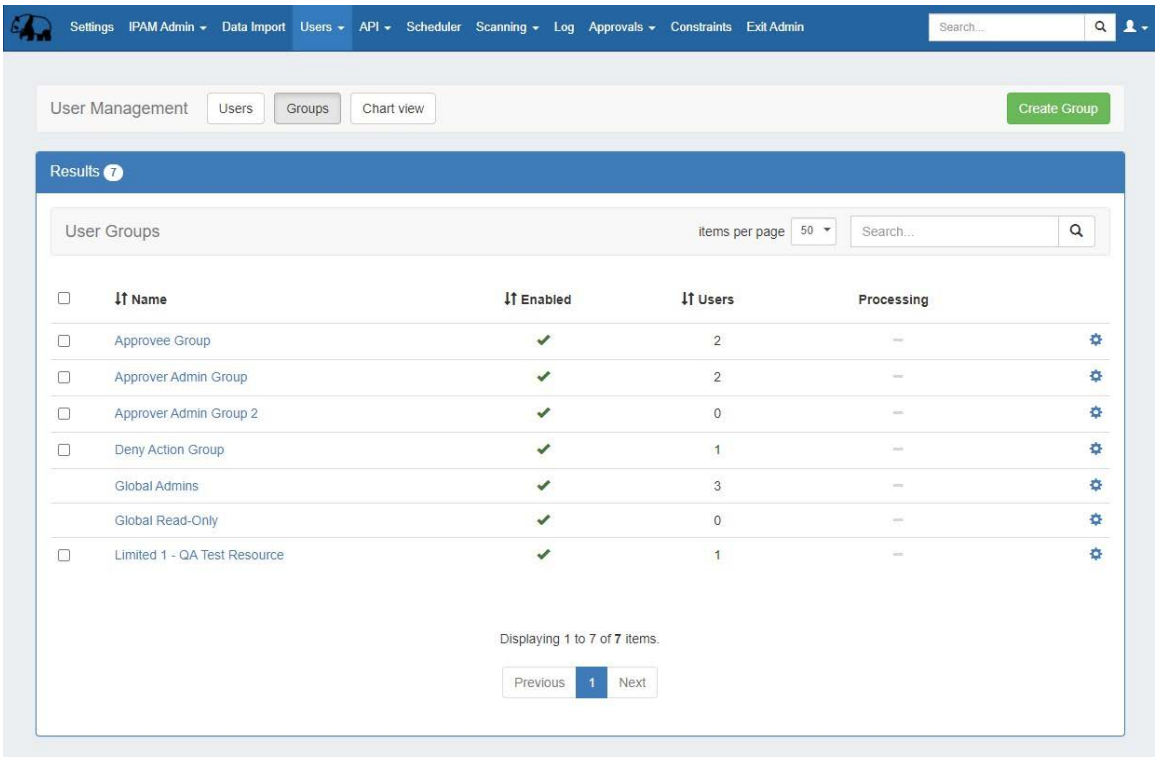
Additional Information

For more information on Users and Groups, see the following areas:

- Working with Groups
- Users & Permissions
- Global Permissions
- Resource Permissions
- Verifying Permissions

Working with Groups

Managing Groups

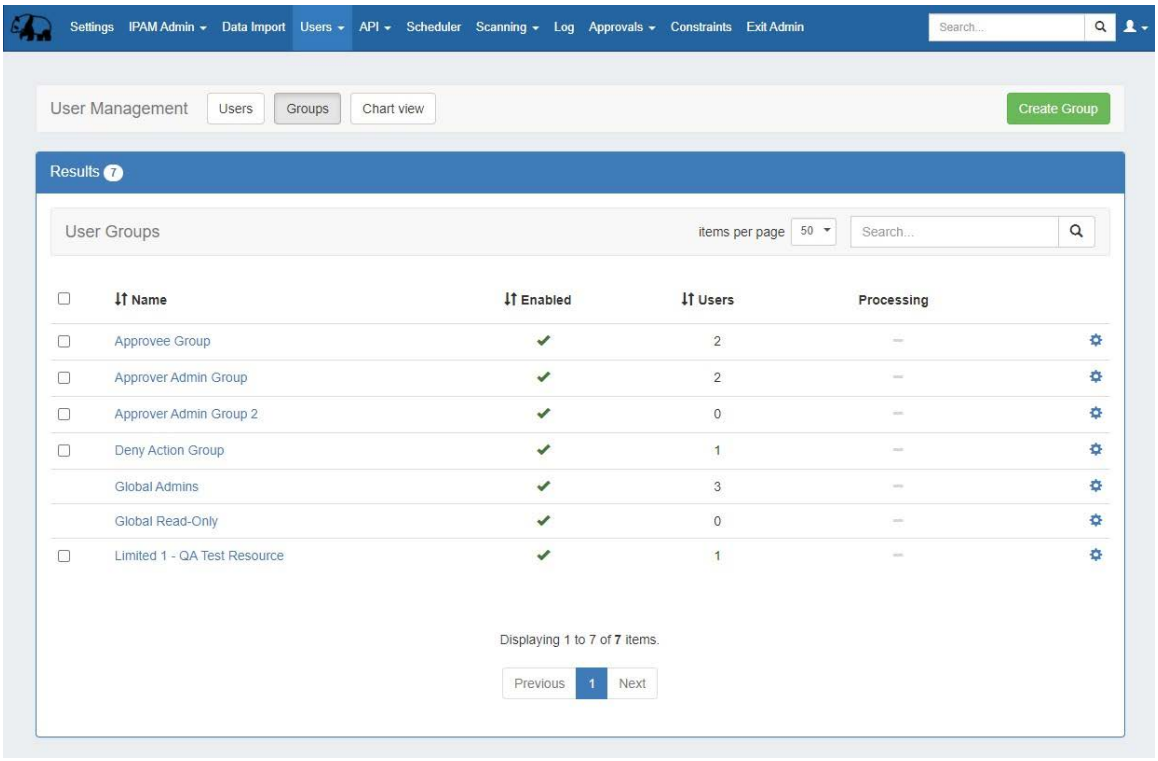


Users and Groups are managed from the Admin area of ProVision, under the Users tab. The Users tab contains three sub-tabs: **Users**, **Groups**, and **Chart View**.

To open the Groups list, click on the **Groups** sub-tab button under the Users tab.

- Groups List Overview
  - View Options:
    - Items per page
    - Search
    - Sort
- Groups Permissions Overview
  - Default Groups
- Working with Groups
  - Create a Group
  - Edit a Group
  - Manage Group Users
  - Delete a Group
- Additional Information

Groups List Overview



When viewing the Groups List, the following is shown:

Selection checkbox: The checkboxes on the the left side of the user may be used to multi-select groups to delete

Name: The group name. Click on the name to view group details.

Enabled: Whether a group is enabled

Users: The number of users associated with the group

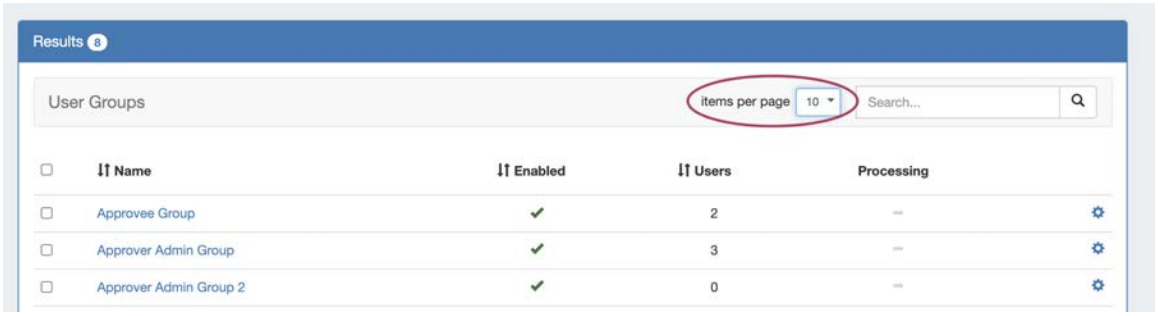
Processing: While group edits are being processed, an indicator will show under the processing column until changes have been propagated throughout the instance

Gear Icon (Action Menu): Right Click on the gear icon (or anywhere on the user row) to open the action menu for the group

View Options:

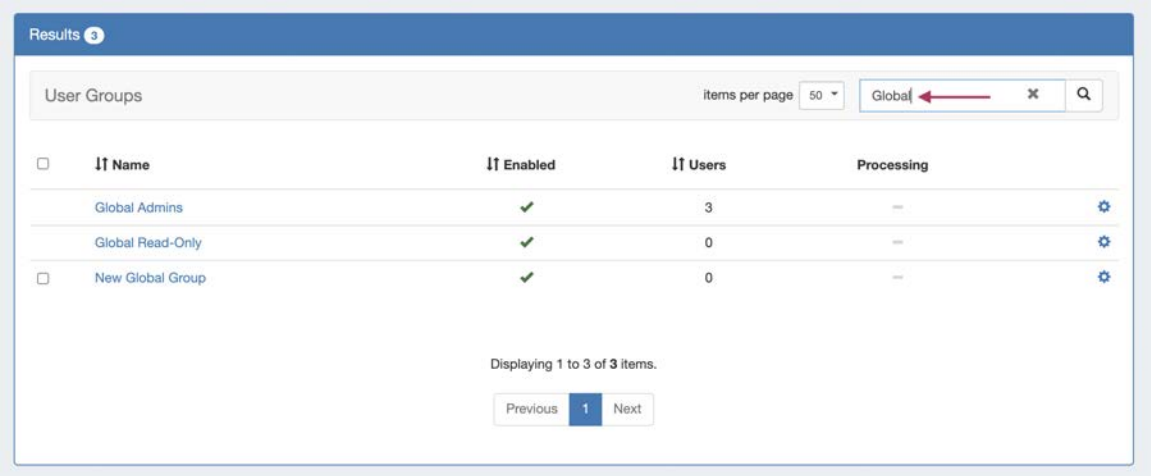
Items per page

Select the "items per page" filter to limit the number of groups displayed at one time. Any additional users will be displayed on following pages.



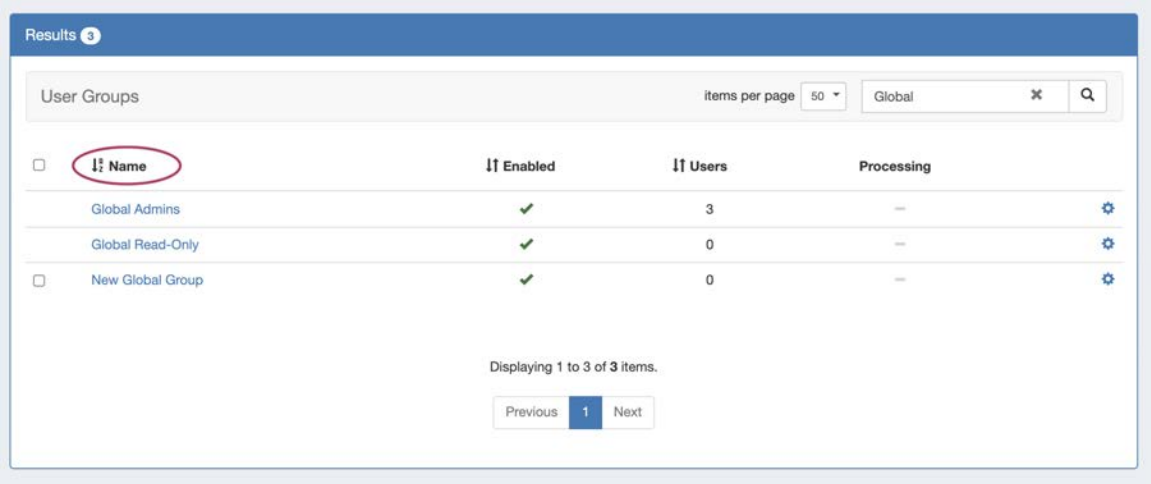
Search

Filter the list for a specific group name by typing all or part of the name in the search box.



Sort

Sort columns into ascending/descending order by clicking on the column header for any column with an up/down arrow ()



Groups Permissions Overview

ProVision administrators can also create permission groups to assign users under. This allows more control over user roles.

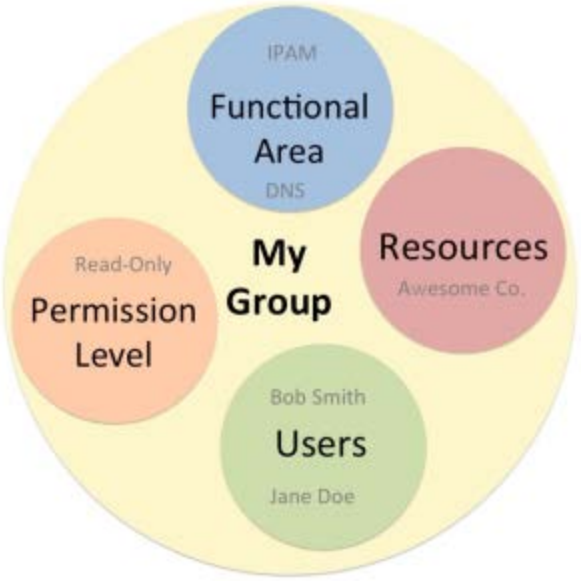
A Group has four elements associated with it:

Users: The Users that are assigned to the group, and will be limited by the selected permissions.

Resources: Resources access may be set to Global TLR (applies to all resources), or to the level of individually selected resources.

Functional Area: The ProVision functional area (IPAM, Resources, Peering, etc) for the selected resource(s) that permissions are set under.

Permission Level: Create, Read, Update, and Delete (C/R/U/D) permissions may be set under each functional area for each resource selected.



In the example above, the group “MyGroup” allows the users Bob Smith and Jane Doe to only read IPAM and DNS data for the Resource “Awesome Co”.

Through the use of these four elements, Groups can create permissions structures that are as flexible as you need.

Default Groups

Two default groups are available initially in ProVision:

- Global Admin (may not be edited or deleted)
- Global Read-Only (may not be edited or deleted)

These Global groups allow for access to the entire ProVision platform. You may add additional Global groups by creating a new group using the TLR (Top Level Resource). You may also add detailed resource level group permissions by selected individual resources.

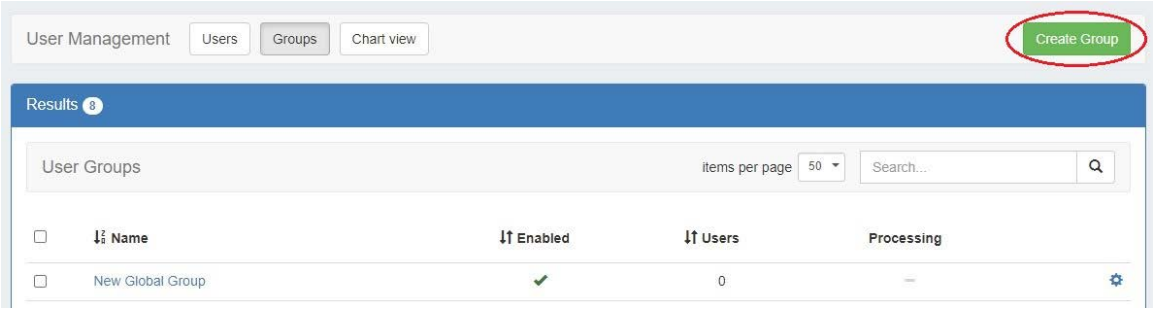
For more detail on top-level and resource permissions, see Global Permissions and Resource Permissions.

> **Overlapping group and user permissions**
>
> Permissions are inherited based on the hierarchy of the objects, unless you specify a different permission!

Working with Groups

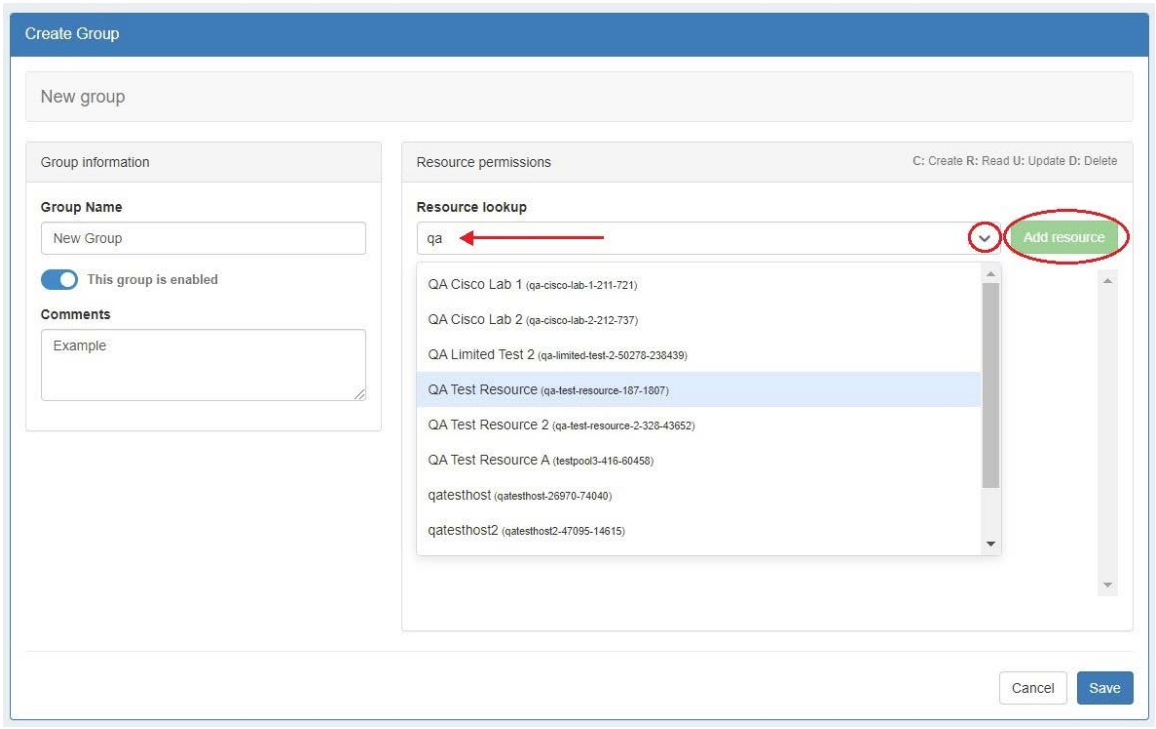
Create a Group

New groups can be created by ProVision administrators by clicking the green "Create Group" button at the upper right of the Groups page.



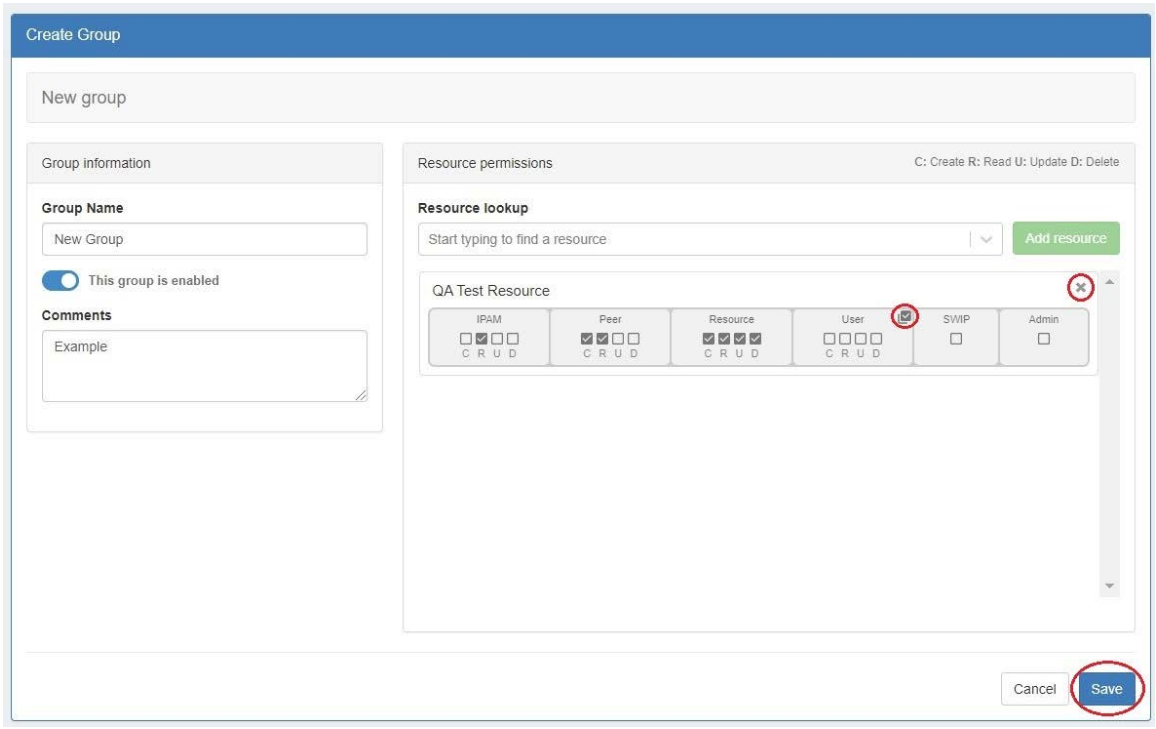
Add in the name of the new group.

Set the permissions for that group by selecting the resource(s) from the Resource lookup dropdown menu, clicking the "Add resource" button, and checking the functional areas that you want accessible.



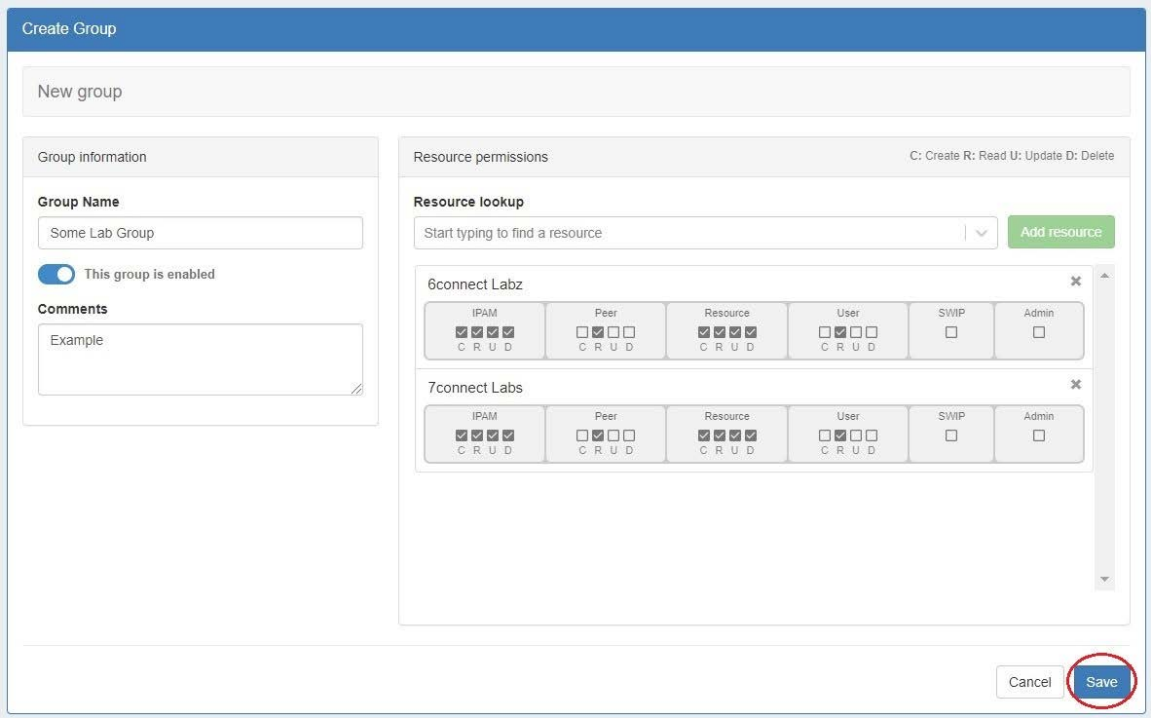
By clicking the checkbox in the upper corner of a permissions box you can select all the checkboxes in that section.

To delete a Resource from the permissions list, simply click the "x" icon in the upper right corner. Click "Save" when done.



In the example below, we make a group called "Some Lab Group", whose users we want to be able to access two resources: 6connect Labz and 7connect Labs.

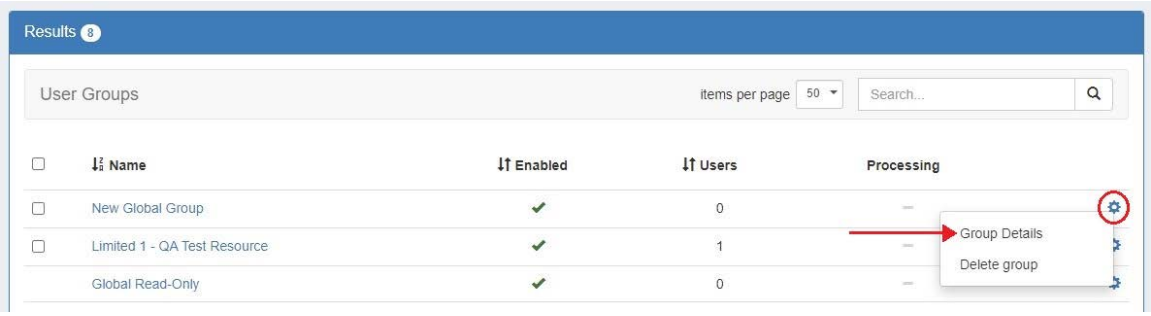
These users will be working extensively in IPAM and Resources, so we give them full access to those areas of ProVision. However, we also want them to view other information, but not edit it. We then check the "R" column under Peer and User.



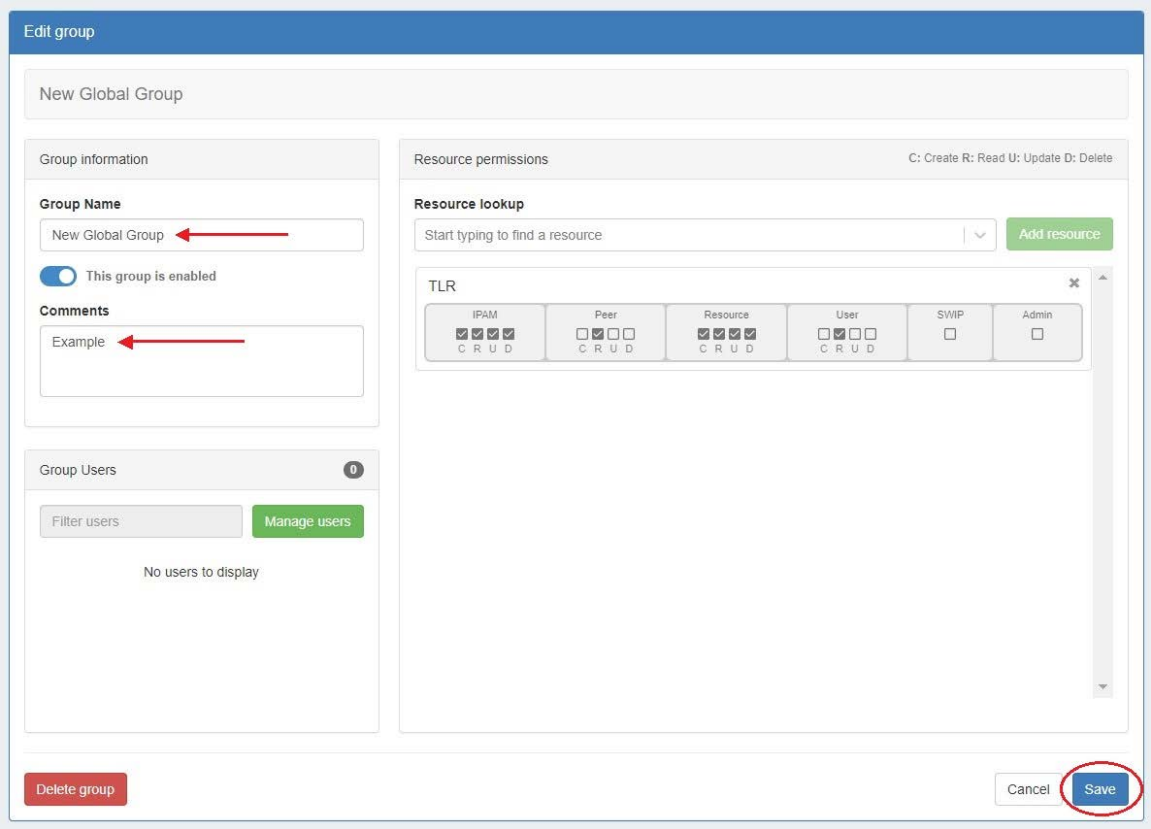
Click "Save" when complete. After adding the group, you can add users to the group by selecting the group when editing a user account or from the "Manage Users" section when editing a group.

Edit a Group

To edit a group's information click on the Action Menu (gear icon) for the group and select "Group Details" or click on the group name.



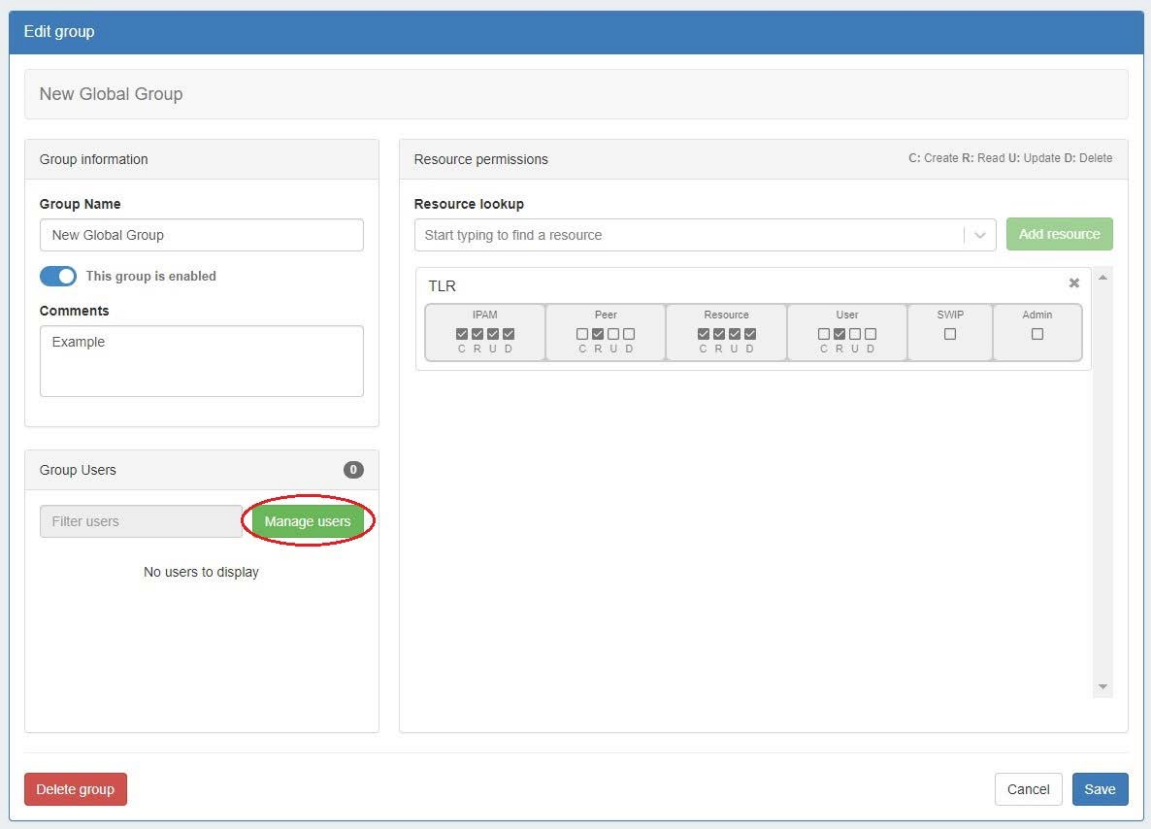
This will bring up the Edit Group screen. From here you can edit the group name or comment, add or remove users from a group, or change resource permissions for the group.



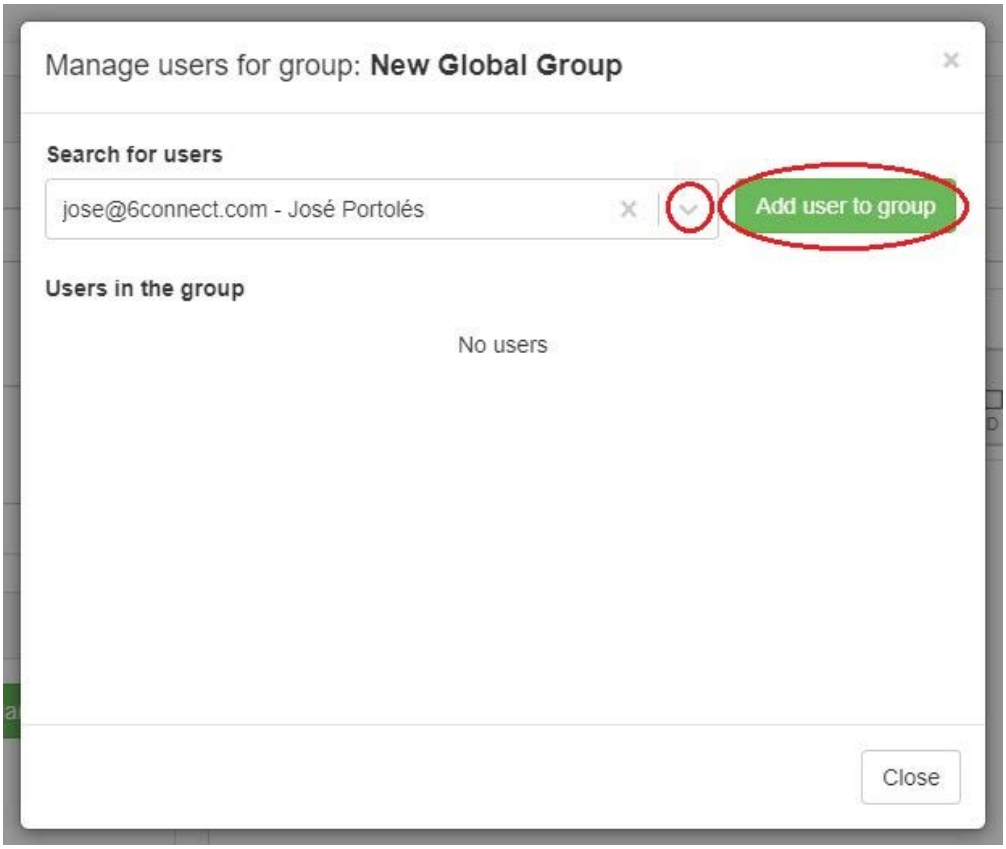
Remember to hit "Save" when done.

Manage Group Users

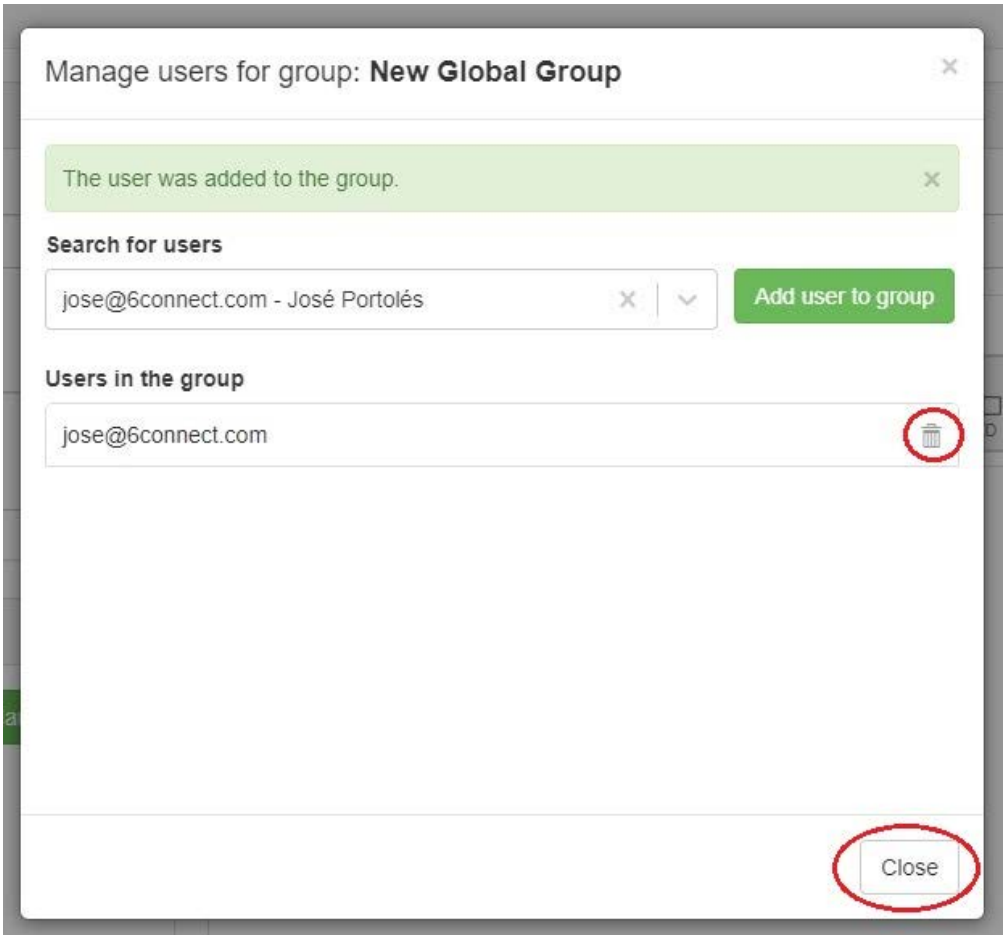
To add or remove users from the Group Details page, click the "Manage Users" button in the Group Users section.



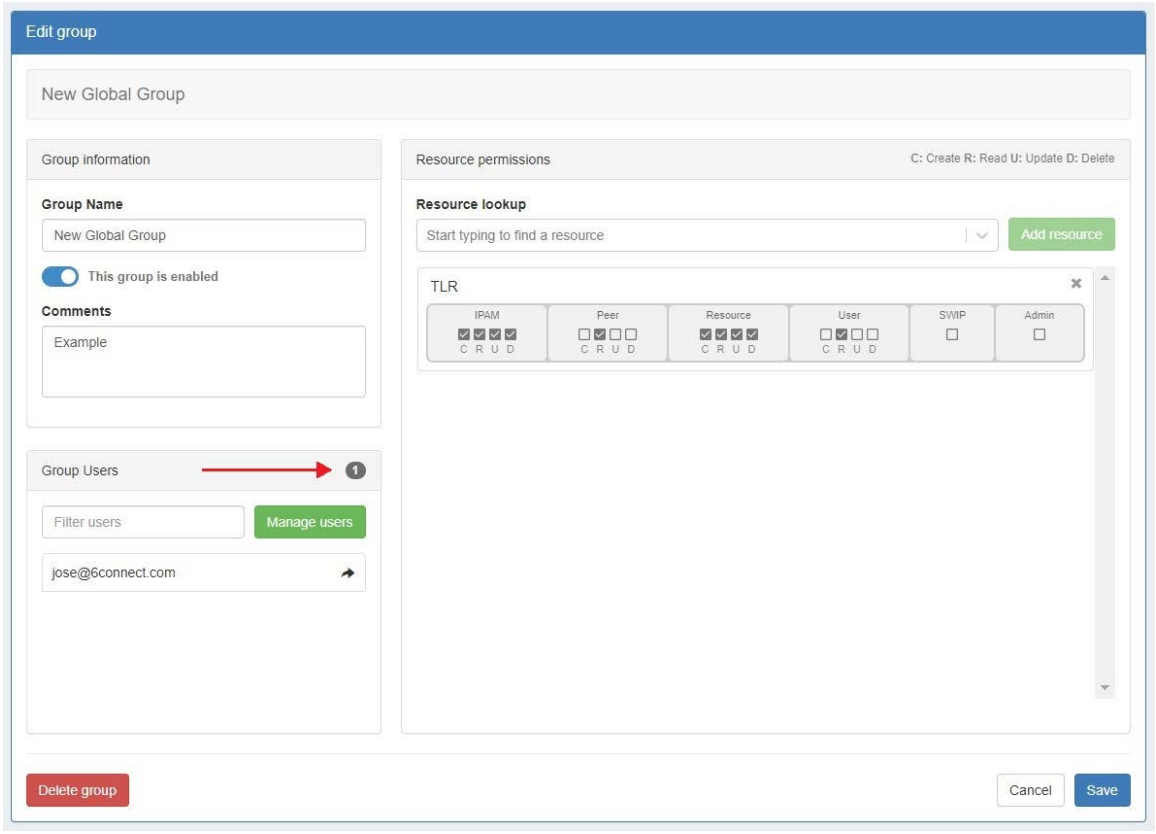
Select a user from the dropdown and click "Add user to group".



The selected user will then appear on the list of users below. You may remove a user by clicking the delete icon.

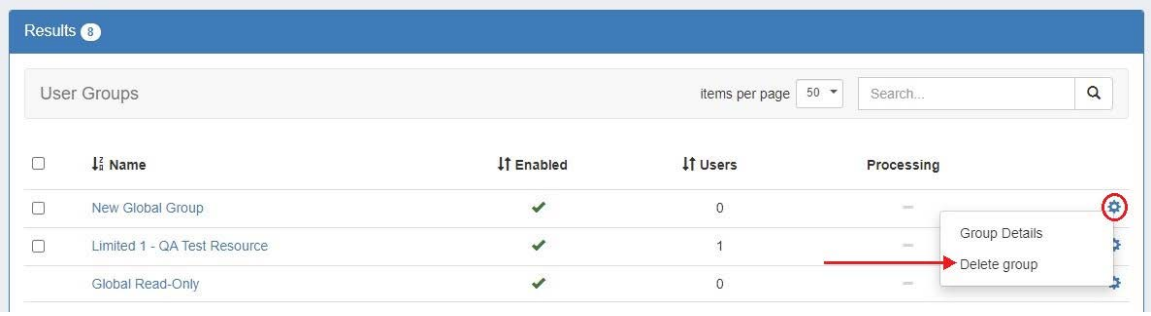


Users added to a group are listed in the Group Users section. Click the arrow next to a user name to go to the User Details screen.



Delete a Group

To remove a group from the Groups list, click on the Action Menu (gear icon) for the user and select the "Delete group" option.

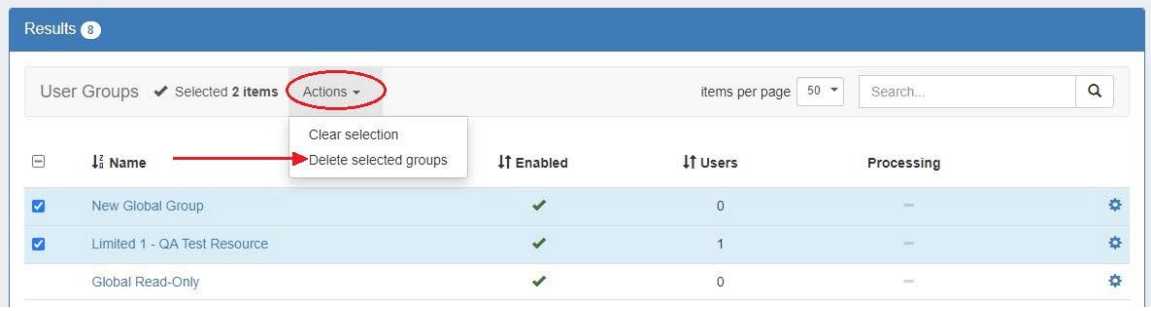


You may also delete a group from the Group Details page by clicking the "Delete group" button at the bottom left of the page.



You may also select more than one group to delete.

To do so, select the checkboxes for the desired groups, then under the "Actions" menu at the top of the list, select "Delete selected groups".



> Note: Users cannot edit or delete permissions for the Group to which they currently belong, unless they are also a member of the default Global Admin Group.

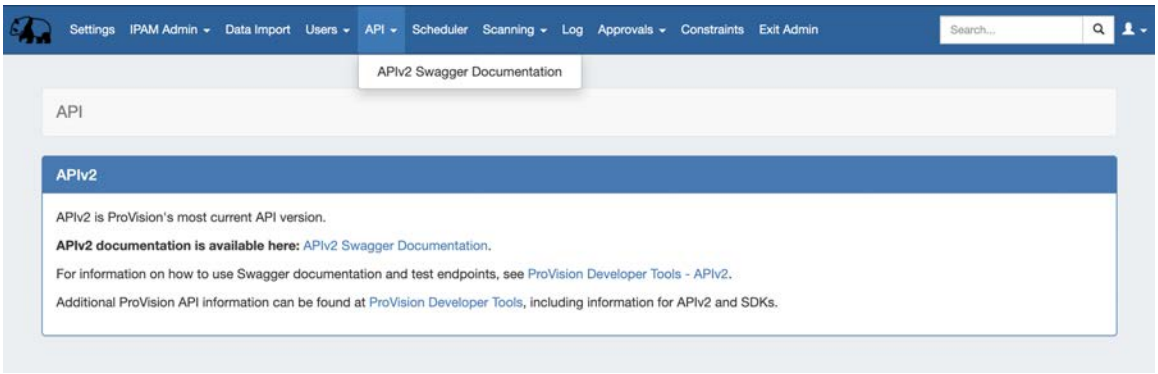
Additional Information

For more information on Users and Groups, see the following areas:

- Working With Users
- Users & Permissions
- Global Permissions
- Resource Permissions
- Verifying Permissions

API Tab

API Tab



The API tab provides links to APIv2 Swagger documentation and Developer Tools documentation.

APIv2

APIv2 documentation is available at ProVision Developer Tools and APIv2.

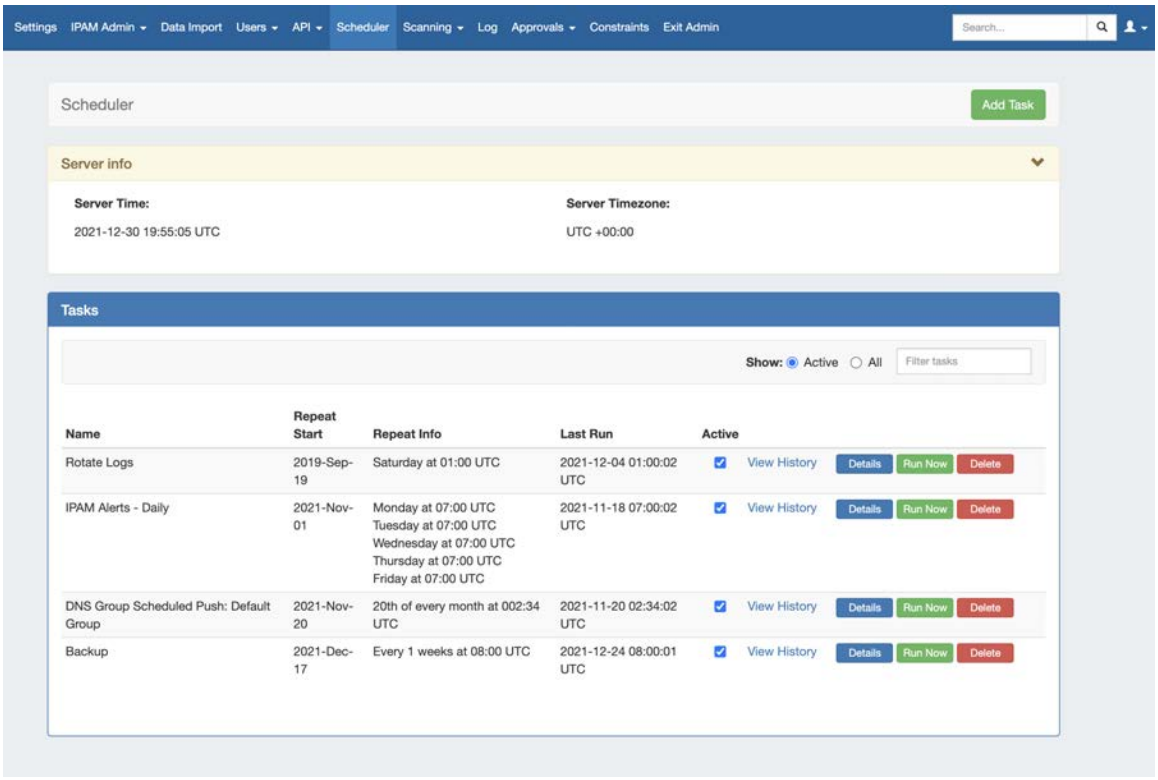
Detailed endpoint descriptions are available at APIv2 Swagger Documentation, or from the instance-specific link provided on the API Tab page / Navigation dropdown.

Additional Information:

- ProVision Developer Tools
- APIv2
- APIv2 Swagger Documentation (Public Access)

Scheduler

Scheduler



The Scheduler tab allows you to manage and schedule repeating tasks in ProVision.

Server time information is displayed at the top of the page, and active tasks are listed in the Task List module. For any task, you can view the run history, information details, run the task now, or delete.

Enabling the Scheduler

To enable the scheduler in a local instance, add the following to cron:
* * * * * /path/to/php /path/to/ProVision/scheduler/task-runner.php

- Available Task Types
- Add Task
  - Enter Task Details
  - Add Repeat Settings
  - Verify Repeat Settings and Save
- Managing Tasks
  - Activate / Deactivate Tasks
  - Edit a Task
  - View Task Log
  - Delete a Task

Available Task Types

Many predefined task types are available through the scheduler:

- **ACP - Run Workflow:**

  Runs the selected ACP Workflow at the scheduled time, with the option to execute the project asynchronously. Requires an ACP license and ACP settings successfully configured under Admin Settings ACP Settings.

- **Approvals - Delete events older than 1 month:**

The "Approvals - Delete events older than 1 month" task deletes any Approvals history events older than 30 days. It is recommended to run this task monthly to clear out obsolete approvals items and reduce approvals page load time. For information on working with Approvals, see DNS Tab and Approvals.

- **Approvals - Process Subscription Events:**

The "Approvals - Process Subscription" task processes approval request events and handles the sending of notification emails to subscribed Approvals Groups. If Approvals are in use with notifications, it is recommended to create this task with a run time of "every 5 minutes" and no end date. For information on working with Approvals, see DNS Tab and Approvals.

- **Backup - Backup the database**

Performs a data backup to the 6connect cloud servers, or to an alternate server.

- **Backup - Delete old archived data and logs:**

The "Delete old archived data" task removes data older than 30 days from archived resources, logs, systems logs, and statistics from your ProVision instance. Be sure to use care with running this task to prevent accidental deletion of log data that may still be necessary for reference. It is typically recommended to run this task once every 1-3 months to reduce log data volumes.

- **Contacts - GEO IP Exporter:**

The Geo IP Exporter searches the ProVision instance for resources which have IP addresses and an address provided in the Contact Info Gadget, then saves the resulting .csv to the ProVision root directory.

- **DHCP - Leases Monitor:**

Updates lease monitoring and checks for lease expiration for the DHCP module. See DHCP Tab for additional information on setting up DHCP Servers and Push options.

- **DHCP - Server Push:**

Pushes configuration updates to the selected DHCP server(s). Select push to a single server, or all DHCP servers. See DHCP Tab for additional information on setting up DHCP Servers and Push options.

- **DNS - Error Monitor:**

Checks the DNS records in theError state to determine if they have been fixed. Default setup is once a day, and you can set it to run more often if necessary. This task may replace or supplement the manual DNS Zone / Record "Check" button, depending on set frequency.

- **DNS - Queue Push:**

If "Enable DNS Push Queue" is set to ON in Admin DNS Push Settings, this task must be created in order for the scheduler to run at the desired interval to execute the queue.

- **DNS - Resource Monitor Task:**

Checks Records/Zones periodically to monitor DNS server response.

- **DNS - S64 Pull Stats:**

Pulls the stats file for the selected S64 DNS server at the desired interval and updates DNS Records associated with that server.

- **DNS - Zone Transfer:**

Pushes zone updates to the DNS servers. Select pushes to apply to all zones in a DNS Group, all zones on one server, or one particular zone. Requires the intended Group / Server / Zone to already exist in ProVision. See DNS Tab for additional information on setting up DNS Servers, Groups, Zones, and Push options.

- **DNS - Zones Backup Removal:**

Removes DNS Zone backups that are older than the "Days to preserve" setting in the Scheduler Task. See DNS Tab for additional information on setting up DNS Servers, Groups, Zones, and Push options.

- **IPAM - Alerts Task:**

Set a time / frequency for IPAM aggregate alert emails to be sent to alert recipients. Alert recipient email and available space threshold percentage is set through the action menu for individual aggregates under the IPAM Tab. For information on setting up an alert for an aggregate, see Working with IP Aggregates. This task is created/enabled by default.

- **IPAM - Process Holding Tank:**

Removes IP Blocks from the Holding Tank and returns them to the available pool. See Holding Tank Management.

- **IPAM - Rotate Dynamic IPs:**

  The Scheduler task "Rotate Dynamic IPs" reassigns single IPv4 NAT addresses (/32s) after 'x' days post-config to an available address denoted by the Dynamic_Available tags.

  Prior to using this task, two blocks (one public, one private) must be NAT'ed in IPAM, the NAT Config pushed to a router, and appropriate blocks tagged with "Dynamic_Base" and "Dynamic_Available". For information on working with NAT'ed Blocks, see Working with IP Blocks .

- **LDAP - Sync Users:**

  Connects to the LDAP server set up in Admin Settings Auth Authentication Options -> LDAP and updates imported LDAP users with any changes.

- **Logs - Rotate Logs:**

  Removed Log items older than the "Delete Logs older than X days" setting in Admin Preferences.

- **Peering - Refresh Session State:**

  Checks for and updates the state of Peering sessions.

- **Peering - Sync Local Database: (Local Only)**

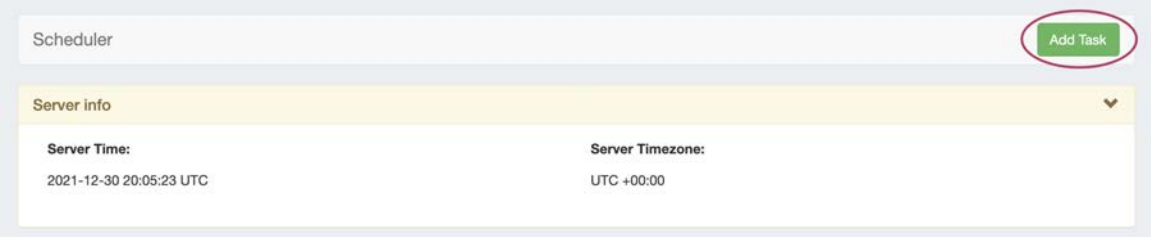
  An advanced option to schedule a sync between a local DB and PeeringDB, only for local installations who opt to self-manage a local peering database. *Note: We recommend that most local installations utilize the PeeringDB API sync option. This option is only recommended for advanced users under exceptional load situations.*

- **Test Task**:

  Tests the scheduler and notification system - it simply sends a notification email to the provided address at the specified run time.

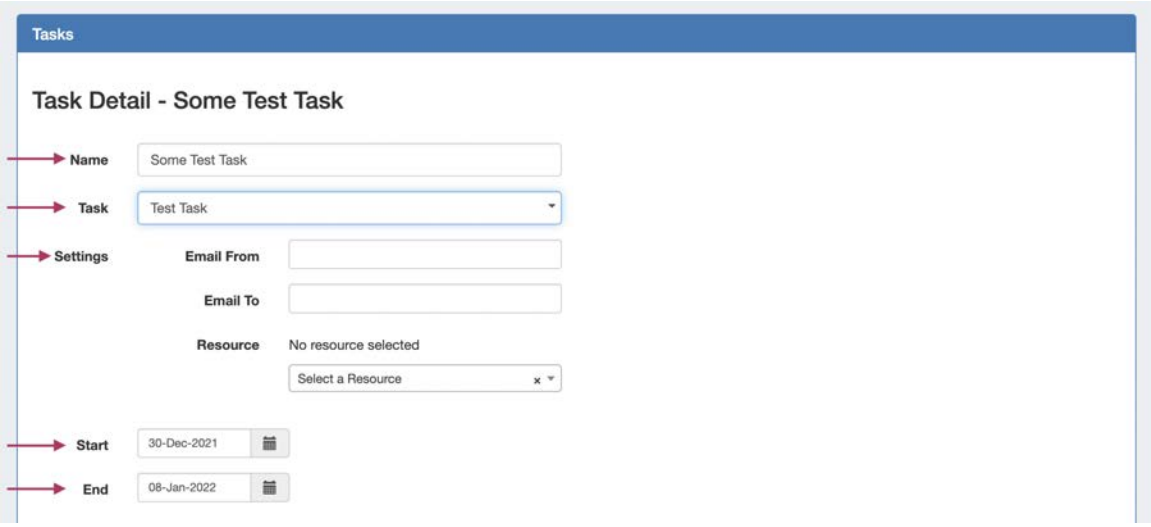
Add Task

To add a new scheduled task, hit the "Add Task" button on the right side of the Scheduler page header bar.



You will then see the Task Detail Settings area.

Enter Task Details



Under "Task Detail", fill in the following fields (fields may vary based on the selected task):

Name: Create a name for your task

Task: Select a pre-created task from the dropdown menu.

Email From / Email To: Enter an email address to send task notifications from, and the desired recipient. This is an optional setting.

Resource / Server / Action / Location: Some tasks have additional selections to perform the task on a specific resource, server, save to a specific location, or perform a specific action type. Options will vary depending on the selected task.

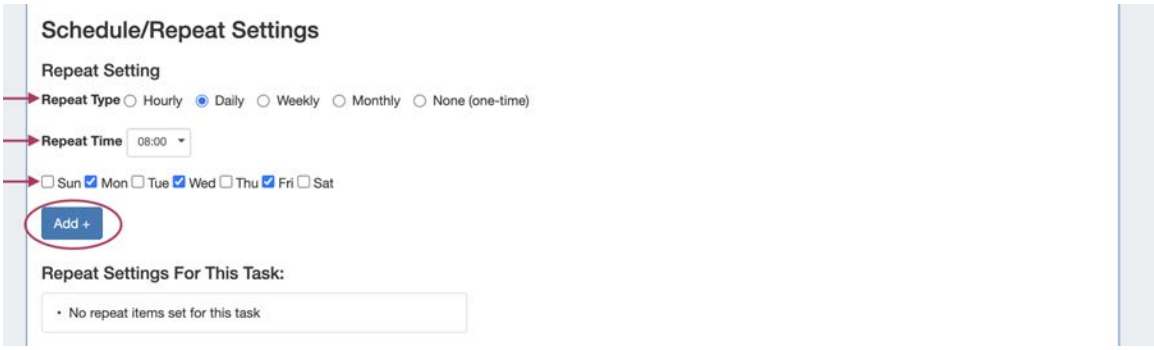
Start: The start date you wish the task to begin repeatedly occurring. By default, the current day is entered.

End: The date you wish repeat settings to end. For one-time tasks, enter the next calendar day after the start (run) date. To have a task run indefinitely, leave the end date blank.

Add Repeat Settings

Add repeat settings for your tasks. First, select your repeat type - hourly, daily, weekly, monthly, or none (one time). The type that you select will prompt different additional setting options.

Once you have selected the type, time, and day(s)/options, click "Add" to associate those settings with this task.



Repeat Type options and details:

Hourly: Selecting the hourly repeat type will then prompt for the number of repeat times per hour - every 5,10, 15, 20, 30, or 60 minutes. All minute selections start from the top of the hour. For example, if every 20 minutes is selected, the task will run at :00, :20, :40 during each hour.

Daily: Selecting the daily repeat type will prompt for the specific time to repeat the task, and which days you wish the task to occur. The Repeat Time is based on a 24 hour clock set at UTC time. To assist in any time zone conversions, the current UTC time is shown at the top of the scheduler page.

Weekly: Selecting the weekly repeat type prompts for the specific time to repeat the task as well as frequency by week. Weekly tasks occur on the day selected as the start date. Using the weekly option, you may choose from a range of weekly (every 1 week) to once every two months (every 8 weeks).

Monthly: Selecting the monthly repeat type prompts for a repeat time and a day. For the day option, you can either choose a specific day (ie, the 15th of each month) or a relative day (the 1st Friday of each month).

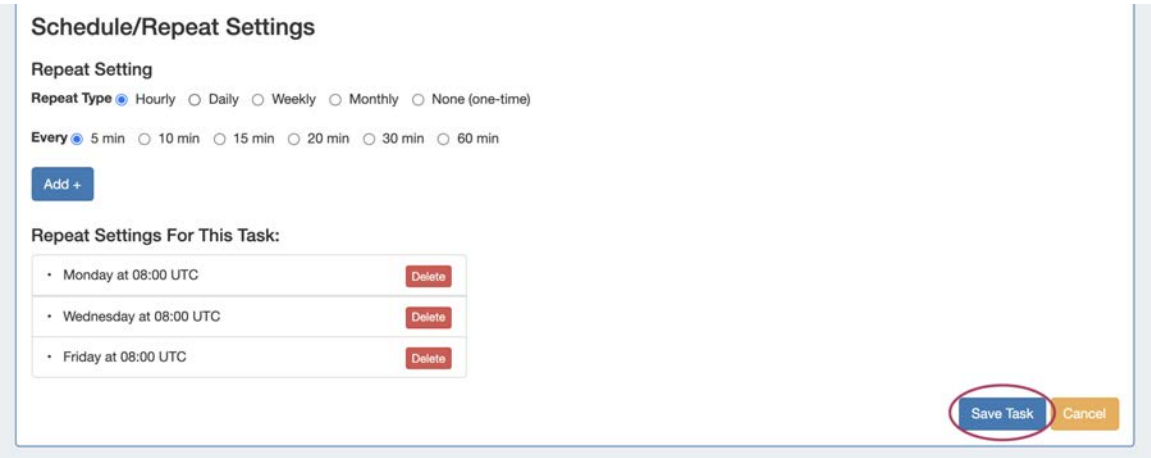
> For Monthly repeat settings, verify that the calendar day you select the task to occur exists! For example, if you select the 5th Saturday of each month, the task will repeat only in months which have 5 Saturdays and skip all other months.

None (one-time): Select the time and day that you wish the single occurrence task to run. (Ensure that "End Date" in task details is set to the day after the desired run date).

After you have selected your Repeat Setting options, click the "Add Repeat Setting" button.

Verify Repeat Settings and Save

When you add repeat settings, they will appear under the "Repeat Settings For This Task" area. Verify all selected settings, and if desired, you may delete individual repeat settings by hitting the "Delete" button.

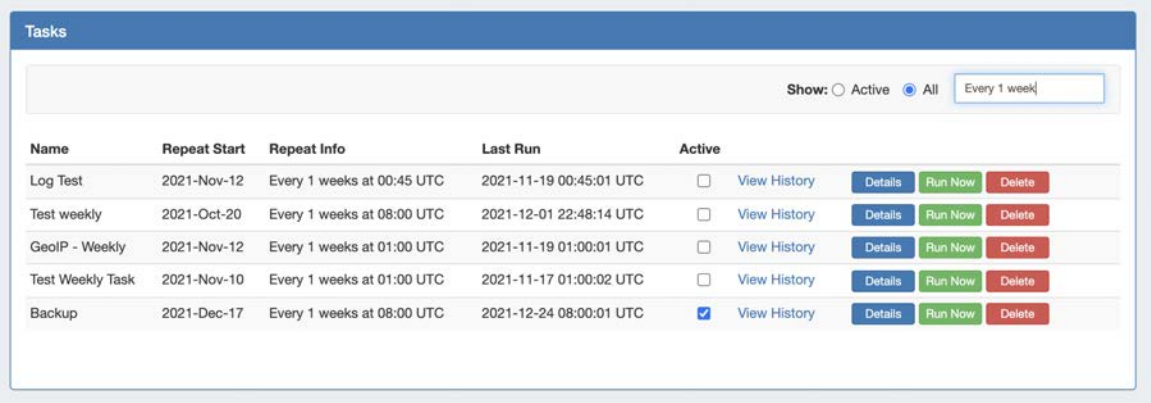


When complete, hit the "Save Task" button to finalize your changes and add your new task to the task list.

Managing Tasks

After tasks have been added, they will show in the task list along with their basic settings. The list may be filtered to show all tasks or active tasks only by selecting the radio buttons next to "Show:". Further filtering may be done by typing a Name or Repeat Info keyword into the "Filter Tasks" input box above the task list.

From the task list itself, you can enable/disable tasks, view details, view history, run tasks, and delete tasks.



Filters:

Show: Select "Active" to show only active tasks (checkbox enabled under "Active" for the task), or "All" to show all tasks

Filter Tasks (Text box): To further filter the task list, type a Name or Repeat Info keyword (ie, "Backup" or "Every day") into the Filter Tasks text box.

Task List:

Name: The task name assigned during the "Add Task" creation process.

Repeat Start: The date selected for the repeat settings to start

Repeat Info: The repeat settings chosen for the task.

Last Run: The date and time the task was last run, if applicable.

Active: To activate tasks, simply click the check box under "Active" in the task list. To deactivate a task, uncheck it. By default, tasks are checked as active once created.

View History: This link will show the log for task actions.

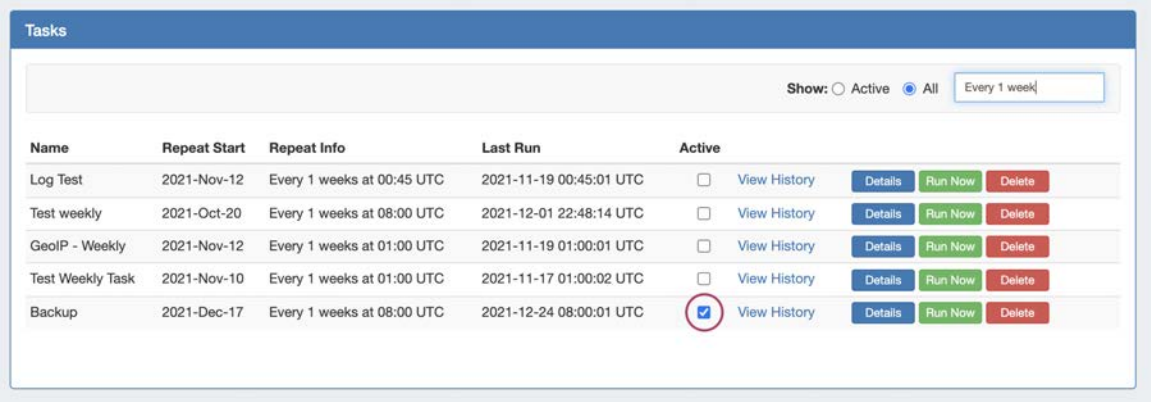
Details: This link will bring up the task details and repeat settings, which then may be edited and re-saved if needed.

Run Now: The "Run Now" button will run the scheduled task when pressed, regardless of the scheduled repeat settings.

Delete: Deletes the task.

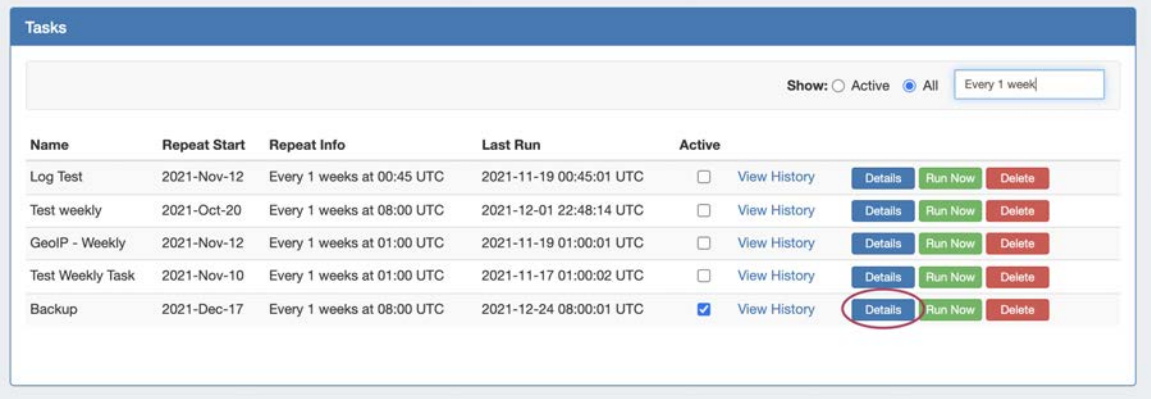
Activate / Deactivate Tasks

Click on the check box under "Active" for the task

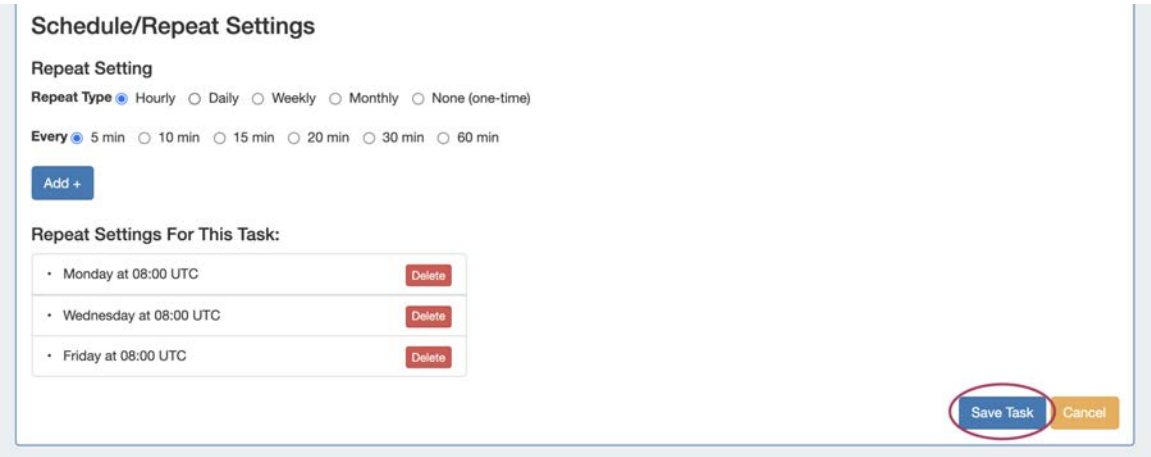


Edit a Task

Click on the "Details" link for the task, then edit the Task Detail and Repeat Settings that appear as needed.

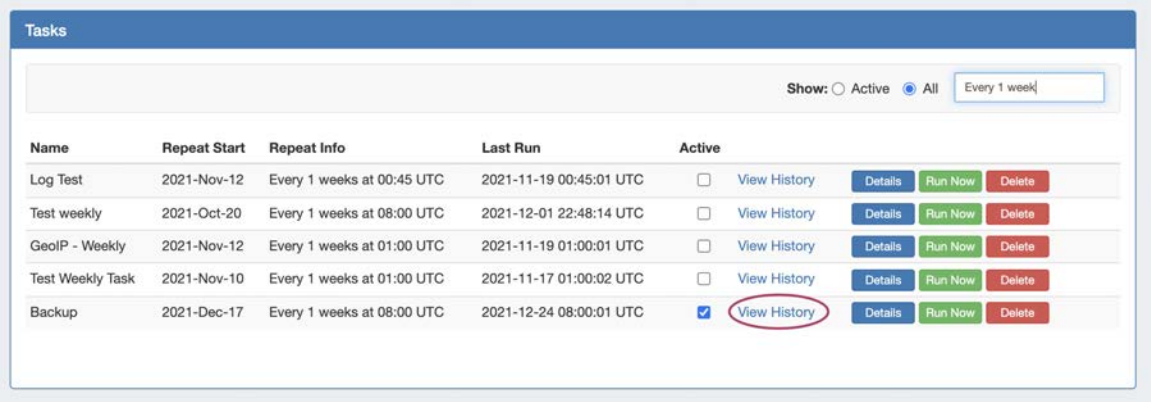


Hit "Save Task" when finished to save your changes, or select "Cancel" to close the view without saving.

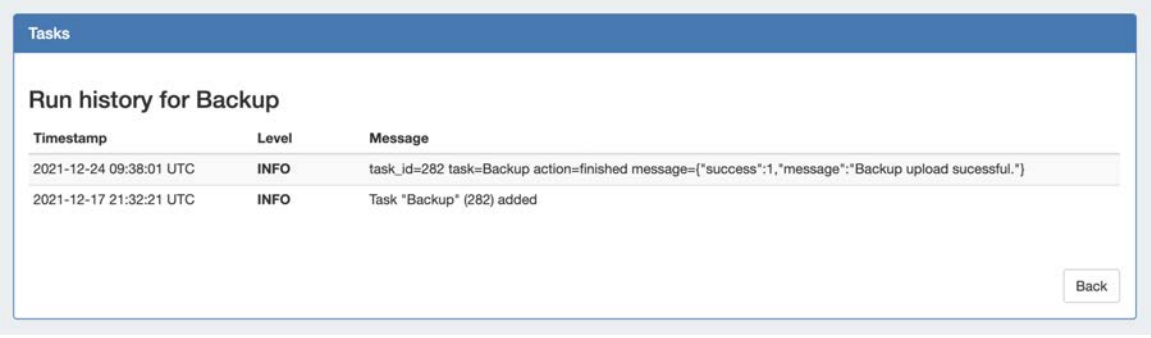


View Task Log

Click on the "View History" link for the task.

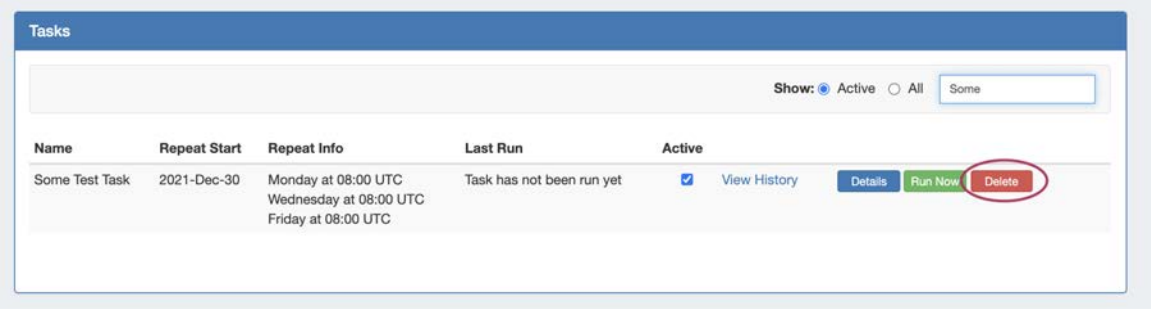


The log details for the task will be shown below. When done, click on the "Back" button to exit the view.

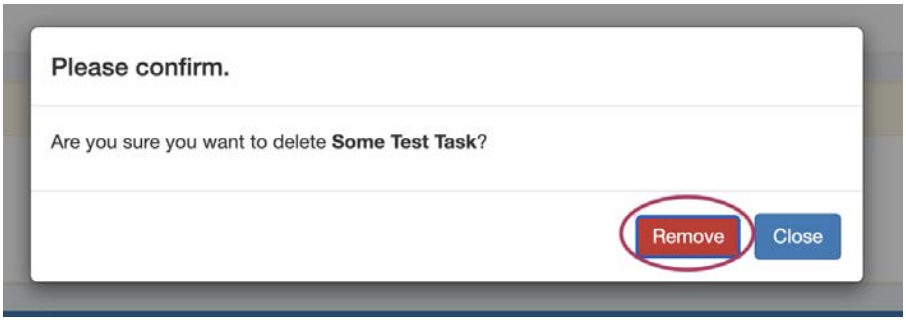


Delete a Task

To delete a task, hit the "Delete" button at the end of the row in the Task List.



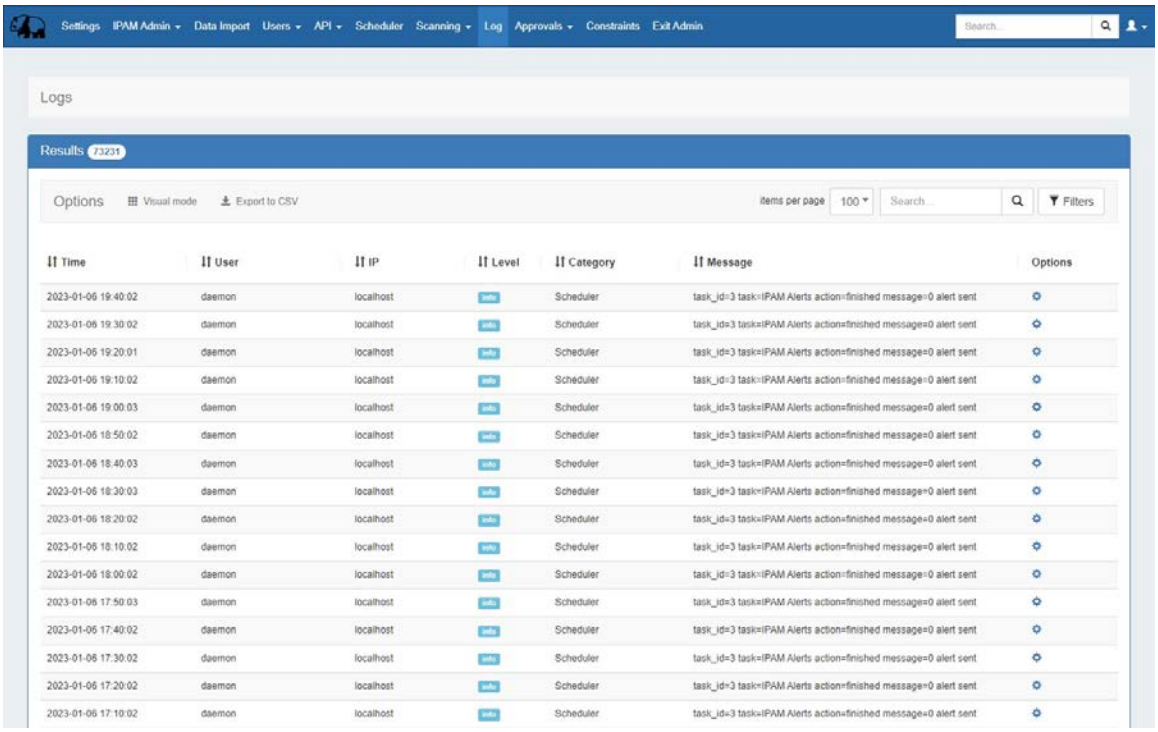
You will be presented with a confirmation message asking if you are sure you wish to delete the task.



Click on the "Remove" button to verify the deletion, or hit "Close" to exit without deleting.

Log

Log



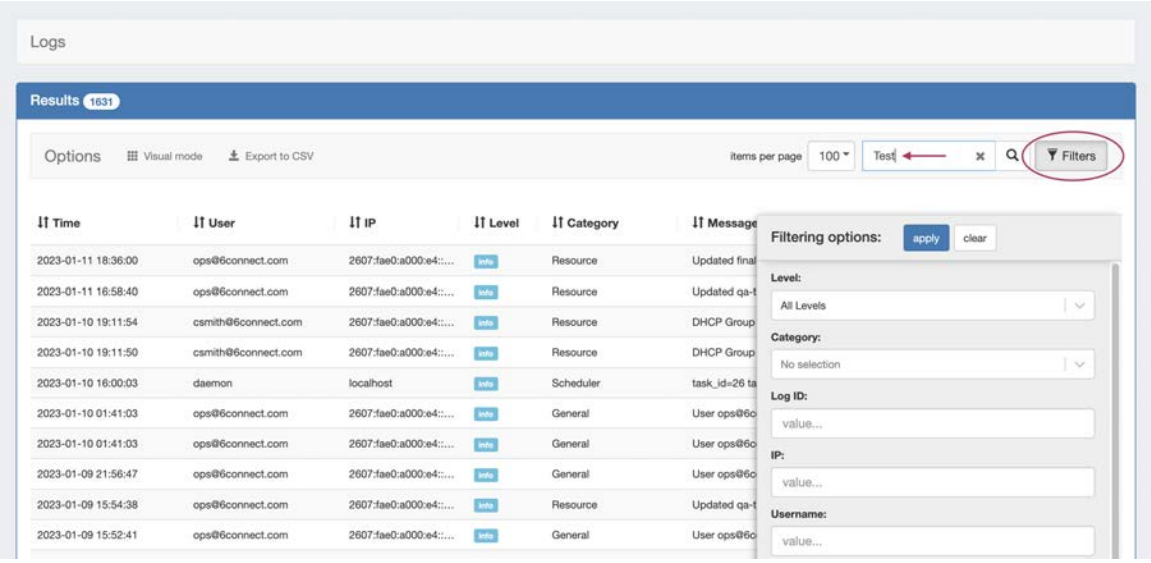
The 6connect ProVision log provides detailed information on actions performed in ProVision. The Log is only available to Admin users.

To access the Log, either navigate to the Admin area of ProVision, then click the Log Tab, or follow an area-specific Log link.

Log Features

Filters and search options:

Search or filter by a specific keyword by entering the term into the search box in the top right of the results list. Search terms may be usernames, resource names, task names, resource or task id numbers, IP's, and so on. Clear the search by clicking the "x" in the search box.



Filter the log list by clicking "Filters" (also at top right), then selecting or entering the desired filter value into the filter flyout, then click on the "Apply" button. To clear active filters, open the filter flyout and click "clear".

You may also change the number of log entries per page by selecting an option next to "Items per page" at the top right of the results list. By default, this value is set to 100.

Filtering Options:

The following filter options are available:

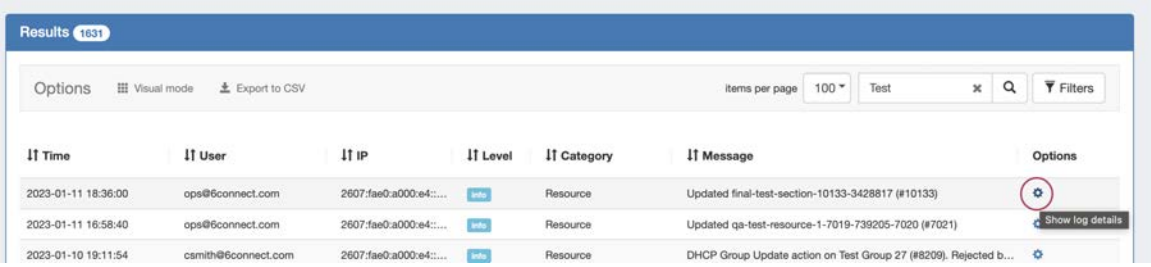
- **Level:** Available Level filters include: "All Levels", "Emergency", "Alert", "Critical", "Error", "Warning", "Notice", "Info", or "Debug".
- **Category:** You may select one or more category filters. Available category filters include: "API" , "Assistant", "Device", "DHCP", "DNS", "IPAM", "NTP", "Peering", "Reporting", "Resource Linkage", "Resource Holder", Resource", "Scheduler", "System", "User", or "VLAN".
- **Log ID:** Retrieve a specific log entry from its log_id parameter.
- **IP:** Search by IP of the machine that created the event in the log.
- **Username:** Filter logs by ProVision username, or by "Unknown" user.
- **Time:** Filter log entries by exact time created. Must be in datetime format (2016-08-14 16:41:18).
- **Time Minimum:** The earliest day and time of log entries to show in results. Must be in datetime format (2016-08-14 16:41:18).
- **Time Maximum:** The latest day and time of log entries to show in results. Must be in datetime format (2016-08-14 16:41:18).

Tip

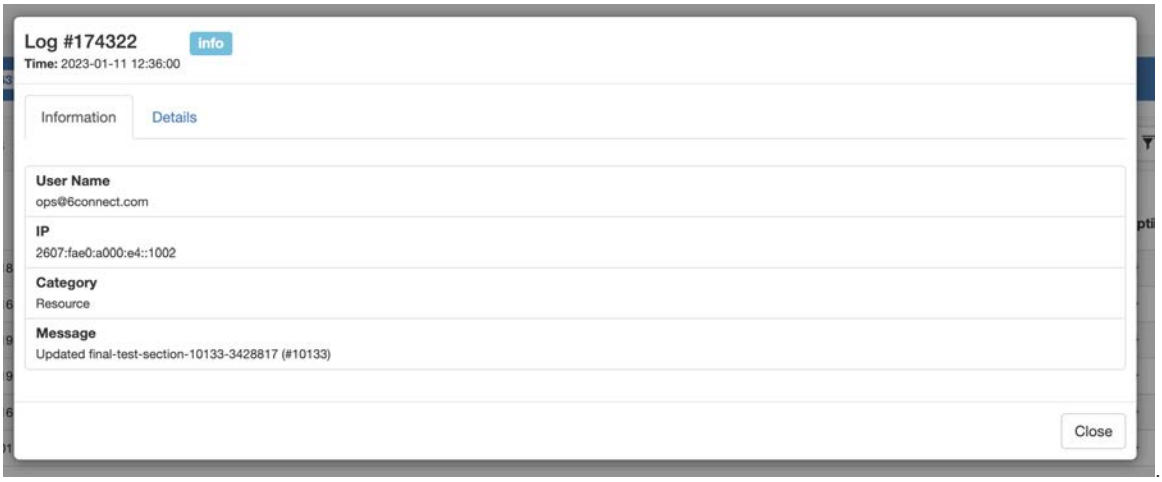
Use "Time Minimum" and "Time Maximum" together to specify a specific date / time range, such as one 24 hour period:

Log Details:

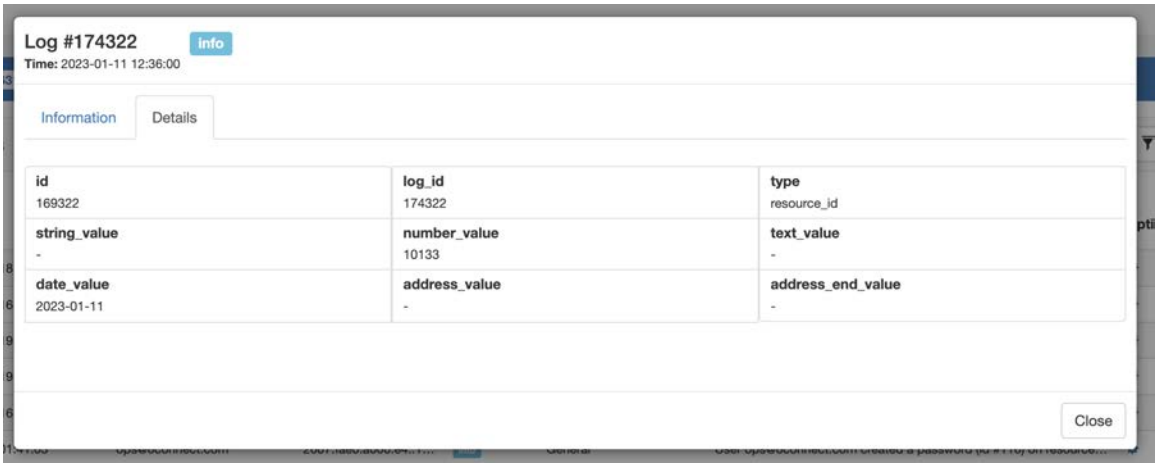
Click on the gear icon for a log entry to display additional details pertaining to that entry.



General information on that log entry will display under the "Information" tab.



Click on the "Details" tab to view specific values pertaining to the log action.



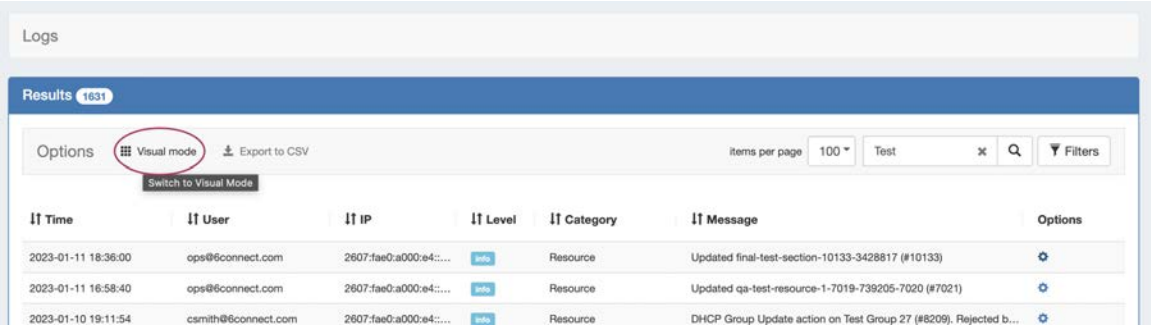
Note: Not all fields may be populated, and not all log types may have applicable details.

Detail fields may include:

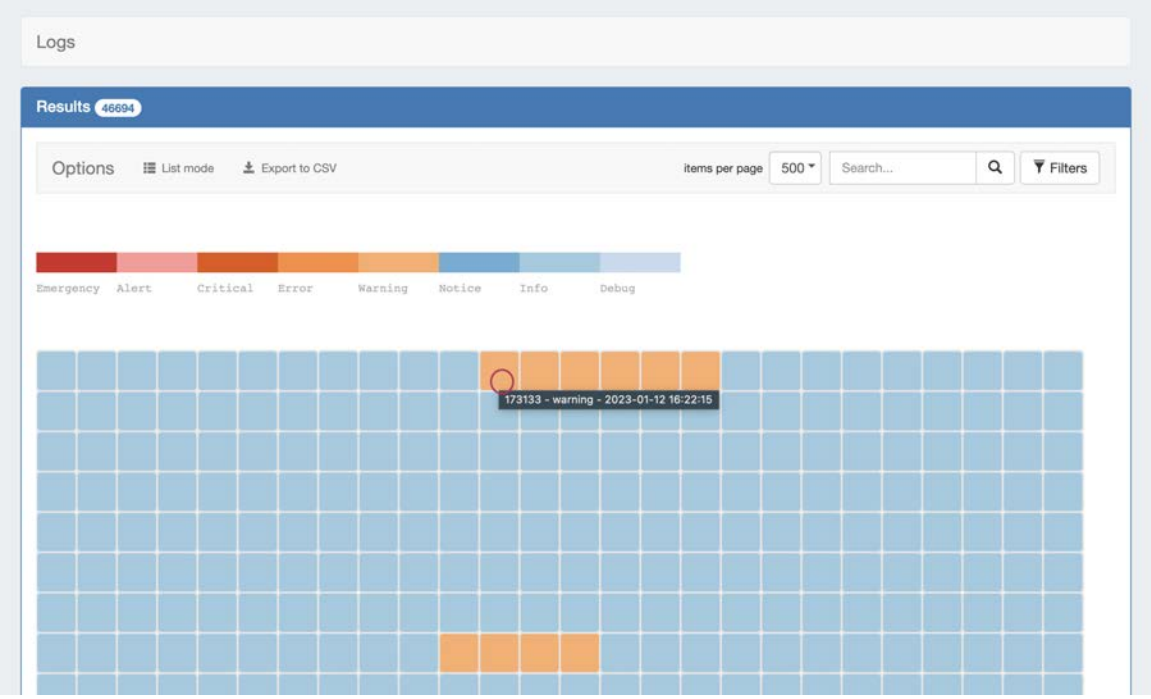
- **id:** The id of the log detail record.
- **log_id:** The id of the parent log entry (the entry that was clicked to reveal details).
- **type:** Log category value.
- **string_value:** String details.
- **number_value:** For resource type log entries, the number_value is the associated resource id.
- **text_value:** API details for API type log entries.
- **date_value:** Day of the log entry.
- **address_value:** For IPAM type log entries, address_value is the starting integer value of the IP Block.
- **address_end_value:** For IPAM type log entries, address_value is the ending integer value of the IP Block.

Log Chart View

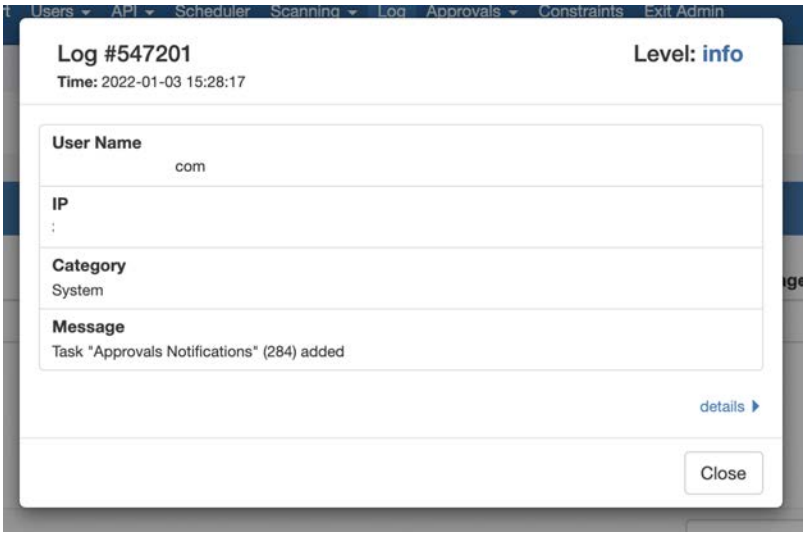
To view the graphical chart version of Logs, click the "Visual Mode" toggle at the top of the results list.



Each log event will be displayed as a color-coded box.

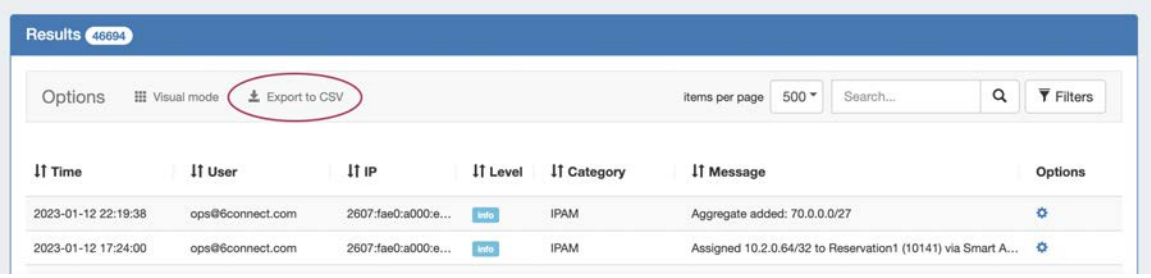


You may view simplified log details by hovering the mouse arrow over an event box, or view extended details by clicking on the event box.



Export Logs

Export the current log search results by clicking the "Export to CSV" button after performing your search.



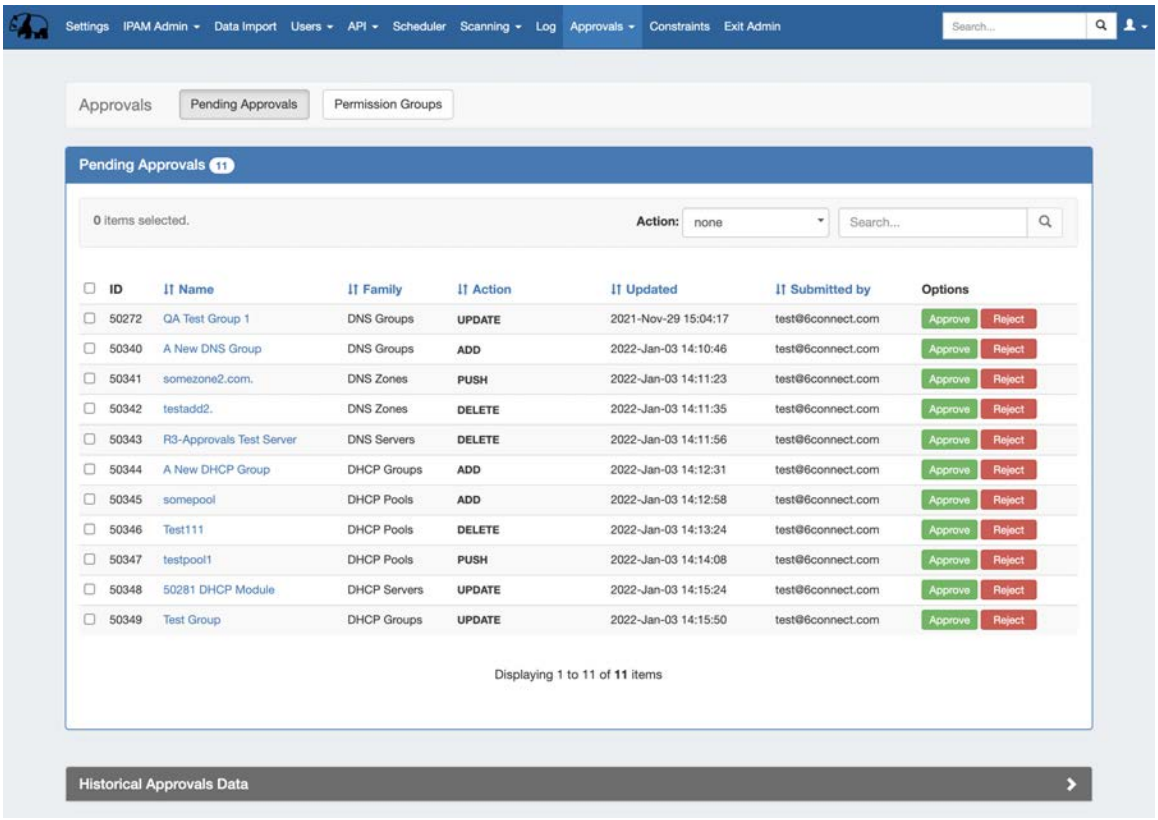
Export Limits

Note: Logs -> Export to .csv has a 100,000 record limit.

If your current filter options result in more records than that, a warning dialog will display when "Export to .csv" is selected.

Approvals

Approvals



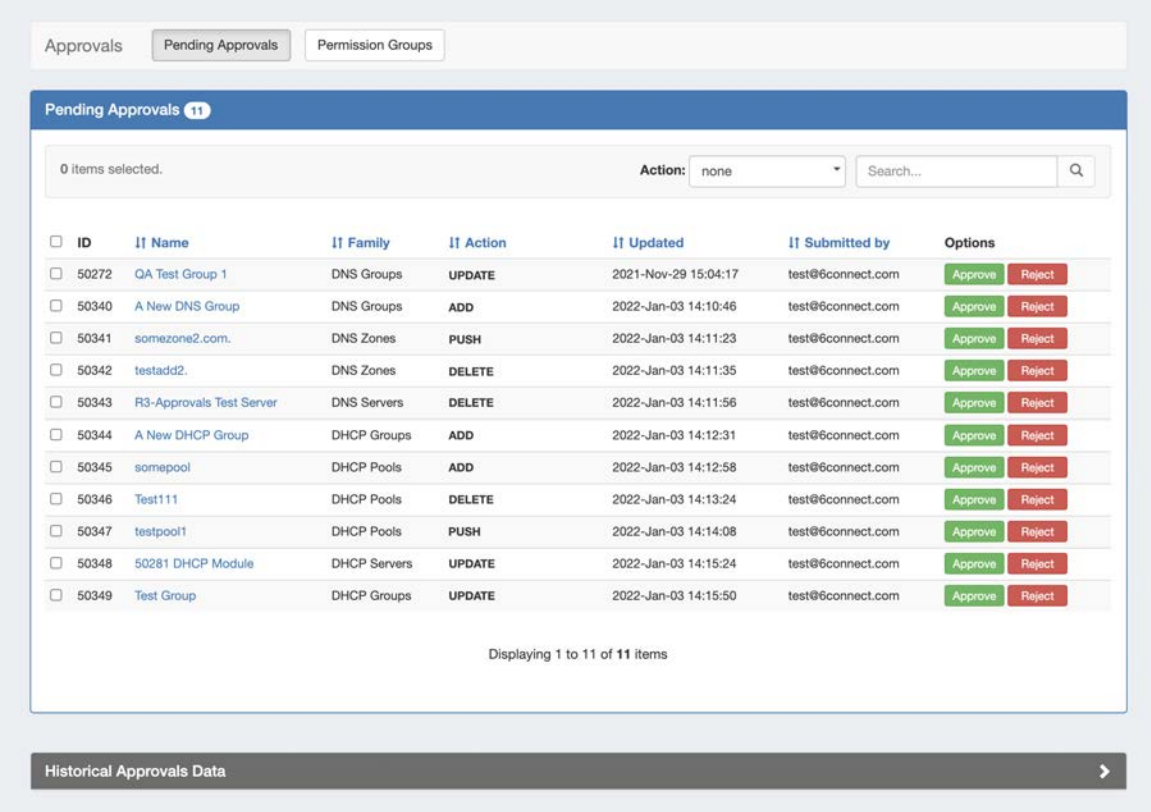
The Approvals module stores and queues DNS and DHCP actions made by selected User Groups, and sends those actions to a Pending Changes list for administrative review. Later, an administrator (or combination of administrators) can approve or reject these stored actions.

The admin Approvals Tab contains two sub-tabs: **Pending Approvals** and **Permission Groups**, which are the primary areas to manage Approvals items.

> Currently, **Approvals** is available only for DNS and DHCP related actions. If you are interested in providing feedback, a use case, or requests for future additions to the Approvals system, please contact feedback@6connect.com.

- Approvals Tab - Overview
  - Approvals Fundamentals (Before you Begin)
    - Policies
    - Family-Action Types
    - User Groups
  - Sample Group Scenarios
    - Scenario 1: One Approver Group, with Restricted Actions
    - Scenario 2: Multiple Approver Groups/Specific user, with Restricted Families
- Approval Workflows
  - Initial Setup
    - Step 1 - Review Existing User Groups and Process Needs
    - Step 2 - Add or Edit ProVision User Groups
    - Step 3 - Assign Approval Action Settings to Groups
    - Step 4 - Enable Notifications (Optional)
    - Step 6 - Add Scheduler Task: "Approvals - Delete events older than 1 month"
  - Daily Use
- Additional Information

Approvals Tab - Overview



The ProVision Approvals system gives administrators an additional layer of flexibility and oversight to manage which changes are allowed to DNS or DHCP items by users.

With Approvals, administrators can set group permission rules requiring that certain types of DNS / DHCP changes made by a user are either 1) automatically denied or 2) approved by an administrator. In the latter case, one or more admin group(s) must be assigned to approve those action types.

Viewing requested changes and managing the group permission rules are both managed from the admin Approvals tab, under the **Pending Approvals** and **Permission Groups** sub tabs**.**

Approvals Fundamentals (Before you Begin)

The approvals system revolves around three primary concepts: Policies, Family-Action Types, and User Groups. An understanding of all three is necessary before setting up Approvals, and additional steps may need to be taken to ensure proper use of Approvals - such as creating additional User Groups.

Policies

When setting up Approvals Permission Groups, a policy will need to be selected to apply to the User Group / Family-Action Type combination selected. The set policy determines how the Approvals system handles an attempted change by a member of the associated User Group.

There are three available policies:

- **Submit Action:** The type of change made by any user in the associated User Group will require an administrative user to approve the change (The approver must be included under a "Approve Action" group for the same action).
- **Approve Action:** A user from the group must approve the action for it to be removed from the "Pending" list, and successfully execute. If more than one group is assigned with the "Approve Action" policy for an action, all groups must have a user from that group approve the action for it to execute. If the change has only been partially approved, its status will be "Pending, awaiting approval from others" and no action will be executed until all groups have provided a response to the action.
- **Deny Action:** The type of change is immediately denied when a member of the User Group attempts to perform that action.

Ensure that for any group/action set with a "Submit" policy, another group is set with "Approve" for the same family-action type. Failure to provide groups for both submitter and approver may result in changes not being processed, due to not having a user assigned to approve the request.

Family-Action Types

In Approvals, the "Action" listed in the Pending Approval information or when setting Approval Permission Groups will be one of the following change types:

- **Add:** Creating a new Group, Zone, Pool, Record, or Server
- **Delete:** Deleting a Group, Zone, Pool, Record, or Server
- **Update:** Any change to an item that isn't Add, Delete, or Push - such as a settings change, renaming, or entering a value in a field.
- **Push:** DNS or DHCP Server Pushes - manual or scheduled
- **Change Group:** Moving a DNS Zone from one Group to another.
- **Bulk Move Zones:** Moving all DNS Zones in a Group to another.

It is important to note that Action types in Approvals is related-to-but-different than CRUD permissions as set in User groups - although the "Add" Action type and "Create" CRUD permission seem the same, the action type "Add" only applies to *a specific event* occurring, rather than a holistic overarching system-level permission. In order to perform a certain Approval Action Type, a user must already have the CRUD permissions to attempt it. The CRUD permissions determine whether the user can even view an area or attempt an action to begin with, Approvals Policies on Action Types determine what is done with the Action *after* the attempted change.

Further fine-tuning of the action types for permissions is done by selecting the combination of "Family" (type of DNS / DHCP item) with the Action Type:

- DNS Families include DNS Servers, DNS Groups, DNS Zones, and DNS Records.
- DHCP Families include DHCP Servers, DHCP Groups, DHCP Pools, and DHCP Reservations

Each type of action can be performed on each family, so when setting up Approval Permission Groups you may choose to set the policy for the entire Family (ex: "All DNS Group actions"), Action (ex: "Add actions for all DNS Families"), or just a specific combination (ex: "Only DNS group Delete").

User Groups

Approvals uses ProVision User Groups to determine which users must have a change approved, denied, or can approve others' actions. Therefore, User Groups must be set up with the appropriate users and basic permissions under each group before using Approvals. For information on setting up User Groups and how the basic permissions structure works in ProVision, see Users & Permissions, Global Permissions , and Working With Users.

Before using Approvals, a review of your user and User Groups is highly recommended to ensure the following:

- That administrators who will be approving change requests are included in a Global Admin (TLR level + Admin) group, in order to access the "Approvals" tab and perform Approve/Reject responses.
- That users included under the same User Groups are similar in terms of what types of tasks they perform and what level of Approval oversight is needed.
    - Example: If "Group A" consists of seven users - four who will need all Add and Delete actions approved, two who do not, and their manager (who will approve their actions)- you may need to move those users under three groups: 1) A group for those requiring action approvals, 3) a group for the users not requiring approvals, and 3) the manager associated with a Global Admin group in order to access Approvals.
- That any user that will be performing DNS Actions with Approvals are in a User Group with appropriate 'resource' CRUD permissions to perform the actions subject to approval.
    - Example: If a user needs zone creations approved, ensure that they have (at the very least) "Create" and "Read" resource permissions so that they can view DNS information and create a zone!
- Consider limiting groups associated with Approvals to *only* those users relevant to the Approvals system, especially if using Approval Notifications. Approval Change Notifications are emailed to all users of the associated User Group - not just the submitter / approver. Be conscientious of colleagues' email boxes and consider which users may not appreciate being included with notifications.

Sample Group Scenarios

Below are a couple of sample scenarios to illustrate common Approval situations, with example notes on Approval Settings.

Scenario 1: One Approver Group, with Restricted Actions

One Admin group and two DNS worker groups with different levels (high - low) of oversight needed, with restrictions set for particular Action types.

Group 1A (Admin)	Group 1B	Group 1C

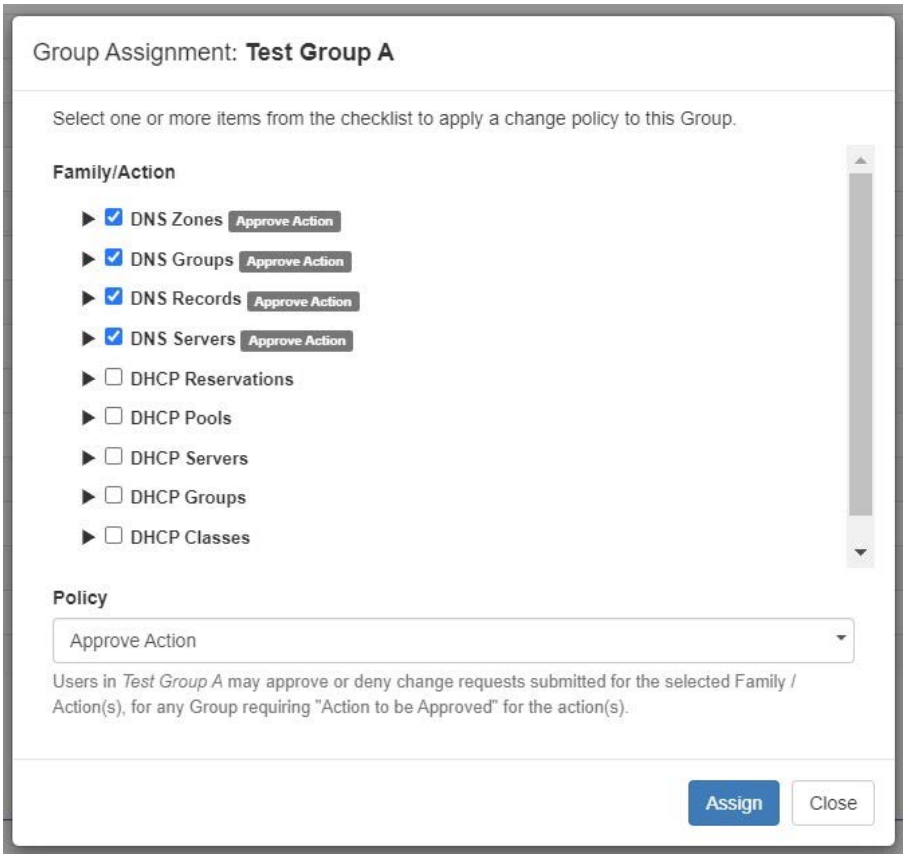
• Global Admins (Full TLR User Group Perms + Admin) • All Admins in this group can approve any change requests • It doesn't matter which Admin user approves a request **Approval Group Settings:** • Set to policy "Approve Action" for all DNS Family / Action types • Tip: Click the quick select checkbox next to each DNS Family name to select all actions under that family	• Users with minimal oversight • Can work fully in all DNS family areas • Only needs admin approval for DNS Pushes **Approval Group Settings:** • Set to policy "Submit Action" for "Push" actions only, under each DNS Family in Group Assignment	• Users with high oversight • Not allowed to Add or Delete any DNS item • Needs admin approval for all DNS Push and Updates **Approval Group Settings:** • Set to policy "Deny Action" for "Add" and "Delete" actions under each DNS Family; save • Open again, set the policy to "Submit Action", and select "Update" and "Push" actions under each DNS family; save.

Expand the following link to view example images of setting the assignments for all three groups:

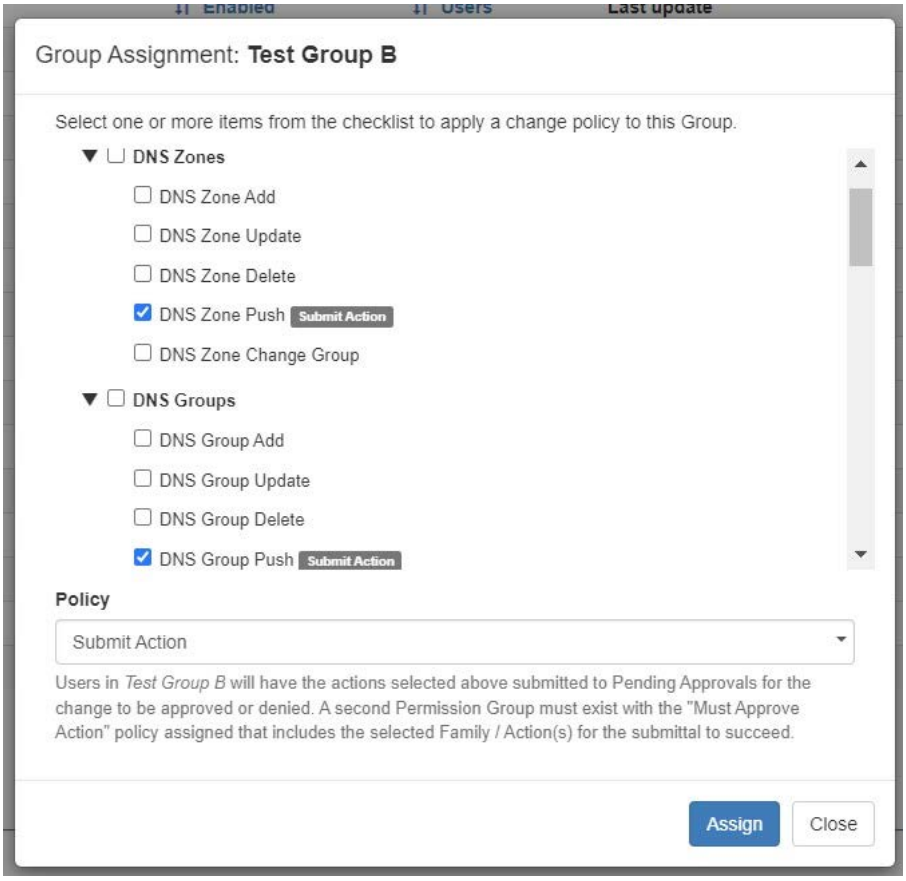
These examples use the "Assign" button for the Group under the Approvals **Permission Groups** sub-tab, Groups page.

Scenario 1

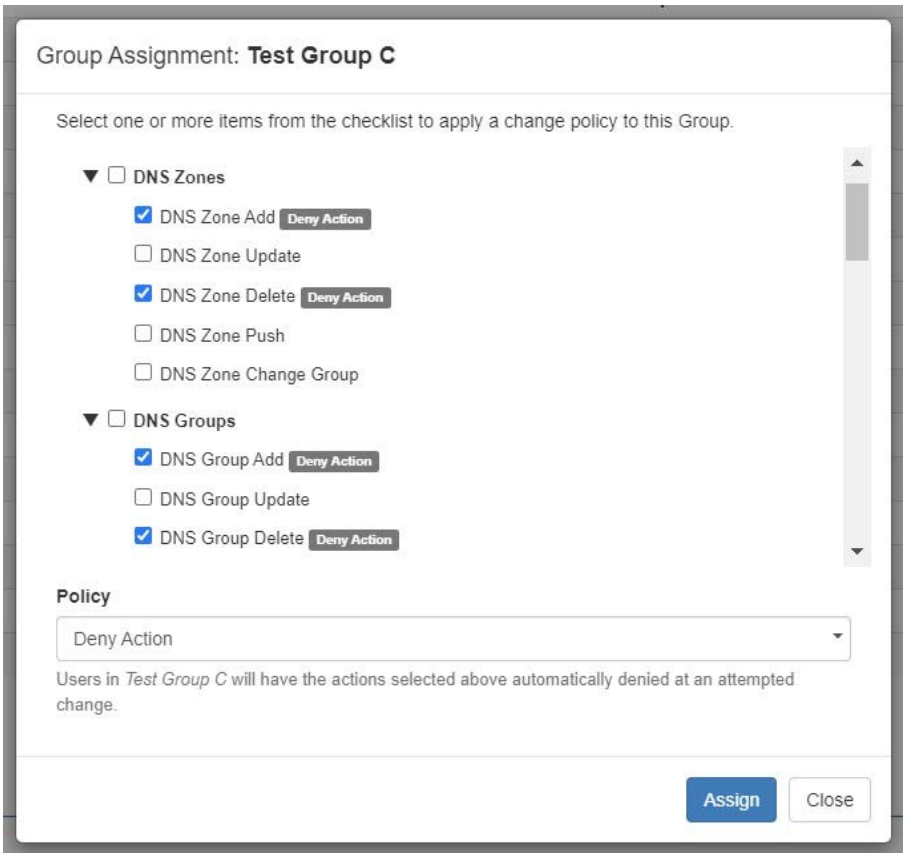
Group A:



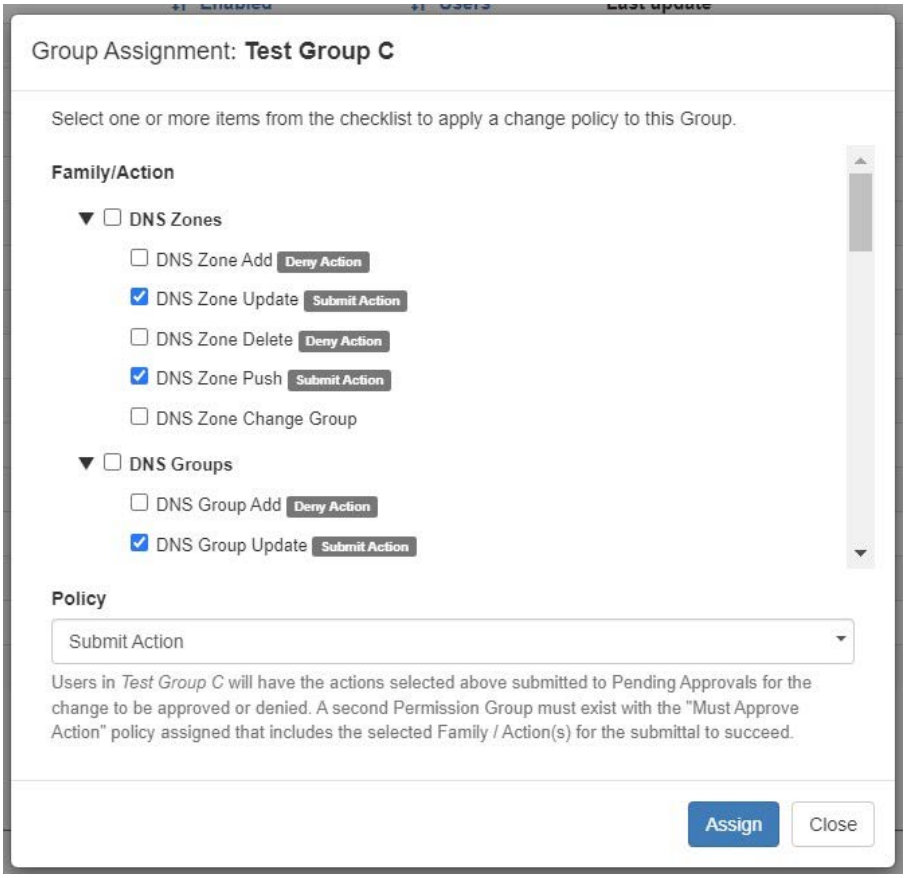
Group B:



Group C, Deny Policy:



Group C, Submit Policy:



These settings may also be set by Action Type instead of Group, from the Approvals **Permission Groups** sub-tab, Actions page.

Scenario 2: Multiple Approver Groups/Specific user, with Restricted Families

Two Admin approval groups exist: One general Approver group that can approve any action type, and a second Group containing one person, Bob, who must sign off on any action taken under DNS Groups.

Group 2A (Admin Approvers)	Group 2B (Admin Approver Bob)	Group 2C
• Global Admins (Full TLR User Group Perms + Admin) • All Admins in this group can approve any change requests • It doesn't matter which Admin user approves a request • DNS Group changes require multiple levels of oversight- from both this group and Bob **Approval Group Settings:** • Set to policy "Approve Action" for all DNS Family / Action types • Tip: Click the quick select checkbox next to each DNS Family name to select all actions under that family	• Global Admins (Full TLR User Group Perms + Admin) • Only contains one user - Bob, who specifically must approve of any change to DNS Groups **Approval Group Settings:** • Set to policy "Submit Action" for "Push" and actions only, under each DNS Family in Group Assignment	• Full Access throughout DNS • Not allowed to work with DNS Servers, even if they might have admin level access otherwise • Changes to DNS Groups and DNS Records require approval **Approval Group Settings:** • Set to policy "Deny Action" before quick-selecting the DNS Servers Family; save • Open again, set the policy to "Submit Action", then quick-select the "DNS Groups" and "DNS Records" families; save.

Approval Workflows

Initial Setup

The high level process to use when first setting up approvals is as follows:

1. Review User Groups and Approval Process Needs

Step 1 - Review Existing User Groups and Process Needs

When setting up Approvals for the first time, review the information in the previous section under "Approvals Fundamentals" to ensure a basic understanding of how Policies, Actions, and User Groups relate together in Approvals.

Then, take a few minutes to think about the following questions to get a better sense of how to use Approvals with your specific organization:

Who are the users that perform DNS / DHCP tasks, and at what level?

Affects which users should be included in what User Groups

What ProVision User Group(s) are they in?

Approvals settings are applied to the User Group, not individuals - ensure users with similar oversight needs are grouped together

What actions made by a certain user group should be automatically denied, if any?

Assign the "Deny Action" policy to that Action/User Group combination

What actions made by a certain user group should require oversight (admin approval / rejection)?

Assign "Submit Action" to that Action/User Group combination

Who is the admin / User Group that will make the final approval on a change?

Ensure the approver(s) is in a User Group with the "Approve Action" policy assigned for the actions requiring approval

Should any changes require multiple admins / User Groups to approve it in order to execute?

A single user from every group assigned with "Approve Action" for the action must approve the action for it to succeed

If two admins are required to both separately agree on a change, they should be under two separate User Groups assigned "Approve"

What User Groups would need to receive email Approval Status notifications, and on what type of actions?

Affects whether to enable notifications and set up the scheduler task to send the notifications, and to what User Groups. When enabled, all users of the relevant group(s) will receive the email(s)

Once your User Groups are optimized for use with Approvals, you may want to write down a quick note on which Action Types and policies are planned for each group.

2. Edit User Groups / Create Approvals-Specific User Groups, if needed

Step 2 - Add or Edit ProVision User Groups

From here, depending on the answers to the questions in step 1, you may need to do one or more of the following from the Users tab:

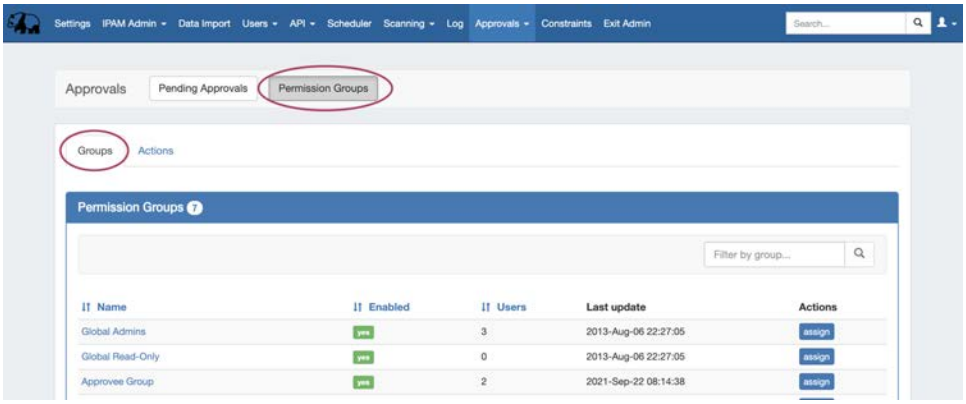
a. Edit existing User Groups to add or remove users, in order to combine users who will need similar action types approved.
b. Verify the User Groups have appropriate CRUD permissions set to perform the action(s) to be approved (e.g, you may have previously removed "Create" permissions for a group, but if the intent is now for those users to have "Add" actions approved by an Admin, the submitter will need User Group resource "Create" permissions back!)
c. Create new User Groups specifically for use with Approvals (recommended)
d. Associate users with different, or additional User Groups (remember - users can be associated with multiple groups!)

For more information on adding and editing ProVision User Groups, see Users & Permissions, Global Permissions, and Working With Users.

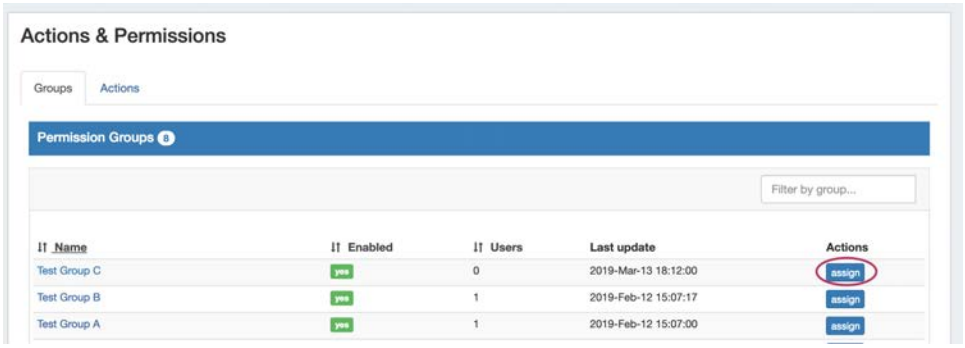
3. Assign Action and Policy Settings to User Groups

Step 3 - Assign Approval Action Settings to Groups

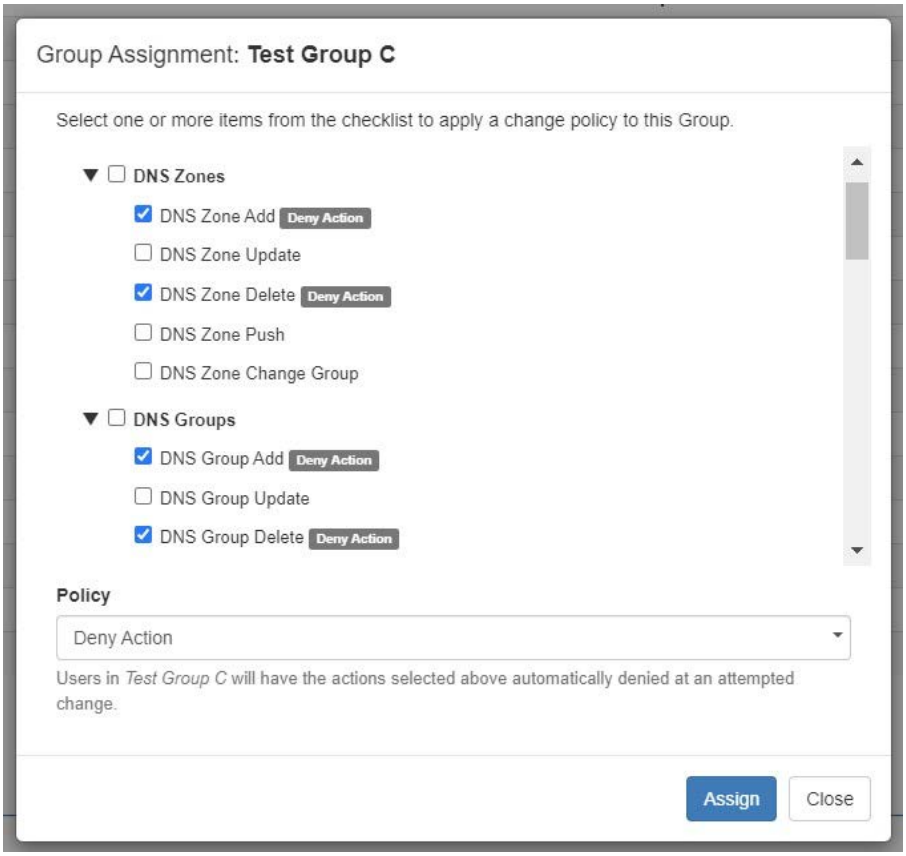
From the Approvals Tab, navigate to the **Permission Groups** sub-tab.



Then, under the **Groups** page tab, find the ProVision User Group you want to assign a policy to and click "Assign".



Clicking the "Assign" button for a group brings up a checklist to select what policy to apply to the group for what Family and Actions (i.e. DNS Zone 'Add' or DNS Group 'Update'). Select either "Deny Action", "Submit Action", or "Approve Action" under Policy. Once you've selected a policy, you can "quick-select" all actions for a DNS Family (Severs, Groups, Zones, Records) by clicking the checkbox next to the family name, or only select individual action types for each Family.

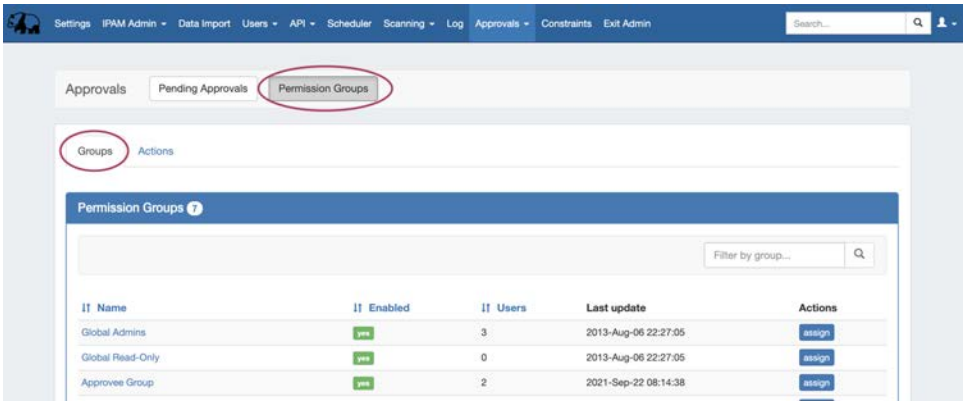


When done, Click "Assign", and repeat as needed for other Policy types or User Groups.

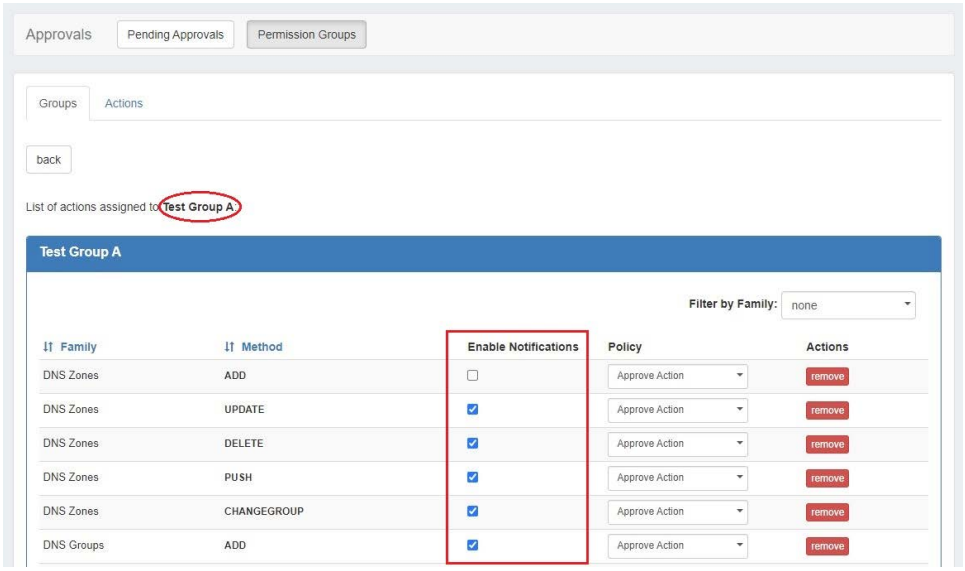
4. If using Approvals notifications, enable notifications for the appropriate Permissions Group(s)

Step 4 - Enable Notifications (Optional)

From the Approvals Tab, navigate to the **Permission Groups** sub-tab **Groups** page tab.



Click on the group name for which you want to set notifications - the Group Permissions Detail page will provide additional information on the group's settings.



For any Family/Action that you want to enable notifications, click the checkbox under "Enable Notifications". All users of that group will get email notifications when a change of the selected type(s) are made.

5. If using Approvals notifications, set up a Scheduler task for "Approvals - Process Subscription"

Step 5 - Add Scheduler Task: "Approvals - Process Subscription"

The "Approvals - Process Subscription" task processes approval request events and handles the sending of notification emails to subscribed Approvals Groups - this task must be created and running on a regular interval in order for Approval Notification emails to be sent.

In order to receive the most up to date information in the Approval Notifications, is recommended to create this task with a run time of "every 5 minutes" and no end date.

For information on setting up Scheduler Tasks, see Scheduler Tab.

6. Set up a Scheduler Task for "Approvals - Delete events older than 1 month", to occasionally clear out old and obsolete Approval request events

Step 6 - Add Scheduler Task: "Approvals - Delete events older than 1 month"

The "Approvals - Delete events older than 1 month" task deletes any Approvals history events older than 30 days.

It is recommended to set this task to run monthly with no end date, to clear out obsolete approvals items, reduce data storage space needs, and reduce approvals page load time.

For information on setting up Scheduler Tasks, see Scheduler Tab.

Daily Use

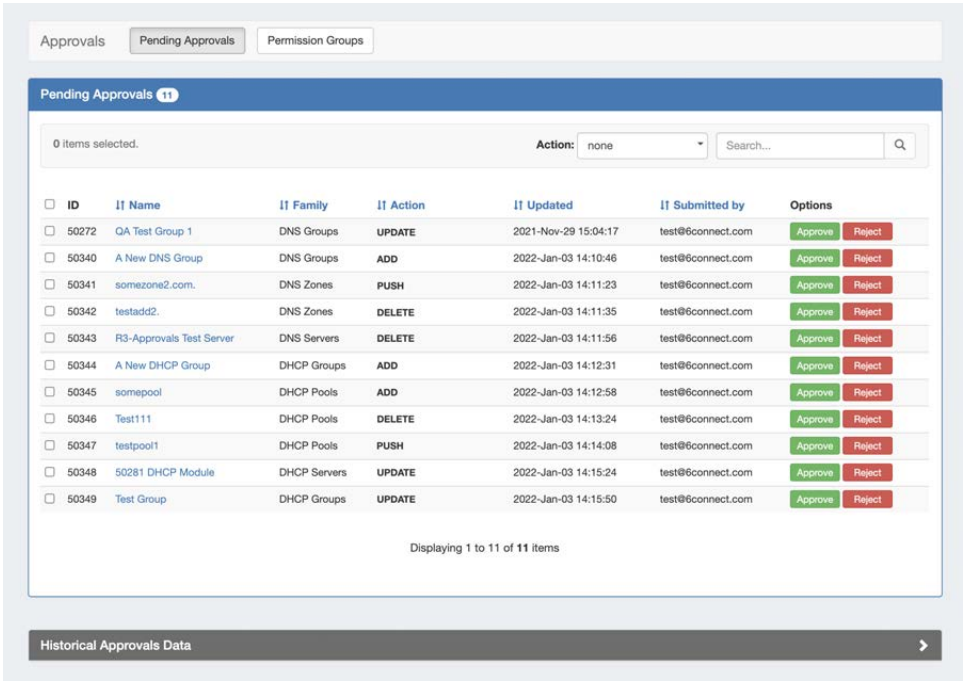
On a day-to-day basis after initial setup, an Approvals Workflow will be similar to the following (with "Submitter" as the user whose actions require approval, and "Approver" as the admin with the ability to approve/reject the change):

1. Submitter makes an action (either by action type or DNS / DHCP Family) that requires approval
2. Submitter is notified that their action is pending approval

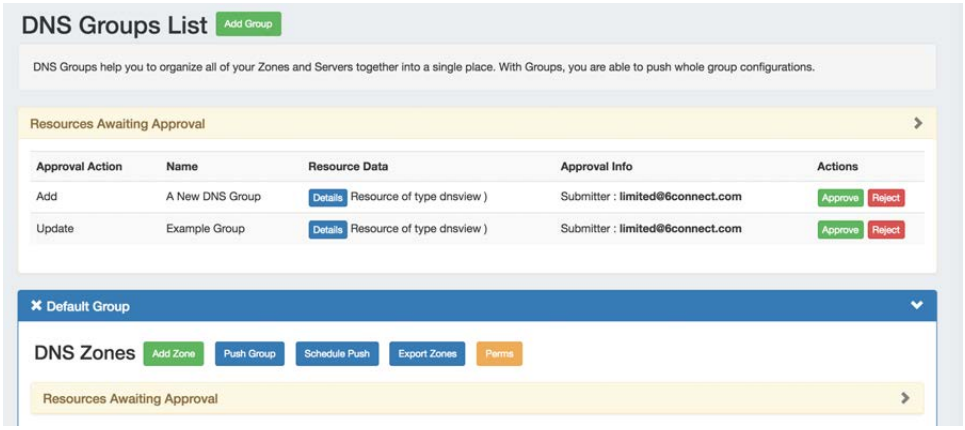


3. The requested change is sent to the Approvals Tab **Pending Approvals** list, and also to the **Resources Awaiting Approval** module for the relevant area (the submitter may see their own submitted action under "Resources awaiting approval", but only Approvers can take approve/reject actions).

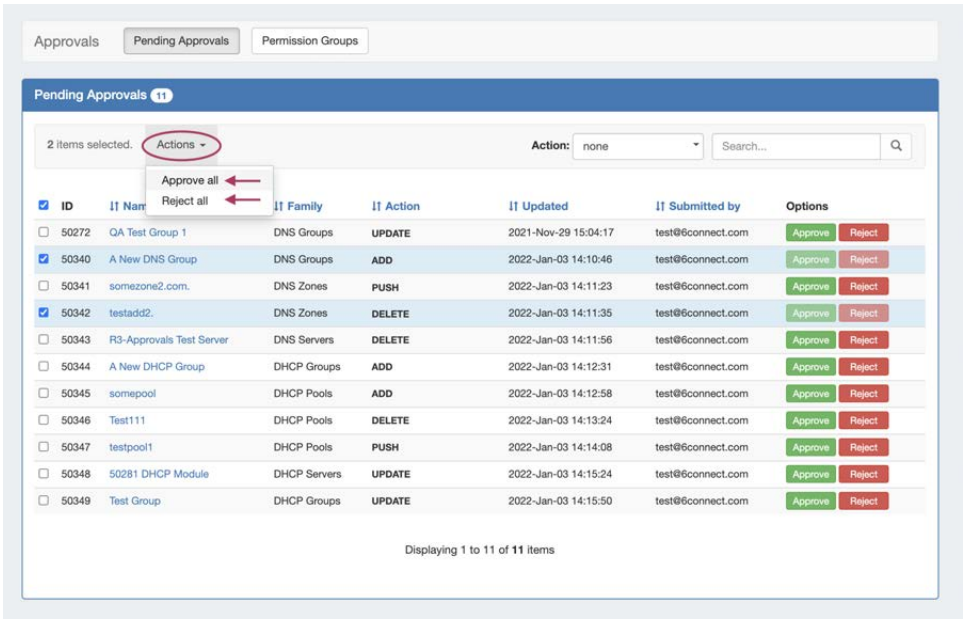
   The **Pending Approvals** list is under the Approvals Tab. It shows Approvals events (change requests) for which the user has the ability to Approve or Deny - it does not show approval requests for all of ProVision or those for other users.



A "Resources Awaiting Approval" module will display in selected DNS / DHCP pages to Users with Admin / Approval permissions, if a change has been submitted on that page that is pending approval by the User's Approval Group.

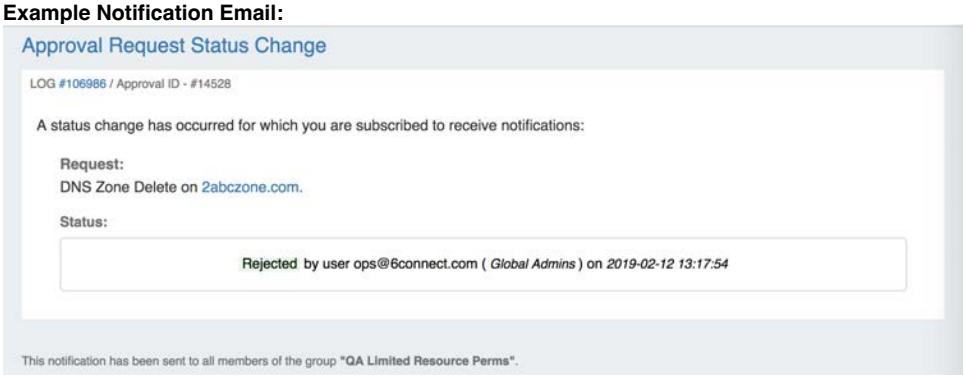


4. The Approver reviews the change in either their Approvals Tab **Pending Approvals** list, or the **Resources Awaiting Approval** module, and chooses to Approve or Reject the change. Events may be approved / rejected individually, or multiple events may be selected for bulk approval / rejection by selecting the desired checkmarks, expanding the "Actions" menu, then selecting either "Approval All" or "Reject All" for the selected events.



   a. If Approved, and no other groups need to approve it, then the change executes and is saved. A status change notification email is sent, if enabled.
   b. If Approved, and is waiting approval from an additional User Group, the change continues to be held as Pending, until the other group responds (Both groups must "Approve" for the change to execute). A status change notification email is sent, if enabled, stating that the change is awaiting another Group.
   c. If Rejected, the change is not executed. A status change notification email is sent, if enabled.

Example Notification Email:



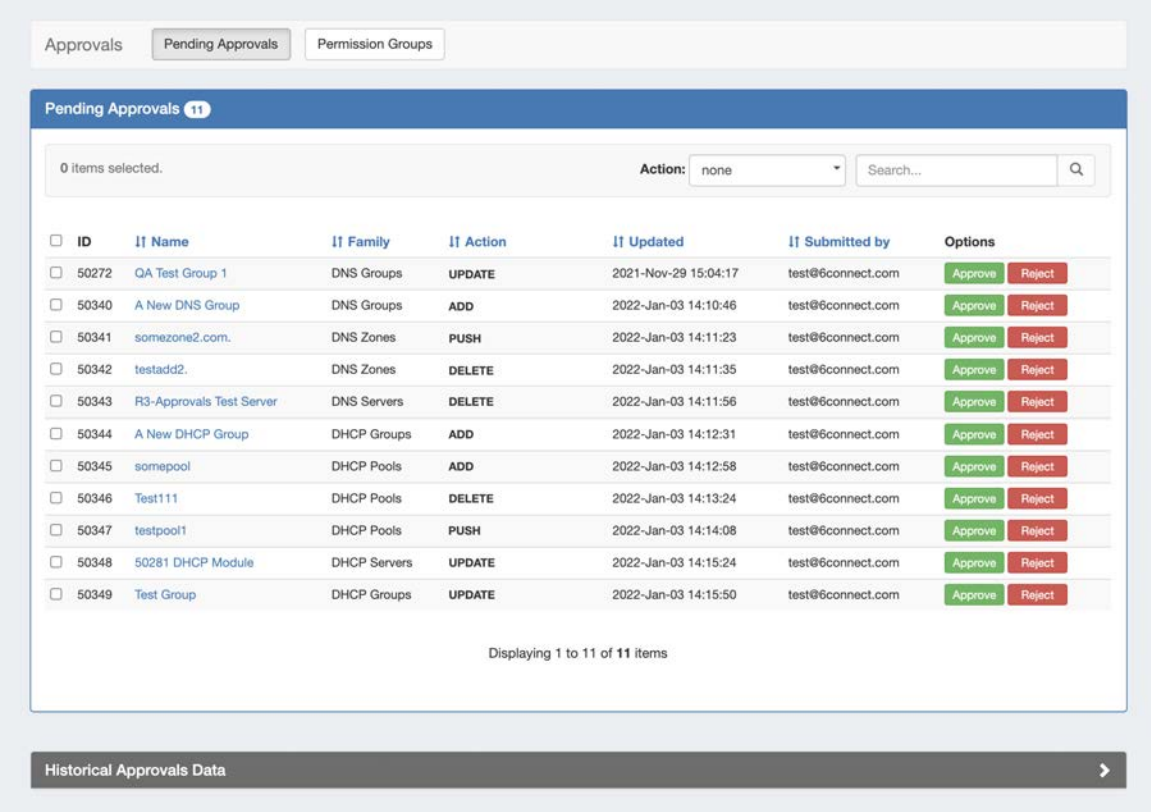
Additional Information

See the following areas for more information on Approvals and using Approvals with DNS:

- DNS Tab
- Pending Approvals
- Permission Groups
- Scheduler Tab

Pending Approvals

Pending Approvals



The Approvals module stores and queues DNS or DHCP actions made by selected User Groups, and sends those actions to a Pending Changes list for administrative review. Later, an administrator (or combination of administrators) can approve or reject these stored actions.

The admin Approvals Tab contains two sub-tabs: **Pending Approvals** and **Permission Groups**, which are the primary areas to manage Approvals items.

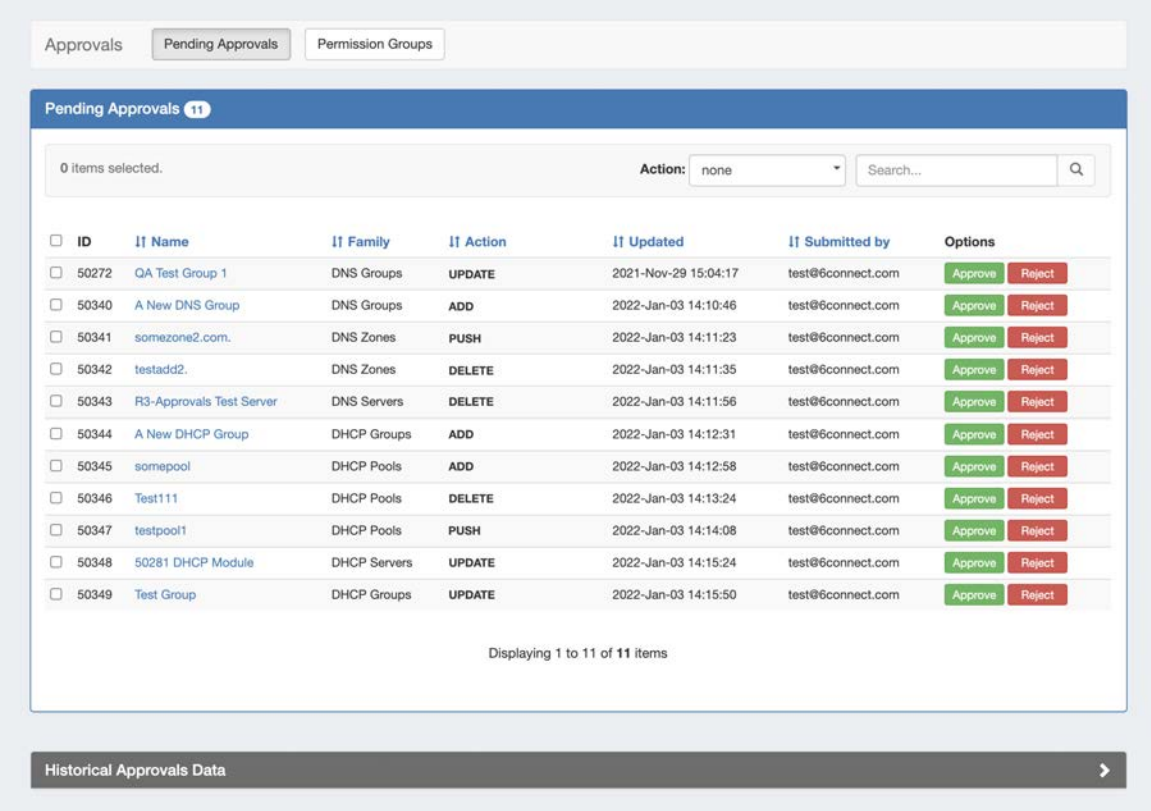
> Currently, **Approvals** is available only for DNS / DHCP related actions, while we gather feedback and use cases to inform possible future updates. If you are interested in providing feedback, a use case, or requests for future additions to the Approvals system, please contact feedback@6connect.com.

- Pending Approvals - Overview
- Working with Pending Approvals
  - View / Sort Pending Approvals
  - View / Sort Approval History
  - Viewing Requests Pending by Other Groups
  - Viewing details on a change request
  - Approve / Reject a single change request
  - Bulk Approve / Reject
  - Resources Awaiting Approval Module
  - View / Send Request Status Change Notifications
  - Delete Old Approval Events (Scheduler)
- Additional Information

Pending Approvals - Overview

The **Pending Approvals** sub-tab lists Pending approval requests (also referred to as change requests, approval events, or approval items) for which the current admin user has permission to "Approve" or "Reject".

The Pending Approvals list may be sorted by Name, Family, Action Type, Updated time, or by submitted user and searched by resource name.



Approving and Rejecting change requests may be done individually, or in bulk by selecting multiple item checkboxes, expanding the "Actions" menu at the top of the list, and then selecting to Approve or Reject all selected items. If notifications are enabled for the Group or Action, an email will be sent notifying the request submitter of the status change.

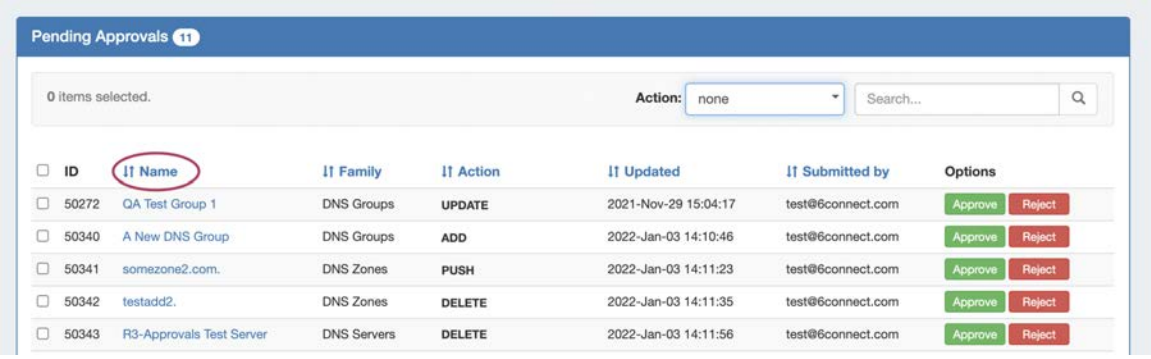
At the bottom of the page, historical approval items for the user are shown. The user may filter their previous approval items by Executed, Approved, Rejected, or Pending by Others (for items requiring multiple Groups to approve).

Working with Pending Approvals

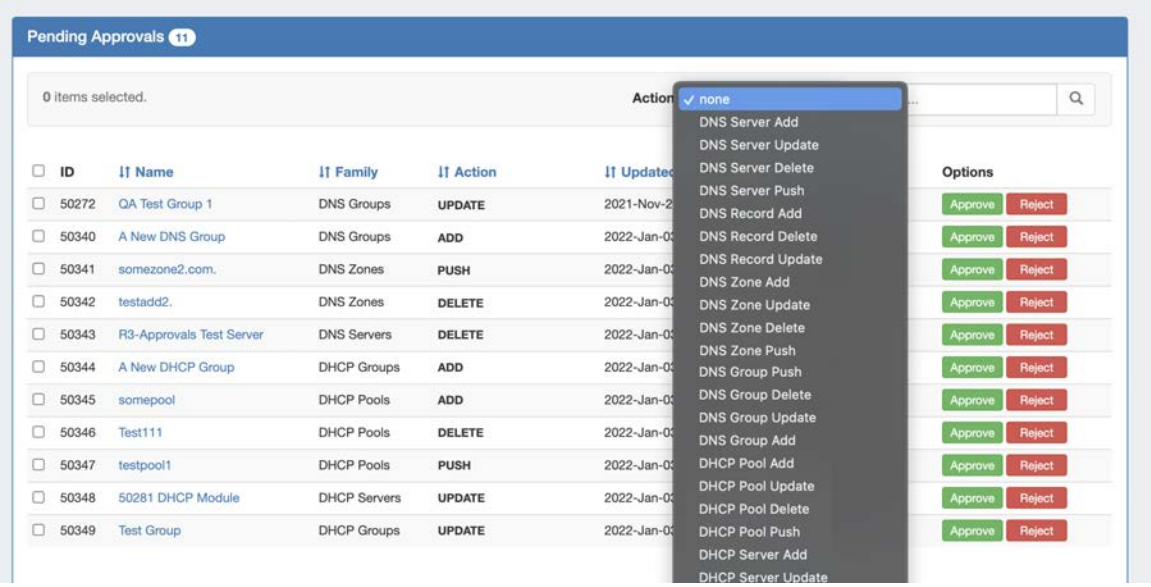
View / Sort Pending Approvals

The Pending Approvals list may be sorted for any column with the sort arrow icon ( ).

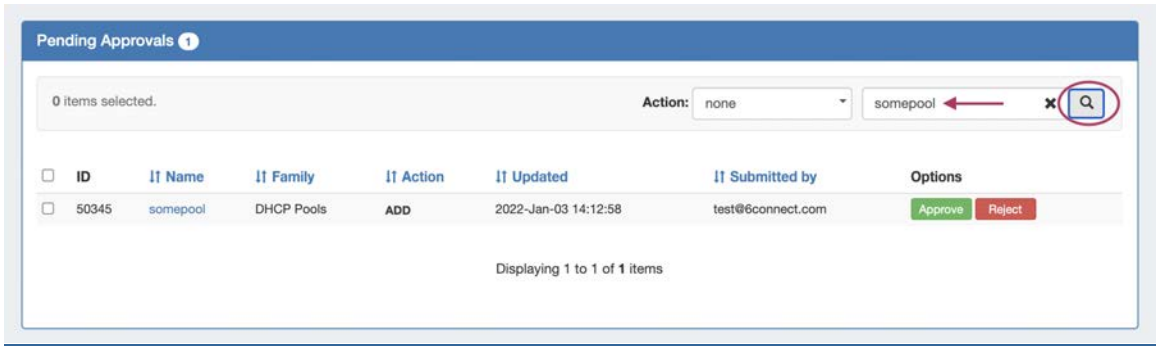
Click on the column name to toggle between ascending / descending order for that field.



Filter the Pending Approvals list to only view a certain Family/Action type by selecting an option from the "Action" dropdown.



Search the list for a specific item name by typing all or part of the name in the search box, then clicking the search icon.

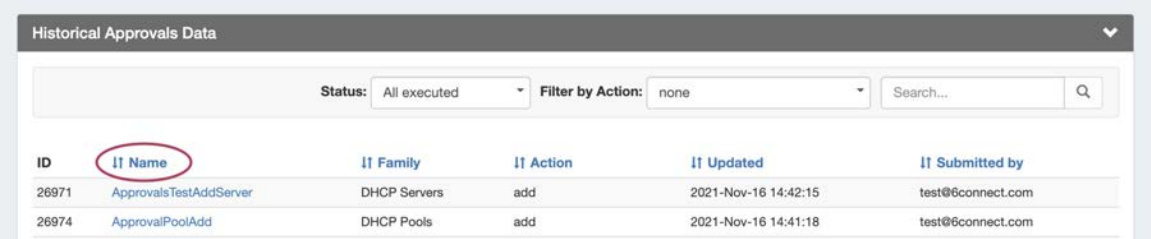


View / Sort Approval History

Previous Approval events applicable to the current admin user are displayed under the Approvals Historical Data section, until they are deleted or removed by an archive process, such as the "Approvals - Delete events older than 1 month" scheduler task process.

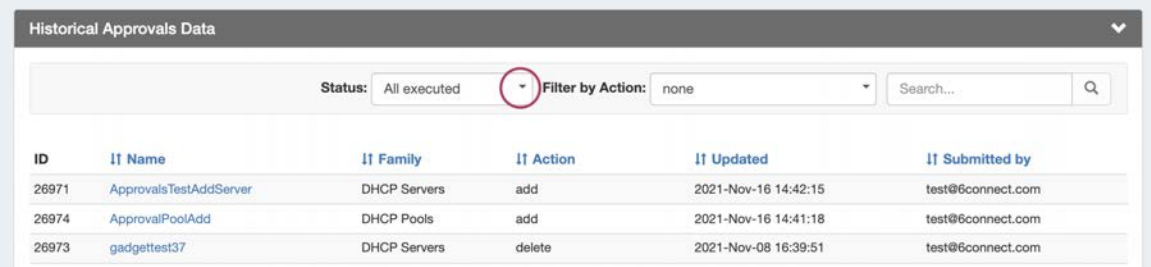
Similar to the Pending Approvals list, it may be sorted ascending / descending by field, filtered by status, filtered by action, or searched by name.

Click on the column name to toggle between ascending / descending order for that field.

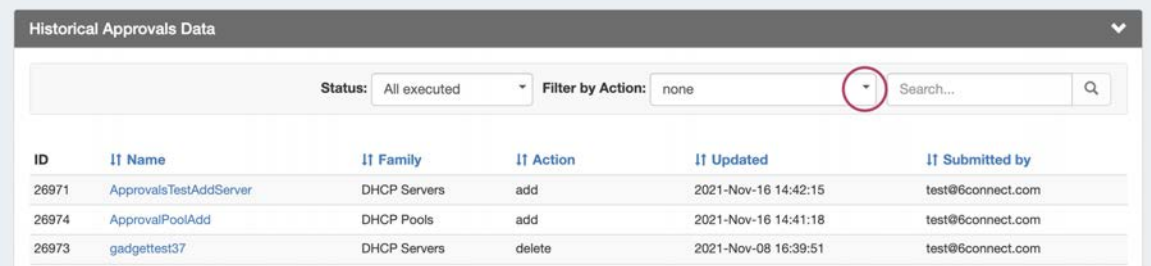


Filter the History to only view a certain status by selecting an option from the "Status" dropdown. The available options include:

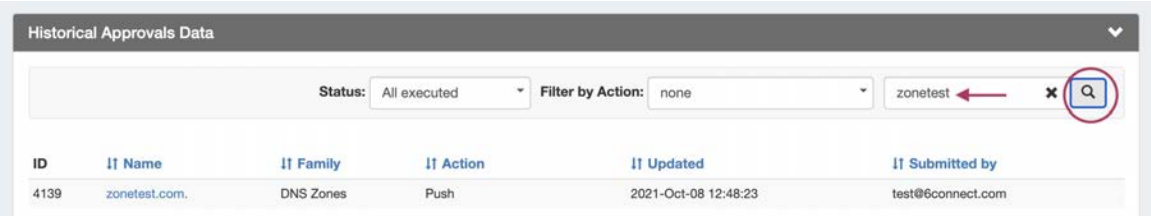
- **All Executed** - Shows historical approval events that were approved and executed.
- **Approved** - Approval change requests approved by you, the currently logged in user.
- **Rejected** - Approval change requests rejected by you, the currently logged in user.
- **Pending by others** - Approval change requests that you have already responded to with an approval or rejection, but that are awaiting responses from one or more other groups.



Filter the History to only view a certain Family/Action type by selecting an option from the "Filter by Action" dropdown.

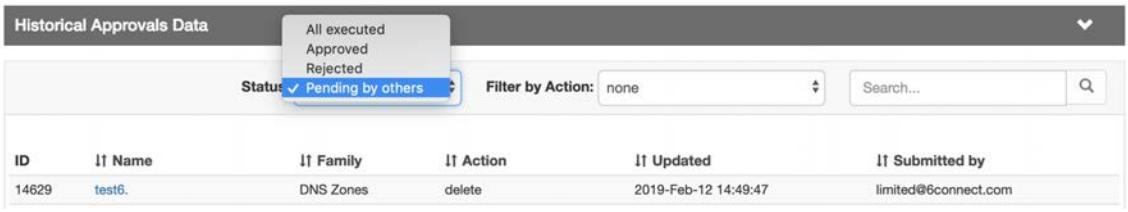


Search the list for a specific item name by typing all or part of the name in the search box, then clicking the search icon.



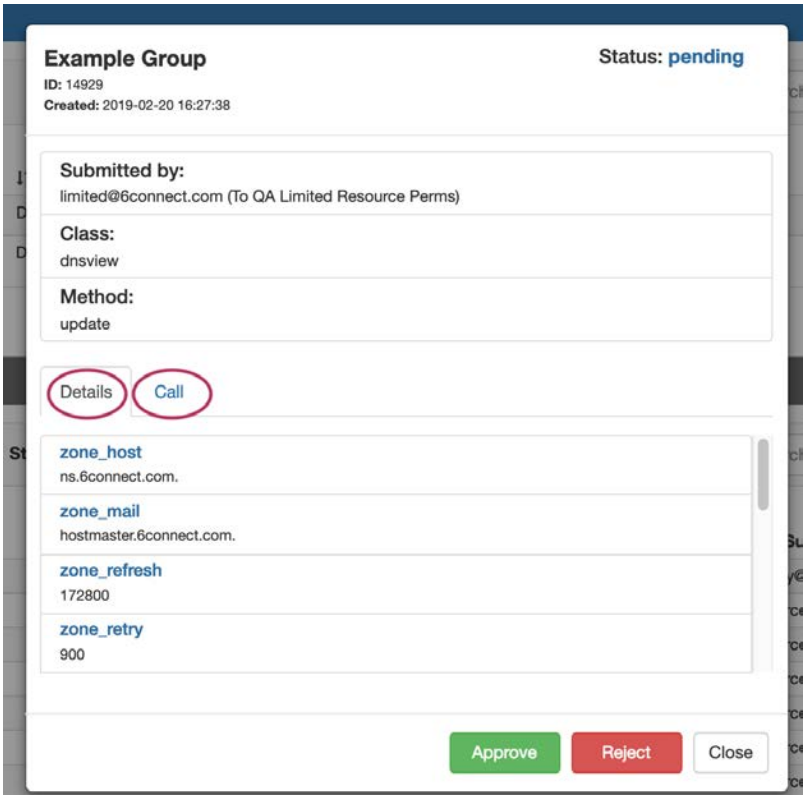
Viewing Requests Pending by Other Groups

Approval requests that you have approved/rejected, but which are still awaiting a response from another group, may be viewed under Historical Approvals Data by setting the "status" filter to view "Pending by Others".



Viewing details on a change request

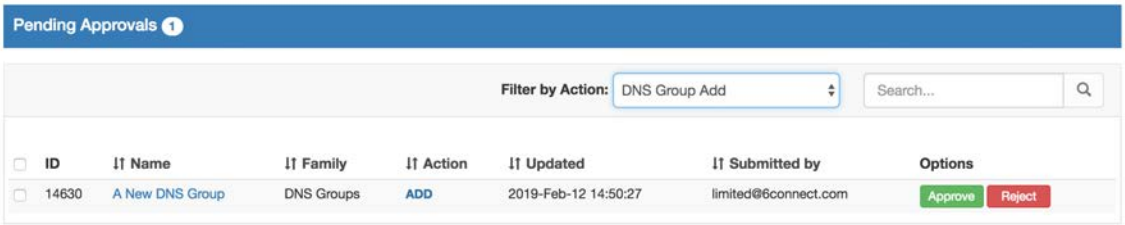
To view details on any Approvals change request, click the name for the desired item. An information box will appear with details on the change, including status, id, creation date, family, field values, and the API Call in JSON format.



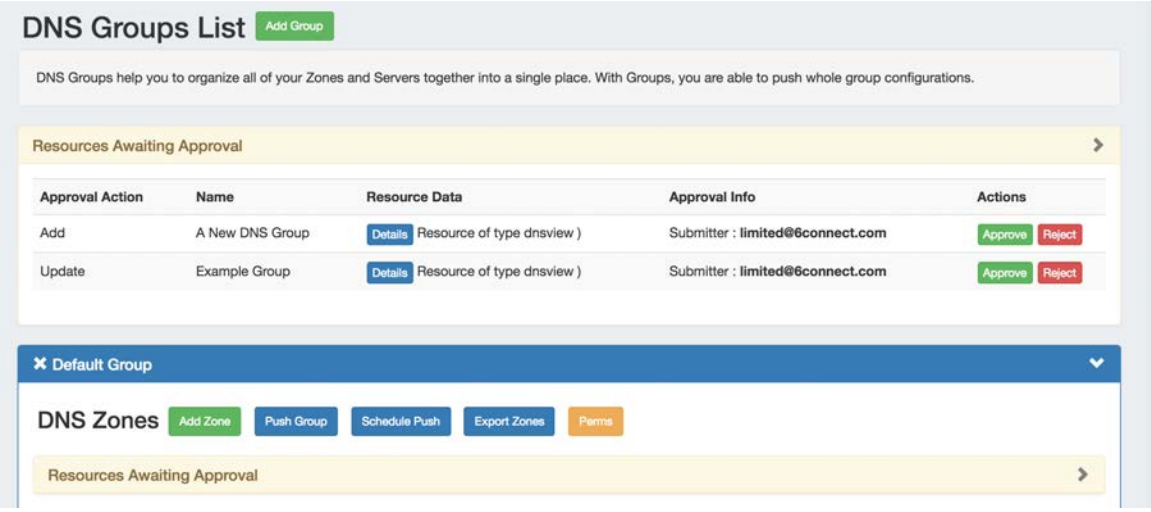
The change may be approved or rejected directly from the detail information box, or you may click "Close" to exit.

Approve / Reject a single change request

To Approve or Reject any single change request, click either the "Approve" or "Reject" button for the pending item.



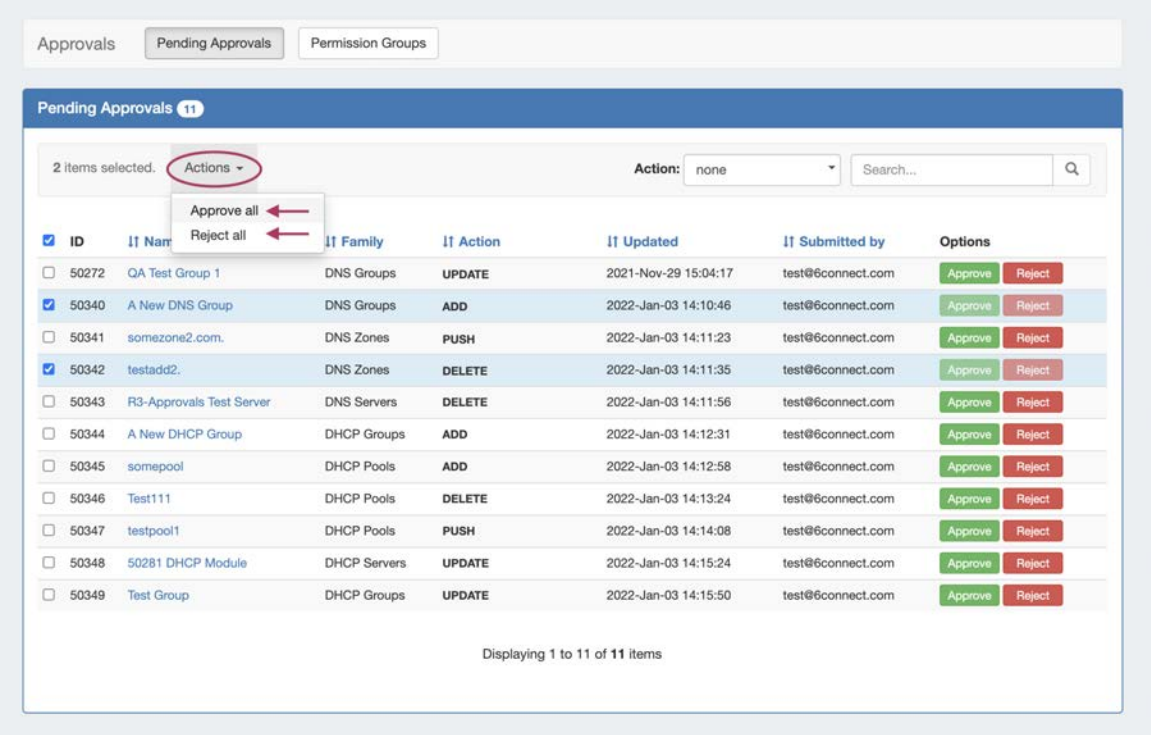
Approving or Rejecting a request may be done from the Pending Approvals list, the detail view for the item, or from the "Resources awaiting approval" module for the relevant area.



Bulk Approve / Reject

Bulk Approve or Reject actions may only be done from the **Approvals** tab **Pending Approvals** list.

Select the checkboxes for the items that you want to bulk approve or deny, then click the "Actions" menu at the top of the list. From there, select either "Approve All" or "Reject All" to apply the response to the selected approval requests.

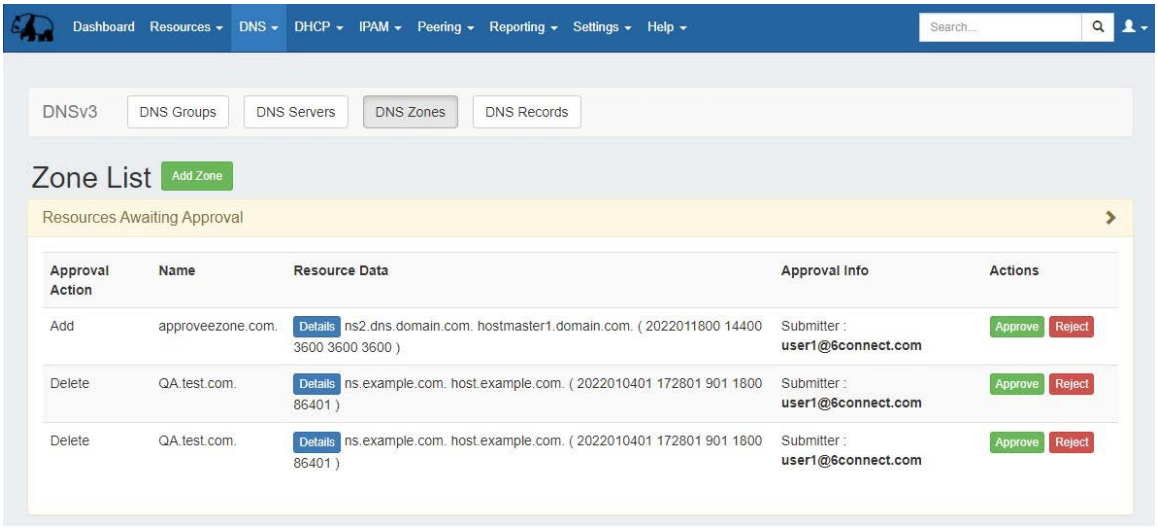


If you wish to select all items in the Pending Approvals list for the same response type, click the "select all" checkbox to the left of the "ID" column name. All of your pending items will be selected, and you may choose to "Approve All" or "Reject All" from the top of the page.

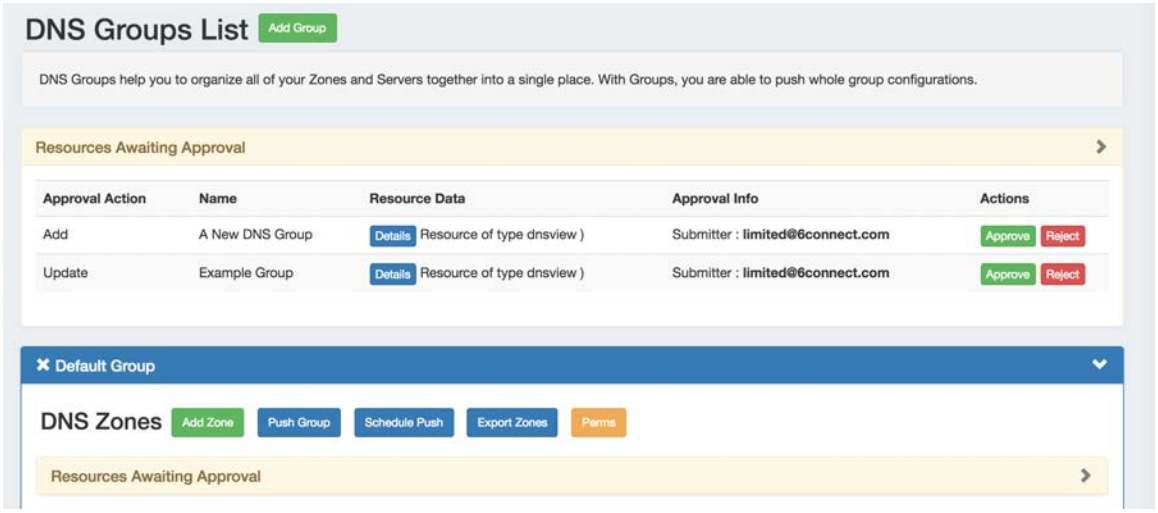
Resources Awaiting Approval Module

A **Resources Awaiting Approval** module will display in the relevant DNS / DHCP areas, if a change has been submitted on that page either by the current user, or that the current user may Approve/Deny.

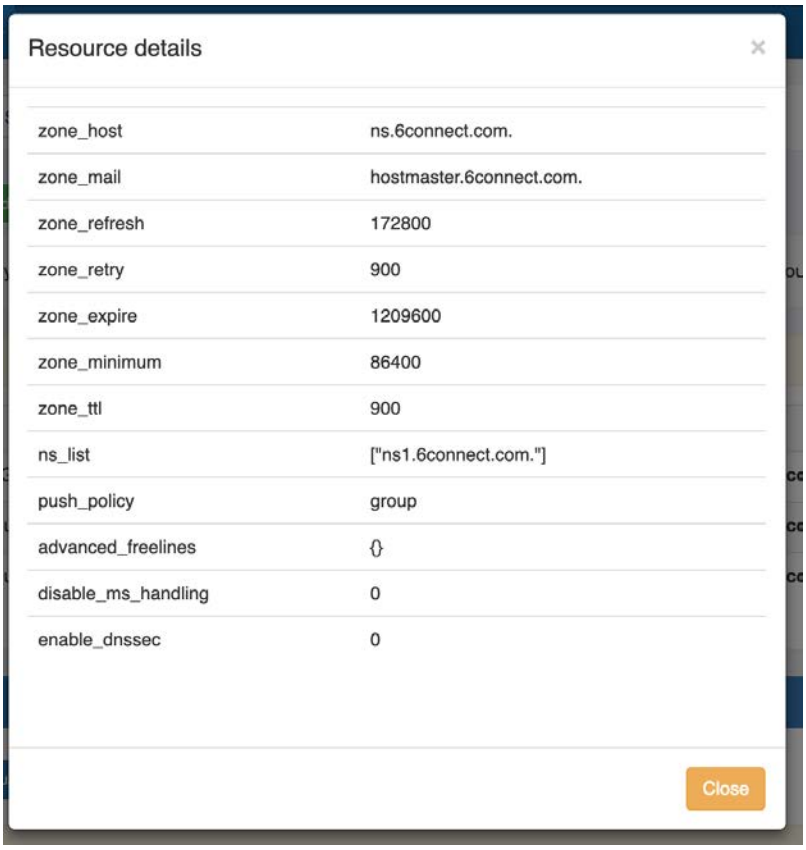
Users who submitted the request will be able to view the request details, but will be unable to take any actions on the request.



Admin users with Approve/Reject Ability will see Approve/Reject buttons available to immediately respond to the request.



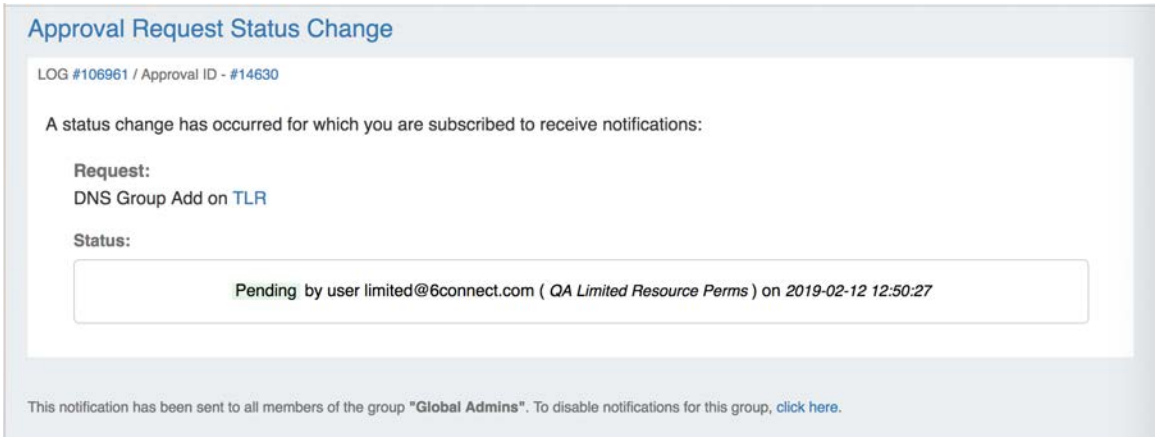
Details for the change may be viewed by clicking the "Details" button in the module.



View / Send Request Status Change Notifications

Email notifications of changes in status are an optional feature that may be set up by Approval Permission Group for the desired action types.

The emails provide the current status, approval ID, links to the log event and change request details, and details on the user, time, and date.



In order to send email notifications to affected groups of a change in the status of an Approval event:

1. Notifications must be enabled for the Group, for the family-action type of the requested change
2. A scheduler task ("Approvals - Process Subscription") must be created and running to process the notification and send the email

Enabling notifications for approval events is done in the **Permission Groups** subtab of Approvals, see the Working with Permission Groups page for additional information on setting up notifications.

The "Approvals - Process Subscription" task processes approval request events and handles the sending of notification emails to subscribed Approvals Groups. If Approvals are in use with notifications, it is recommended to create this task with a run time of "every 5 minutes" and no end date. For details on setting up this task, see documentation for the Scheduler Tab.

Delete Old Approval Events (Scheduler)

Old Approval events may be purged from the system by enabling and running the scheduler event "Approvals - Delete events older than 1 month". This task deletes any Approvals history events older than 30 days, and It is recommended to run this task monthly to clear out obsolete approvals items and reduce approvals page load time.

For information on setting up scheduler events, see documentation for the Scheduler Tab.

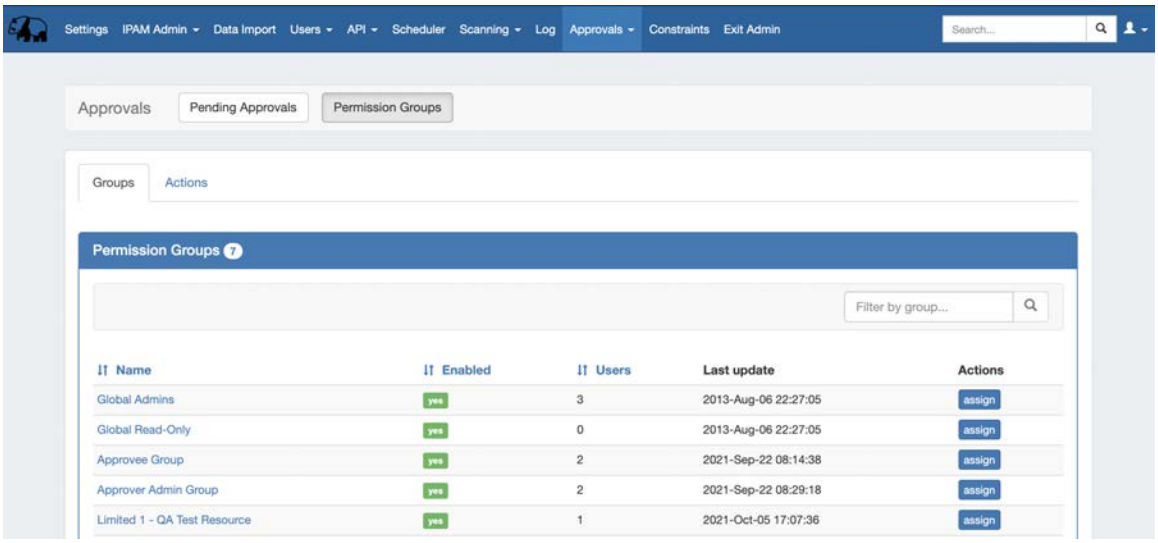
Additional Information

See the following areas for more information on Approvals and using Approvals with DNS:

- DNS Tab
- Approvals
- Permission Groups
- Scheduler Tab

Approval Permission Groups

Approvals Permission Groups



The Approvals Tab **Permission Groups** subtab is where admins may view and manage assignments, actions, and settings for Approvals permission groups.

> Currently, **Approvals** is available only for DNS / DHCP related actions, while we gather feedback and use cases to inform possible future updates. If you are interested in providing feedback, a use case, or requests for future additions to the Approvals system, please contact feedback@6connect.com.

- Permission Groups - Overview
  - Groups
    - Group Assignment (Assign Button)
    - Group Details Page
  - Actions
    - Actions - View Groups Page
    - Actions - Assign Groups
- Working with Approval Permission Groups
  - Sort or Filter the Group List
  - View/Edit Existing Assignments
    - Groups Tab
    - Actions Tab
  - Assign a new Permission Group policy
    - Assign a Policy from the Groups Tab
    - Assign a Policy from the Actions Tab
  - Manage Approval Notifications for Groups
    - Set up the "Approvals - Process Subscription" Scheduler Task
    - Enable Notifications
- Additional Information

Permission Groups - Overview

The **Permission Groups** sub-tab contains areas to manage a User Group's level of approval permissions ("Policy"), and on what actions they apply. By default, all existing ProVision User Groups are displayed under Approvals - Permission Groups. However, you may assign Approval policies to few or as many of the groups as you want.

There are two tabs available under Permission Groups - **Groups** and **Actions**. Both tabs provide similar levels of functionality to view and assign policies, but they differ in organization.

Use the **Groups** tab view if you want to:

- Assign a policy to a specific group that includes multiple action types
- View, edit, or remove the policies associated with any or all action types for a group
- Enable/disable a group's Notification setting

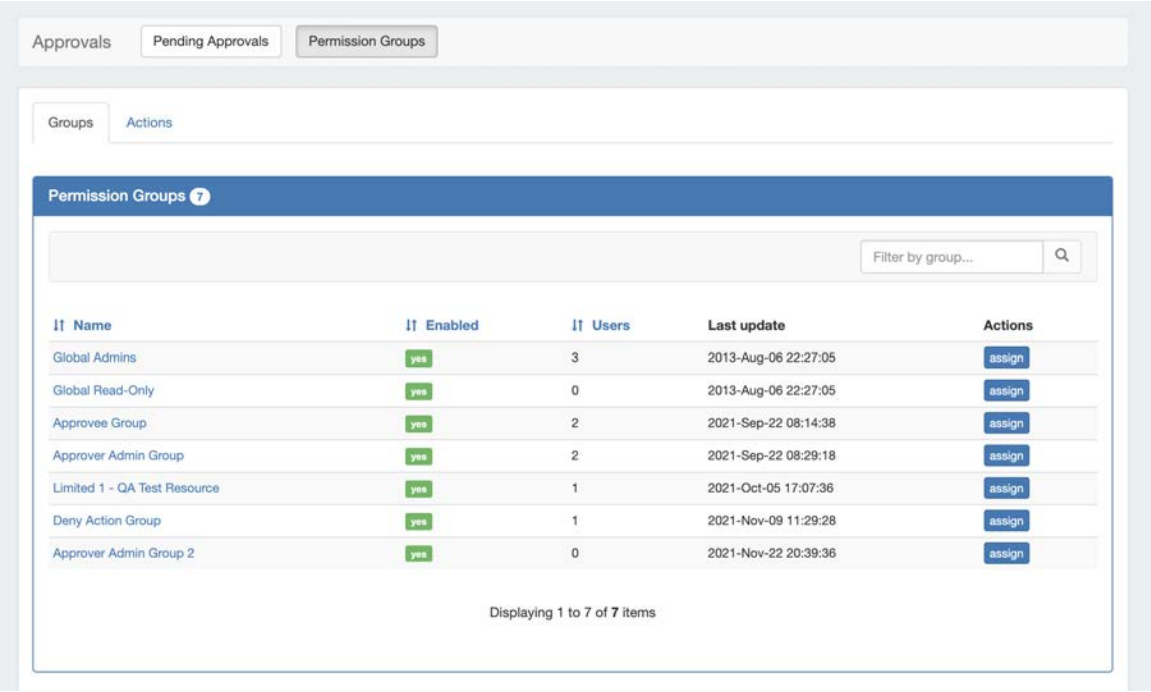
Use the **Actions** tab view if you want to:

- View how many or what groups are assigned policies for a specific action type
- Want to confirm that an action type has group assignments covering both the "Submit" and "Approve" policies
- View, edit, or remove policies associated with a specific action family or action type
- Assign a single policy to a one or more groups for a specific family-action type

Before using the functions available from the **Permission Groups** page, you may wish to review the Approvals documentation page for information on best practices for setting up User Groups for use with Approvals, policy definitions, and workflows.

Groups

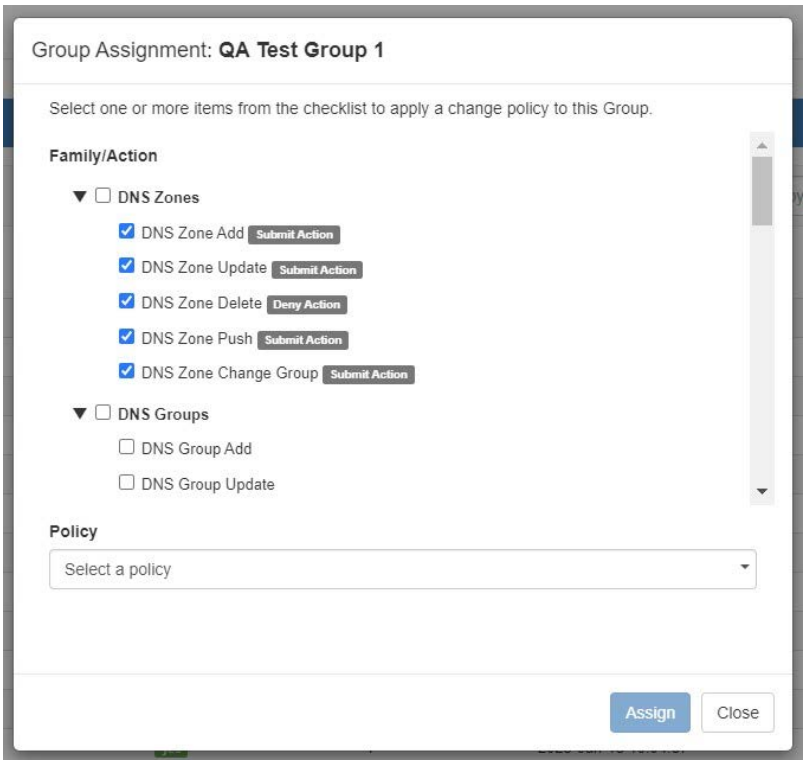
In the **Groups** tab, each ProVision User Group is listed with details on the status, number of users, and last updated time.



From here, you may either click on "Assign" to assign action policies to the Group, or view/edit existing settings by clicking on the Group Name to open the Group Details page.

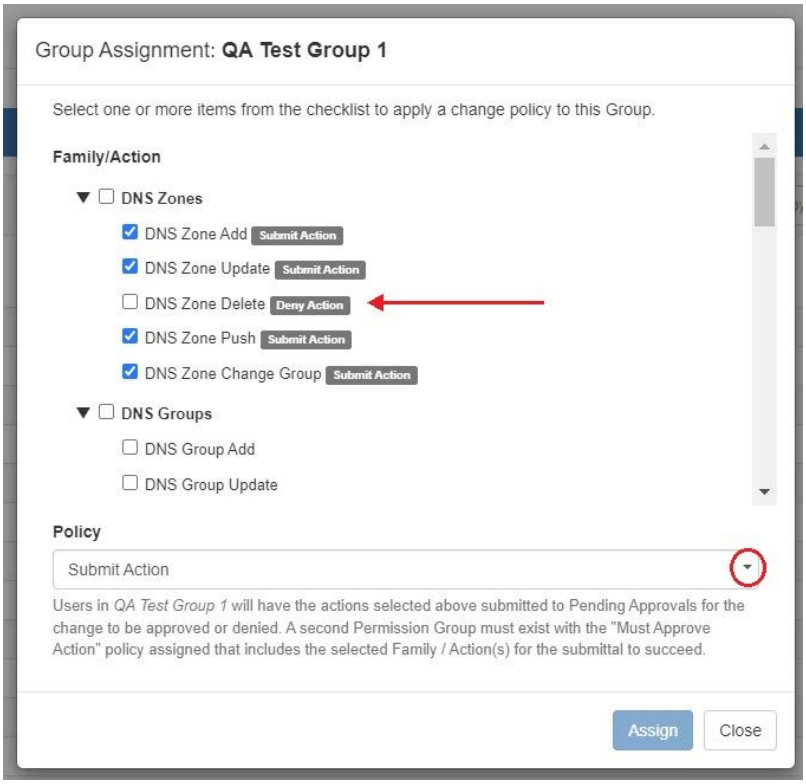
Group Assignment (Assign Button)

Clicking the "Assign" button for a group brings up a checklist to select one or more actions to apply a policy to for that Group.

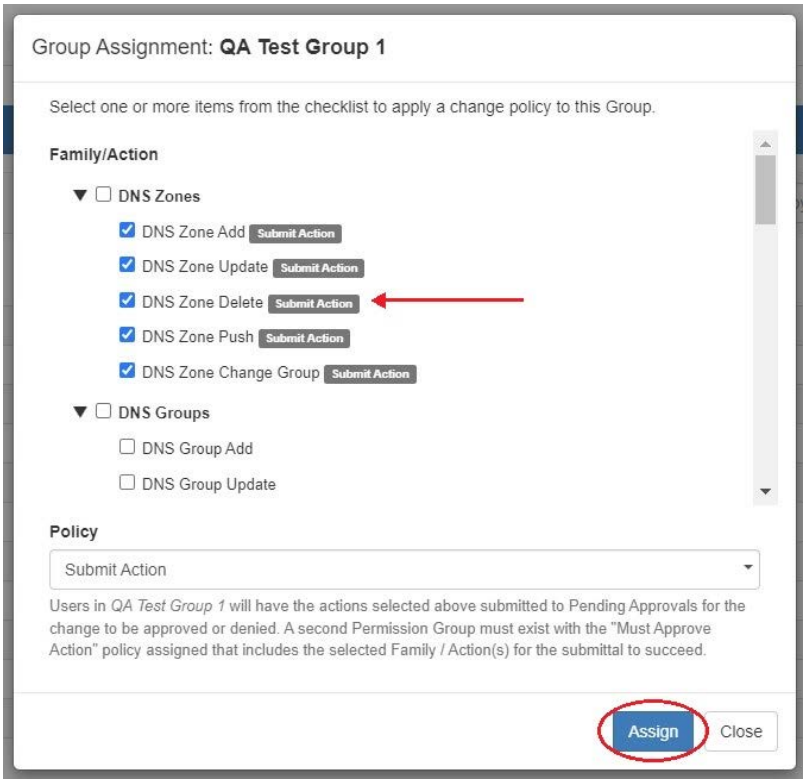


Select a policy, select one or more Family/Actions to apply the policy to, and then click "Assign".

If there are policies already assigned to a group, these checkboxes are preselected and the policy assigned to each is shown next to the action. To change a policy for a specific action, choose a new policy from the dropdown.



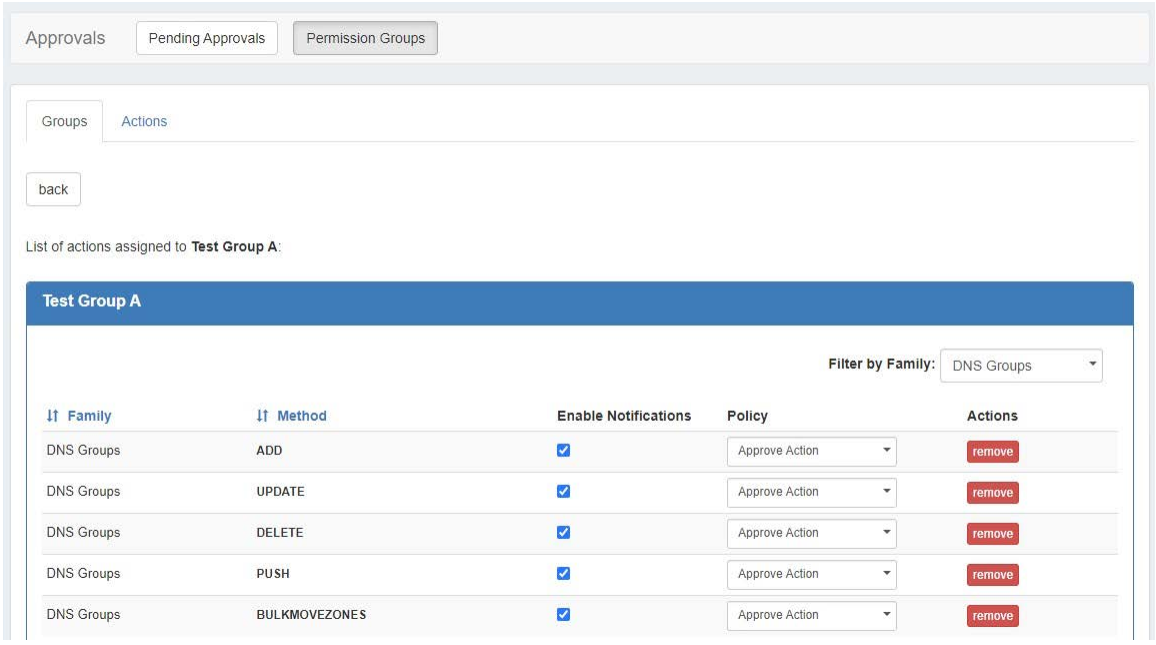
This will deselect the checkbox next to the action, allowing it to be selected again.



Click "Assign" to save the policy change.

Group Details Page

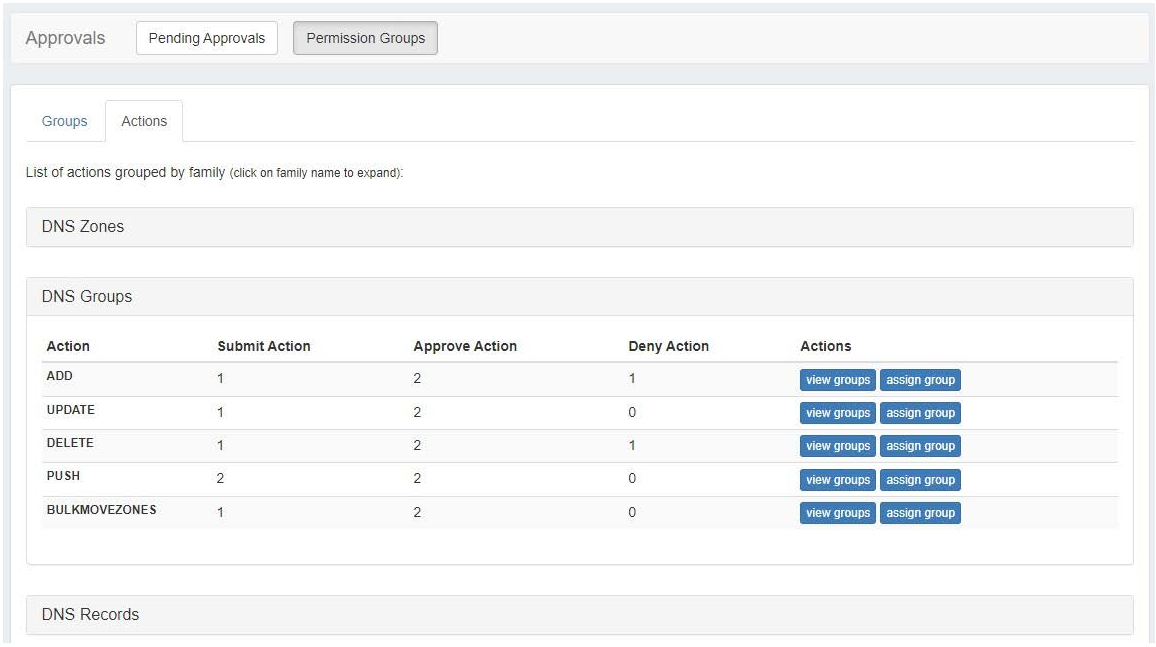
From the list of Permission Groups, click on a Group name to bring up the permission details for that Group.



Here, you may view, edit, or remove current policy assignments, and enable/disable notification emails for each action type. The list of assigned actions for the group may be sorted by Family or Method, and filtered by Family (here: "DNS Groups").

Actions

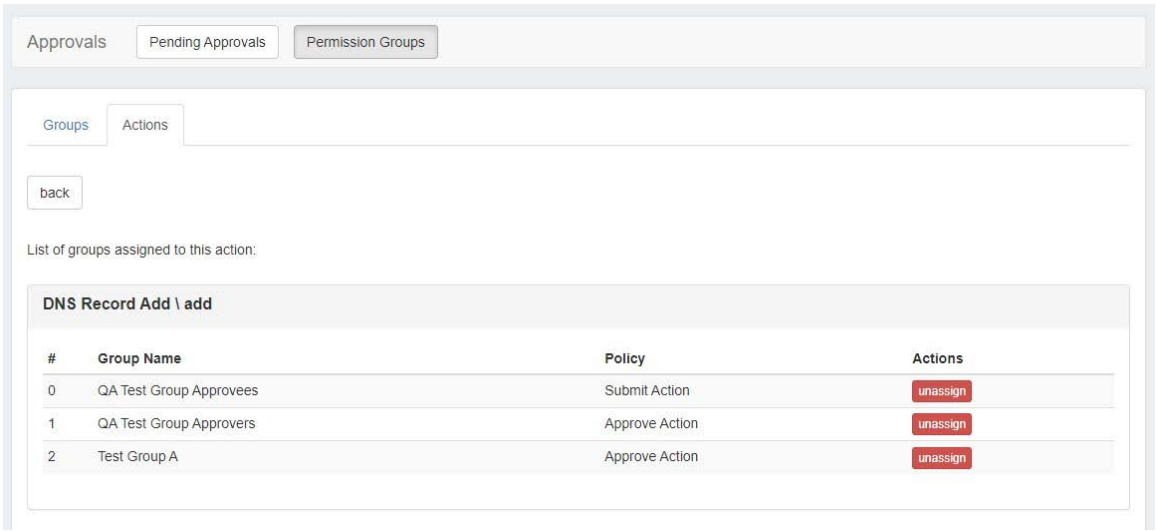
The **Actions** Tab lists the group permissions organized by Family/Action type.



Expanding a Family shows the available actions, and a matrix of how many groups are assigned under each policy.

Actions - View Groups Page

Clicking the "View Groups" button from the Actions tab shows the list of each group assigned to that action, with the option to unassign a group from that action.



Actions - Assign Groups

The "Assign Group" button on the Actions tab lets you assign a Group and Policy to that action.

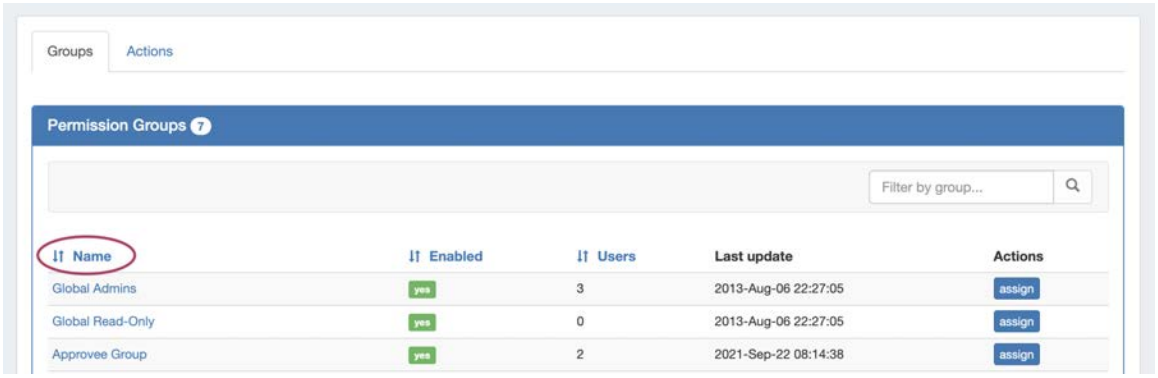


This performs the same function as the earlier assignment window, but is organized to only assign a single group/policy to that action, instead of assigning multiple actions to a group.

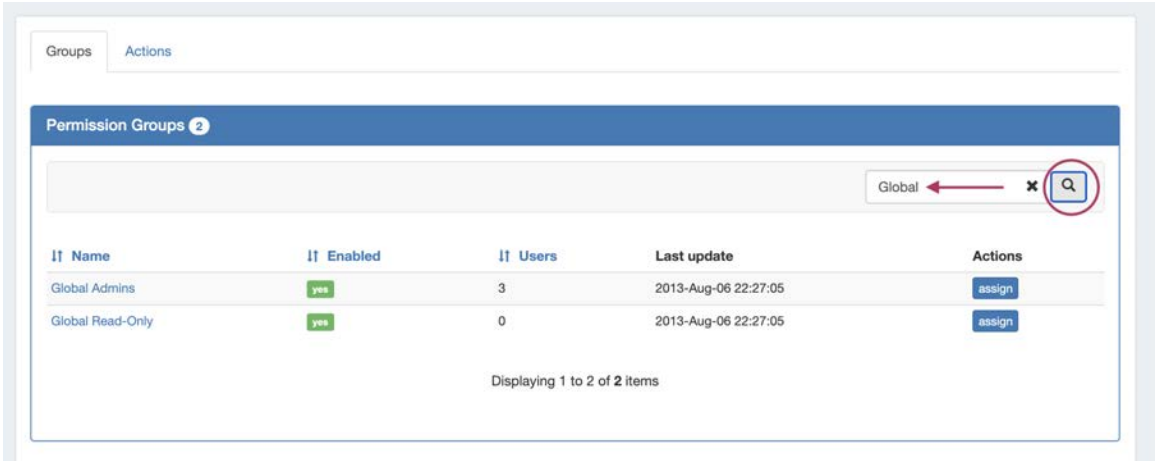
Working with Approval Permission Groups

Sort or Filter the Group List

Sort the Permission Groups list by Name, Enabled, or Users by clicking on the column name.



To Filter the list, type all or part of the group name into the "Filter by Group" box, and the list will automatically narrow to show results.

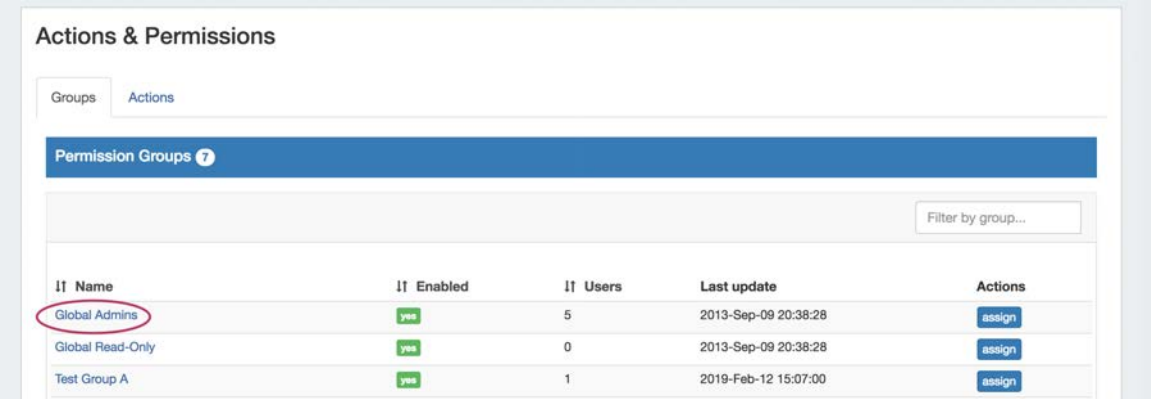


View/Edit Existing Assignments

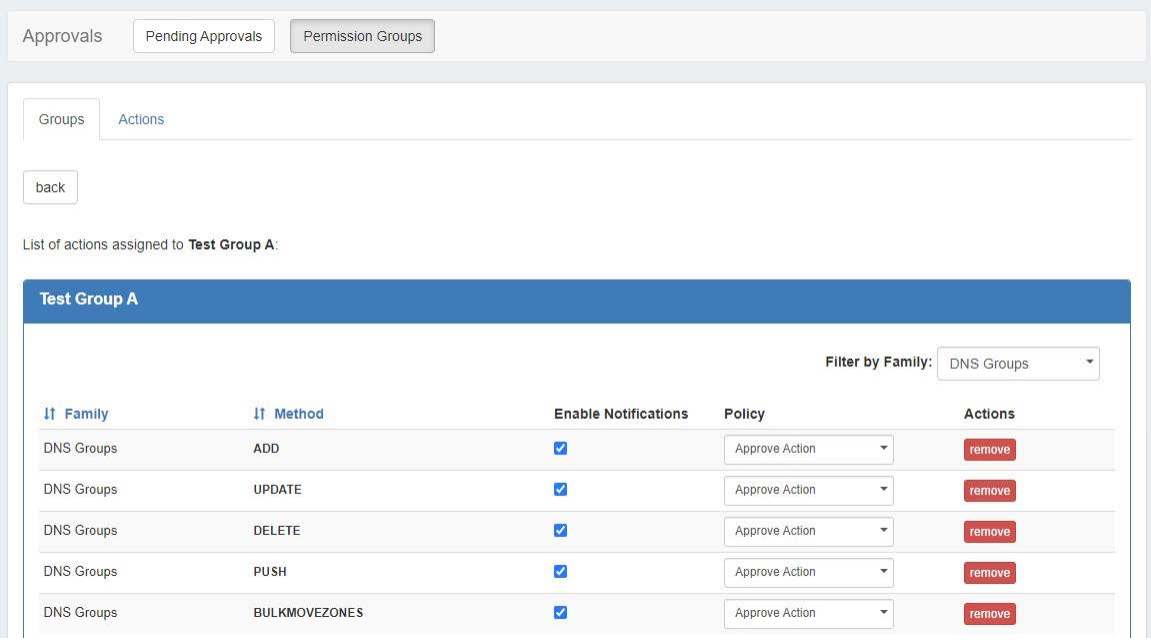
Viewing and editing existing assignments may be done from either the **Groups** tab or the **Actions** tab:

Groups Tab

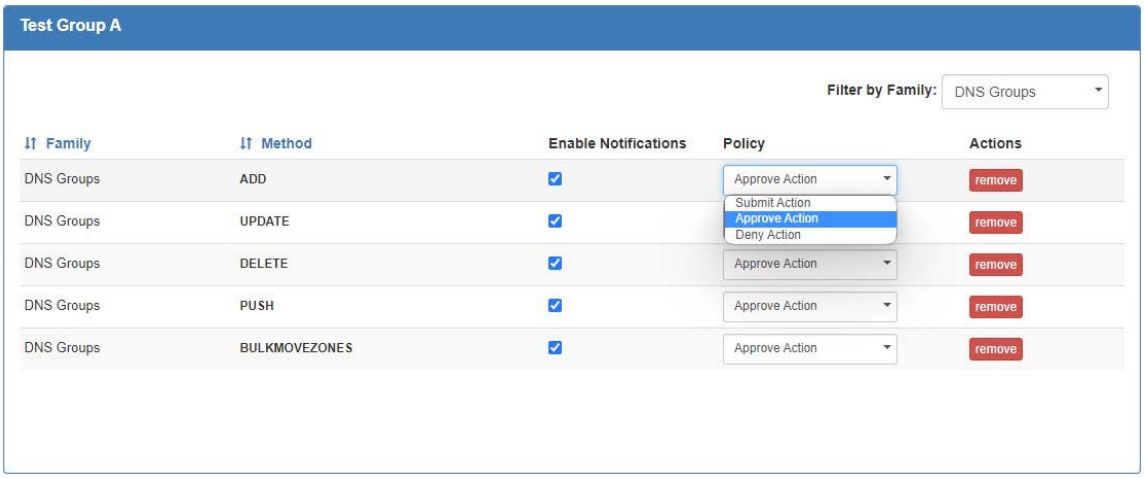
To view details for a permission group, click on the Group Name from the Permission Groups list.



The **Group Details** page will open, displaying all Family-Action types currently assigned to the Group



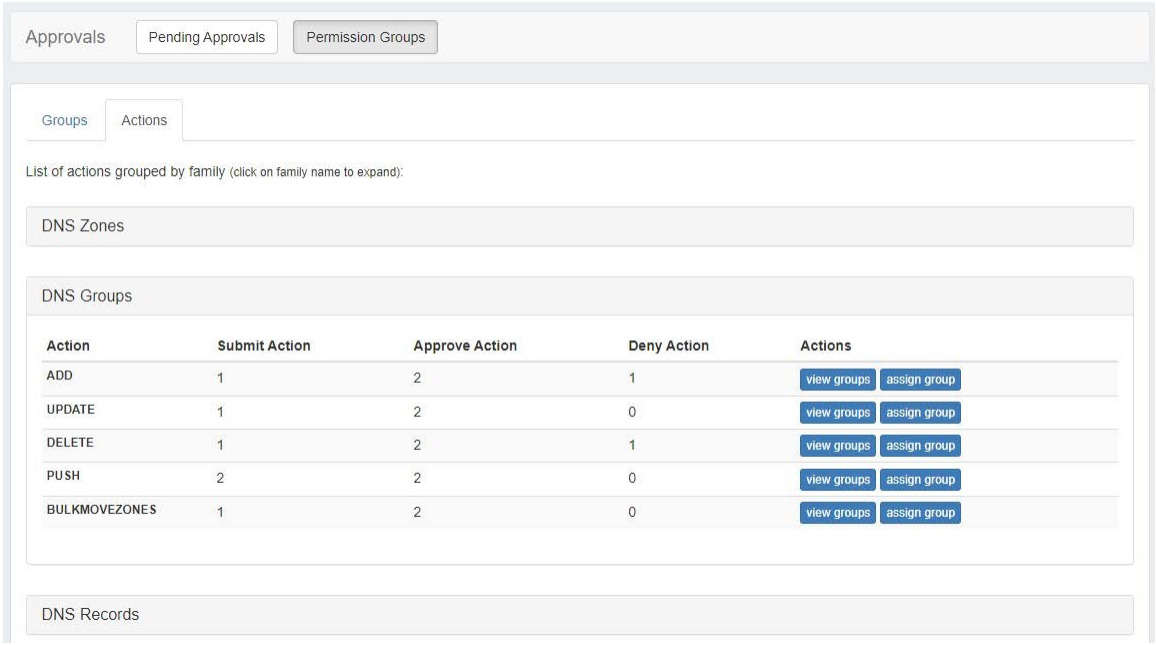
Click on the "Policy" dropdown to select a different policy to apply for the action, or click the "Remove" button to remove the policy assignment completely. Changes will be automatically applied and saved.



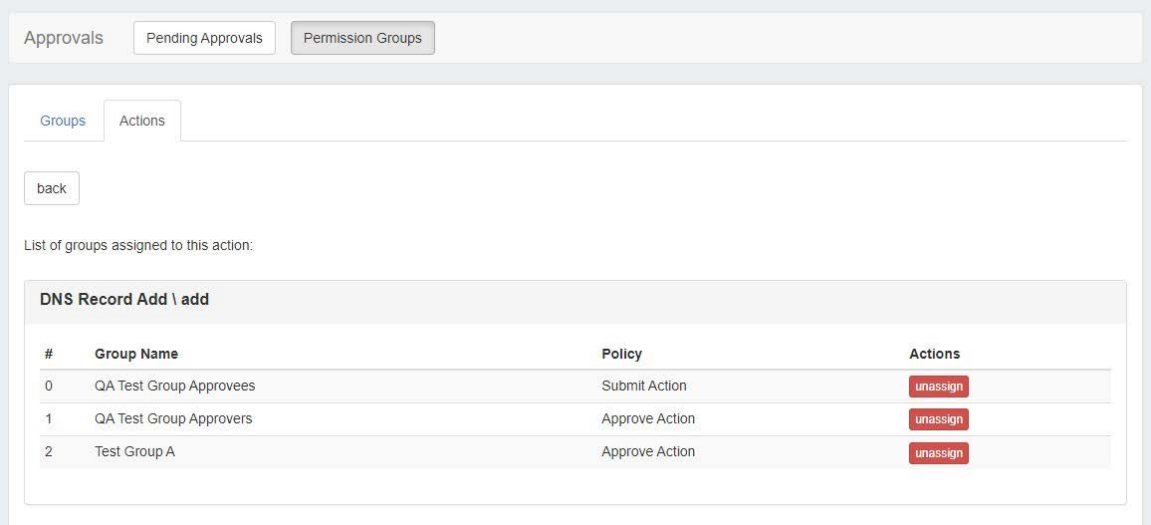
Actions Tab

You may also view or edit current assignments as organized by action, from the **Actions** Tab.

On the Actions page, expand a Family to view the actions under each family, and how many Groups are assigned for each policy.



Click "View Groups" to view the groups assigned for each action. To remove the policy / group assignment for the action, click "Unassign".



Assign a new Permission Group policy

Three policy settings are available to assign to a Group / Action:

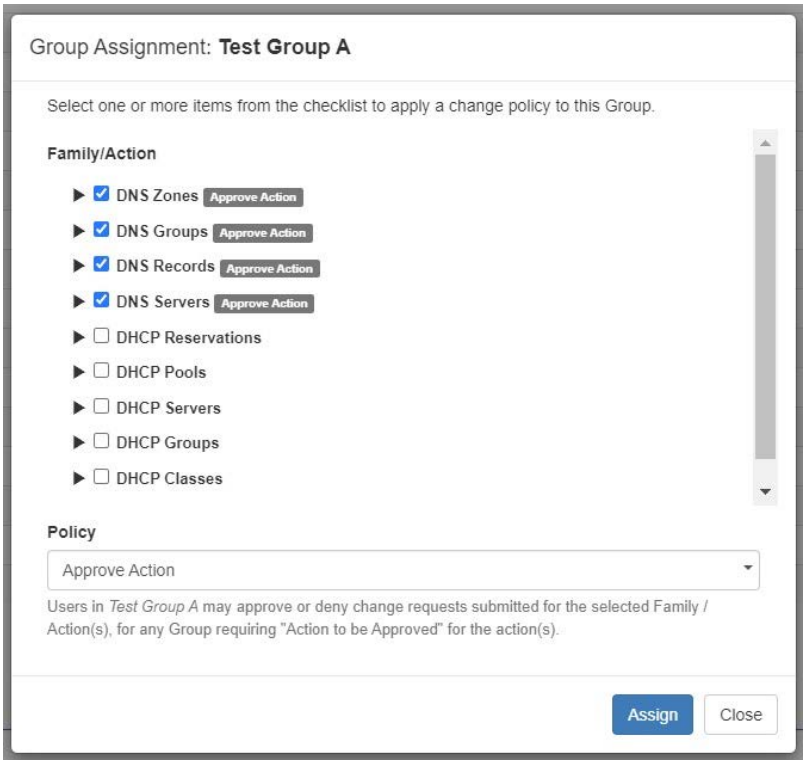
- **Submit Action:** Users in the group will have the selected actions submitted to Pending Approvals for the change to be approved or denied. A second Permission Group must exist with the "Approve Action" policy assigned to the same action for the submittal to succeed.
- **Approve Action:** A User in the group must approve or deny change requests submitted for the selected Family / Action(s), for any Group requiring "Submit Action" for the same action(s) in order for the change to execute. If multiple groups are set as "Approve Action" for the same type of change, then the change will be held as "Pending" or "Pending by Others" until a user from *each group* approves the change request.
- **Deny Action:** All users in the group will have the selected actions automatically denied at an attempted change.

Policies may be applied from either the Approvals **Groups** tab, or the **Action** tab, depending on whether you want to assign policies/actions to a specific group, or assign a group and policy to an action, respectively.

Assign a Policy from the Groups Tab

From Approvals **Permission Groups** Groups tab, Click the "Assign" button.

The Group Assignment checklist opens to select one or more actions to apply a policy to for that Group.



Select the policy to apply, select one or more Family/Actions, and then click "Assign".

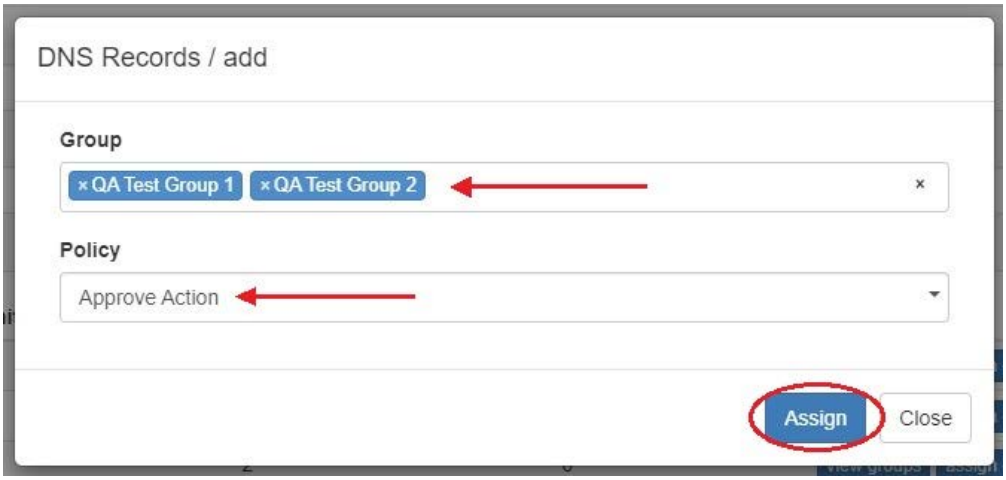
> Click the checkbox next to the family name (e.g. "DNS Servers")to quickly select all actions under that family!

Assign a Policy from the Actions Tab

From the Approvals **Permission Groups** Actions tab, click the "Assign Group" button for the Action you want to assign to a Group / Policy.



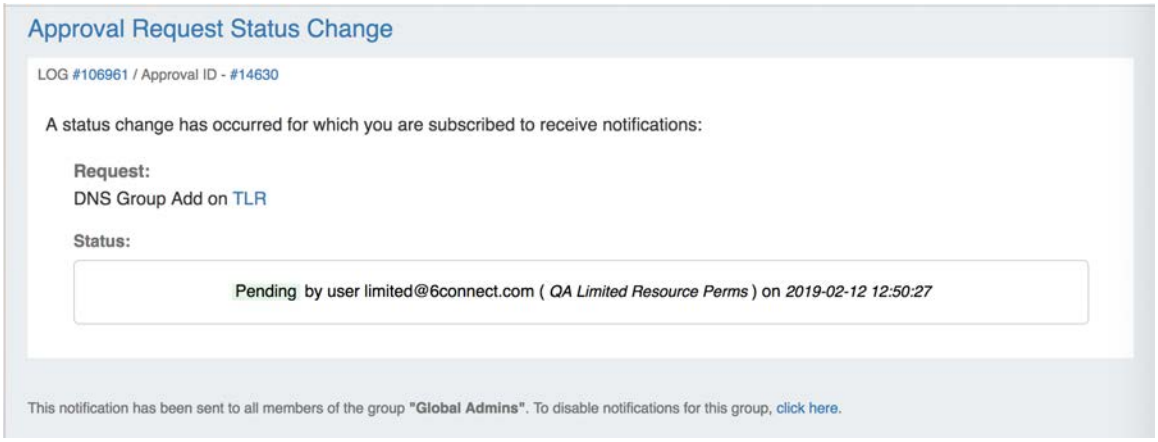
Select the Group(s) that you wish to assign, and select the policy to apply to the action. When done, click the "Assign" button to save.



Manage Approval Notifications for Groups

Email notifications of changes in status are an optional feature that may be enabled for a Permission Group for the desired action types.

The emails provide the current status, approval ID, links to the log event and change request details, and details on the user, time, and date.



In order to send email status notifications to groups associated with an Approval event:

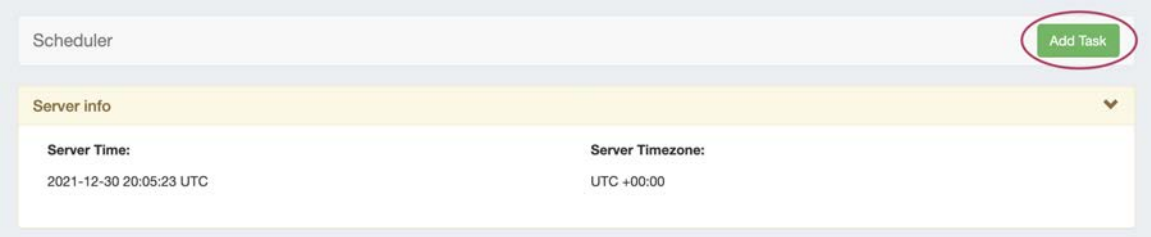
1. A scheduler task ("Approvals - Process Subscription") must be created and running to process the notification and send the email
2. Notifications must be enabled for the Group, for the family-action type of the requested change

Set up the "Approvals - Process Subscription" Scheduler Task

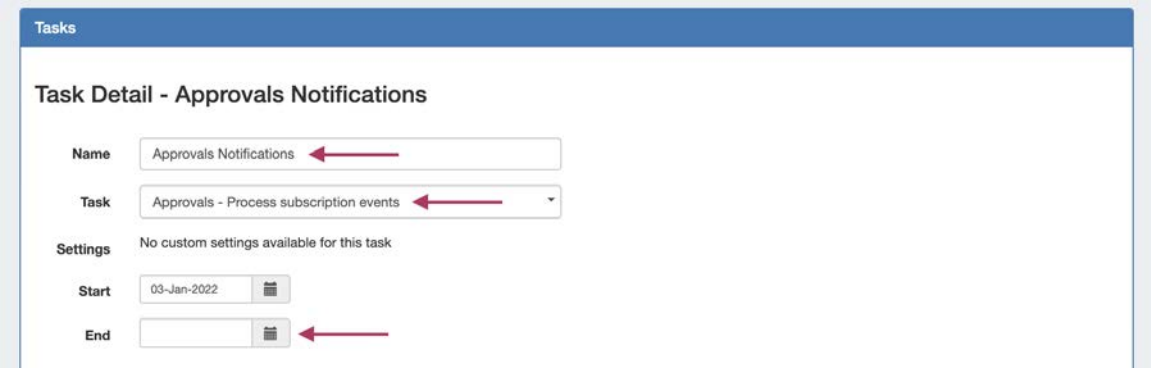
Go to the Scheduler Tab, and verify that the "Approvals - Process Subscription" task has been created, is enabled, and is running at short, regular intervals appropriate to the needs of the users receiving the emails (recommended to run every 5 minutes).

If the task does not yet exist:

From the Scheduler Tab, click "Add Task"



Enter a Name for the task (including a reference to "Approvals Notifications" is recommended for clarity), select the task as "Approvals - Process Subscription", and enter an End date - or leave blank to run as a 'forever' task.

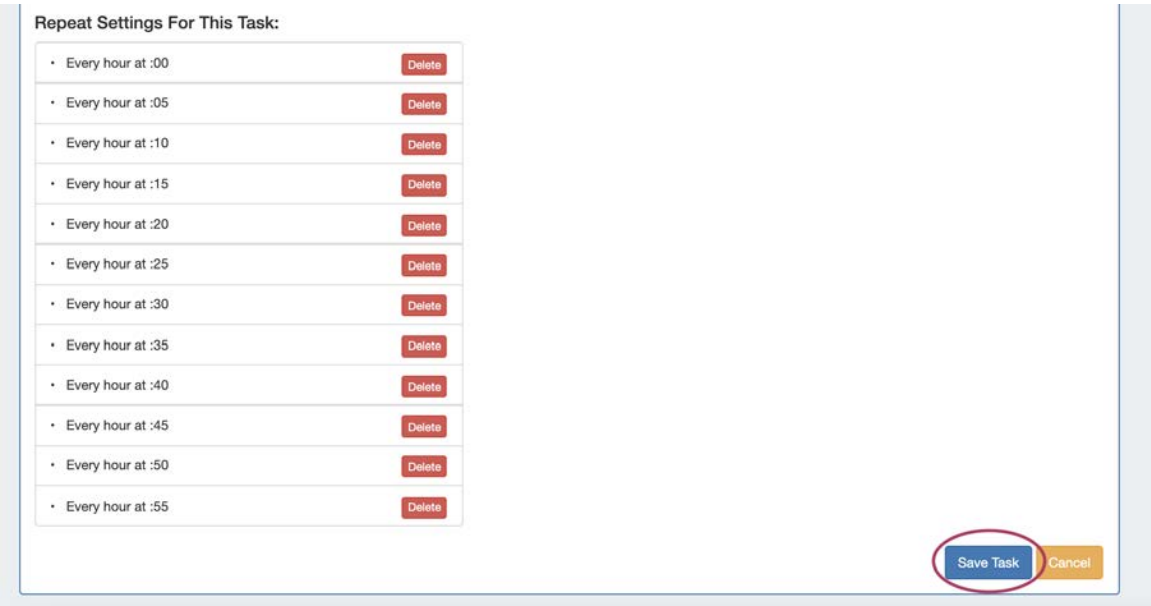


For Repeat Settings, select how often you'd like the scheduler to check for new approvals changes and send the notification emails - every 5 or 10 minutes is recommended.

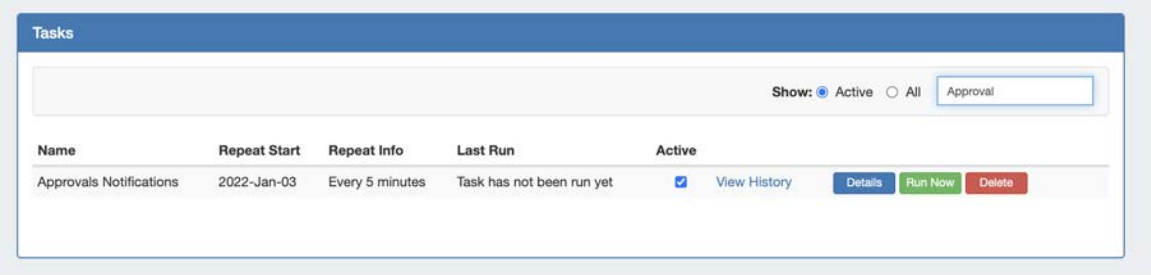


Select your time interval and click "Add". Each instance of the selected time increment will display under "Repeat Settings for this task.

Review the list (deleting individual instances if desired), and click "Save Task" when done.



The Approvals Email Notification task is now set up, active, and ready to process Approvals Event changes.



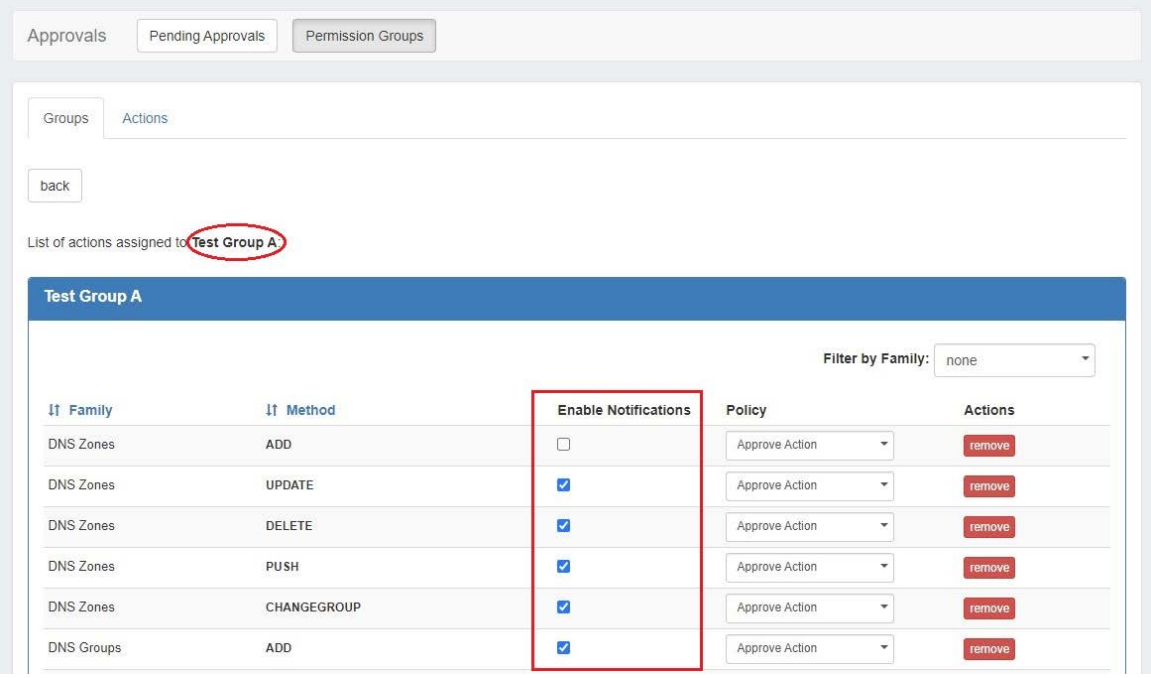
For additional information on working with the Scheduler, see Scheduler Tab documentation.

Enable Notifications

Once the Scheduler task is verified created and active, notifications must be enabled for the desired Groups / Actions for the status changes to be emailed to the appropriate Groups.

From the Approvals **Permission Groups** Groups tab, Click on the Group name that you wish to enable/disable notifications for.

In the Group Details page, click the checkbox under "Enable Notifications" to enable / disable status change notifications for the Group for the selected Family/Action types.



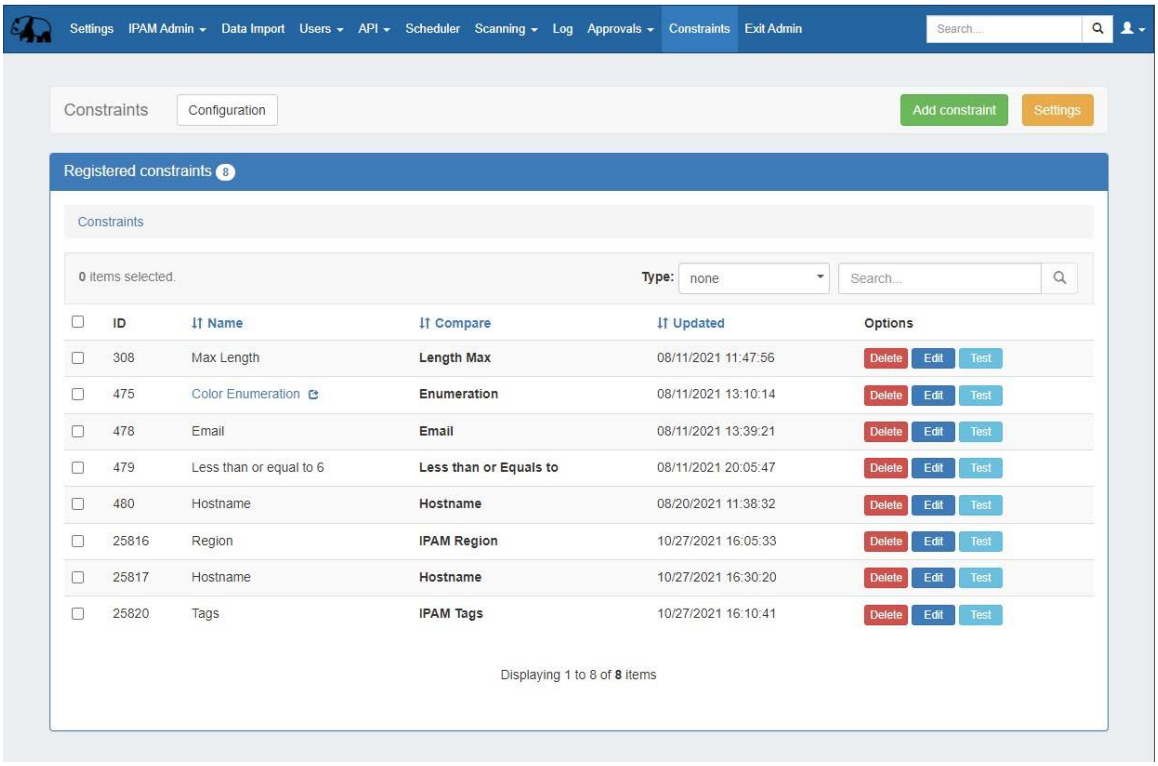
Additional Information

See the following areas for more information on Approvals and using Approvals with DNS and DHCP:

- DNS Tab
- DHCP Tab
- Approvals
- Pending Approvals
- Scheduler Tab

Constraints

Constraints



The Constraints system allows Admin users to configure custom field validation and limitations into IPAM fields. Many constraint types are available, such as mathematical comparison operators, length, enumeration, pre-set lists, RegEx, IPv4/IPv6, Phone, email, hostname, FQDN, Mac Address, and URL.

The Constraints Tab has one sub-tab - **Configuration** - where new constraints may be created and managed.

> Currently, **Constraints** is available only for IPAM related actions, while we gather feedback and use cases to inform possible future updates. If you are interested in providing feedback, a use case, or requests for future additions to the Constraints system, please contact feedback@6connect.com.

- Constraints Tab - Overview
- Available Constraint Types
- Add a Constraint
- Test Constraint
- Edit Constraint
- Delete Constraint
- Working with Constraints in IPAM Manage
- Constraint Permissions
- Example: Adding an Enumeration / Constraint Containing Children
    - Create the Parent Constraint
    - Open the Parent Constraint
    - Add Child Items
    - Using the Enumeration
- Additional Information

Constraints Tab - Overview

The Constraints Tab, available to Admin users, allows for custom field validation and field restrictions to be applied to IPAM fields. The applied constraint may be anything from a numerical comparison operation, a check against a pre-determined text string, ensuring selections from a pre-set list, or forcing entries into a specific format, such as IPv4/IPv6, phone number, or RegEx.

These constraints can be applied to the following IPAM fields:

- ASN
- Custom Generic Field
- Notes
- Metadata 1-10, if enabled for the instance

Depending on the type of constraint applied, the constraint may be a simple single-value comparison needing only one constraint to be created, such as "Equals to" or "Length Max". Some other constraint types, however, may have two or more levels deep of constraint types and value checks. One example of this is "Enumeration", which requires the user to first set up an "Enumeration" constraint, and then a second level list of sub-constraint types or a list of values. For a detailed constraint tree, it may be worth

Available Constraint Types

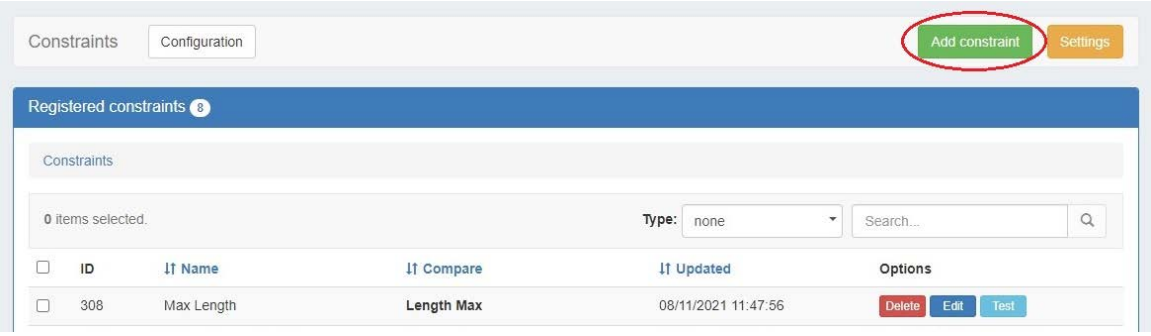
The following constraint types are currently available:

Type	Description
Enumeration	Create a list of child enum items. Note: Set binding / control type for parent constraint (enumeration) only, do not provide for child items. Children type: Valid child enum types are: =, !=, , , =, =, regex, allow, oneof, allof, ip, ipv4, ipv6, email, url, hostname, fqdn, mac, phone, lenmax, lenmin, section_entry
Section Entry	Creates an enumeration based on all entries that belong to a given section.
Resource Type	Creates an enumeration based on a Resource type.
Resource Entry	Creates an enumeration based on all resource entries.
IPAM Region	Creates an enumeration based on all IPAM Regions.
IPAM Tags	Creates an enumeration based on all IPAM Tags.
Equals to	Checks to ensure a value is exactly equal to a provided value, e.g. (X == Y) is true
Not Equal to	Checks to ensure a value is not equal to a provided value, e.g. (X != Y) is true
Greater Than	Checks if the input value (left operand) is greater than a given value (right operand). e.g. (X Y) is true
Less Than	Checks if the input value (left operand) is less than a given value (right operand). e.g. (X Y) is true
Greater Than or Equal to	Checks if the input value (left operand) is greater than or equals to a given value (right operand). e.g. (X = Y) is true
Less Than or Equal to	Checks if the input value (left operand) is less than or equals to a given value (right operand). e.g. (X = Y) is true
One of	Create a list of child constraint items. It will be true if one of child constraints is true. Its children must be previously configured. Note: Set binding / control type for parent constraint (enumeration) only, do not provide for child items.
All of	Create a list of child constraint items. It will be true if all of the child constraints are true. Its children must be previously configured. Note: Set binding / control type for parent constraint (enumeration) only, do not provide for child items.
Length Max	Checks to ensure a string has, at most, the specified number of characters

Length Min	Checks to ensure a string has, at minimum, the specified number of characters
Regular Expression	Compares the input format to a provided Regular Expression
IPv4	Sets the required format for the input to an IPv4 address
IPv6	Sets the required format for the input to an IPv6 address
Email	Sets the required format for the input to an email address (uses an "@" symbol)
Hostname	Sets the required format for the input to a hostname. Hostnames may not have underscore or dash characters.
FQDN	Sets the required format for the input to a FQDN
MAC Address	Sets the required format for the input to a MAC address
URL	Sets the required format for the input to a url
Phone Number	Sets the required format for the input to a phone number

Add a Constraint

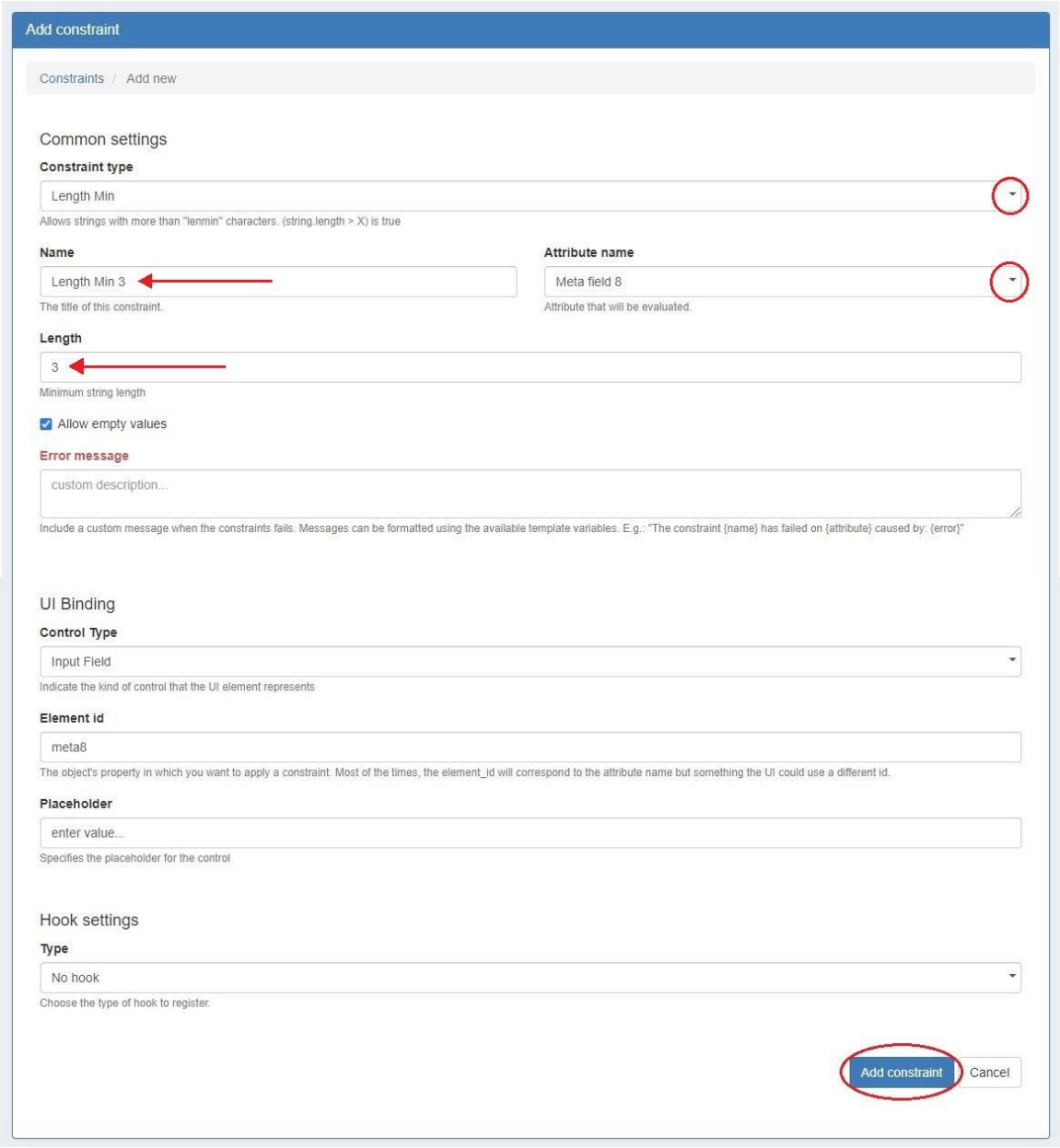
To add a new Constraint, click "Add Constraint" at the top right of the page.



In the "Add Constraint" screen, select (at minimum, depending on the selected constraint type):

- The constraint type (here, "Length Min")
- The name for the constraint
- The attribute (IPAM Field) on which to apply the constraint
- Constraint specific comparison values, here as "Length"
- Select whether to allow empty values in the attribute field

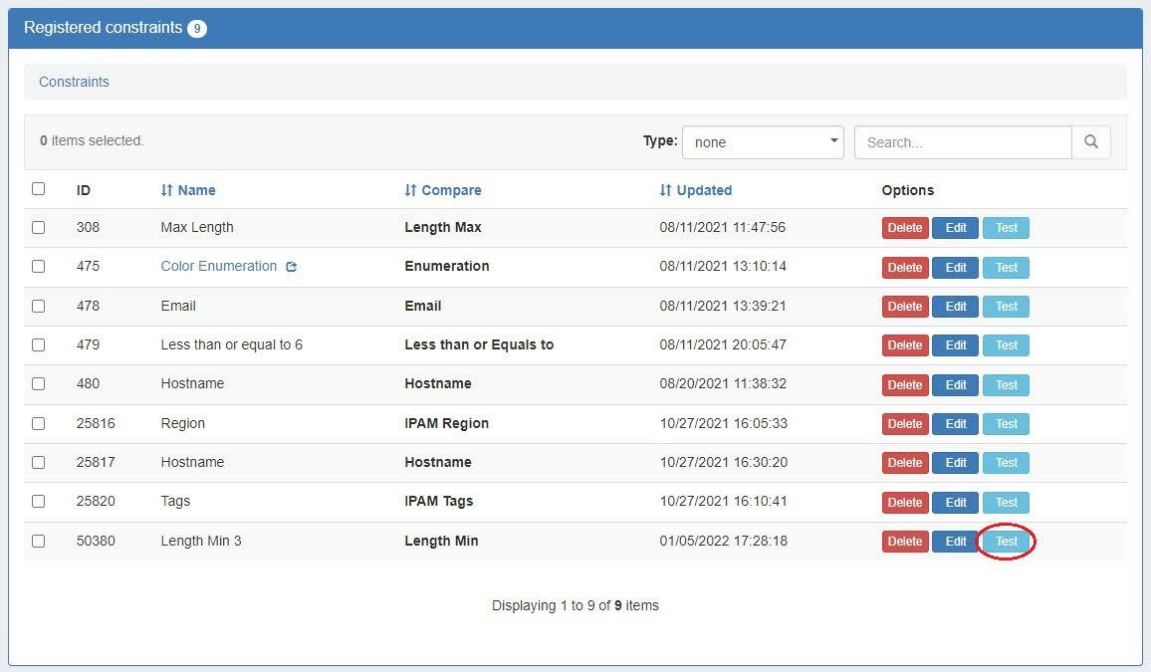
If desired, you may enter a custom error message, customize the UI binding (although it it automatically filled in if you select a standard IPAM Attribute), or add an event hook setting.



When done, click "Add Constraint" to save.

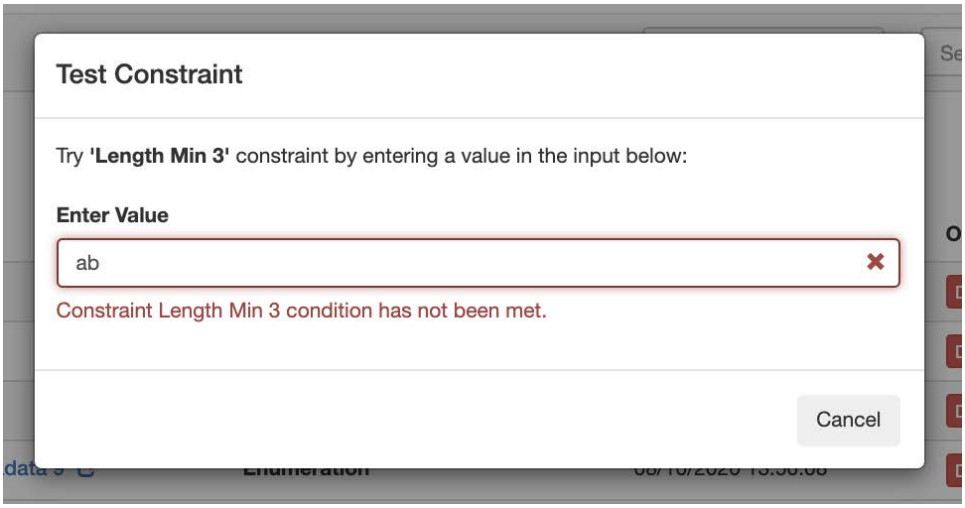
Test Constraint

To test a Constraint, click "Test".

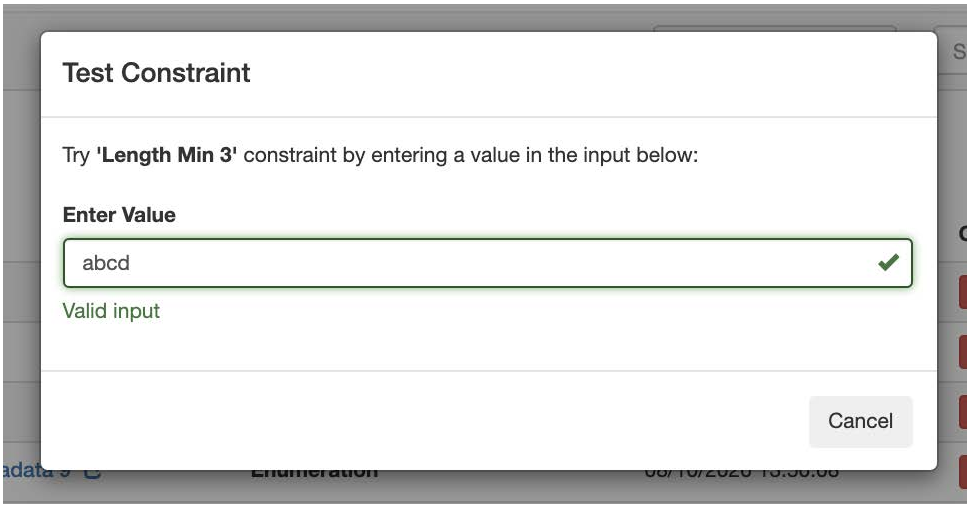


The test constraint form will appear - enter a test value, and you can check whether the constraint returns an appropriate invalid or valid response:

Invalid result, for "Length Min 3":

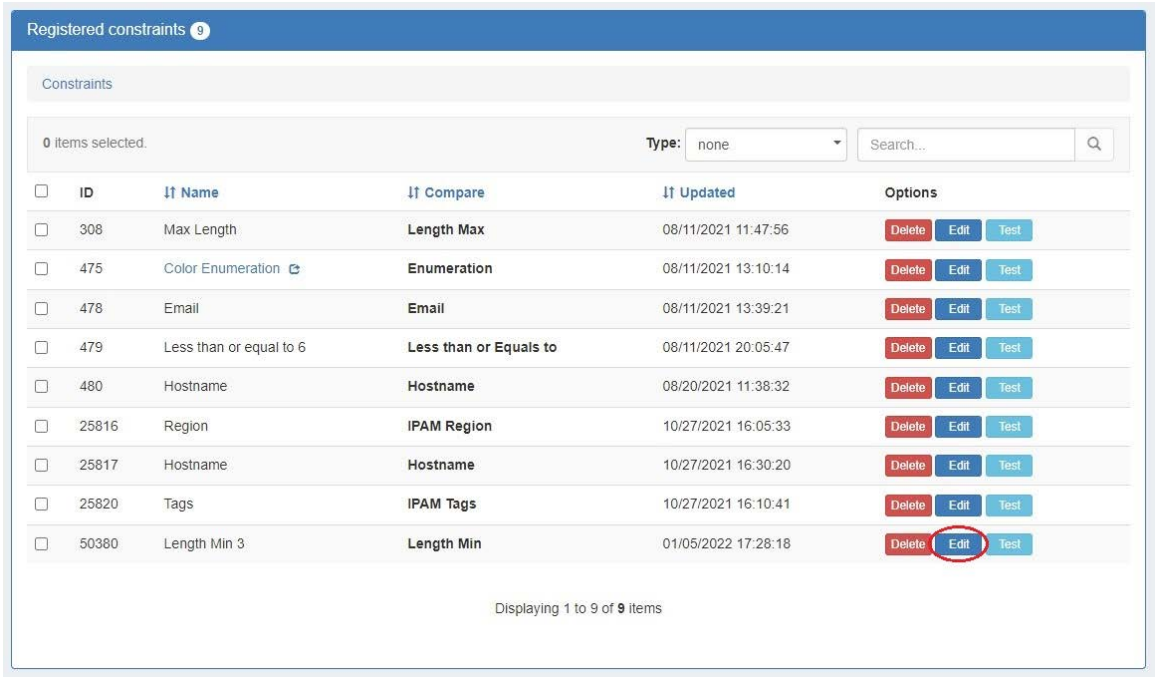


Valid result, for "Length Min 3":



Edit Constraint

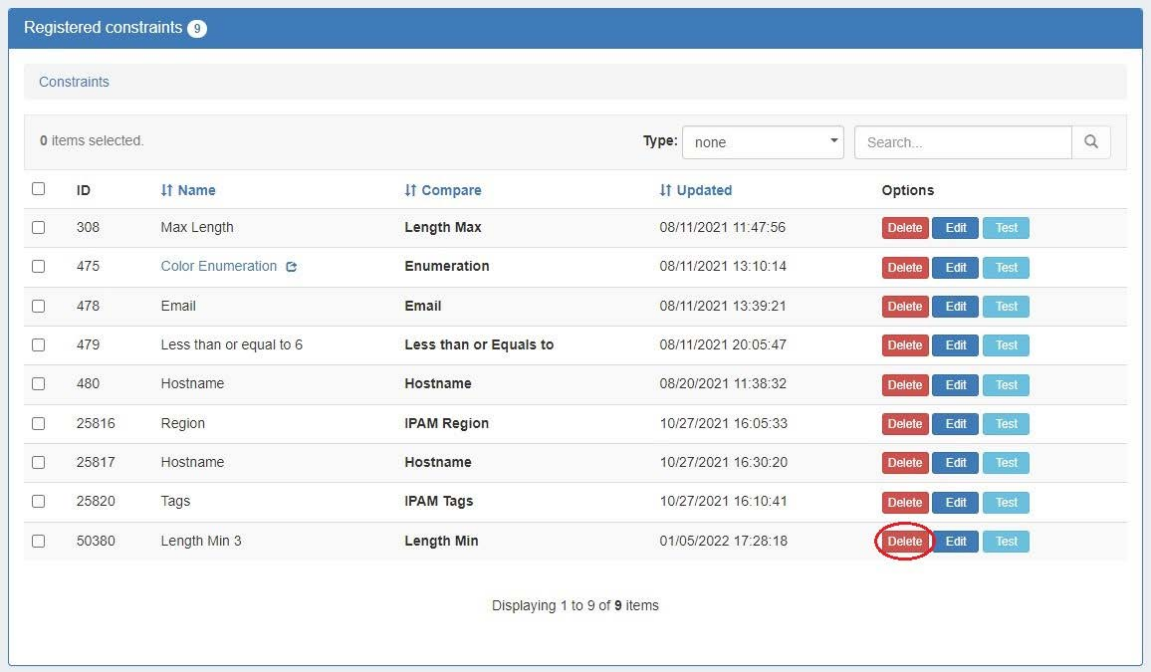
To edit a Constraint, click "Edit". The constraint details will open, matching the "Add Constraint" form.



Adjust values or settings as desired, and then click "Update Constraint".

Delete Constraint

To delete a Constraint, click "Delete".

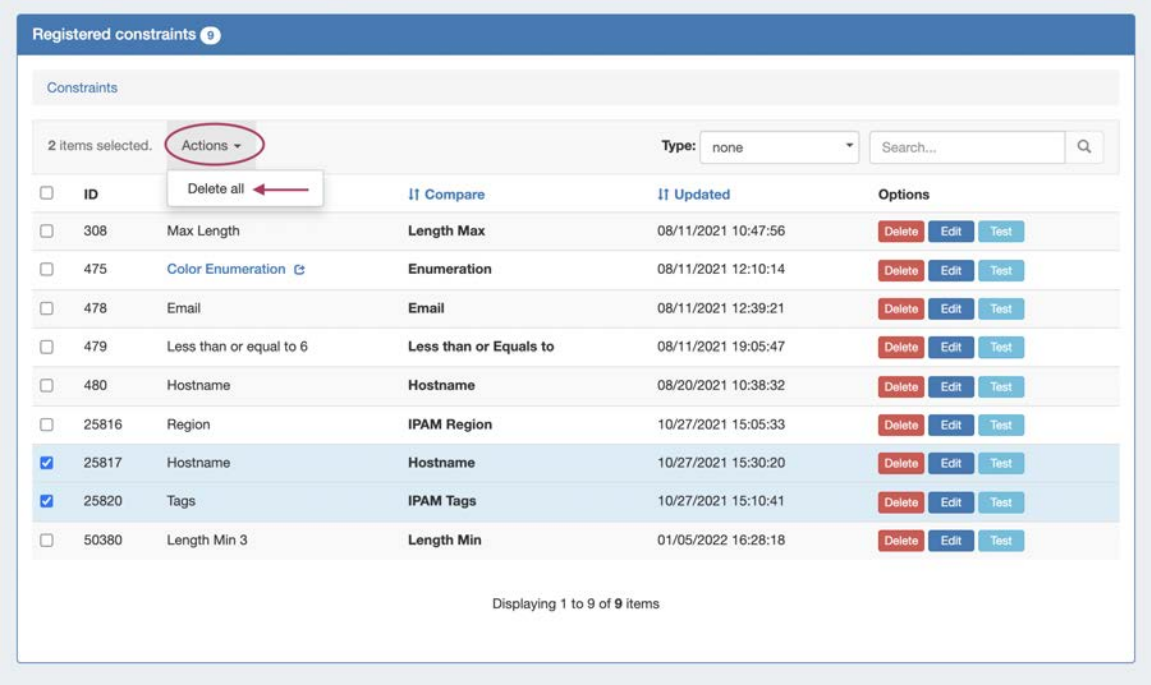


A Confirmation box will appear - confirm whether to delete the constraint, or click "Close" to exit without deletion.



You may also select more than one constraint to delete.

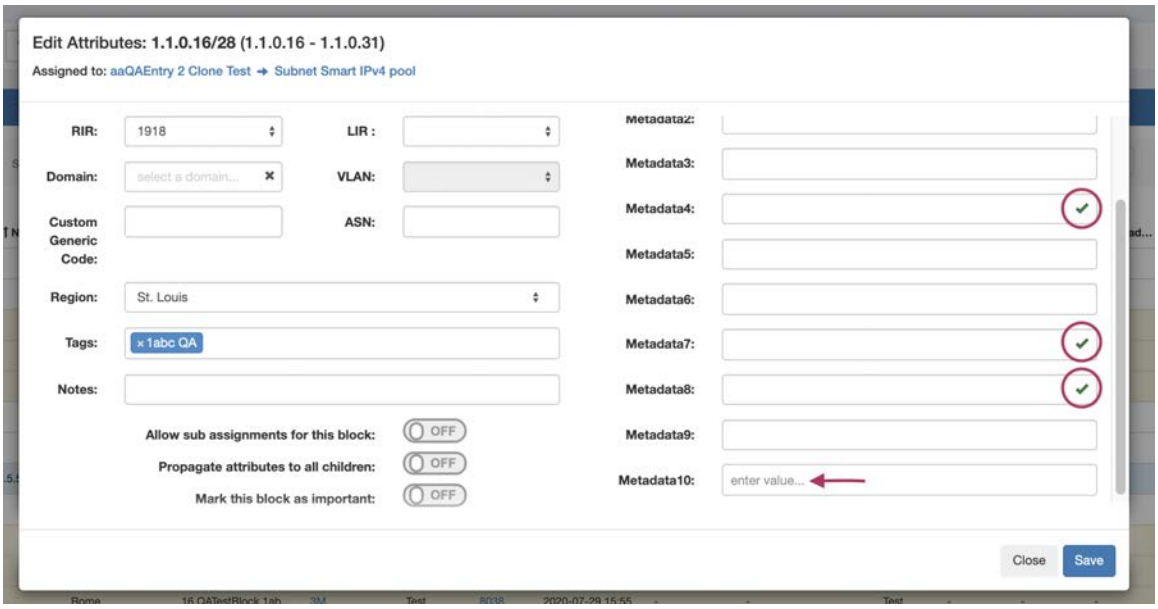
To do so, select the checkboxes for the desired constraints, then under the "Actions" menu at the top of the list, select "Delete All".



Working with Constraints in IPAM Manage

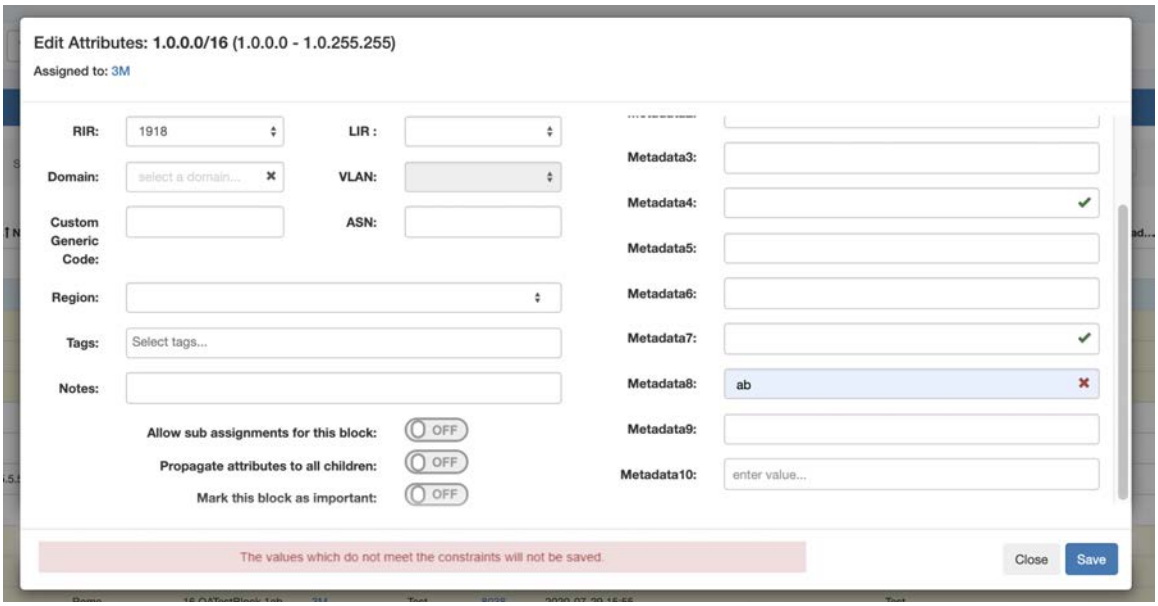
When a field is viewed in IPAM Manage that has a constraint applied, a "check" icon will display next to the field input for simple input constraint checks, if empty values are allowed.

If the constraint is of a type that has been set up with a dropdown box, then the dropdown box and placeholder text will be applied:

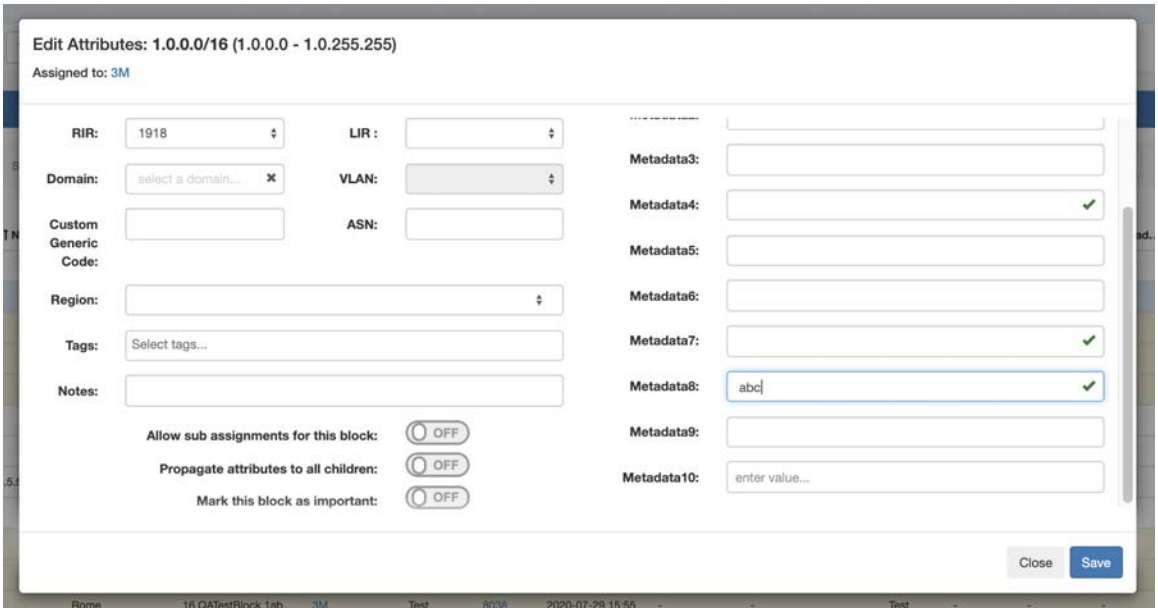


In this example, constraint validation checks have been applied to Metadata4, Metadata7, and Metadata8, with a dropdown "One Of" constraint applied to Metadata 10.

Metadata8 has been associated with our previous constraint example, "Length Min 3", so if we enter less than three characters into that field, we should get an error, and see the "X" for the input not meeting the constraint settings:

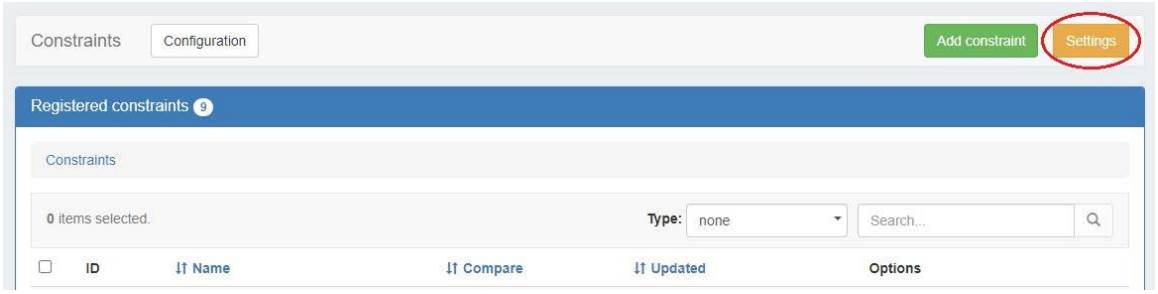


On the other hand, a valid input will return to displaying the "valid" success checkmark:

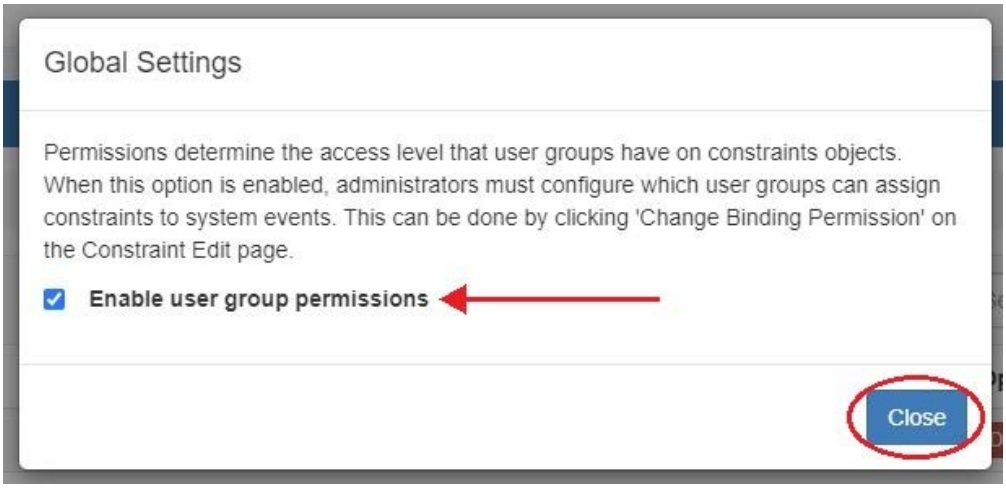


Constraint Permissions

Admins can limit which users are bound by certain constraints by clicking "Settings" at upper right.



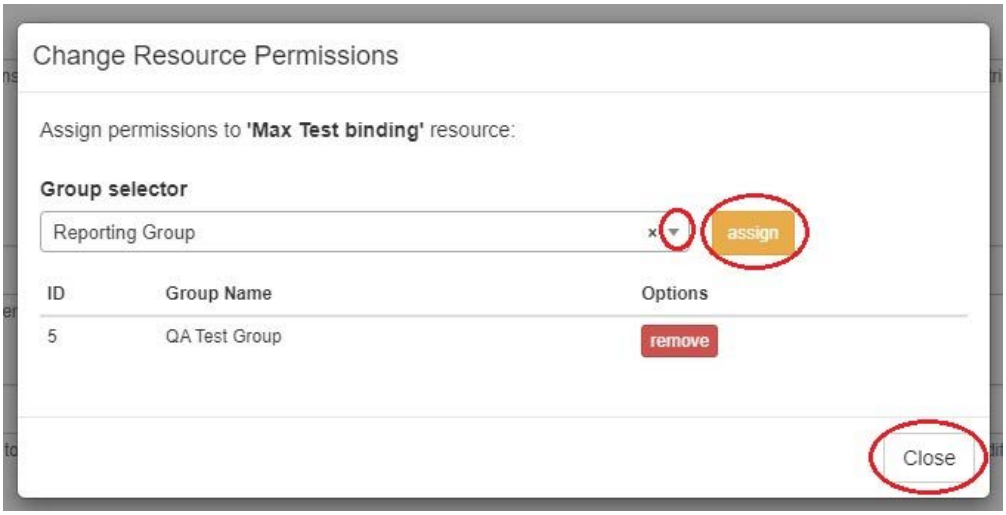
From there, select "Enable user group permissions" to limit constraint visibility by User Permission Group.



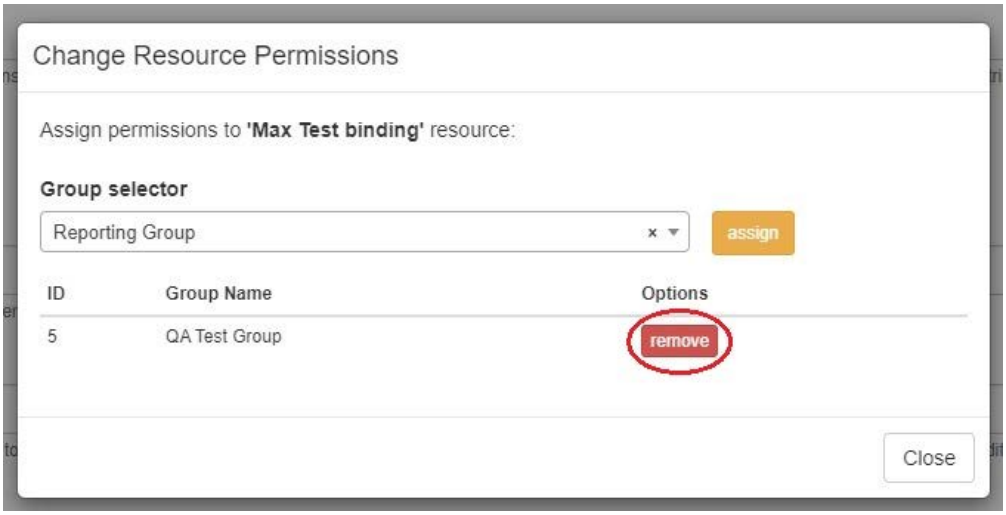
Once permissions are enabled a new option will appear when adding and editing a constraint, "Change Binding Permissions".



Selecting "Change Binding Permissions" opens the "Change Permissions" dialog box where you can select a group(s) to assign the constraint to. The groups assigned to a constraint are listed below the group selector.



To remove a group, just click the "remove" button next to the group name.



For more information on working with Permission Groups see Permission Groups and Working with Groups.

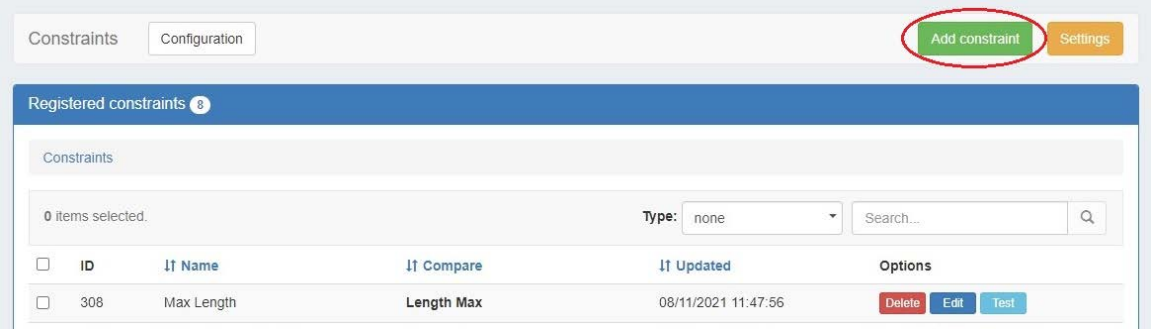
> Enabling user group permissions applies to all constraints, including those already existing. If no group is assigned to a constraint, it will not be visible in IPAM Manage to any users.

Example: Adding an Enumeration / Constraint Containing Children

This example shows how to add a two-level constraint, such as Enumeration, All of, or One of - all of which are set up having a "parent" constraint at the top level list, and "child" items or constraints on a sub-level. Here, we will be using Enumeration as the example constraint, although All of and One of may be created similarly - just using the "add constraint" button to create children instead of the "add item" button.

Create the Parent Constraint

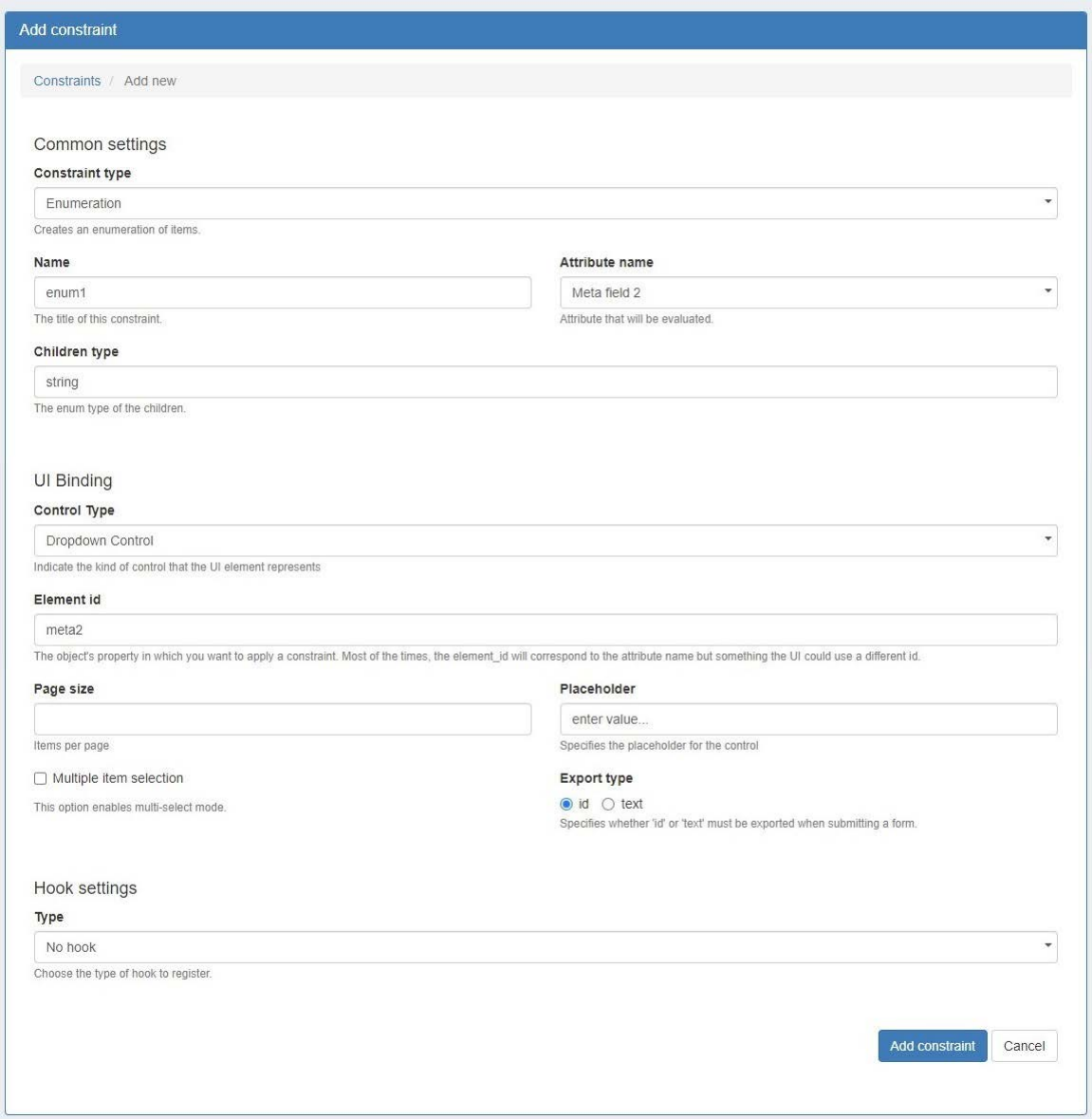
From the Constraints "Configuration" page, click "Add Constraint".



Select "Enumeration" for the constraint type, and enter a name, attribute binding, and select the Control type - here, we will be using a dropdown control.

> For Parent/Child constraint types, you only need to enter the attribute binding and control type for the parent constraint, and do not need to enter these settings for the child items - those settings are inherited by the child items you will create later.

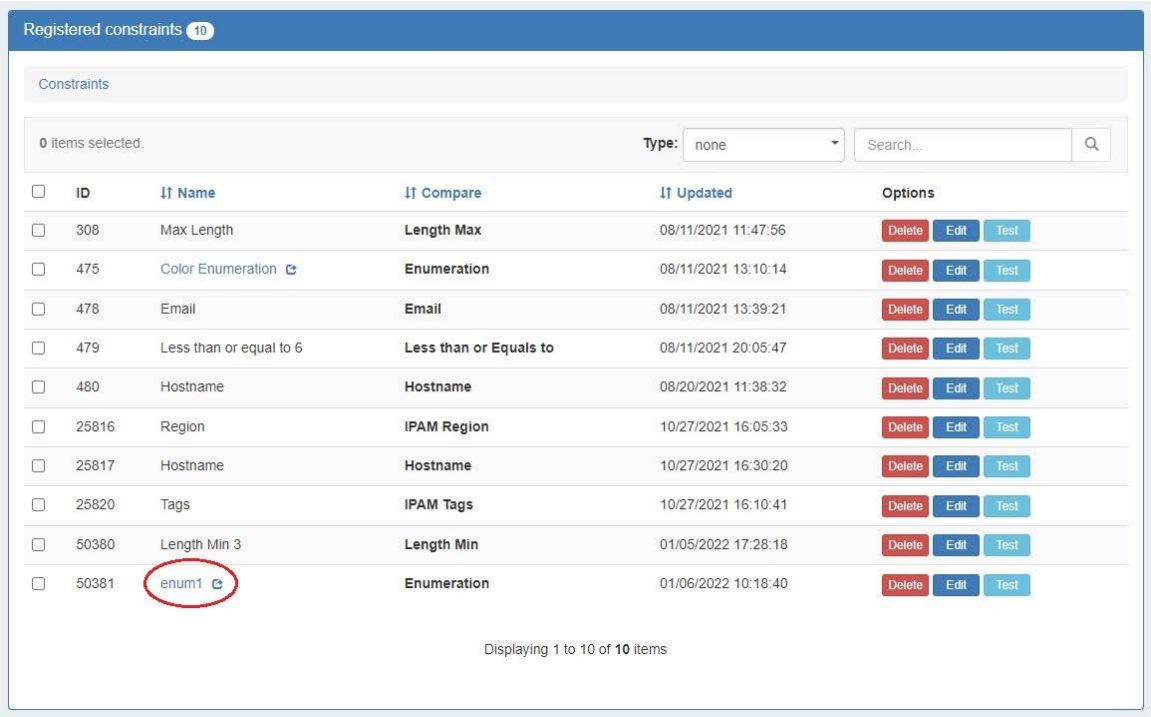
All other fields are optional, and may be skipped if desired.



When done, Click "Add Constraint". You will see the new constraint added to the Constraints List.

Open the Parent Constraint

Constraints that have parent/child relations show as a blue link in the constraint list. Click on the constraint name to open the parent constraint to view or add child settings.

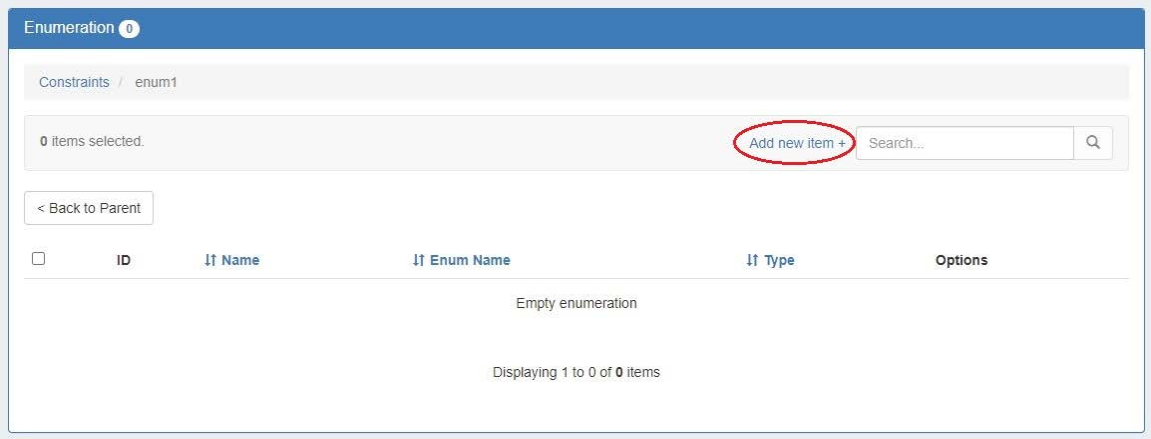


Add Child Items

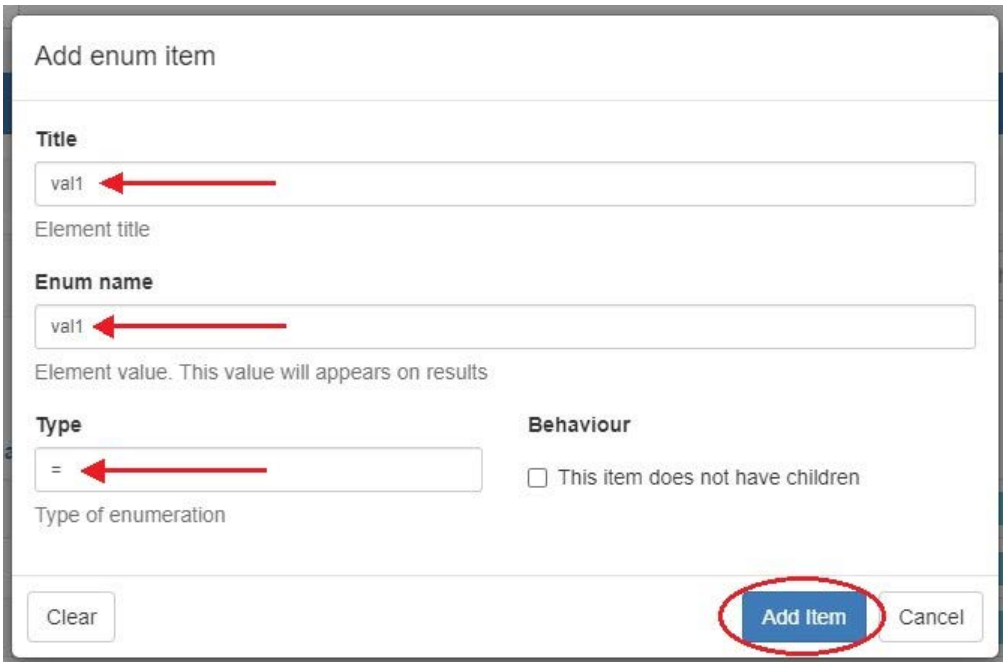
Once you have opened the parent constraint, here: Enumeration, you can add the child values that you wish to have listed as valid options.

For Enumeration, click "Add New Item", If using All of or One of types, then you will need to click "Add Constraint" to add child constraint items.

> For Parent/Child constraint types such as "All of" and "One of", you only need to enter the attribute binding and control type for the parent constraint, and do not need to enter these settings for the child items.

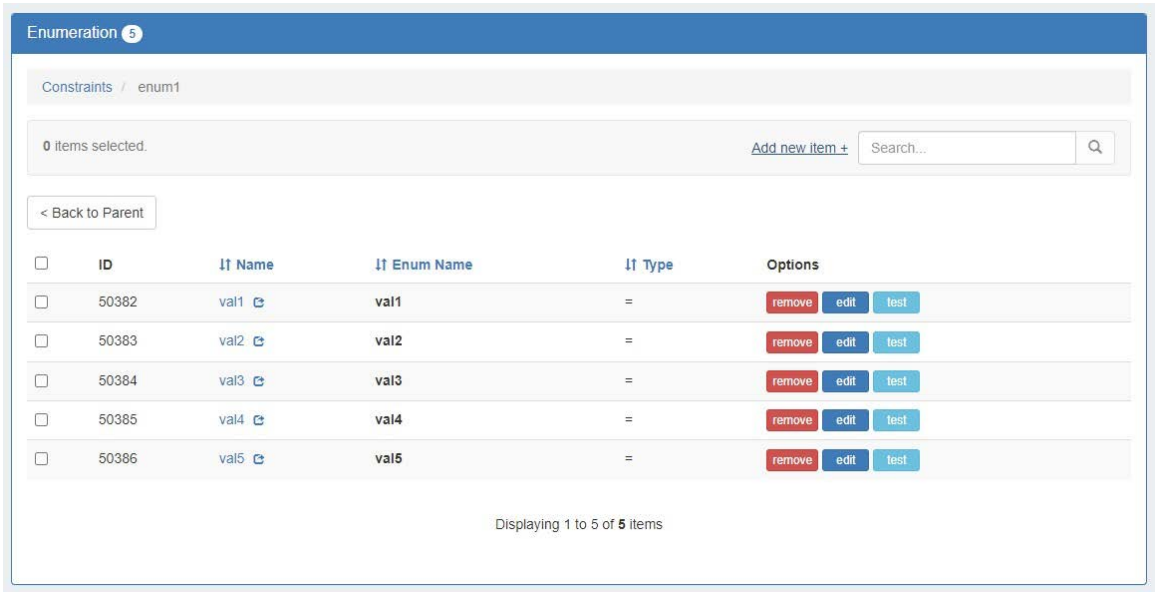


Add a new child enum item by entering a title, name/value, and the type. Typically, the type will be "=", for "equals this value".



When done, click "Add Item", and repeat for any additional values that you wish to make available in your enumeration dropdown.

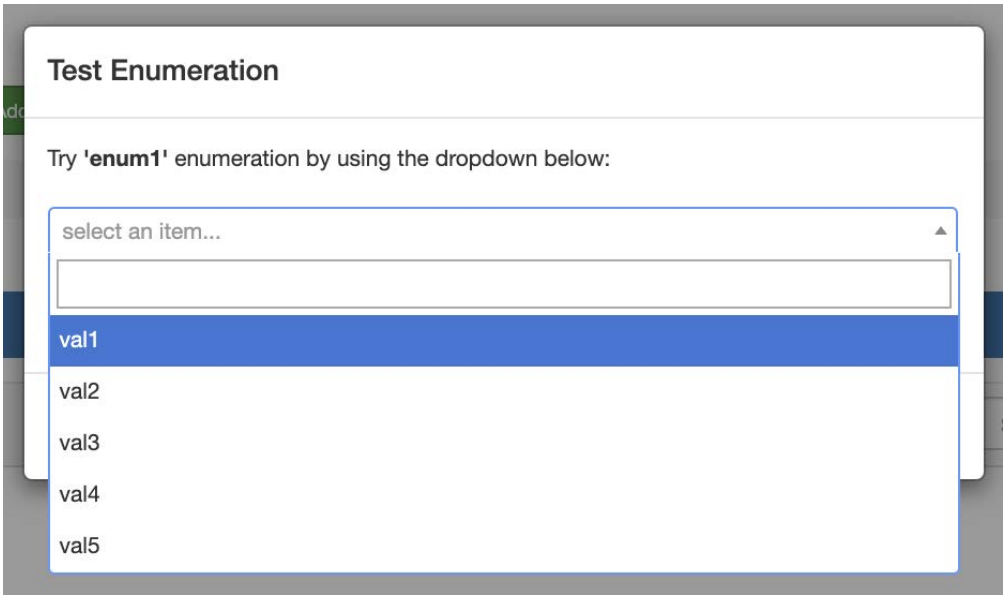
Here, we have added additional enum items to cover "val1" through "val 5".



From here, navigate back up to the parent constraint list that displays "enum1", and click "Test" (test will not work on individual child constraint items)

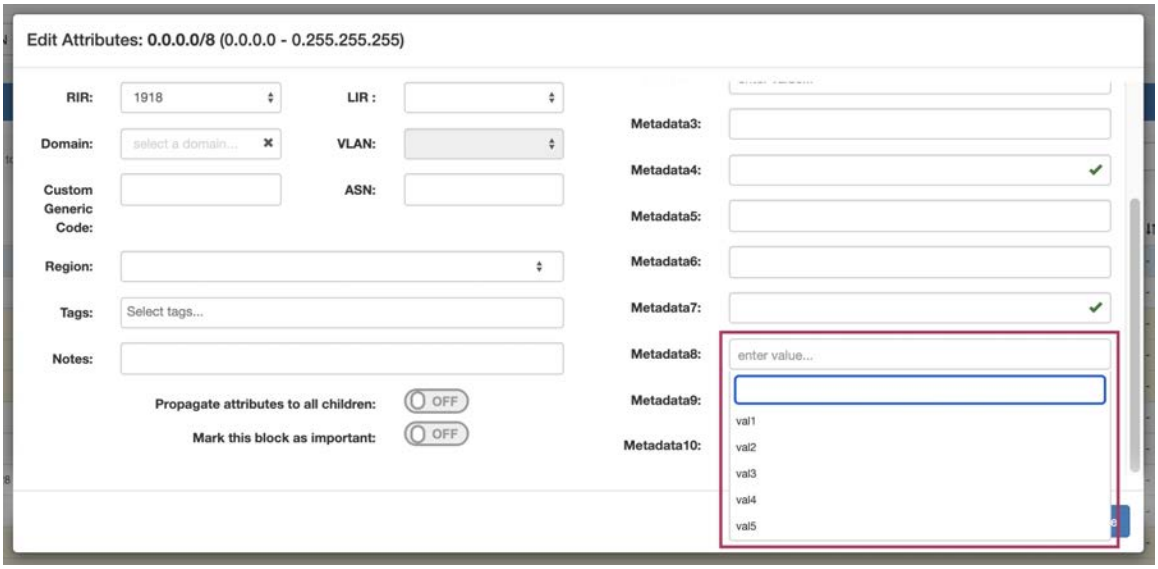


A display dropdown box will appear, click inside of it to confirm your child items show as selectable options.



Using the Enumeration

To see the constraint in action in IPAM Manage, navigate to a block and open Edit Block mode. Select the field that you applied the "enum1" element binding to (metadata 8, here), to view/select constraint items from the dropdown



Additional Information

For additional information on working with IPAM Manage or IPAM Blocks, see

- IPAM Tab
- IPAM Administration

Developer Tools

Developer Tools

ProVision can integrate with your existing tools and workflow through use of the API and CLI. The API allows you to access the data and functions of the web tools to run advanced commands in ProVision, and supports a wide variety of update and deletion conditions not available in the UI.

To use the API, you will need a basic understanding of object oriented programming in PHP and the right tools installed on your system.

Table of Contents

- Theming Customization
- API Overview
- API v2
- Portable Gadgets
- Toolkit
- Resource Concepts

Theming Customization

In addition to the standard Light / Dark Mode themes available in ProVision, several methods are available to customize the entire product, allowing for additional company branding and fine control over what areas of the product are visible and what are not.

Theming Customization includes:

- Changing the instance logo and brand name
- Customizing the visible tabs or subtabs instance-wide
- Creation of fully custom themes to match company branding

> Note: Theming customization requires read/write access on the instance's "assets" directory, and experience using vi or another text editor of your choice to edit options.
>
> Creating a custom theme requires strong CSS knowledge, as well as access and write permissions to your instance's "assets" directory

API Overview

The API is a RESTful API to access your data in the ProVision tools. ReST relies on stateless, client-server communication, and APIv2 is implemented using the HTTPS protocol. It is a simple and lightweight alternative to Web Services and can implemented in nearly any language. The API operates similarly to other popular ReST APIs you may have worked with, such as Facebook or Twitter.

To learn more about request formatting, making requests, and the tools available, visit Making API Requests. You can also get the PHP SDK for PHP libraries and sample code.

Here are some important details about our ReST implementation:

- The API only comes with the full IPAM product. If you would like to upgrade to the full version, contact sales@6Connect.com.
- All transactions are over HTTPS (SSL - port 443) only. Any transaction not using SSL will be rejected, and you will have potentially exposed sensitive data.
- All API results are formatted in JSON. XML support is coming soon.
- APIv2 requests use standard HTTP methods such as GET, PUT, POST, PATCH, and DELETE. We suggest using POST if the length of data in the request is over 8KB.
- You can use any language you would like to query the API.

API v2

> **APIv2 Sections**
>
> Public APIv2 documentation is located at https://cloud.6connect.com/APIv2/.

APIv2 documentation includes:

- IPAM API

  Includes actions for LIRs, IP aggregate and block management, VLAN, IP Rules, and SWIP.

- Resource API

  Includes actions for managing the Resource System.
  The resource API provides CRUD endpoints for resources, resource attributes, resource attachments and resource backups.

- Resource View API

  Provides CRUD endpoints for resource views.

- DNS API

  The DNS API allows you to manage DNS Zones, Records, Servers, Groups and ACLS.

- Peering API

  Allows you to manage routers and BGP sessions.

- Contacts API

  Allows you to manage contacts.

- Users API

  Includes actions for users, permissions and actions.

- Usergroups API

  Includes actions for groups, permissions and actions

- Scheduler API

  The API Allows you to easily schedule tasks.

- API Composer Platform

  API Composer Platform (ACP) is an additional module to help automate frequently used combinations of calls.

- SSH API

  Includes actions for SSH credentials and SHH Routes.

APIv2 is ProVision's currently supported RESTful API version. APIv2 adds new endpoints and upgraded functionality over APIv1, through use of HTTPS authentication, additional HTTP methods (GET, PUT, POST, etc.), and JSON payloads.

To test APIv2 queries, you may:

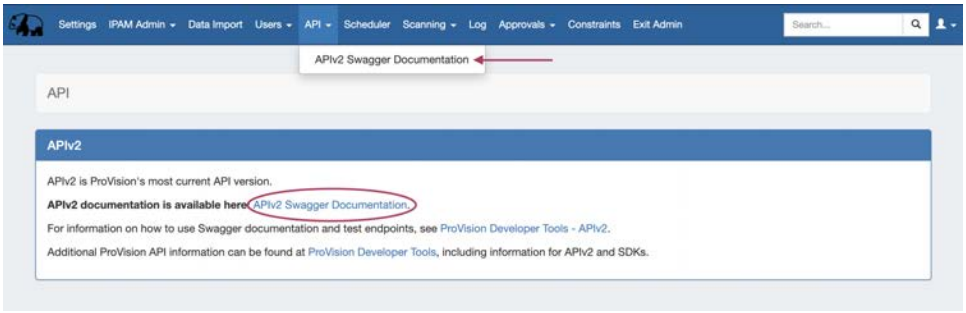
1. Use a browser extension REST client, such as Postman
2. Access ProVision's APIv2 Swagger documentation from your instance (*instance*/dev/swagger), which provides the ability to test inputs and responses using your instance data.
    a. Continue to the section: "APIv2 - Using Swagger" at APIv2 for more details.
3. Use CURL in the command line to authenticate and execute APIv2 endpoints. See cURL documentation at https://curl.haxx.se/.
    a. Continue to the section: "APIv2 - Using cURL" at APIv2 for more details.

APIv2 Swagger Documentation

Public APIv2 documentation is located at https://cloud.6connect.com/APIv2/.

Existing customers may also access APIv2 Documentation from your instance (user must have Admin permissions):

1. Log into your ProVision instance.
2. Go to the Admin area of ProVision and click on the **API** Tab.
3. Under the API dropdown menu, click the Swagger link provided. You may also click on the "APIv2 Swagger Documentation" link provided under the APIv2 section of the page.



Portable Gadgets

Portable Gadgets are drop-in code snippets that use the ProVision API to bring in data to other systems or web pages. Portable Gadgets allow for quick data access and increased integration.

Currently, four Gadgets are available: Global Search, IPAM Search, DHCP Search, and Log. Each Gadget comes in various default option types for display style, number of records return, or behavior. Additional client-side style customizations may be made to further integrate the gadget with company styles.

Toolkit

Additional CLI modules are available for power users in the /tools directory.

Resource Concepts

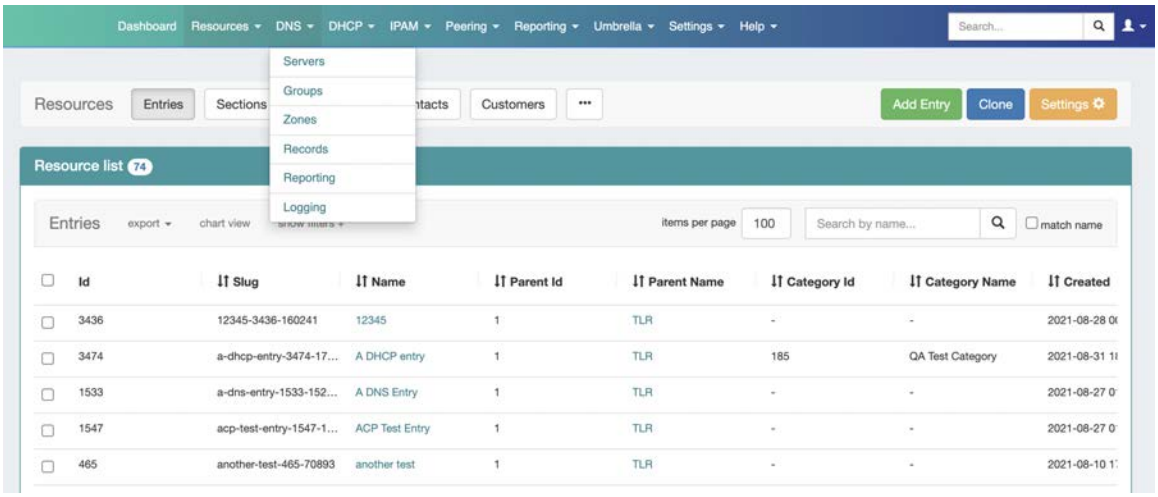
A developer-oriented overview of the Resource System.

Table of Contents

- Theming
- APIv2
- API v1 (Deprecated)
- Portable Gadgets
- Toolkit
- Resource Concepts

Theming

Theming



In addition to the standard Light / Dark Mode themes available in ProVision, several methods are available to customize the entire product, allowing for additional company branding and fine control over what areas of the product are visible and what are not.

Theming Customization includes:

- Changing the instance logo and brand name
- Customizing the visible tabs or subtabs instance-wide
- Creation of fully custom themes to match company branding

> Note: Theming customization requires read/write access on the instance's "assets" directory, and experience using vi or another text editor of your choice to edit options.
>
> Creating a custom theme requires strong CSS knowledge, as well as access and write permissions to your instance's "assets" directory

Table of Contents

- Theming Overview
  - Overview of menu.json
- Navigation Customization
  - Customize the Instance Logo / Name
  - Custom Navigation Menu Visibility
- Theme Customization
  - Changing Themes
  - Create a Custom Theme

Theming Overview

GUI themes can be set on a per-user level, including the much-requested "dark mode" to help alleviate eyestrain.

In addition, we provide several methods of customizing the entire product, which will allow for additional company branding and fine control over what areas of the product are visible and what are not.

Sub-features included under Theming include:

- Customizing the instance logo and name
- Custom Navigation Menu Tab Visibility
- Standard Dark / Light Mode Themes
- Custom Themes

Overview of menu.json

Customization of the images, names, tabs, and subtabs displayed in the navigation bar is handled through the menu.json customization file, located in your instance's "assets" directory, at: "/var/www/html/[instance name]/assets".

Access menu.json by navigating to the assets directory:

```
cd /var/www/html/[instance name]/assets
```



You may open the menu customization file, "menu.json" in vi, or another text editor:

```
sudo vi menu.json
```



When you view menu.json, tabs and their drop down sub-menu options are visible in a hierarchy organized by menu type.

The top level of menu.json contains instance-wide settings for:

- brandName - displayed company name
- brandImage - logo image
- brandUrl - default page at login
- showCurrentReplicaServer- displays a small banner with the server hostname to which ProVision is currently connected

Below the instance wide settings are three top-level menu groupings, each containing their relevant tabs, subtabs, and menu settings.



In order, the three top menu groups are:

- "footer_menu", containing settings for the Settings and Help menus
- "menubar", containing settings for the standard provision navigation tabs and sub-tabs
- "admin_menubar", containing settings for the admin area navigation tabs and sub-tabs

The second level of the hierarchy contains each navigation tab under that group, showing properties for name, visibility, url, and tab children.

The third level, under "children" for a tab, lists the drop-down menu options available for the tab. Each child menu option has the same available properties, and can likewise be edited.

Navigation Customization

Customize the Instance Logo / Name

The instance logo and company name displayed throughout ProVision may be edited to reflect your own company name and logo.

In this example, we will change the topbar logo from the default (topbar-logo.png) to panda.png. You may also follow steps 2 and 3 to change the instance name ("brandName") referenced throughout ProVision.

Note: This action requires access and write permissions to your instance's "assets" directory

Tip - Before You Begin

Have your logo file ready to save into ProVision (png., .jpg, etc) ahead of time, and verify that the logo design is visible at small sizes, 48px or 64px wide.

There are no set size limitations, however ProVision will set the image to 48px wide by default.

This size property can be adjusted in the custom css theme files by searching for the the css property: "--brand-image-width", and adjusting the pixel width accordingly.

Click the walkthrough below for detailed instructions:

Step 1: Save your desired logo into ProVision

Using the Command Line Interface (CLI), save the desired logo image file (here, "panda.png") to your instance's "assets" directory, located at: "/var/www/html/[instance name]/assets"

```
cd /var/www/html/[instance name]/assets
```



Step 2: Open the Menu Customization File

Open the menu customization file, "menu.json" in vi, or another text editor:

Note: Depending on available user permissions "sudo" may or may not be required.

```
sudo vi menu.json
```



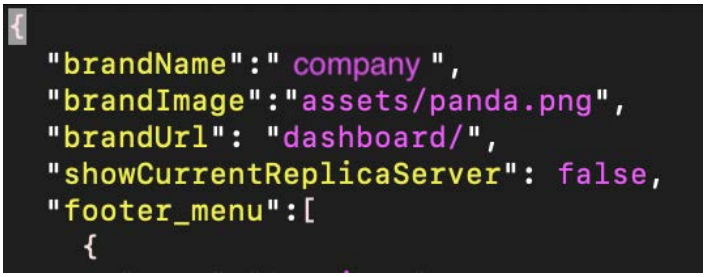
Step 3: Change the brandImage / brandName Reference

At the top of the file, look for the "brandImage" attribute. By default, it should read "assets/topbar-logo.png".



Edit the menu customization file to change the "brandImage" property to the new image name, here "assets/panda.png".

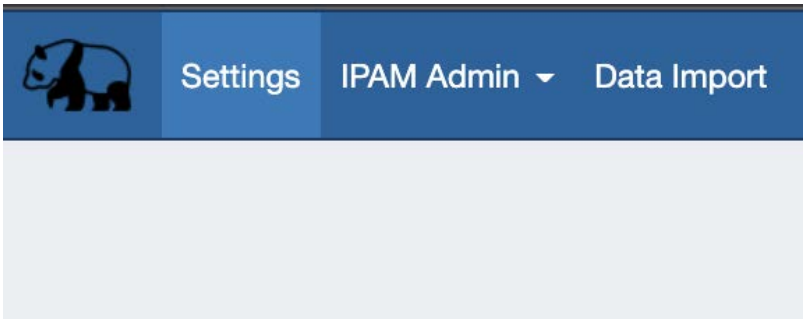
If needed, you may also update the "brandName" property to reflect your company or brand to match the new logo.



Save/write your changes to the file and exit.

Step 4: View the New Logo

Clear your browser cached image files, and log into ProVision. The new logo image should be visible on the left side of the navigation menu.



Custom Navigation Menu Visibility

ProVision instances can be customized to adjust the visibility of menu tabs and sub-tabs, so that unused modules and pages may be hidden.

In this example, we will hide the "IPAM" Tab from ProVision.

Note: This action requires access and write permissions to your instance's "assets" directory

Expand the walkthrough below for detailed instructions on changing the visibility of Navigation menu items:

Step 1: Open the Menu Customization File

Using the Command Line Interface (CLI), navigate to your instance's "assets" directory, located at: "/var/www/html/[instance name]/assets"

```
cd /var/www/html/[instance name]/assets
```



Open the menu customization file, "menu.json" in vi, or another text editor:

Note: Depending on available user permissions "sudo" may or may not be required.

```
sudo vi menu.json
```

```
:/var/www/html/qa-8.0.0/assets$ ls
rd.js  logo.png  menu.json  topbar-logo.png
:/var/www/html/qa-8.0.0/assets$ sudo vi menu.json
```

Step 2: Find the Tab in menu.json

When you view menu.json, tabs and their drop down sub-menu options are visible in a hierarchy organized by menu type.

The top level of menu.json contains instance-wide settings for brandName (displayed company name), brandImage (logo), brandUrl (default page), and "showCurrentReplicaServer" (displays a small banner with the hostname of the server to which ProVision is currently connected).

```
{
  "brandName":" company ",
  "brandImage":"assets/topbar-logo.png",
  "brandUrl": "dashboard/",
  "showCurrentReplicaServer": false,
  "footer_menu":[
    {
      "name":"Settings",
      "visibility": true,
      "url":"#",
      "children":[
        {
          "name":"Admin",
          "scope": "admin",
          "visibility": true,
          "url":"admin/admin.php"
        }
      ]
    },
    {
      "name":"Help",
      "visibility": true,
      "url":"#",
      "children":[
        {
          "name":"Documentation",
          "visibility": true,
          "url":"https://             .com"
        },
        {
          "name":"Contact Support",
          "visibility": true,
          "url":"mailto:                .com"
        }
      ]
    }
  ],
  "menubar": [
    {
      "scope": "dashboard",
      "name":"Dashboard",
      "visibility": true,
      "url":"dashboard/"
    },
    {
      "scope": "resources",
"menu.json" 448L, 10200C
```

In order, the three top menu levels are:

- "footer_menu", containing settings for the Settings and Help menus
- "menubar", containing settings for the standard provision navigation tabs
- "admin_menubar", containing settings for the admin area navigation tabs

Under each menu grouping, on the second level of the hierarchy, is each main menu tab.

Each tab has properties for name, visibility, url, and tab children.

The third level, under "children" for a tab, lists the drop-down menu options available for the tab. Each child menu option has the same available properties, and can likewise be edited.

Since we are wanting to hide the "IPAM" tab in the standard area of ProVision, we need to scroll down to the "menubar" navigation grouping, and then find the second level tab with name "IPAM".

Step 3: Change the Tab Visibility

Once you find the desired tab to hide, enter edit mode, then change the "visibility" property from "true" to "false" (do not include the quotes, and be sure to retain the trailing comma).

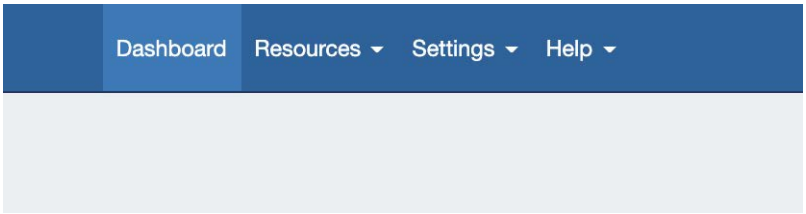


Save/write your changes to the file and exit.

Step 4: View the Updated Navigation

Clear your browser cached image files, and log into ProVision.

The updated navigation should be apparent, in this case with "DNS", "DHCP", "IPAM", "Peering", and "Reporting" tabs no longer visible.

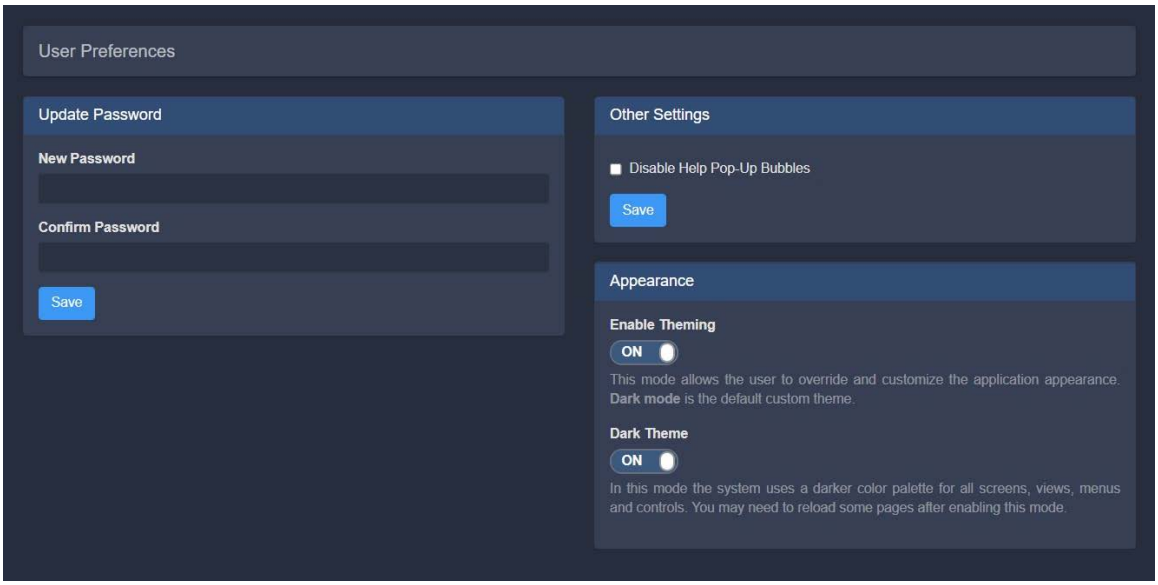


Theme Customization

Two default ui themes are provided with ProVision - Light and Dark mode themes. Additional custom themes may be created and enabled to reflect company branding, if desired.

Themes are enabled on a per-user basis, by adjusting the Appearance settings available on the User Preferences page.

Changing Themes



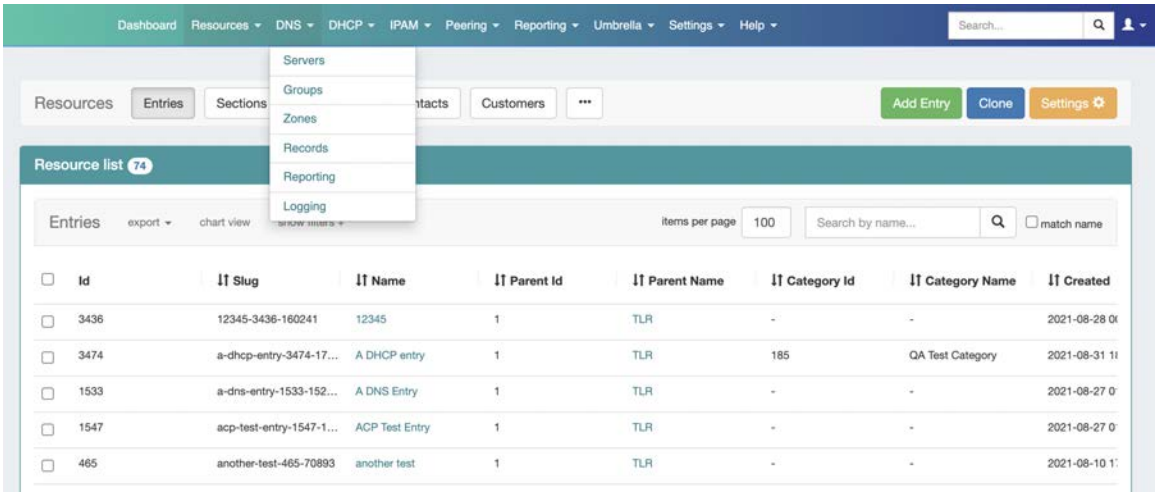
Users may select the desired theme by navigating to the User Preferences page and adjusting the Theming settings under "Appearance" as follows:

- Light Mode Theme (default): Both "Enable Theming" and "Dark Theme" set to the OFF position
    - (Note: if no custom theme file exists, Light mode is also the fallback theme if "Enable Theming" is set to ON and "Dark Theme" is OFF)
- Dark Mode Theme: Both "Enable Theming" and "Dark Theme" toggles set to ON
- Custom Theme: If a custom theme file exists, set "Enable Theming" to ON, and "Dark Theme" to OFF to enable. If no custom theme file exists, this combination will fall back to Light Mode.

Create a Custom Theme

A custom theme file may be used to customize colors, fonts, and sizing to reflect your company's branding.

Note: Creating a custom theme requires strong CSS knowledge, as well as access and write permissions to your instance's "assets" directory



For a detailed walkthrough, expand the instructions below:

Step 0: Before You Begin

To customize the default theme and change how the application looks with CSS, you'll need to add your own stylesheets or edit an existing theme file.

If you edit an existing theme file, we recommend making a copy of the existing file and keeping it as a backup file (.BKP).

The best practice is to manage your customizations in a new css file, using the information provided in the README.txt file under [your instance directory]/assets/css/custom (as seen below).

```
           :/var/www/html/           /assets/css/custom$ ls
custom-theme-full.BKP  custom-theme-simple.BKP  custom-theme-simple.css  README.txt
           :/var/www/html/           /assets/css/custom$
```

The README.txt file provides basic instructions as well as list of all available theming variables that may be used for a custom theme.

```
CSS Theming Variables

By enabling the "Theming" preference, css variables become available for a flexi
ble look & feel customization. This is
useful if a client wants to have their own colors and typography. Provides an ea
sy way of managing the overall look & feel
without writing complicated css selectors.
List of all available theming variables:

/* header */
--header-height
--header-background
--header-font-family
--header-border-color
--header-border-shadow
--header-border-radius
--brandlogo-display
--brand-image-width
--brandname-display
--brandname-text-size
--brandname-text-weight
--brandname-text-color
--brandname-hover-text-color
--brandname-text-padding
```

We recommend reviewing the README.txt file and becoming familiar with the available theme variables and what elements they affect in a small test theme file before finalizing your custom theme.

Step 1: Create a Theme file

In this example, we'll create a simple teal theme using some of these variables, which focuses on color and font changes to the top navigation menu, panels, and dashboard:

```
:root {

    /* header menu */
    --header-height: 45px;
    --header-background: linear-gradient(90deg, #3FC6A8 0%, #2B3B90 100%);
    --header-font-family: Roboto,Helvetica,Arial,sans-serif;
    --header-border-color: #3282ee;
    --header-border-shadow: 0px;
    --header-border-radius: 0px;
    --brandlogo-display: none;
    --brand-image-width: 48px;
    --brandname-display: inline;
    --brandname-text-size: 24px;
    --brandname-text-weight: 400;
    --brandname-text-color: #ffffff;
    --brandname-text-padding: 5px;
    --menu-item-hover-background-color: #52525226;
    --menu-item-text-color: #ffffff;
    --menu-item-text-size: 13px;
    --menu-item-text-weight: 400;
    --menu-item-text-hover-color: #ffffff;
    --dropdown-text-size: 13px;
    --dropdown-text-color: #207c88;
    --dropdown-text-hover-color: #dc2870;
    --dropdown-text-background-color: #f6f6f6;
    --dropdown-text-padding: 6px 15px;
    --option-item-hover-background-color: transparent;


    /* anchors */
    --anchors-color: #207c88;

    /* panels */
    --panels-primary-border-color: #3998a0;
    --panels-primary-heading-background-color: #3998a0;
    --panels-primary-heading-border-color: #3998a0;

    /* dashboard */
    --dashboard-widget-heading-background-color: #3998a0;


}
                                                                1,1
```

Step 2: Save the Theme File(s)

Once you are done, save your custom stylesheet file(s) into the assets/css/custom directory, like this:

assets/

css/

custom/

custom-theme-one.css

custom-theme-two.css

custom-theme-three.css

Make sure that any files used for the intended theme use the .css extension, and any separate theme or backup theme files are changed to the .BKP extension.

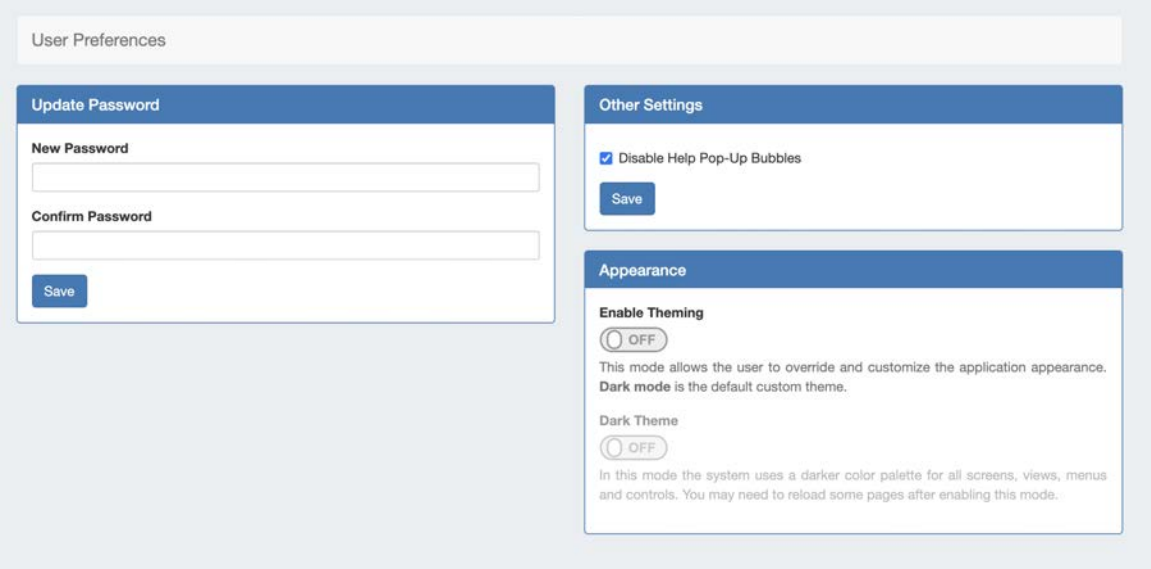
If multiple css files are used for a theme, they will all be applied together as the final custom theme displayed.

In our example, we are using "custom-theme-simple.css" as our new primary theme file:

```
            :/var/www/html/           /assets/css/custom$ ls
custom-theme-full.BKP  custom-theme-simple.BKP  custom-theme-simple.css  README.txt
            :/var/www/html/           /assets/css/custom$
```

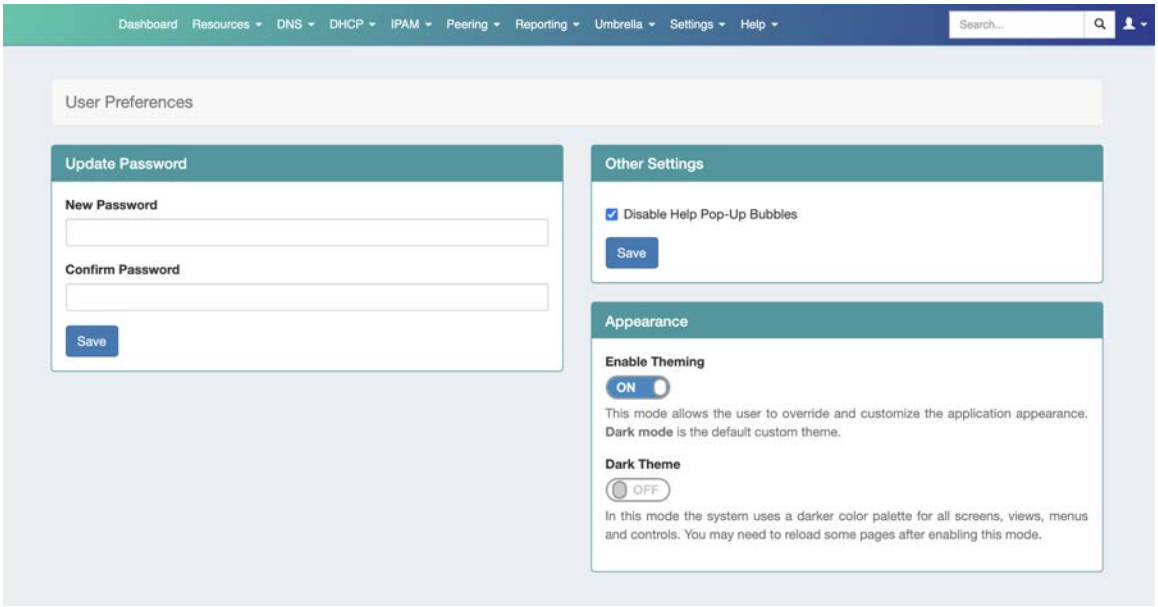
Step 3: Enable the Custom Theme in ProVision

Log into ProVision, and go to the User dropdown -> "User Preferences" "Appearance".



Under "Enable Theming", turn the toggle to the ON position, and verify that "Dark Theme" is turned to OFF (otherwise, Dark Mode theming will overwrite the custom theming files).

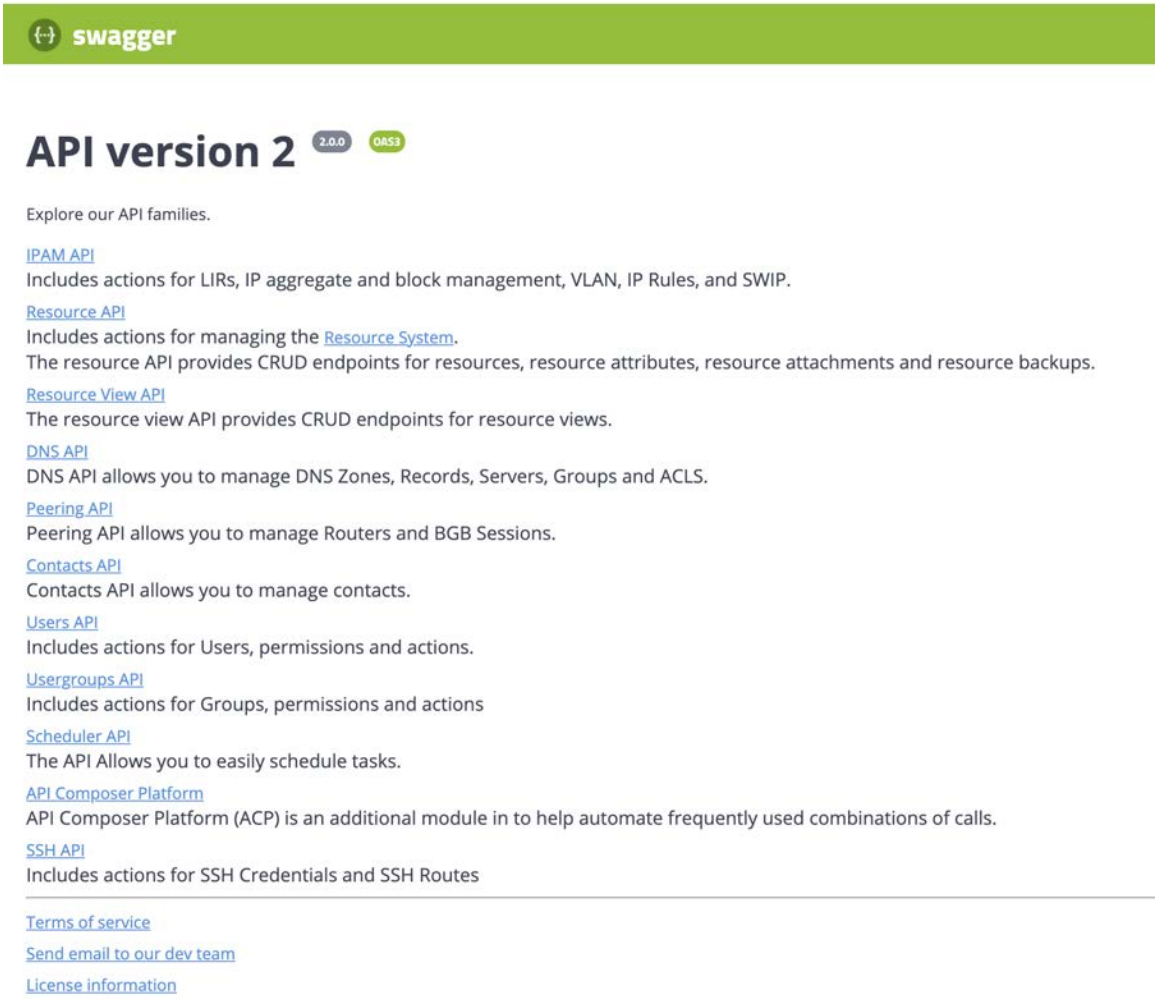
Once you're done, refresh the page and the custom theme should be visible. In some cases, you may need to empty your browser's cached images and files, and "Hard Refresh".



Here, we can see the new theme has changed the color and font of the top navigation menu, menu dropdowns, and panels.

APIv2

APIv2



- APIv2
  - API v2 Overview
  - APIv2 Access Options
  - APIv2 - Using Swagger
    - Accessing Swagger
    - Viewing APIv2 Information
    - Testing/Executing Endpoints in Swagger
  - APIv2 - Nested Queries
  - APIv2 - Using cURL
    - cURL syntax template for APIv2:
    - cURL Examples
  - Additional Information

API v2 Overview

APIv2 is ProVision's currently supported RESTful API version. APIv2 improvements include:

- HTTPS Basic Authentication
- Use of HTTP Methods (GET, PUT, POST, etc.)
- Supports JSON payloads
- Additional endpoints and functionality

APIv2 Access Options

To test or execute APIv2 queries, you may:

1. Use a browser extension / desktop REST client, such as Postman
    a. Postman is the current industry standard: Go to https://www.getpostman.com/ to install, and visit the Postman Learning Center for user documentation, training videos, and support help.
2. Access the APIv2 Swagger documentation from your instance (*instance*/dev/swagger), which provides the ability to test inputs and responses using your instance data.
    a. Continue to the section below: "APIv2 - Using Swagger" for more details, or see the Developer Tools page for a broader overview.
3. Use CURL in the command line to authenticate and execute APIv2 endpoints. See cURL documentation at https://curl.haxx.se/.
    a. Continue to the section below: "APIv2 - Using cURL" for more details, examples, and tips.

APIv2 - Using Swagger

Accessing Swagger

Public APIv2 documentation is located at https://cloud.6connect.com/APIv2/.

APIv2 documentation includes:

- IPAM API

  Includes actions for LIRs, IP aggregate and block management, VLAN, IP Rules, and SWIP.

- Resource API

  Includes actions for managing the Resource System.
  The resource API provides CRUD endpoints for resources, resource attributes, resource attachments and resource backups.

- Resource View API

  Provides CRUD endpoints for resource views.

- DNS API

  The DNS API allows you to manage DNS Zones, Records, Servers, Groups and ACLS.

- Peering API

  Allows you to manage routers and BGP sessions.

- Contacts API

  Allows you to manage contacts.

- Users API

  Includes actions for Users, permissions and actions.

- Usergroups API

  Includes actions for Groups, permissions and actions

- Scheduler API

  The API Allows you to easily schedule tasks.

- API Composer Platform

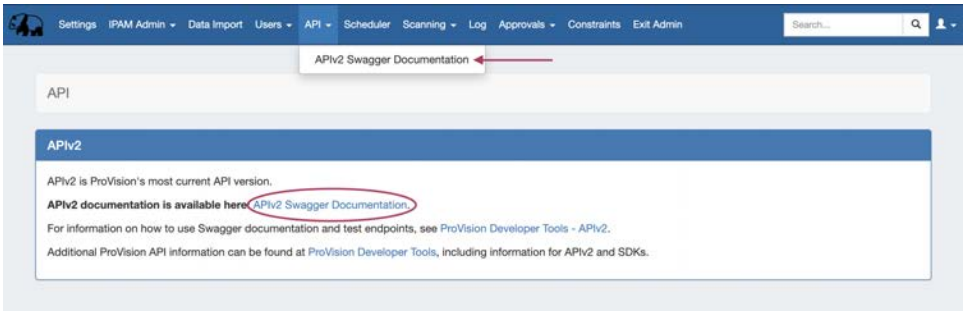
  API Composer Platform (ACP) is an additional module to help automate frequently used combinations of calls.

- SSH API

  Includes actions for SSH credentials and SHH Routes.

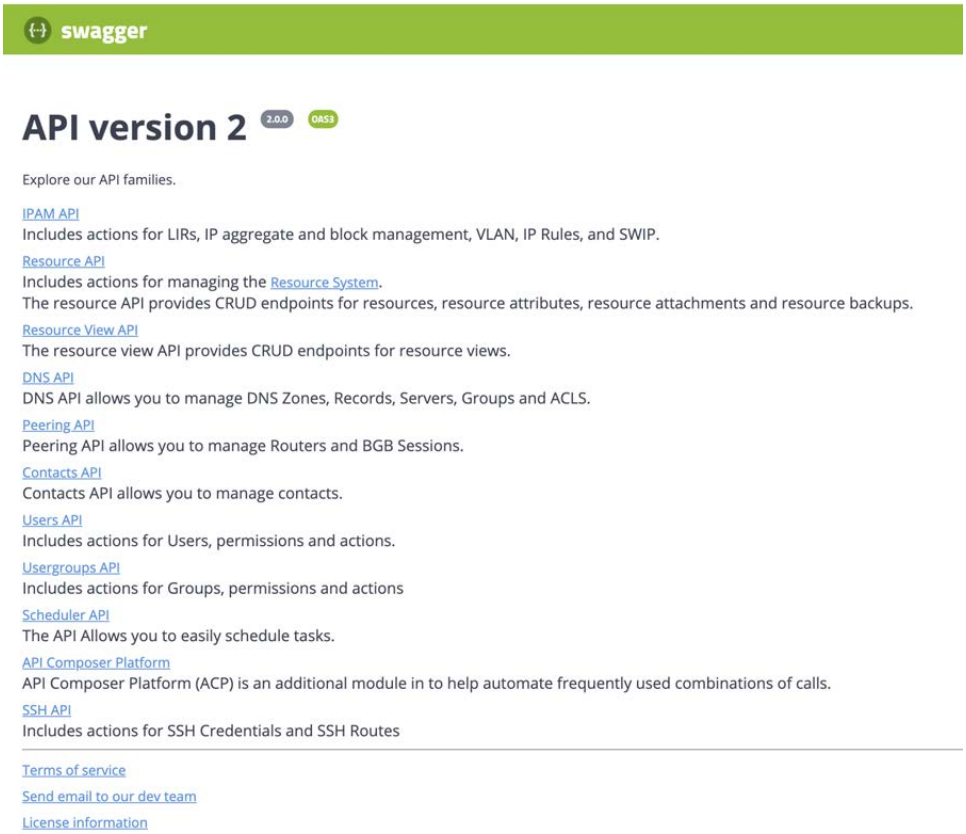
Existing customers may also access APIv2 Documentation from your instance (user must have Admin permissions):

1. Log into your ProVision instance.
2. Go to the Admin area of ProVision and click on the **API** Tab.
3. Under the API dropdown menu, click the Swagger link provided. You may also click on the "APIv2 Swagger Documentation" link provided under the APIv2 section of the page.



Viewing APIv2 Information

1. On the API Swagger home page, click on the name link for the API family that you wish to browse (IPAM, Resource, DNS, etc).



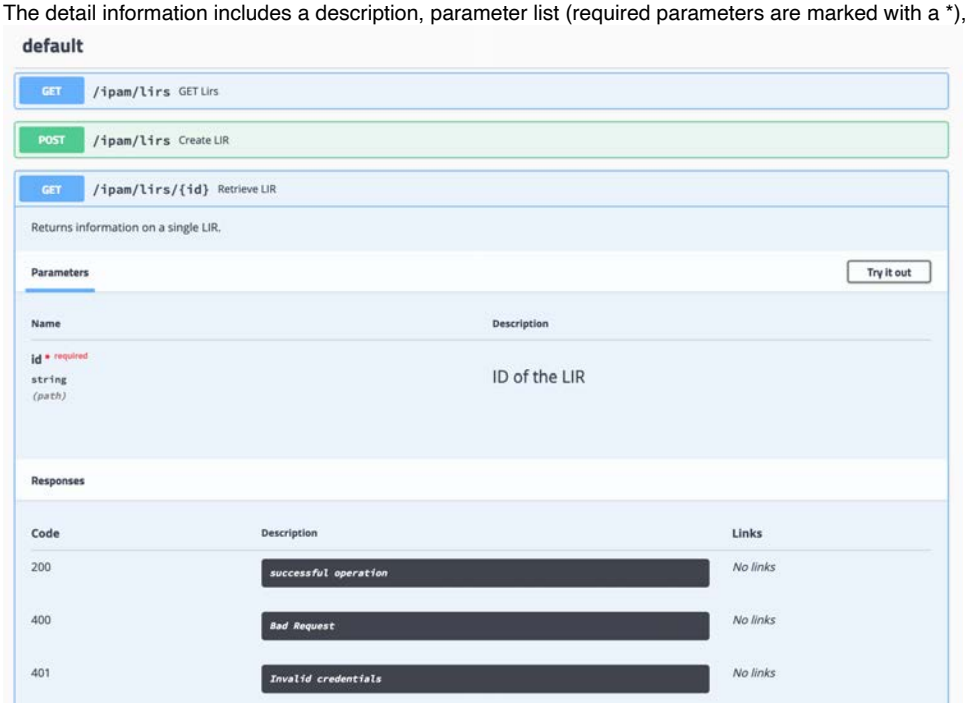
2. Once on an API Family page, verify that the displayed server name is correct for your instance/local server.

In most situations, only one ProVision instance/server will be displayed, with authentication already provided from your ProVision login. If your ProVision session has ended, or the server changed, you may need to re-provide ProVision credentials by clicking the "Authorize" button.



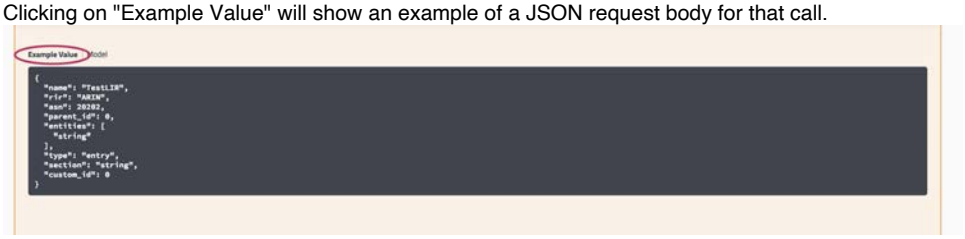
3. Scroll further down the page and begin reviewing available APIv2 calls and details. Clicking on any call will expand it to view parameter details - you can even test call responses (using your instance data) by clicking "Try it Out"!

   The detail information includes a description, parameter list (required parameters are marked with a *), and response information



4. Some calls that involve a JSON request body payload (PUT, PATCH, etc) will display "Example Value" and "Model" information under a "Request Body" section - additional parameter descriptions may be displayed under "Model" Information.

   Clicking on "Example Value" will show an example of a JSON request body for that call.

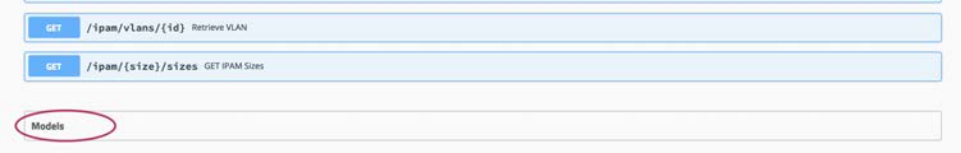


Clicking on "Model" will display details and descriptions of the request body parameters, if available.



5. Additional "Model" examples are available at the bottom of the page with additional descriptive information.

At the bottom of the page, click on "Models".



Then, click on the "Model" you wish to view. Some models may contain additional information that you can expand to view, such as valid values for a parameter. In the example below, the circled "array" will display valid RIR values.



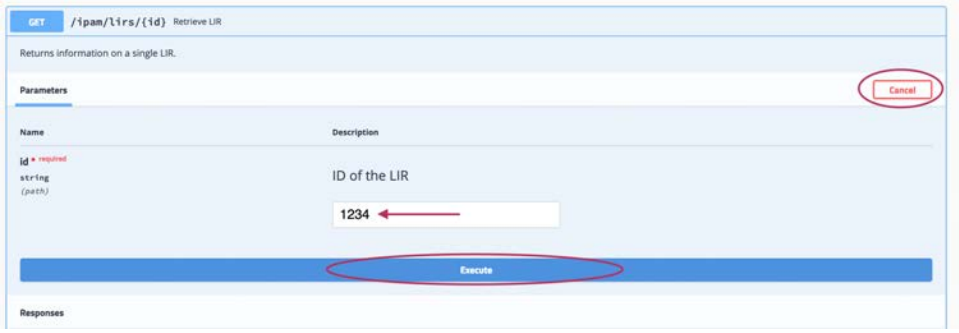
Testing/Executing Endpoints in Swagger

You may execute endpoints in Swagger by using the "Try it out" button for any call.

1. Navigate to the call that you want to try out.
2. Expand the call to view its details, then click the "Try it out" button.



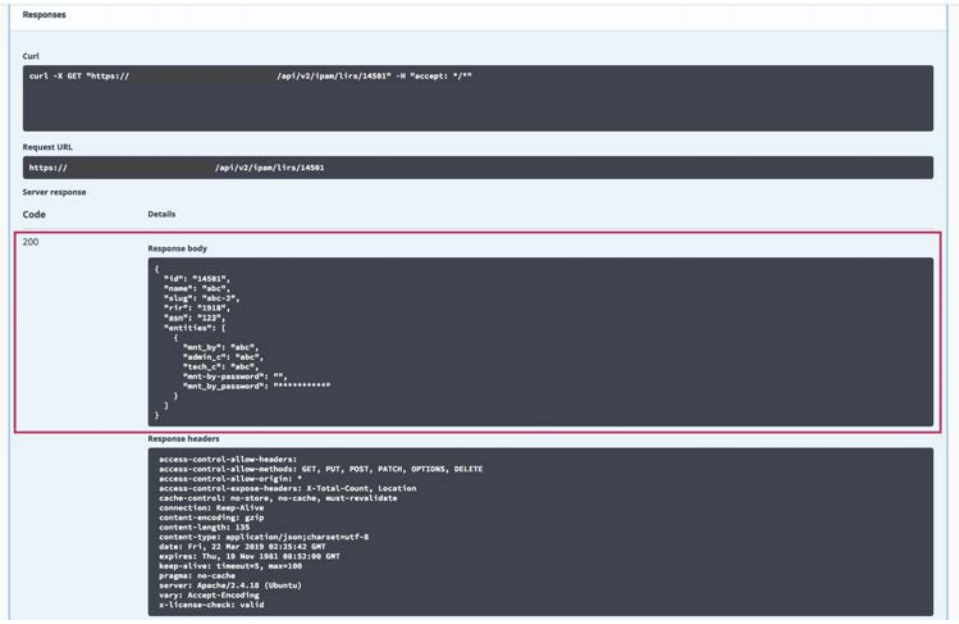
3. Input the desired parameters to test, and click "Execute".



If the call is a method that uses a JSON request body, you will have the option to edit the body text in the "Example Value" box - when done, click "Execute".



4. The example response will display under "Responses" after being executed. The "Response" section also includes the cURL command, Request URL, and Response Headers.



APIv2 - Nested Queries

You can use nesting to write more complicated API calls to handle multiple conditions. Here, we'll illustrate a query with an OR / AND condition, such as to find resource entries with (Section = 76 OR Section = 77) AND managed = Yes:

```
{"type": "entry","attrs":[{"key":"_custom_id","value":"101","rule":"AND"},{"attr_rule":"AND","attr_nested":
[{"attr_key":"_section","attr_value":"78","attr_rule":"OR"},{"attr_key":"_section","attr_value":"74","
attr_rule":"OR"}]}]}
```

You should be able to adapt that to point at whatever attributes you like.

Here it is in CURL format:

```
curl -X POST "https://$HOSTNAME/instance/api/v2/resources/query" -H "accept: application/json" -H "Content-
Type: application/json" -d "{\"type\":\"entry\",\"attrs\":[{\"key\":\"_custom_id\",\"value\":\"101\",\"
rule\":\"AND\"},{\"attr_rule\":\"AND\",\"attr_nested\":[{\"attr_key\":\"_section\",\"attr_value\":\"78\",\"
attr_rule\":\"OR\"},{\"attr_key\":\"_section\",\"attr_value\":\"74\",\"attr_rule\":\"OR\"}]}]}"
```

APIv2 - Using cURL

One option to execute an APIv2 call is to use CURL from the Command Line.

If you do not already have cURL installed, you may download it and access its documentation at https://curl.haxx.se/.

cURL syntax template for APIv2:

When using cURL, the general layout of the cURL command will be as follows:

1. Invoke cURL:
    a. *curl -X PATCH "https://$HOSTNAME/instance/api/v2/config" -H "Content-Type:application/json;charset=utf-8" -u testing@example.com:password -d "{\"auto_merge_limits\":\"10\"}"*
2. Use the Request Flag (-X):
    a. *curl -X PATCH "https://$HOSTNAME/instance/api/v2/config" -H "Content-Type:application/json;charset=utf-8" -u testing@example.com:password -d "{\"auto_merge_limits\":\"10\"}"*
    b. This specifies a custom request method to use when communicating with the HTTP server. The specified request method will be used instead of the method otherwise used (which defaults to GET)
3. Specify the HTTP Action:
    a. *curl -X PATCH "https://$HOSTNAME/instance/api/v2/config" -H "Content-Type:application/json;charset=utf-8" -u testing@example.com:password -d "{\"auto_merge_limits\":\"10\"}"*
4. In quotes, specify the URL of the APIv2 endpoint you are executing. This should be similar to: "https://$HOSTNAME/instance/api/v2/[endpoint family-action]"
    a. *curl -X PATCH "https://$HOSTNAME/instance/api/v2/config" -H "Content-Type:application/json;charset=utf-8" -u testing@example.com:password -d "{\"auto_merge_limits\":\"10\"}"*
5. Use the Header Flag (-H):
    a. *curl -X PATCH "https://$HOSTNAME/instance/api/v2/config" -H "Content-Type:application/json;charset=utf-8" -u testing@example.com:password -d "{\"auto_merge_limits\":\"10\"}"*
    b. Denotes an extra header to include in the request when sending HTTP to a server. You may specify any number of extra headers. Note that if you should add a custom header that has the same name as one of the internal ones curl would use, your externally set header will be used instead of the internal one. This allows you to make even trickier stuff than curl would normally do.
6. Add endpoint-specific data, such as specifying a JSON payload or attribute setting. This may involve one or more additional flags or information sets, depending on the endpoint:
    a. *curl -X PATCH "https://$HOSTNAME/instance/api/v2/config" -H "Content-Type:application/json;charset=utf-8" -u testing@example.com:password -d "{\"auto_merge_limits\":\"10\"}"*

Tip!

Swagger displays cURL commands and request URLs in the execution response!

Use the "Try it Now" feature from your instance's Swagger page (Accessed from Admin API Tab APIv2 Swagger Documentation) for the endpoint/attribute changes you wish to make, and view the cURL command for that change. Copy the command text, and use it as a template for your next cURL execution of the command!



For help using Swagger to test endpoints, see "Testing Endpoints in Swagger" in this APIv2 documentation page.

cURL Examples

Example: cURL APIv2 Authentication

This example authenticates a user, so that you may perform APIv2 commands as that user.

```
curl -X GET "https://$HOSTNAME/instance/api/v2/config" -H "accept: */*" -u testing@example.com
```

This will ask for a password. To hard-code it with a password, add it to the end like so:

```
curl -X GET "https://$HOSTNAME/instance/api/v2/config" -H "accept: */*" -u testing@example.com:password
```

APIv2 commands are executed as the user provided, so their permissions must be set appropriately. The Swagger "execute" feature produces CURL strings that can be used to test specific API commands.

Example: cURL APIv2 POST Command

This example illustrates how to provide POST/PATCH data to an APIv2 command via cURL. This command updates the automerge configuration setting:

```
curl -X PATCH "https://$HOSTNAME/instance/api/v2/config" -H "Content-Type:application/json;charset=utf-8" -u
testing@example.com:password -d "{\"auto_merge_limits\":\"10\"}"
```

Review the general CURL documentation at https://curl.haxx.se/ can offer greater insight into what other flags can be used.

Example: cURL / APIv2 Nested Query

You can use nesting to write more complicated API calls to handle multiple conditions. Here, we'll illustrate a query with an OR / AND condition, such as to find resource entries with (Section = 76 OR Section = 77) AND managed = Yes:

{"type": "entry","attrs":[{"key":"_custom_id","value":"101","rule":"**AND**"},{"attr_rule":"**AND**","**attr_nested**":[{"attr_key":"_section","attr_value":"
78","attr_rule":"**OR**"},{"attr_key":"_section","attr_value":"74","attr_rule":"**OR**"}]}]}

The items in bold red are the necessary components to achieve the AND/OR condition in a nested format, though the attributes used may be changed depending on your needs.

The same query in cURL is given below:

```
curl -X POST "https://$HOSTNAME/instance/api/v2/resources/query" -H "accept: application/json" -H "Content-
Type: application/json" -d "{\"type\":\"entry\",\"attrs\":[{\"key\":\"_custom_id\",\"value\":\"101\",\"
rule\":\"AND\"},{\"attr_rule\":\"AND\",\"attr_nested\":[{\"attr_key\":\"_section\",\"attr_value\":\"78\",\"
attr_rule\":\"OR\"},{\"attr_key\":\"_section\",\"attr_value\":\"74\",\"attr_rule\":\"OR\"}]}]}"
```

Example: cURL APIv2 Attach Zone to a DNS Group

To attach a newly created DNS Zone to a DNS Group using APIv2, you need to make a Resource Link with the relation type "dnsZoneView":

```
curl -X POST "https://$HOSTNAME/instance/api/v2/resources/274/links" -H "accept: application/json" -H
"Content-Type: application/json" -d "{\"resource_id\":\"15648\",\"relation\":\"dnsZoneView\",\"data\":{}}"
```

Where resource #274 is the "Default Group" on the instance (your instance may vary), and Resource #15648 is the resource ID for the new zone. The two are now linked together.

To attach a DNS server to a DNS Group you use the same process but the relation is "dnsViewServer".

To attach a zone to a server directly the relation is either "dnsZoneMaster" or "dnsZoneSlave" depending on what you're doing.

Additional Information

See the following areas for additional information:

- Developer Tools
- Public APIv2 Swagger documentation: https://cloud.6connect.com/APIv2/.

API v1

API v1 (Deprecated)

> ProVision's APIv1 system has been replaced by APIv2, and is now considered deprecated.

It is highly recommended that any customer utilizing ProVision's API for custom scripting refer to APIv2 documentation instead, and consider upgrading existing APIv1 scripts to use APIv2.

However, APIv1 documentation will remain accessible from the links below in order to support legacy uses.

APIv1 - Overview

The 6Connect API is a RESTful API to access your data in the 6Connect tools. ReST relies on stateless, client-server communication, and is usually always implemented using the HTTP protocol (the 6Connect API uses HTTPS). It is a simple and lightweight alternative to Web Services and can implemented in nearly any language. The 6Connect API operates similarly to other popular ReST APIs you may have worked with, such as Facebook or Twitter. You simply create an HTTP GET or POST request according to our standard, send it to the server, and receive data back.

To learn more about request formatting, making requests, and the tools available, see "Making APIv1 Requests", below.
You can also get the PHP SDK for PHP libraries and sample code.

Here are some important details about our ReST implementation:

- The API only comes with the full 6Connect IPAM product. If you would like to upgrade to the full version, contact sales@6Connect.com.
- All transactions are over HTTPS (SSL - port 443) only. Any transaction not using SSL will be rejected, and you will have potentially exposed sensitive data.
- All API results are formatted in JSON. XML support is coming soon.
- All requests are either HTTP GET or POST requests. We suggest using POST if the length of data in the request is over 8KB.
- You can use any language you would like to query the API. We currently have an SDK for PHP. Looking at the sample code would probably help you implement it in any language though.

Making APIv1 Requests

API requests can be generated within the web UI by the API Request Generator, or generated programmatically in any language.

An API request looks like this: https://[your instance]/ex/api/v1/api.php?target=ipam&action=get&type=IP&mask=24

An API response is a JSON-encoded text string, and looks like this:


```
{"success":1, "message":"1 blocks found", "data":[{"id":"7539","oct1":"1","oct2":"2","oct3":"3","oct4":"0","
mask":"24","child1":null,"child2":null,"is_assigned":"0","is_swipped":"0", "is_aggregate":"1","custid":"
holding","last_updated_time":"2012-03-20 09:49:00","description":null,"parent":null,"rir":"ARIN","notes":"
2012-03-20 09:49:00","generic_code":null,"region":null,"vlan":null,"arin_net_id":null,"arin_cust_id":null,"
arin_swip_time":"0000-00-00 00:00:00","assigned_time":"2012-03-20 09:45:12"}]}
```


Instructions on decoding this return data can be found in the API endpoint documentation pages.

Using API Keys:
When using the API without pre-established authentication to ProVision, you must include both your API Key and a specially-prepared query hash parameter, like so:

> https://[your instance]/ex/api/v1/api.php?target=ipam&action=get&type=IP&mask=24&apiKey=00-TMHQV8CV2XZYABCD&hash=8jxj4IApYmgb5IZ0wBY4tFv+WilXb5JuVpjrwupyXQo=

API Keys can be generated from your ProVision instance by navigating to the Admin panel by using the gear icon in the upper right hand corner, then navigating to the API tab. The API tab will present the API authentication information in the following format:

> API Key: 00-TMHQV8CV2XZYABCD

Secret Key: 6e04e5822ce10fecc8947dedxc46878

The secret key serves as an API password and is used in the creation of the API Authentication hash. The formula for creating a API query hash from an API query and a Secret Key is the following:

Hash = Base64Encode(Sha256HMACHash (QueryString, SecretKey))

In PHP, this would be performed with the following line of code:

$hash = *base64_encode(hash_hmac('sha256', $_SERVER['QUERY_STRING'], $secretKey, TRUE));*

Because the hash function is computed based on the query string, you must calculate a unique hash for every API request!

Example

Lets say you wanted to create a hash for the following API request:

https://[your instance]/api/v1/api.php?target=ipam&action=get&type=IP&mask=24

And that your API Key and Secret Key are as follows:

API Key: 00-TMHQV8CV2XZYABCD

Secret Key: 6e04e5822ce10fecc8947dedxc46878

The first step is to append your API Key to the URL. The API Key indicates which user is executing the API query.

https://[your instance]/api/v1/api.php?target=ipam&action=get&type=IP&mask=24&apiKey=00-TMHQV8CV2XZYABCD

The next step is to isolate the Query String from the request URL. The Query String is everything which follows the question mark. So,

Query String: target=ipam&action=get&type=IP&mask=24&apiKey=00-TMHQV8CV2XZYABCD

The next step is to calculate the SHA256 hash of this string with your Secret Key. In PHP, this would be:

$sha256 = hash_hmac('sha256', "target=ipam&action=get&type=IP&mask=24&apiKey=00-TMHQV8CV2XZYABCD", "48b278ec873bda4738923dbc467f8669", TRUE);

As this value has been 256-bit hashed, it will contain many unprintable characters. The solution to this is to encode it in base 64 for transport. Again, in PHP:

$hash = *base64_encode($sha256);*

Calculating it out yields the completed hash:

$hash = yneSFMyxPPe+3W4IOkVp50K3VStatBcRRak+2ygDUWQ=

The calculated hash can then be appended to the full API Query URL to form a completed request:

https://[your instance]/api/v1/api.php?target=ipam&action=get&type=IP&mask=24&apiKey=00-TMHQV8CV2XZYABCD&hash=yneSFMyxPPe+3W4IOkVp50K3VStatBcRRak+2ygDUWQ=

A Note on False Positives

ProVision utilizes several possible authentication schemes of which key-based API authentication is only one. Session-based, username/password authentication is used for the majority of user interaction with the ProVision front end. Because session information is stored in browsers cookies, a browser can be authenticated to execute API commands as long as the session is active.

Unfortunately, this can lead to confusion when using a machine-based API as the user might use an authenticated browser session to test API-Key based API queries. These queries will always succeed regardless of whether the API Query Hash was calculated correctly as the system defaults to Session-based authentication when it is available.

To ensure that session-based authentication is not polluting your API-Key based testing, always use a separate browser which is not logged in to your ProVision instance to test API queries.

Other Languages

The 6Connect API can be used in just about any scripting or programming language. We have a PHP SDK that provides example code, and several useful functions for interacting with the API. Even if you don't want to use PHP, the samples will help you create code in other languages

APIv1 - Getting Started with the SDK

The 6connect API allows you to access to data and functions of the 6connect web tools. The SDK for PHP or Python will help you get this setup quickly by outlining the requirements, prerequisites and provide sample code.

SDK for PHP

Prerequisites

The API only comes with a licensed 6connect ProVision application. If you would like access to a ProVision license please contact sales@6connect.com.

Create Your API Credentials

To use the 6connect SDK for PHP, you will need a 6connect API Key and Secret Key.

To create your API Key and Secret Key:

- Log into your 6connect instance (hosted or local)
- Click on the Admin icon, and go into the Administration section.
- Click on the "API" tab.
- Select the user from the drop down you want to enable API access for, and click "Generate Keys".
- The API Key and the Secret Key will now appear directly below that.

*Note that generating a new API will automatically revoke an older API Key.

> 6connect recommends that each user accessing the API have their own API key configured. However, you can alternatively setup API users by functionality or roles. While the platform is flexible, you should follow your organizations security policies.

Important!

> Your Secret Key is a secret! Only you and 6connect should ever know this information. It is important to keep it confidential to protect the privacy of your data. Store it securely and never share this key with other users or place it on other systems. Never include the secret key in requests to 6connect, support requests to 6connect, and never e-mail it to anyone. Do not share it outside your organization. No one who legitimately represents 6connect will ever ask you for your Secret Key.

Requirements

Aside from following the prerequisites, you will need a basic understanding of object oriented programming in PHP and the right tools installed on your system to use the API.

Minimum Requirements

- PHP 5.5 or newer.
- PHP JSON and PCRE extensions (XML will be coming soon).
- Curl PHP extension compiled with OpenSSL libraries. Click here for more information on curl.

If you aren't sure what is running on your system, you can create a php page on your system and call phpinfo() and view this page in a browser, or run php -i on the command line.

Install the SDK

Download the file "6connect_ProVision_PHP_SDK_5_1_4.tar" from the APIv1 SDK page.

Configure the SDK Security Credentials

- Extract the zipped tar file to a directory.
- Open the api-config.php located in the downloaded SDK files.

- Read through the file and place in your instance name (or path for local installs), API Key and Secret Key information as specified.
- Make sure all files are in the same directory (the core class looks for a config file in the same directory by default).
- Run the sample code api-examples.php!

Important!

You must setup user API access before running the sample. See the previous section "Create Your API Credentials" for more information.

SDK for Python

Install the SDK

Download the file "6c-api-examples-python.zip" from the APIv1 SDK page.

Configure the SDK Security Credentials

- Extract the zipped tar file to a directory.
- Open the apiclient.py located in the downloaded SDK files.
- Read through the file and place in your instance name (or path for local installs), API Key and Secret Key information as specified.
- Make sure all files are in the same directory (the core class looks for a config file in the same directory by default).
- Run the sample code api-examples.php!

Important!

You must setup user API access before running the sample. See the previous section "Create Your API Credentials" for more information.

APIv1 Documentation (Deprecated)

- API Module - Admin and Audit
- API Module - DHCP
- API Module - DNS
- API Module - IPAM
- API Module - LIR
- API Module - Peering
- API Module - Resource
- API Module - VLAN
- APIv1 SDK
- How Do I...

API Module - Admin and Audit

Admin and Audit

This section covers the functions found under the Admin section of ProVision.

> ProVision's APIv1 system has been replaced by APIv2, and is now considered deprecated.

Table of Contents

- Authentication Testing
- Backup
- Log Management
- Scheduler API
- Zone Templates

Authentication Testing

- Authentication Testing
  - testSSH
  - testLDAP
  - testSecure64

Authentication Testing

testSSH

URL	/api/v1/api.php?target=auth&action=testSSH
Description	Returns success or failure of a connection to an external server via SSH.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Success!"} ERROR: *{'success':0, 'message':'error message'}*

Required Parameters

Name	Type	Example	Description
SSHServer	STRING	totally.awesome.com	IP or FQDN of server.
SSHPort	NUMBER	22	Port ssh is running on.

Optional Parameters

Name	Type	Example	Description
username	STRING	jsmith	Username on target server.
password	STRING	password123	Password for user.
directory	STRING	/tmp	Directory to attempt to access after successful login.

Example URL	/api/v1/api.php?target=auth&action=testSSH&username=jsmith&password=password123&directory=%2Fvar%2Fnamed%2F6connect%2Fqa4&SSHPort=22&SSHServer=myssh.awesome.com

testLDAP

URL	/api/v1/api.php?target=auth&action=testLDAP
Description	Test basic connectivity to an LDAP server. Does not test actual authenticaion against server.
Returns	**Examples:** SUCCESSFUL: *{'success':1, 'id':'12345'}* ERROR: *{'success':0, 'message':'unable to add block'}*>

Required Parameters

Name	Type	Example	Description
ldapServer	STRING	ldap.awesome.com	IP or FQDN of the LDAP server.
ldapPort	NUMBER	389	User-defined block code as defined in Admin-IPAM settings: Generic Code Per Block Name

	ldapMode	STRING	SSL	Options are: SSL, TLS, or None.
Optional Parameters	None			
Example URL	/api/v1/api.php?target=auth&action=testLDAP&ldapPort=389&ldapServer=ldap.awesome.com&ldapMode=None			

testSecure64

URL	/api/v1/api.php?target=auth&action=testSecure64
Description	Returns success or failure of a connection to an Secure64 DNS appliance.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Success!"} ERROR: *{'success':0, 'message':'error message'}*

Required Parameters

Name	Type	Example	Description
SSHServer	STRING	totally.awesome.com	IP or FQDN of server.
SSHPort	NUMBER	22	Port ssh is running on.

Optional Parameters

Name	Type	Example	Description
username	STRING	jsmith	Username on target server.
password	STRING	password123	Password for user.
directory	STRING	/tmp	Directory to attempt to access after successful login.

Example URL	/api/v1/api.php?target=auth&action=testSecure64&username=jsmith&password=password123&directory=%2Fvar%2Fnamed%2F6connect%2Fqa4&SSHPort=22

Backup

- Backup
  - backup now

Backup

backup now

URL	/api/v1/api.php?target=backup&action=now
Description	Performs a manual backup to the designated location.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Backup via curl complete: "} ERROR: *{"success":0, "message":"Error Message"}>*
Required Parameters	**Name** | **Type** | **Example** | **Description** type | STRING | curl | File transfer type. Acceptable values are 'curl' or 'scp'
Optional Parameters	**Name** | **Type** | **Example** | **Description** resource | INTEGER | 2213 | The server resource id to backup to. If left blank, backs up to the 6connect cloud.
Example URL	**Backup to designated server:** /api/v1/api.php?target=backup&action=now&type=scp&resource_id=2213 **Backup to 6connect cloud:** /api/v1/api.php?target=backup&action=now&type=curl

When specifying a backup server resource ID, that server must have the Hostname, Username, and Password fields correctly provided in ProVision.

Log Management

- Log Management
  - Get

Log Management

Get

URL	/api/v1/api.php?target=log&action=get
Description	Returns a list of log entries. Use optional parameters to filter the list.
Returns	**Examples:**

SUCCESSFUL	*{"success":1,"message":"Search Successful.","data":[{"logId":"31568","time": "2012-05-07 17:44:43", "logLevel":"INFO","userId":"39","userName": "user@6connect.com","logCategory": "User","message": "User Doe (user@6connect.com) logged in via local authentication","ip":"107.111.0.228"}]}*
ERROR	*{'success':0, 'message':'error message'}*

Data Detail

Name	Type	Example	Description
log_id	INTEGER	24	Unique log entry id.
time	DATETIME	2012-05-07 22:10:07	Date and time year to second.
log_level	STRING	NOTICE	Standard syslog log levels in verbose format (EMERG, ALERT, CRIT, ERR, WARNING, NOTICE, INFO, DEBUG).
user_id	INTEGER	11	The unique user id associated with the log entry.
username	STRING	user@6connect.com	The unique user name associated with the log entry.
log_category	STRING	IPAM	The 6connect category for the log entry (User, IPAM, Resource Holder, DNS, Peering, Assistant, NTP, Reporting).
message	STRING	Created new children from 1.0.0.0/24	The detailed log message.
ip	STRING	107.111.0.228	The remote IP address of the user who took the action being logged.

Required Parameters

None*

*There are no required parameters, but at least one optional parameter must be provided for the call to succeed.

Optional Parameters

Name	Type	Example	Description
block_id	INTEGER	310	Id of the IPAM netblocks to which the logs belong
get_attributes	BOOLEAN	1	Display the log attributes along with the log into the client's response. (The attributes for each log record). Valid values are 1 (true) and 0 (false).
log_id	INTEGER	24	Unique log entry id.
time_min	DATETIME	2015-05-07 [21:00:00]	Retrieve logs starting at this Date and optional time year to second.
time_max	DATETIME	2015-05-07 [22:00:00]	Retrieve logs ending at this Date and optional time year to second.

	limit	INTEGER	100	Total log entries to retrieve. Default limit is 1000 records.
	orderby	STRING	log_id	Order results by log_id, time, log_level
	order	STRING	ASC	Order by ascending / descending (ASC / DESC).
	offset	INTEGER	50	Offset from 0 to retrieve log entries
	username	STRING	user@6connect.com	The unique user name associated with the log entry.
	log_category	STRING	IPAM	The 6connect category for the log entry (User, IPAM, Resource Holder, DNS, Peering, Assistant, NTP, Reporting).
	log_level	STRING	NOTICE	Standard syslog log levels in verbose format (EMERG, ALERT, CRIT, ERR, WARNING, NOTICE, INFO, DEBUG).
	ip	STRING	1.2.3.4	The remote IP address of the user whose action was logged
	search	STRING	Aggregate Added	Search for a string in the logs. It searches in 'message', 'username', 'time', 'ip' and 'log_category'
	time	DATETIME	2015-05-07 [21:00:00]	Search logs from a specific time.
Example URL	/api/v1/api.php?target=log&action=get&block_id=310&order_by=log_id&order=DESC			

Scheduler API

- Scheduler
  - addTask
  - updateTask
  - deleteTask
  - executeTask
  - getTaskHistory
  - getTasks

Scheduler

addTask

URL	/api/v1/api.php?target=scheduler&action=addTask
Description	Add a new scheduled task. Request is POST-only. Params are a single JSON object:
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Message "} ERROR: *{"success":0, "message":"Error Message"}>*

Required Parameters

Name	Type	Example	Description
user_id	INTEGER	100	User ID
name	STRING	Process Holding Tank	Name given to the new
class_name	STRING	\scheduler\Tasks\ProcessHoldingTask	PHP-namespaced name for the task class. Currently available: \scheduler\Tasks\ProcessHoldingTask \scheduler\Tasks\BackupTask \scheduler\Tasks\DNSPushTask
data		{}	
active	BOOL	true	
repeat_items			

Optional Parameters

Name	Type	Example	Description
repeat_start	STRING	2015-05-06	Date to start repeating task. Date must be in YYYY-MM-DD format.
repeat_end	STRING	null	Date to end repeating task or null. Date must be in YYYY-MM-DD format.
repeat_hour	INTEGER	8	Hour of day to repeat, from 0-23
repeat_minute	INTEGER	0	Minute of that hour to repeat, from 0-59
repeat_day	INTEGER	1	Day of month, from 1-31
repeat_week	INTEGER	1	Week of month, from 1-5
repeat_weekday	INTEGER	1	Days to repeat. Sun-Sat are from 0-6 respectively

updateTask

URL	/api/v1/api.php?target=scheduler&action=updateTask
Description	Update a scheduler task
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"*Message*"} ERROR: *{"success":0, "message":"Error Message"}>*

Required Parameters

Name	Type	Example	Description
id	INTEGER	4	ID of the task to be updated
user_id	INTEGER	100	User ID
name	STRING	Process Holding Tank	Name given to the new
class_name	STRING	\scheduler\Tasks\ProcessHoldingTask	PHP-namespaced name for the task class. Currently available: \scheduler\Tasks\ProcessHoldingTask \scheduler\Tasks\BackupTask \scheduler\Tasks\DNSPushTask
data		{}	
active	BOOL	true	
repeat_items			

Optional Parameters

Name	Type	Example	Description
repeat_start	STRING	2015-05-06	Date to start repeating task. Date must be in YYYY-MM-DD format.
repeat_end	STRING	null	Date to end repeating task or null. Date must be in YYYY-MM-DD format.
repeat_hour	INTEGER	8	Hour of day to repeat, from 0-23
repeat_minute	INTEGER	0	Minute of that hour to repeat, from 0-59
repeat_day	INTEGER	1	Day of month, from 1-31
repeat_week	INTEGER	1	Week of month, from 1-5
repeat_weekday	INTEGER	1	Days to repeat. Sun-Sat are from 0-6 respectively

deleteTask

URL	/api/v1/api.php?target=scheduler&action=deleteTask
Description	Delete a scheduler task
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Task \"New Task\" (2) deleted","data":null} ERROR: *{"success":0, "message":"Error Message"}>*

Required Parameters

Name	Type	Example	Description
taskId	INTEGER	4	ID of the task to delete

Optional Parameters	None
Example URL	/api/v1/api.php?target=scheduler&action=deleteTask&taskId=2

executeTask

URL	/api/v1/api.php?target=scheduler&action=executeTask
Description	Execute a task immediately
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Holding tank processed. 0 IPv4 and 0 IPv6 blocks moved to the available pool. ","data":null} ERROR: *{"success":0, "message":"Error Message"}>*
Required Parameters	**Name** | **Type** | **Example** | **Description** taskId | INTEGER | 4 | ID of the task to run
Optional Parameters	None
Example URL	/api/v1/api.php?target=scheduler&action=executeTask&taskId=1

getTaskHistory

URL	/api/v1/api.php?target=scheduler&action=getTaskHistory
Description	Get history for a specific task
Returns	**Examples:** SUCCESSFUL: { "success": 1, "data": [{ "log_id": "1005037", "time": "2015-05-07 12:29:45", "log_level": "6", "user_id": "31", "username": "usernamehere", "log_category": "System", "message": "task_id=1 task=Process Holding Tank action=finished message=Holding tank processed. 0 IPv4 and 0 IPv6 blocks moved to the available pool.", "ip": null }, { "log_id": "1005033", "time": "2015-05-07 12:28:50", "log_level": "6", "user_id": "31", "username": "usernamehere", "log_category": "System", "message": "task_id=1 task=Process Holding Tank action=finished message=Holding tank processed. 1 IPv4 and 0 IPv6 blocks moved to the available pool.", "ip": null }, { "log_id": "1005030", "time": "2015-05-07 12:28:14", "log_level": "6", "user_id": "31", "username": "usernamehere", "log_category": "System", "message": "Task \"Process Holding Tank\" (1) added", "ip": null }] } ERROR: *{"success":0, "message":"Error Message"}>*
Required Parameters	**Name** | **Type** | **Example** | **Description** taskId | INTEGER | 1 | ID of the task to view
Optional Parameters	None
Example URL	/api/v1/api.php?target=scheduler&action=getTaskHistory&taskId=1

getTasks

URL	/api/v1/api.php?target=scheduler&action=getTasks
Description	Gets a list of scheduled tasks and their repeat settings
Returns	**Examples:** SUCCESSFUL: { "success": 1, "data": [{ "id": "1", "user_id": "31", "name": "Process Holding Tank", "class_name": "\\scheduler\\Tasks\\ProcessHoldingTask", "active": true, "data": null, "last_run": "2015-05-07 12:29:45", "repeat_items": [{ "id": "1", "task_id": "1", "repeat_start": "2015-05-06", "repeat_end": null, "repeat_interval": null, "repeat_year": "*", "repeat_month": "*", "repeat_day": "*", "repeat_week": "*", "repeat_weekday": "4", "repeat_hour": "20", "repeat_minute": "0" }, { "id": "2", "task_id": "1", "repeat_start": "2015-05-06", "repeat_end": null, "repeat_interval": null, "repeat_year": "*", "repeat_month": "*", "repeat_day": "*", "repeat_week": "*", "repeat_weekday": "5", "repeat_hour": "20", "repeat_minute": "0" }, { "id": "3", "task_id": "1", "repeat_start": "2015-05-06", "repeat_end": null, "repeat_interval": null, "repeat_year": "*", "repeat_month": "*", "repeat_day": "*", "repeat_week": "*", "repeat_weekday": "6", "repeat_hour": "20", "repeat_minute": "0" }, { "id": "4", "task_id": "1", "repeat_start": "2015-05-06", "repeat_end": null, "repeat_interval": null, "repeat_year": "*", "repeat_month": "*", "repeat_day": "*", "repeat_week": "*",

	"repeat_weekday": "0", "repeat_hour": "20", "repeat_minute": "0" }] }, { "id": "2", "user_id": "31", "name": "New Task", "class_name": "\\scheduler\\Tasks\\TestTask", "active": true, "data": null, "last_run": "2015-05-07 12:35:41", "repeat_items": [{ "id": "5", "task_id": "2", "repeat_start": "2015-05-06", "repeat_end": null, "repeat_interval": null, "repeat_year": "*", "repeat_month": "*", "repeat_day": "*", "repeat_week": "*", "repeat_weekday": "1", "repeat_hour": "21", "repeat_minute": "0" }, { "id": "6", "task_id": "2", "repeat_start": "2015-05-06", "repeat_end": null, "repeat_interval": null, "repeat_year": "*", "repeat_month": "*", "repeat_day": "*", "repeat_week": "*", "repeat_weekday": "2", "repeat_hour": "21", "repeat_minute": "0" }, { "id": "7", "task_id": "2", "repeat_start": "2015-05-06", "repeat_end": null, "repeat_interval": null, "repeat_year": "*", "repeat_month": "*", "repeat_day": "*", "repeat_week": "*", "repeat_weekday": "3", "repeat_hour": "21", "repeat_minute": "0" }, { "id": "8", "task_id": "2", "repeat_start": "2015-05-06", "repeat_end": null, "repeat_interval": null, "repeat_year": "*", "repeat_month": "*", "repeat_day": "*", "repeat_week": "*", "repeat_weekday": "4", "repeat_hour": "21", "repeat_minute": "0" }, { "id": "9", "task_id": "2", "repeat_start": "2015-05-06", "repeat_end": null, "repeat_interval": null, "repeat_year": "*", "repeat_month": "*", "repeat_day": "*", "repeat_week": "*", "repeat_weekday": "5", "repeat_hour": "21", "repeat_minute": "0" }] }] } ERROR: *{"success":0, "message":"Error Message"}>*
Required Parameters	None
Optional Parameters	None
Example URL	/api/v1/api.php?target=scheduler&action=getTasks

Zone Templates

- Zone Templates
  - Get
  - Update
  - Delete

Zone Templates

Get

URL	/api/v1/api.php?target=zoneTemplate&action=get
Description	Returns success or failure of a connection to an external server via SSH.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Found 1 records for template \"Awesome Template\".","data":{"templateId":"1011","name":"Awesome Template","created":"2013-07-31 14:01:24","modified":"2013-07-31 14:01:24","userId":"112","soa":null,"refresh":"14400","retry":"3600","expire":"604800","minimum":null,"ttl":null,"userName":"joe@smith.com","records":[{"templateRecordId":"4","templateId":"1011","host":"www","type":"A","ttl":"3600","value":"1.2.3.4","ordering":"0"}]}} ERROR: *{'success':0, 'message':'error message'}*
Required Parameters	None
Optional Parameters	**Name** / **Type** / **Example** / **Description** templateId / NUMBER / 3 / ID of the specific template to get.
Example URL	/api/v1/api.php?target=zoneTemplate&action=get

Update

URL	/api/v1/api.php?target=zoneTemplate&action=update
Description	Create a new template or update an existing template.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Template updated","data":{"templateId":"1011","name":"Awesome Template","created":"2(23:15:52","modified":"2013-08-05 23:15:52","userId":"112","soa":"ns1.test.net hostmaster.ns1.test.net","refresh":"14400","retry":"36(604800","minimum":null,"ttl":false,"userName":"anna@6connect.com","records":"1"}} ERROR: *{'success':0, 'message':'Error updating template: error details'}*>
Required Parameters	**Name** / **Type** / **Example** / **Description** name / STRING / Test Template / The name of the template to be created or updated.
Optional Parameters	**Name** / **Type** / **Example** / **Description**

	soa	STRING	ns1.test.net hostmaster.ns1.test.net	A valid SOA for the template in for format
	ttl	INTEGER	86400	The TTL for the zone template, which is the default expiration time for all records witho own TTL.
	refresh	INTEGER	14400	The time period for slaves to refresh the zone.
	retry	INTEGER	3600	Time that a slave should retry refreshing the zone in case of incident.
	expire	INTEGER	604800	Time for a slave to expire a zone.
	mininum	INTEGER	3600	The maximum caching time in the event of failed lookups.
	count_records	INTEGER	5	Number of host records submitted with the update. All the following parameters names followed with their position in the count. In this example, the first record would have all parameters for the first record followed by _1, the second record _2, and so on. This w order all records in the template follow.
	host_1	STRING		The DNS record value.
	ttl_1	INTEGER	3600	TTL of the specific host record.
	type_1	STRING	A	A valid DNS record type.
	value_1	IP	1.2.3.4	A valid IPv4 or IPv6 address.
Example URL	api/v1/api.php?target=zoneTemplate&action=update&templateId=1011&count_records=1&name=Awesome+Template&soa=ns1.te net+hostmaster.ns1.test.net &refresh=14400&retry=3600&expire=604800&minimum=3600&value_0=undefined+undefined&host_1=www&ttl_1=3600&type_1=A 2.3.4			

Delete

URL	/api/v1/api.php?target=zoneTemplate&action=delete
Description	Deletes a DNS template.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Template \"Test Template\" delete."} ERROR: {"success":0,"message":"No template found for templateId \"1005\"."}
Required Parameters	**Name** / **Type** / **Example** / **Description** templateId / INTEGER / 3 / ID of the template to delete.
Optional Parameters	None.
Example URL	/api/v1/api.php?target=zoneTemplate&action=delete&templateId=1005

API Module - DHCP

DHCP Management Version 2

> ProVision's APIv1 system has been replaced by APIv2, and is now considered deprecated.

- Overview
- API Updates
- DHCP API How-To
  - Relate with Resources
  - Create DHCP IP Aggregates
  - Subnets and Hosts
  - Linking Subnets and Hosts with DHCP Servers
  - Pushing Configurations
- Detailed API Specification

Overview

DHCP Management Version 2 integrates DHCP management with ProVision's resource and permissions hierarchy, as well as the IP Management system. Individual DHCP servers can be assigned via Resource Permissions to different internal user groups, to be managed by only the appropriate parties.

Under DHCPv2 there is no distinct “DHCP Server” type or section – instead there is a “DHCP Module” which, when attached as a child to an existing resource, transforms it into a DHCP-enabled device. The most common use is to take the generic “Server” Section and turn it into a DHCP Server by attaching the DHCP Module as a child. This configuration allows users to add functionality to a basic resource and provides a cleaner management interface.

API Updates

The DHCPv1 API operated via calls to the DHCPServer and the DHCPEntry endpoint families. However, now that DHCPv2 is contained entirely within the resource system, most of the API calls to manipulate DHCP data do so using the Resource family of API endpoints to modify specific Resource attributes reserved for DHCP functionality.

DHCP API How-To

Relate with Resources

The DHCPv2 system builds upon the ProVision Resource API. With the exception of a few configuration commands all DHCPv2 API commands use the Resource family of API endpoints.

As described above, DHCPv2 functionality is enabled on a particular resource by attaching a DHCP Module as a child. A command to do this is as follows:

```
            [ProVision root]/api/v1/api.php?target=resource&action=add

            data:
meta[type]: dhcp_module
meta[name]: [parent resource id] DHCP Module
meta[parent_id]: [parent resource id]
```

The special resource type “dhcp_module” indicates to ProVision that the DHCP system is enabled for the parent object. The attributes associated with the “dhcp_module” resource govern the DHCP system's behavior.

Updating the attributes of a DHCP Server uses a Resource Update command:

```
[ProVision root]/api/v1/api.php?target=resource&action=update&meta[id]=2178 &meta[type]=dhcp_module&fields
[_dhcp_attributes][]={"type":"ISC","notes":"notes go here","username":"username","port":"port","
config_test":"/etc/init.d/dhcpd configtest","server_stop":"/etc/init.d/dhcpd stop","server_start":"/etc/init.
d/dhcpd start","config_path":"/tmp/dhcpd.conf","option_routers":"192.168.0.0","option_domain_name_servers":"
ns1.6connect.com","option_domain_name":"6connect.com","authoritative":"1","default_lease_time":"600","
max_lease_time":"7200","local_port":"67","log_facility":"local7","password":"password","server_ip":"
192.168.0.1","freeLines":3,"freeLine1":"free line 1","freeLine2":"free line 2","freeLine3":"free line 3"}
```

This command appears rather complicated, but can be broken apart into reasonable pieces. The first section:

```
target=resource&action=update&meta[id]=2178&meta[type]=dhcp_module
```

is familiar from other parts of ProVision. We are updating a resource of type “dhcp_module” whose resource id is 2178. The second section of the command details the update values, starting with

```
 fields[_dhcp_attributes][]=
```

which contains a JSON-encoded string of all the fields specific to a DHCP server's function. When expanded into its full object form it is substantially easier to digest:

```
{
            "type":"ISC",
            "notes":"notes go here",
            "username":"username",
            "port":"port",
            "config_test":"/etc/init.d/dhcpd configtest",
            "server_stop":"/etc/init.d/dhcpd stop",
            "server_start":"/etc/init.d/dhcpd start",
            "config_path":"/tmp/dhcpd.conf",
            "option_routers":"192.168.0.0",
            "option_domain_name_servers":"ns1.6connect.com",
            "option_domain_name":"6connect.com",
            "authoritative":"1",
            "default_lease_time":"600",
            "max_lease_time":"7200",
            "local_port":"67",
            "log_facility":"local7",
            "password":"password",
            "server_ip":"192.168.0.1",
            "freeLines":3,
            "freeLine1":"free line 1",
            "freeLine2":"free line 2",
            "freeLine3":"free line 3"
}
```

This object describes all the most common DHCP server configuration options. For a full explanation of each of the fields, see the Detailed API Specification later in this document.

Please note that the object above must be passed to the DHCP system as a JSON-encoded string. It must be passed into the special “_dhcp_attributes” attribute for it to be functional, as in the example URL.

Create DHCP IP Aggregates

For details on how to manage IP aggregates using ProVision's IPAM API, see API Module - IPAM.

Of particular interest to DHCP management is the addition of DHCP aggregates, which are sections of IP space marked as available for use by the DHCPv2 system.

An example command to add a DHCP Aggregate is:

```
[ProVision root]/api/v1/api.php?target=ipam&action=add&block=192.168.0.0/24&rir=
1918&vlan=&tags=&region=&resourceId=1282&allowSubAssignments=true
```

The important part to note is that the IP block is being assigned to resourceId 1282, which corresponds to the DHCP Available resource. The DHCP Available resource is a system-level resource which is used to hold all unassigned DHCP IP addresses. Every instance has its own DHCP Available resource, whose id can be found with the following command:

```
[ProVision root]/api/v1/api.php?target=resource&action=get&slug=dhcp-available
```

New DHCP subnets and hosts draw their IPs from this pool. If there are no IPs in the DHCP Available pool new subnets and hosts will not be able to be created.

DHCP IP aggregates are fetched, updated, split, and deleted using the standard IPAM management API endpoints. Please see the IPAM API Documentation. for details.

Subnets and Hosts

Every DHCP configuration file consists primarily of Subnet and Host declarations, mapping out what IP addresses are available for what purpose. In DHCPv2, DHCP Pools are reusable components that can be attached to several DHCP Servers in order to build flexible, responsive DHCP configurations.

In ProVision DHCPv2 all DHCP Pools regardless of whether they span Subnets or individual Hosts require that a “dhcp_pool” resource be created to govern them.

Similar to how the “dhcp_module” resource was created above, the command to create a DHCP Pool is as follows:

```
[ProVision root]/api/v1/api.php?target=resource&action=add&meta[type]=dhcp_pool &meta[name]=New Subnet&fields
[_dhcp_type][]=subnet&fields[_dhcp_pool_attributes][]={"mac":"","rangeStart":"","rangeEnd":"","freeLines":3,"
freeLine1":"Free Line 1","freeLine2":"Free Line 2","freeLine3":"Free Line 3"}
```

The first half of this command is relatively straightforward:

```
target=resource&action=add&meta[type]=dhcp_pool&meta[name]=New Subnet
```

This section informs the API that we wish to create a new, empty “dhcp_pool” resource whose name is “New Subnet.”

```
fields[_dhcp_type][]=subnet&fields[_dhcp_pool_attributes][]={"mac":"","rangeStart":"", "rangeEnd":"","
freeLines":3,"freeLine1":"Free Line 1","freeLine2":"Free Line 2","freeLine3":"Free Line 3"}
```

The second half of the command behaves in a similar manner to the “dhcp_module.” The “_dhcp_pool_attributes” field holds a JSON-encoded string which describes the dhcp_pool resource. When expanded, the JSON string becomes the following object:

```
{
            "mac":"",
            "rangeStart":"",
            "rangeEnd":"",
            "freeLines":3,
            "freeLine1":"Free Line 1",
            "freeLine2":"Free Line 2",
            "freeLine3":"Free Line 3"
}
```

For a full explanation of each of the fields, see the Detailed API Specification.

> Please note that the object above must be passed to the DHCP system as a JSON-encoded string. It must be passed into the “_dhcp_pool_attributes” attribute for it to be functional, as in the example URL.

Once a dhcp_pool resource is in the system it can be updated with IP data obtained from the IP Management system. Under DHCPv2, the DHCP system uses all the standard IPAM API endpoints and can make use of both the smartAssign and the directAssign methods. Please see the IPAM API documentation for details.
An example command for smart-assigning a DHCP IP range from the DHCP Available resource to a newly-created dhcp_pool resource is as follows:

```
[ProVision root]/api/v1/api.php?target=ipam&action=smartAssign&resourceId=2180&
type=ipv4&mask=31&rir=1918&assignedResourceId=1282
```

In this example we are using the IPAM API endpoint to smart-assign an IPv4 /31 from the DHCP Available resource (resource id 1282) to the newly-created dhcp_pool object (resource id 2180). This action removes this IP range from the available pool and prevents it from being used by other parts of ProVision.

Once an IP block is assigned to a dhcp_pool it should be updated with the proper range start and range end. A Resource Update command is used for this.

```
[ProVision root]/api/v1/api.php?target=resource&action=update&meta[type]=dhcp_pool& meta[name]=Another
Test&fields[_dhcp_type][]=subnet&fields[_dhcp_pool_attributes][]={"mac":"","rangeStart":"10.10.10.4","
rangeEnd":"10.10.10.5","freeLines":3,"freeLine1":"example1","freeLine2":"example2","freeLine3":"example3"}
&fields[_dhcp_ip_id][]=92430&meta[id]=2180
```

The key information here is that the “rangeStart” and the “rangeEnd” fields in the JSON-encoded '_dhcp_pool_attributes' attribute have been populated with the beginning and end of the IP range assigned by smart-assign. Also note that a new field is being populated as '_dhcp_ip_id', which contains the IPAM id of the newly-assigned IP block.

When assigning dhcp_pools covering a single host the steps are much the same, but the 'mac' field in the '_dhcp_pool_attributes' object must be populated with the MAC address of the host in question.

Linking Subnets and Hosts with DHCP Servers

DHCP Pools exist as re-usable components which can be individually assigned to any number of DHCP Servers in order to assemble flexible DHCP Configurations. Once created, a DHCP Pool is not attached to any DHCP Server in the system. DHCP Pools must be linked to a server for the pool to be included in DHCP configuration pushes.

An example of building a link between a dhcp_pool and a DHCP Server is:

```
[ProVision root]/api/v1/api.php?target=resource&action=addLink&resource_id1=2178&
resource_id2=1452&relation=dhcpPoolLink
```

The Resource Linkage system controls which DHCP Pools are associated with a given DHCP Server. In the case of linking a DHCP Pool to a DHCP Server, the relation used is “dhcpPoolLink”. This is a directional link, so it is important that resource_id1 and resource_id2 do not get confused.

```
relation:  "dhcpPoolLink"
resource_id1:  the id of the dhcp_module this pool is being linked to
resource_id2:  the id of the dhcp_pool being linked
```

It is very important that resource_id1 not be confused with resource_id2. The link will not function with the values reversed.

To undo the above and break a DHCP Pool link, use the same command but substitute “deleteLink” for the action “addLink”.

```
[ProVision root]/api/v1/api.php?target=resource&action=deleteLink&resource_id1=2178&
resource_id2=2179&relation=dhcpPoolLink
```

Pushing Configurations

Pushing configuration files and restarting a DHCP server is a fairly straightforward process.

Once the server has been configured according to the previous sections, hitting the following API endpoint will trigger a DHCP push:

```
[ProVision root]/api/v1/api.php?target=dhcp&action=push&id=2178
```

The “id” in the above string is the id of the dhcp_module resource attached to the server you whose configuration is to be pushed. The API return payload will contain success or failure codes, as well as a description of any errors which might have occurred.

When a DHCP configuration file is pushed an SSH connection is opened to the configured server using the user, password, and port supplied to the '_dhcp_attributes' attribute on the dhcp_module resource. If the system successfully connects, it will assemble a DHCP configuration from the information given to the dhcp_module's '_dhcp_attribute' attribute and then parse and add in all linked dhcp_pool resources.

After the assembled file has been transferred to the DHCP server it will be placed in the location given by 'config_path' on the dhcp_module, and then the command described in 'config_test' will be run to determine whether or not this new file parses correctly. If 'config_test' is blank or omitted, this step is skipped.

If the file parses correctly the DHCP will be stopped and restarted according to the 'server_stop' and 'server_start' commands on the DHCP module. If there are errors at any point the system backs out, replaces old config files, and reports the errors via the 'message' return field of the API call.

Detailed API Specification

A detailed listing of API endpoints related to DHCP Servers, Pools, and Links can be found here:

- API Module - DHCPv2

API Module - DHCPv2

- DHCPv2 Module
  - get all DHCP-enabled resources
  - create a new DHCP-enabled resource
  - update a DHCP-enabled resource with new configuration info
  - remove DHCP functionality from a resource
  - get all DHCP Pools
  - create a new DHCP Pool resource
  - update a DHCP Pool
  - delete a DHCP Pool
  - assigning an IP address or blocks to a DHCP Pool
  - get all DHCP Pool linkages
  - add a new DHCP Pool linkage
  - delete DHCP Pool linkages
  - push a DHCP config
  - DHCP search
- Data Attributes
  - _dhcp_attributes
  - _dhcp_pool_attributes

DHCPv2 Module

The DHCPv2 system is built upon the Resource API, so actions relating to DHCP tasks are largely expressed in terms of Resource actions.

This section describes common DHCP tasks and how they are accomplished via the DHCPv2 system.

get all DHCP-enabled resources

Description	Finds all resources from section 'dhcp_module,' which indicates that their parents are DHCP-enabled. Adding in other Resource-Get API parameters can filter this list further.
URL	/api/v1/api.php?target=resource&action=get&type=dhcp_module
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Search successful","data":[{"id":"1432", "name":"1392 DHCP Module" ,"slug":"1392-dhcp-module", "type":"dhcp_module", "parent_id":"1392", "category_id":null, "attr":{"_dhcp_attributes":"{\" type\":\"ISC\", \"notes\":\"\", \"username\":\"\", \"port\":\"\", \"config_test\":\"Vetc\/init.d\/dhcpd configtest\", \" server_stop\":\"Vetc\/init.d\/dhcpd stop\", \"server_start\":\"Vetc\/init.d\/dhcpd start\", \"config_path\":\"\", \" option_routers\":\"\", \"option_domain_name_servers\":\"\", \"option_domain_name\":\"\", \"authoritative\":\" 1\", \"default_lease_time\":\"600\", \"max_lease_time\":\"7200\", \"local_port\":\"67\", \"log_facility\":\"local7\", \" password\":\"\", \"server_ip\":\"10.0.0.0\", \"freeLines\":0}", "_dhcp_config_id":"33"}}], "result_count":1, "found_count":1}
ERROR:	{"success":0, "message":"error message"}

Return Detail:

Name	Type	Description
id	INTEGER	ID of the dhcp_module resource
name	STRING	The name of the dhcp_module
slug	STRING	The unique reference string for this resource
type	STRING	Always 'dhcp_module
parent_id	INTEGER	The resource to which the dhcp_module is attached
category_id	INTEGER	The category to which this dhcp_module is associated
result_count	INTEGER	How many dhcp_modules are returned in this search.

found_count	INTEGER	How many dhcp_modules were found in this query, without pagination.

Attributes:

Key	Type	Description
_dhcp_attributes	JSON	A JSON-encoded string containing all the specific configuration parameters which govern this DHCP server. An expansion of the JSON object is given below in the Data Attributes section.
_dhcp_config_id	INTEGER	A reference to the DHCP Config file written within the system. This field is maintained by the DHCPv2 system itself and should not be set externally.

create a new DHCP-enabled resource

Description	A resource becomes a DHCP-enabled by adding a special "dhcp_module" resource as a child. This action is identical to a normal Resource Create command.
URL	/api/v1/api.php?target=resource&action=add&meta[type]=dhcp_module&meta[name]=2163 DHCP Module&meta[parent_id]=2163
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Resource added","data":{"id": 2165,"name" :"2163 DHCP Module","slug": "2163-dhcp-module-2","type" :"dhcp_module","parent_id": 2163,"category_id": null,"attr":[]}}
ERROR:	{"success":0, "message":"error message"}

Return Detail:

Name	Type	Description
id	INTEGER	ID of the newly created dhcp_module
name	STRING	The name of the dhcp_module
slug	STRING	The unique reference string for this resource
type	STRING	Always 'dhcp_module'
parent_id	INTEGER	The resource to which the dhcp_module is attached
category_id	INTEGER	The category to which this dhcp_module is associated

update a DHCP-enabled resource with new configuration info

Description	Modifying an existing dhcp_module uses the identical commands as all other Resource-Update actions. An example of configuring a DHCP server is given below.
URL	/api/v1/api.php?target=resource&action=update&meta[id]=2178 &meta[type]=dhcp_module&fields[_dhcp_attributes][]={"type":"ISC","notes":"notes go here","username":"username","port":"port","config_test":"/etc/init.d/dhcpd configtest","server_stop":"/etc/init.d/dhcpd stop","server_start":"/etc/init.d/dhcpd start","config_path":"/tmp/dhcpd.conf","option_routers":"192.168.0.0","option_domain_name_servers":"ns1.6connect.com","option_domain_name":"6connect.com","authoritative":"1","default_lease_time":"600","max_lease_time":"7200","local_port":"67","log_facility":"local7","password":"password","server_ip":"192.168.0.1","freeLines":3,"freeLine1":"free line 1","freeLine2":"free line 2","freeLine3":"free line 3"}
Returns	**Examples:**

SUCCESSFUL:	{"success": 1,"message": "Resource Updated","data": {"id":"2166" ,"name":"2163 DHCP Module", "slug":"2163-dhcp-module-3" ,"type":"dhcp_module", "parent_id":"2163", "category_id":null ,"attr":

	{"_dhcp_attributes": "{\"type\":\"ISC\", \"notes\":\"notes go here\", \"username\":\"username\", \"port\":\"port\", \"config_test\":\"\\\/etc\\\/init.d\\\/dhcpd configtest\" ,\"server_stop\":\"\\\/etc\\\/init.d\\\/dhcpd stop\" ,\" server_start\":\"\\\/etc\\\/init.d\\\/dhcpd start\",\"config_path\":\"\\\/tmp\\\/dhcpd.conf\", \"option_routers\":\" 192.168.0.0\", \"option_domain_name_servers\":\"ns1.6connect.com\", \"option_domain_name\":\"6connect. com\", \"authoritative\":\"1\", \"default_lease_time\":\"600\", \"max_lease_time\":\"7200\", \"local_port\":\"67\", \"log_facility\":\"local7\" ,\"password\":\"**********\", \"server_ip\":\"192.168.0.1\", \"freeLines\":3, \"freeLine1\":\" free line 1\", \"freeLine2\":\"free line 2\", \"freeLine3\":\"free line 3\"}"}}}
ERROR:	{"success":0, "message":"error message"}

Return Detail:

Name	Type	Description
id	INTEGER	ID of the newly created dhcp_module
name	STRING	The name of the dhcp_module
slug	STRING	The unique reference string for this resource
type	STRING	Always 'dhcp_module'
parent_id	INTEGER	The resource to which the dhcp_module is attached
category_id	INTEGER	The category to which this dhcp_module is associated

Attributes:

Key	Type	Description
_dhcp_attributes	JSON	A JSON-encoded string containing all the specific configuration parameters which govern this DHCP server. An expansion of the JSON object is given below in the Data Attributes section.

remove DHCP functionality from a resource

Description	To remove DHCP functionality, delete the dhcp_module child resource. This operation uses general Resource->Delete functionality.
URL	/api/v1/api.php?target=resource&action=delete&id=2166
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Deleted 2163-dhcp-module-3 (#2166)"}
ERROR:	{"success":0, "message":"error message"}

get all DHCP Pools

Description	As with the dhcp_module commands, the API endpoints governing DHCP IP Pools use the general Resource system. All the modifiers that can be applied to a Resource-Get can be used to filter this query.
URL	/api/v1/api.php?target=resource&action=get&type=dhcp_pool
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Search successful","data":[{"id":"1482","name":"Blah","slug":"blah","type":" dhcp_pool","parent_id":"1","category_id":null,"attr":{"_dhcp_type":"subnet","_dhcp_pool_attributes":"{\"mac\": \"\",\"rangeStart\":\"13.0.0.0\",\"rangeEnd\":\"13.0.0.255\",\"freeLines\":0}","_dhcp_ip_id":"80902"}}]," result_count":1,"found_count":1}

ERROR:	{"success":0, "message":"error message"}

Return Detail:

Name	Type	Description
id	INTEGER	ID of the dhcp_pool resource
name	STRING	The name of the dhcp_pool
slug	STRING	The unique reference string for this resource
type	STRING	Always 'dhcp_pool'
parent_id	INTEGER	The resource to which the dhcp_pool is attached
category_id	INTEGER	The category to which this dhcp_pool is associated
result_count	INTEGER	How many dhcp_pools are returned in this search.
found_count	INTEGER	How many dhcp_pools were found in this query, without pagination.

Attributes:

Key	Type	Description
_dhcp_type	STRING	Either 'subnet' or 'host'. Determines whether this DHCP Pool is describing a Subnet or a Host.
_dhcp_pool_attributes	JSON	A JSON-encoded string containing all the specific configuration parameters which govern this DHCP Pool. An expansion of the JSON object is given below in the Data Attributes section.
_dhcp_ip_id	INTEGER	The id of the IPAM subnet or host which is assigned to this DHCP Pool

create a new DHCP Pool resource

Description	Uses the general Resource-Add endpoint to create a DHCP Pool resource.
URL	/api/v1/api.php?target=resource& action=add& meta[type]=dhcp_pool& meta[name]=New Subnet& fields[_dhcp_type][]=host& fields[_dhcp_pool_attributes][]={"mac":"aa:bb:cc:dd:ee:ff", "rangeStart":"", "rangeEnd":"", "freeLines":3, "freeLine1":"Free Line 1", "freeLine2":"Free Line 2", "freeLine3":"Free Line 3"}
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Resource added","data":{"id":2167,"name":"New Subnet","slug":"new-subnet"," type":"dhcp_pool ","parent_id":1,"category_id":null,"attr":[]}}
ERROR:	{"success":0, "message":"error message"}

Return Detail:

Name	Type	Description
id	INTEGER	ID of the newly created dhcp_pool
name	STRING	The name of the dhcp_pool
slug	STRING	The unique reference string for this resource
type	STRING	Always 'dhcp_pool'
parent_id	INTEGER	The parent resource; by default the TLR.
category_id	INTEGER	The category to which this dhcp_pool is associated

update a DHCP Pool

Description	Modifying an existing dhcp_pool uses the identical commands as all other Resource-Update actions.
URL	/api/v1/api.php?target=resource& action=update& meta[type]=dhcp_pool& meta[name]=Another Test& fields[_dhcp_type][] =subnet& fields[_dhcp_pool_attributes][]={"mac":"", "rangeStart":"10.10.10.4", "rangeEnd":"10.10.10.5", "freeLines":3, "freeLine1":"example1", "freeLine2":"example2", "freeLine3":"example3"}&fields[_dhcp_ip_id][]=92430&meta[id]=2165
Returns	**Examples:**

SUCCESSFUL:	{"success":1, "message":"Resource Updated", "data":{"id":"2165", "name":"Another Test", "slug":"2163-dhcp-module-2", "type":"dhcp_module", "parent_id":"2163", "category_id":null,"attr":{"_dhcp_type":"subnet" ," _dhcp_pool_attributes":"{\"mac\":\"\", \"rangeStart\":\"10.10.10.4\", \"rangeEnd\":\"10.10.10.5\", \"freeLines\": 3, \"freeLine1\":\"example1\", \"freeLine2\":\"example2\", \"freeLine3\":\"example3\"}", "_dhcp_ip_id":" 92430"}}}
ERROR:	{"success":0, "message":"error message"}

Return Detail:

Name	Type	Description
id	INTEGER	ID of the newly created dhcp_module
name	STRING	The name of the dhcp_module
slug	STRING	The unique reference string for this resource
type	STRING	Always 'dhcp_module'
parent_id	INTEGER	The resource to which the dhcp_module is attached
category_id	INTEGER	The category to which this dhcp_module is associated

Attributes:

Key	Type	Description
_dhcp_type	STRING	Either 'subnet' or 'host'. Determines whether this DHCP Pool is describing a Subnet or a Host.
_dhcp_pool_attributes	JSON	A JSON-encoded string containing all the specific configuration parameters which govern this DHCP Pool. An expansion of the JSON object is given below in the Data Attributes section.
_dhcp_ip_id	INTEGER	The id of the IPAM subnet or host which is assigned to this DHCP Pool

delete a DHCP Pool

Description	To delete a DHCP Pool, use the standard Resource-Delete functionality
URL	/api/v1/api.php?target=resource&action=delete&id=2165
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Deleted 2165-another-subnet-3 (#2165)"}
ERROR:	{"success":0, "message":"error message"}

assigning an IP address or blocks to a DHCP Pool

Description	Assigning IP addresses or blocks to a DHCP Pool resource removes them from the available pool so they cannot be assigned out again. This procedure uses all the standard IPAM assignment functions, so long as the resource assigned **from** is the DHCP Available resource.
URL	/api/v1/api.php?target=ipam&action=smartAssign&resourceId=2162&type=ipv4&mask=31&rir=1918&assignedResourceId=1282
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Assigned 10.8.1.4\/31 to 208.39.104.106 (2162) via Smart Assign","id":94468,"data":{"id":94468,"type":"ipv4","top_aggregate":44616,"cidr":"10.8.1.4\/31","formatted_ip":"10.8.1.4\/31","address":"168296708","end_address":"168296709","mask":31,"netmask":"255.255.255.254","child1":null,"child2":null,"is_assigned":1,"is_swipped":0,"is_aggregate":1,"custid":2162,"resource_id":2162,"resource_name":null,"last_updated_time":"2015-03-15 20:17:32","description":null,"parent":80882,"rir":"1918","lir_id":null,"notes":null,"generic_code":null,"code":null,"region":"Quito","region_name":"Quito","vlan":null,"arin_net_id":null,"arin_cust_id":null,"org_id":null,"arin_swip_time":null,"assigned_time":"2015-03-15 20:17:32","asn":null,"allowSubAssignments":false,"permissions":[],"range":"10.8.1.4 - 10.8.1.5","tags":["DHCP"]}}
ERROR:	{"success":0, "message":"error message"}

Return Detail:

For a detailed breakdown of this endpoint's return data, please see the IPAM documentation.

get all DHCP Pool linkages

Description	The association between DHCP Pools and DHCP Modules belongs to the Resource Linkage family of endpoints. The 'relation' field should be set to the 'dhcpPoolLink' type to pull only DHCP Pool linkage information.
URL	/api/v1/api.php?target=resource&action=getLink&relation=dhcpPoolLink
Returns	**Examples:**

SUCCESSFUL:	{"success":1 ,"message":"Search successful", "data":{"meta":{"totalRecords":"3", "retrieved":3}, "0":{"id":"22", "resource_id1":"1292", "resource_id2":"1302", "relation":"dhcpPoolLink"}, "1":{"id":"2", "resource_id1":"1292", "resource_id2":"1452", "relation":"dhcpPoolLink"}, "2":{"id":"12", "resource_id1":"1422", "resource_id2":"1482", "relation":"dhcpPoolLink"}}}
ERROR:	{"success":0, "message":"error message"}

Return Detail:

Name	Type	Description
id	INTEGER	Id of the pool-module linkage
resource_id1	INTEGER	The id of the dhcp_module resource
resource_id2	INTEGER	The id of the dhcp_pool resource
relation	STRING	The relation type. Always 'dhcpPoolLink'

Meta Attributes:

Name	Type	Description
totalRecords	INTEGER	How many records were found by this query, without pagination.

retrieved	INTEGER	How many records were returned by this query, with pagination.

Optional Attributes:

Name	Type	Description
resultsPerPage	INTEGER	How many records to include per page display.*
page	INTEGER	Which page to display, when used with "resultsPerPage"*
*Example pagination: api.php?target=resource&action=getLink&relation=dhcpPoolLink&resultsPerPage=100&page=2		

add a new DHCP Pool linkage

Description	Adds a new link between a DHCP Pool and a dhcp_module resource. A single pool can be linked to many dhcp_modules, and a single dhcp_module can have any number of linked pools.
URL	/api/v1/api.php?target=resource&action=addLink&resource_id1=1292&resource_id2=2162&relation=dhcpPoolLink
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Resource link added"} ERROR: {"success":0, "message":"error message"} **Data Detail:** resource_id1 (INTEGER) The id of the dhcp_module resource resource_id2 (INTEGER) The id of the dhcp_pool resource relation (STRING) The relation type being added. Always 'dhcpPoolLink'

delete DHCP Pool linkages

Description	Deletes a link between a dhcp_module and a dhcp_pool. Uses the standard Resource Linkage endpoints.
URL	/api/v1/api.php?target=resource&action=deleteLink&id=22
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Resource link(s) deleted."} ERROR: {"success":0, "message":"error message"}

push a DHCP config

Description	Builds a DHCP configuration from the attributes assigned to a dhcp_module and all of the linked dhcp_pools. Pushes that config to the configured DHCP server, tests it against the config parsing function, then restarts the server with the new configuration.

URL	/api/v1/api.php?target=dhcp&action=push&id=1292
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Pushes Attempted.","data":[[1,"1292","381 DHCP Module","Configuration successfully pushed."]]} ERROR: {"success":0, "message":"error message"} **Data Detail** **Name** / **Type** / **Description** id / INTEGER / The id of the dhcp_module resource whose configuration is to be pushed.

DHCP search

Description	Searches DHCP information by name, mac, or IP.
URL	/api/v1/api.php?target=dhcp&action=search&searchType=name&searchValue=Blah /api/v1/api.php?target=dhcp&action=search&searchType=mac&searchValue=22: /api/v1/api.php?target=dhcp&action=search&searchType=ip&searchValue=13.0.0.255
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Search Successful","data":[{"id":"1482","name":"BlahBlah","slug":"blah","type":"dhcp_pool","parent_id":"1","category_id":null,"attr":{"_dhcp_type":"subnet","_dhcp_pool_attributes":"{\"mac\":\"\",\"rangeStart\":\"13.0.0.0\",\"rangeEnd\":\"13.0.0.255\",\"freeLines\":0}","_dhcp_ip_id":"80902"},"dhcp_links":["1422","3673"]}]} ERROR: {"success":0, "message":"error message"} **Return Detail** **Name** / **Type** / **Description** id / INTEGER / ID of the dhcp_module resource name / STRING / The name of the dhcp_module slug / STRING / The unique reference string for this resource type / STRING / Always 'dhcp_pool' parent_id / INTEGER / The resource to which the dhcp_module is attached category_id / INTEGER / The category to which this dhcp_module is associated **Attributes** **Key** / **Type** / **Description** _dhcp_type / STRING / Either 'subnet' or 'host'. Determines whether this DHCP Pool is describing a Subnet or a Host. _dhcp_pool_attributes / JSON / A JSON-encoded string containing all the specific configuration parameters which govern this DHCP Pool. An expansion of the JSON object is given below in the Data Attributes section. _dhcp_ip_id / INTEGER / The id of the IPAM subnet or host which is assigned to this DHCP Pool. _dhcp_links / INTEGER / The id of dhcp links.

Required Parameters

Name	Type	Example	Description
searchType	STRING	name	Type of search performing. Valid values are 'name', 'mac', and 'ip'.
searchValue	STRING	Blah	If searchType is 'IP': searchValue must be a valid IP address or IP Block. if searchType"is 'mac': searchValue must be a full or partial mac address. Not required if searchType is 'name', but is recommended to filter results.

Optional Parameters

Name	Type	Example	Description
selectOffset	INTEGER	10	Start number for the first result to show on the page to set pagination. For example, a selectOffset=15 with a selectCount=10 would return result numbers 15 through 25 on the page. Default value is 0 if not specified.
selectCount	INTEGER	5	The number of results to return on the page, if return results exceed the number of selectCount. Default value is 10
linkedTo	INTEGER	1422	The ID of the resource's DHCP link(s)

Data Attributes

_dhcp_attributes

Description: The _dhcp_attributes data attribute holds the specific settings used to generate a DHCP configuration file, place it on a server via SCP, and restart that server via a SSH session.

Example:

{"type":"ISC", "notes":"notes here", "username":"username", "port":"22", "config_test":"/etc/init.d/dhcpd configtest", "server_stop":"/etc/init.d/dhcpd stop", "server_start":"/etc/init.d/dhcpd start", "config_path":"/tmp/dhcpd.conf", "option_routers":"", "option_domain_name_servers":"", "option_domain_name":"", "authoritative":"1", "default_lease_time":"600", "max_lease_time":"7200", "local_port":"67", "log_facility":"local7", "password":"", "server_ip":"10.0.0.0", "freeLines":0}

Data Description

Name	Type	Description
type	STRING	The type of DHCP server being administered. Currently only 'ISC' is supported.
notes	STRING	Notes associated with this DHCP server
server_ip	STRING	The IP address of the DHCP server
username	STRING	The SSH username employed when transferring the DHCP configuration file to the server.
password	STRING	The SSH password employed when transferring the DHCP configuration file to the server.
port	INTEGER	The SSH port employed when transferring the DHCP configuration file to the server.
config_test	STRING	The command to test if a configuration file parses correctly. ex: /etc/init.d/dhcpd configtest
server_stop	STRING	The command to stop the DHCP server. ex: /etc/init.d/dhcpd stop
server_start	STRING	The command to start the DHCP server. ex: /etc/init.d/dhcpd start
config_path	STRING	Where to place the configuration file on the server.
authoritative	BOOL	Whether or not this DHCP server is authoritative.
default_lease_time	INTEGER	The default lease time for IPs distributed by this DHCP server.
max_lease_time	INTEGER	The max lease time for IPs distributed by this DHCP server.
local_port	INTEGER	The port on which this DHCP server listens

option_routers	STRING	The information which populates the "routers" option in the DHCP configuration
option_domain_name_servers	STRING	The information which populates the "domain_name_servers" option in the DHCP configuration
option_domain_name	STRING	The information which populates the "domain_name" option in the DHCP configuration
log_facility	STRING	The log facility to which this DHCP Server sends its logging information
freeLines	INTEGER	As this system cannot hope to support all the thousands of different DHCP configurations, ProVision's DHCPv2 system includes a mechanism for adding "free lines" to the end of certain DHCP config sections so that administrators can customize their DHCP config file to their needs. The "freeLines" field indicates how many of these lines exist to be inserted after the general server definition section but before the subnets and hosts are enumerated.
freeLine#	STRING	Free line data to be inserted after the general server definition section but before the subnets and hosts are enumerated. There can be multiple instances of this attribute, numbered appropriately. ex: "freeLine1", "freeLine2", "freeLine3", etc. The number of freeLine# entries must match the number in the "freeLines" attribute.

_dhcp_pool_attributes

Description	A JSON-encoded string containing all the specific configuration parameters which govern this DHCP Pool.
Example:	{"mac":"ab:cc:de:ff:aa:bc","rangeStart":"13.0.0.0","rangeEnd":"13.0.0.255","freeLines":1,"freeLines1":"free line"}

Data Description

Name	Type	Description
mac	STRING	Only used when setting up a DHCP Host-type Pool. Holds the MAC address of the system to which the IP will be associated.
rangeStart	STRING	Only used when setting up a DHCP Subnet-type Pool. Holds the beginning of the Subnet range being allocated.
rangeEnd	STRING	Only used when setting up a DHCP Subnet-type Pool. Holds the end of the Subnet range being allocated.
freeLines	INTEGER	As this system cannot hope to support all the thousands of different DHCP configurations, ProVision's DHCPv2 system includes a mechanism for adding "free lines" to the end of certain DHCP config sections so that administrators can customize their DHCP config file to their needs. The "freeLines" field indicates how many of these lines exist to be inserted within the DHCP Pool declaration.
freeLine#	STRING	Free line data to be inserted after the general server definition section but before the subnets and hosts are enumerated. There can be multiple instances of this attribute, numbered appropriately. ex: "freeLine1", "freeLine2", "freeLine3", etc. The number of freeLine# entries must match the number in the "freeLines" attribute.

API Module - DNS

DNS Server Control

ProVision's APIv1 system has been replaced by APIv2, and is now considered deprecated.

- DNS Server Control
  - get
  - add
  - delete
  - update
  - transferServer
  - transferSingle
- DNS Zone Control
  - get
  - search
  - update
  - add
  - delete
  - getRecordTypes
  - getFile
  - getDSFile
  - checkZone
  - getArchivedZone
- DNS Record Control
  - get
  - update
  - add
  - delete
  - switch
- Server-Zone Linkage
  - get
  - add
  - delete
- Name Server Control
  - get
  - add
  - delete
  - setDefault
  - orderUp
  - orderDown

get

URL	/api/v1/api.php?target=dnsServer&action=get
Description	If provided with an id, fetches that DNS Server from the database. If not, fetches a list of all stored DNS Servers
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Fetch Sucessful.","data":[{"id":"10","server":"mrbomasm-dns-4.onnet.net", "username":"user", "password":"vwvddp","port":"2600","customer_name":null,"transfer_type": "SCP"," remote_directory":"zones", "named_conf_path":"\/etc\/zones","active":"1","post_command":null," pre_command":null,"dyn_DNSSEC_contact":null, "powerdns_backend":"Bind","db_username":null," db_password":"(","db_port":null,"db_name":null, "server_type":"slave","SOA":null,"master_id":null,"options": "{\"customer_name\":\"\",\"server_type\":\"slave\" ,\"SOA\":\"\",\"remote_directory\":\"zones\", \" named_conf_path\":\"\\\/etc\\\/zones\", \"dyn_DNSSEC_contact\" :\"\",\"post_command\":\"\" ,\" pre_command\":\"\",\"powerdns_backend\":\"Bind\", \"db_username\":\"\",\"db_password\":\"(\",\"db_port\":\"\", \"db_name\":\"\",\"enable_views\":\"1\"}", "testID":"963","zoneCount":"8","views":"[{\"id\":\"1\", \"server_id\":\" 10\",\"name\":\"_6connectDefault\",\"extras\":\"[]\",\"description\":\"\",\"timestamp\":\"1371789181\"},{\"id\":\"3\", \"server_id\":\"10\",\"name\":\"internal\",\"extras\":\"[]\",\"description\":null,\"timestamp\":\"1374686650\"}]"}]}
ERROR:	{"success":0, "message":"error message"}

Data Detail:

Name	Type	Description
id	INTEGER	Server ID
server	STRING	Server Name
username	STRING	Login Name
password	CRYPT	Login Password
port	INTEGER	Port the Server listens on
zoneCount	INTEGER	The number of zones attached to this server.
options	JSON	The options entry is a JSON-encoded string containing a variety of server-specific configuration options. This string will vary widely by server type and configuration. The following are a selection of common settings.
transfer_type	STRING	Protocol used for transfer of DNS zones and records. Valid settings include SCP, PowerDNS, Secure64, Secure64Signer
server_type	STRING	Whether this server is a master or a slave server
SOA	STRING	The SOA entry to be used for zones on this server
remote_directory	STRING	The directory where SCP will place the zone files.
named_conf_path	STRING	The path to the zone files used within the named.conf file.
pre_command	STRING	The command executed on the server before the zones are transferred
post_command	STRING	The command executed on the server after the transfer is complete
enable_views	INTEGER	Whether or not Views are enabled
views	JSON	The views entry is a JSON-encoded string containing all the information about the Views attached to this server, if any exist.
id	INTEGER	The View ID
server_id	INTEGER	The ID of the server the View is attached to
name	STRING	The name of the View
description	STRING	A description of the View
timestamp	INTEGER	The UNIX timestamp of when the view was created.
extras	JSON	A JSON-encoded array of the extra attributes printed out in the view definition in the config file.

Required Parameters	None
Optional Parameters	

Name	Type	Example	Description
id	INTEGER	15	The server id to fetch.

Example URL	/api/v1/api.php?target=dnsServer&action=get&id=15

add

URL	/api/v1/api.php?target=dnsServer&action=add

Description	Adds a new DNS Server
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Add Successful."} ERROR: {"success":0, "message":"error message"}

Required Parameters

Name	Type	Example	Description
server	STRING	dns.yourdomain.com	IP or FQDN of the DNS Server
password	STRING	password1	Login password for Server
transferType	STRING	SCP	Protocol used for transfer of DNS zones and records. Valid settings include SCP, PowerDNS, Secure64, Secure64Signer
serverType	STRING	Master	Values are 'Master' or 'Slave' only
displayName	STRING	Primary NS	The name displayed representing the DNS server, can be the same as server or different
SOA	STRING	ns1.6connect.com. hostmaster.6connect.com.	Server of Authority record for DNS server

Optional Parameters

These optional parameters vary according to what type of server is being configured.

Name	Type	Example	Description
customerName	STRING	/tmp/zones	Customer Name
remoteDirectory	STRING	/tmp/zones	Zone Directory on Server
port	INTEGER	22	Port for ssh or scp access to server
namedConfPath	STRING	/tmp	The path to the zone files used within the named.conf file.
preCommand	STRING	/path/to/stuff /precommand	Command to execute before zone transfer
postCommand	STRING	/path/to/stuff /postcommand	Command to execute after zone transfer
DNSSECContact	STRING	joeuser	For use with Dyn dns service
username	STRING	bobuser	Login name for Server
active	INTEGER	0	Values 0 or 1 only, sets the server to inactive on 0 value
masterId	INTEGER	53	Master server ID. If a server is a slave, masterId points to its master.
powerDNSBackend	STRING	Bind or MySQL	pDNS server backend type
dbDatabaseName	STRING	pdns_1	DB name for pDNS servers with MySQL powerDNSBackend type
dbPort	INTEGER	3306	Port for for pDNS servers with MySQL powerDNSBackend type
dbUsername	STRING	someuser	DB username for pDNS servers with MySQL powerDNSBackend type
dbPassword	STRING	somepass	DB password for pDNS servers with MySQL powerDNSBackend type

Example URL

/api/v1/api.php?target=dnsServer&action=add&server=dns.yourdomain.com&transferType=Secure64&displayName=PrimaryNS&serverType=master&password=password1&SOA=ns1.6connect.com.+hostmaster.6connect.com.

delete

URL	/api/v1/api.php?target=dnsServer&action=delete
Description	Deletes a DNS Server
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Delete Successful."} ERROR: {"success":0, "message":"error message"}
Required Parameters	**Name** / **Type** / **Example** / **Description** id / INTEGER / 5 / ID of server to delete
Optional Parameters	None
Example URL	/api/v1/api.php?target=dnsServer&action=delete&id=5

update

URL	/api/v1/api.php?target=dnsServer&action=update
Description	Updates an existing DNS Server with new information.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Update Successful."} ERROR: {"success":0, "message":"error message"}

Required Parameters

Name	Type	Example	Description
id	INTEGER	5	ID of server
server	STRING	dns.yourdomain.com	IP or FQDN of the DNS Server
SOA	STRING	ns1.6connect.com. hostmaster.6connect. com.	Server of Authority record for DNS server
transferType	STRING	SCP	Protocol used for transfer of DNS zones and records. Valid settings include SCP, PowerDNS, Secure64, Secure64Signer

Optional Parameters

These optional parameters vary according to what type of server is being configured.

Name	Type	Example	Description
active	INTEGER	0	Values 0 or 1 only, sets the server to inactive on 0 value
customerName	STRING	/tmp/zones	Customer Name
dbDatabaseName	STRING	pdns_1	DB name for pDNS servers with MySQL powerDNSBackend type
dbPassword	STRING	somepass	DB password for pDNS servers with MySQL powerDNSBackend type
dbPort	INTEGER	3306	Port for for pDNS servers with MySQL powerDNSBackend type
dbUsername	STRING	someuser	DB username for pDNS servers with MySQL powerDNSBackend type
displayName	STRING	Primary NS	The name displayed representing the DNS server, can be the same as server or different
DNSSECContact	STRING	joeuser	For use with Dyn dns service
enable_views	INTEGER	1	Whether or not Views are enabled. Valid values are '1' for enable or

			'0' for do not enable
masterId	INTEGER	53	Master server ID. If a server is a slave, masterId points to its master.
namedConfPath	STRING	/tmp	The path to the zone files used within the named.conf file.
password	STRING	password1	Login password for Server
port	INTEGER	22	Port for ssh or scp access to server
powerDNSBackend	STRING	Bind or MySQL	pDNS server backend type
postCommand	STRING	/path/to/stuff /postcommand	Command to execute after zone transfer
preCommand	STRING	/path/to/stuff /precommand	Command to execute before zone transfer
remoteDirectory	STRING	/tmp/zones	Zone Directory on Server
serverType	STRING	Master	Values are 'Master' or 'Slave' only
username	STRING	bobuser	Login name for Server

Example URL	/api.php?target=dnsServer&action=update&id=74&transferType=SCP&server=dns.yourdomain.com&SOA=ns1.6connect.com.+hostmaster.6connect.com.

transferServer

URL	/api/v1/api.php?target=dnsServer&action=transferServer
Description	Performs a full zone push on a DNS Server, executing pre and post commands, transferring files, and restarting services.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Transfer Successful."} ERROR: {"success":0, "message":"error message"}
Required Parameters	**Name** / **Type** / **Example** / **Description** push / INTEGER / 1 / The ID of the server to push zones to
Optional Parameters	None
Example URL	/api/v1/api.php?target=dnsServer&action=transferServer&push=1

transferSingle

URL	/api/v1/api.php?target=dnsServer&action=transferSingle
Description	Transfers a single Zone file to all its associated DNS Servers, along with updated server configurations. Performs pre and post commands on the target servers, transfers the zone file(s), and restarts services.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Updated Zone: $name.zone on $server via SCP"} ERROR: {"success":0, "message":"error message"}
Required Parameters	**Name** / **Type** / **Example** / **Description** zoneId / INTEGER / 35 / The ID of the zone to push

Optional Parameters	None
Example URL	/api/v1/api.php?target=dnsServer&action=transferSingle&zoneId=35

DNS Zone Control

get

URL	/api/v1/api.php?target=zone&action=get
Description	Accepts search criteria to retrieve a list of all matching DNS Zones and associated Records. Search can be performed on any combination of Zone and Record attributes.
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Search Successful.","data":[{"zoneId":"932","zoneName":"185.160.209.in-addr.arpa","zoneResourceId":"81", "zoneSerial":"2013040302","zoneRefresh":"28800","zoneRetry":"7200","zoneExpire":"604800","zoneMinimum":"86400","zoneSOA":null, "zoneTTL":"28800","zoneAutoCheck":"1","zoneEnableDNSSEC":null,"recordId":"154110","recordZoneId":"932", "recordHost": "185.160.209.inaddr.arpa.","recordType":"NS","recordValue":"auth01.veroxity.net.","recordDescription":null,"recordTTL":"28800", "recordOrdering":"1", "recordErrors":null,"assetId":"0","userCanCreate":0,"userCanDelete":1,"userCanUpdate":1}]}
ERROR:	{"success":0, "message":"error message"}

Data Detail:

Name	Type	Description
zoneId	INTEGER	The Id of the Zone entry. A single Zone entry might have multiple Records.
zoneName	STRING	The Zone name.
zoneResourceId	INTEGER	The resource Id associated with this Zone.
zoneSerial	INTEGER	Zone Serial.
zoneRefresh	INTEGER	Zone Refresh.
zoneRetry	INTEGER	Zone Retry.
zoneExpire	INTEGER	Zone Expire.
zoneMinimum	INTEGER	Zone Minimum.
zoneSOA	STRING	Zone SOA.
zoneTTL	STRING	Zone TTL.
zoneEnableDNSSEC	BOOL	Whether or not DNSSEC is enabled for this Zone.
zoneAutoCheck	BOOL	Whether or not this zone is configured to be automatically validated on load/edit.
recordId	INTEGER	The Id of this Record Entry. It is always included with its parent Zone.
recordHost	STRING	The Hostname of this Record.
recordType	STRING	The Record Type (MX,NS,A,PTR,etc)
recordValue	STRING	The Value of this Record.
recordDescription	STRING	A short description of this Record.

recordTTL	STRING	The TTL of this Record.
recordOrdering	INTEGER	The numerical order in which the record appears in the zone.
recordErrors	STRING	A string containing any detected problems with this record
userCanCreate	BOOL	Whether or not the user has DNS CREATE permissions on this zone's resource
userCanUpdate	BOOL	Whether or not the user has DNS UPDATE permissions on this zone's resource
userCanDelete	BOOl	Whether or not the user has DNS DELETE permissions on this zone's resource
unpagedRows	INTEGER	If pagination is used, this value will contain a total count of records had the pagination not been used.

Required Parameters: None

Optional Parameters:

Name	Type	Example	Description
likeFlag	BOOL	1	When 1, string searches are done via LIKE with wildcards at both ends. When 0, strict comparison is used.
generalFlag	BOOL	1	When 1, searches over the provided parameters using OR. If 0 or omitted, uses AND.
selectCount	INTEGER	30	When supplied only returns the first X entries

Name	Type	Example	Description
zoneId	INTEGER	123	The Zone Id to search for.
zoneName	STRING	foo	The Zone Name to search for.
zoneResourceId	INTEGER	5	The Resource Id to search for.
zoneSerial	INTEGER	2012033001	The Zone Serial to search for.
zoneRefresh	INTEGER	36000	The Zone Refresh to search for.
zoneRetry	INTEGER	800	The Zone Retry to search for.
zoneExpire	INTEGER	6090000	The Zone Expire to search for.
zoneMinimum	INTEGER	10	The Zone Minimum to search for.
zoneSOA	STRING	200	The Zone SOA to search for.
zoneTTL	INTEGER	3600	The Zone TTL to search for.
zoneEnableDNSSEC	INTEGER	1	Search based on DNSSEC settings.
recordId	INTEGER	123	The Record Id to search for.
recordZoneId	INTEGER	123	The parent Zone to search for.
recordHost	STRING	@	The Record Host to search for.
recordType	STRING	NS	The Record Type to search for.
recordValue	STRING	ns1.dns.6connect.com.	The Record Value to search for.
recordDescription	STRING	Description	Search based on Record Description.
recordTTL	STRING	3600	The Record TTL to search for.

Example URL: /api/v1/api.php?target=zone&action=get&zoneId=123

search

URL: /api/v1/api.php?target=zone&action=search

Description	Accepts search criteria to retrieve a list of all matching DNS Zones but NO associated Records. Search can be performed on any combination of Zone and Record attributes.
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Search Successful.","data":[{"zoneId":"123","zoneName":"foobs.net","zoneResourceId":"483","zoneIpver":null,"zoneMask":null,"zoneSerial":"2012121803","zoneRefresh":null,"zoneRetry":null,"zoneExpire":null,"zoneMinimum":null,"zoneSOA":null,"zoneTTL":"3600","zoneEnableDNSSEC":"1","zoneLocalSigning":"1","assetId":"0","recordCount":"1","unpagedRows":"215"}]}
ERROR:	{"success":0, "message":"error message"}

Data Detail:

Name	Type	Description
zoneId	INTEGER	The Id of the Zone entry. A single Zone entry might have multiple Records.
zoneName	STRING	The Zone name.
zoneResourceId	INTEGER	The resource Id associated with this Zone.
zoneSerial	INTEGER	Zone Serial.
zoneRefresh	INTEGER	Zone Refresh.
zoneRetry	INTEGER	Zone Retry.
zoneExpire	INTEGER	Zone Expire.
zoneMinimum	INTEGER	Zone Minimum.
zoneSOA	STRING	Zone SOA.
zoneTTL	STRING	Zone TTL.
zoneEnableDNSSEC	BOOL	Whether or not DNSSEC is enabled for this Zone.
zoneAutoCheck	BOOL	Whether or not this zone is configured to be automatically validated on load/edit.
recordCount	INTEGER	How many records are associated with this zone.
userCanCreate	BOOL	Whether or not the user has DNS CREATE permissions on this zone's resource
userCanUpdate	BOOL	Whether or not the user has DNS UPDATE permissions on this zone's resource
userCanDelete	BOOl	Whether or not the user has DNS DELETE permissions on this zone's resource
unpagedRows	INTEGER	If pagination is used, this value will contain a total count of records had the pagination not been used.

Required Parameters	None
Optional Parameters	

Name	Type	Example	Description
likeFlag	BOOL	1	When 1, string searches are done via LIKE with wildcards at both ends. When 0, strict comparison is used.
generalFlag	BOOL	1	When 1, searches over the provided paramenters using OR. If 0 or omitted, uses AND.
selectCount	INTEGER	30	When supplied only returns the first X entries
selectOffset	INTEGER	10	When supplied, only returns entries after record X
sortArray	JSON	{"zoneName":"desc","zoneMask":"asc"}	A JSON-encoded object containing a list of columns to sort on and the direction in which to sort. Any API variable may be used for sorting. Valid sort directions are ASC and DESC.

Name	Type	Example	Description
zoneId	INTEGER	123	The Zone Id to search for.
zoneName	STRING	foo	The Zone Name to search for.
zoneResourceId	INTEGER	5	The Resource Id to search for.
zoneSerial	INTEGER	2012033001	The Zone Serial to search for.
zoneRefresh	INTEGER	36000	The Zone Refresh to search for.
zoneRetry	INTEGER	800	The Zone Retry to search for.
zoneExpire	INTEGER	6090000	The Zone Expire to search for.
zoneMinimum	INTEGER	10	The Zone Minimum to search for.
zoneSOA	STRING	200	The Zone SOA to search for.
zoneTTL	INTEGER	3600	The Zone TTL to search for.
zoneEnableDNSSEC	INTEGER	1	Search based on DNSSEC settings.
recordId	INTEGER	123	The Record Id to search for.
recordZoneId	INTEGER	123	The parent Zone to search for.
recordHost	STRING	@	The Record Host to search for.
recordType	STRING	NS	The Record Type to search for.
recordValue	STRING	ns1.dns.6connect.com.	The Record Value to search for.
recordDescription	STRING	Description	Search based on Record Description.
recordTTL	STRING	3600	The Record TTL to search for.

Example URL	/api/v1/api.php?target=zone&action=search&zoneId=123

update

URL	/api/v1/api.php?target=zone&action=update
Description	First performs a search based on the submitted Zone and Record criteria, then performs an Update across those entries based on new values.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Update Successful."} ERROR: {"success":0, "message":"error message"}
Required Parameters	None
Optional Parameters	

Name	Type	Example	Description
likeFlag	BOOL	1	When 1, string searches are done via LIKE with wildcards at both ends. When 0, strict comparison is used.
generalFlag	BOOL	1	When 1, searches over the provided parameters using OR. If 0 or omitted, uses AND.

Name	Type	Example	Description
searchZoneId	INTEGER	123	The Zone Id to search for.
searchZoneName	STRING	foo	The Zone Name to search for.
searchZoneResourceId	INTEGER	5	The Resource Id to search for.

searchZoneSerial	INTEGER	2012033001	The Zone Serial to search for.
searchZoneRefresh	INTEGER	36000	The Zone Refresh to search for.
searchZoneRetry	INTEGER	800	The Zone Retry to search for.
searchZoneExpire	INTEGER	6090000	The Zone Expire to search for.
searchZoneMinimum	INTEGER	10	The Zone Minimum to search for.
searchZoneSOA	STRING	200	The Zone SOA to search for.
searchZoneTTL	INTEGER	3600	The Zone TTL to search for.
searchZoneEnableDNSSEC	INTEGER	1	Search based on DNSSEC settings.
searchRecordId	INTEGER	123	The Record Id to search for.
searchRecordHost	STRING	@	The Record Host to search for.
searchRecordType	STRING	NS	The Record Type to search for.
searchRecordValue	STRING	ns1.dns.6connect.com.	The Record Value to search for.
searchRecordDescription	STRING	Description	Search based on Record Description.
searchRecordTTL	STRING	3600	The Record TTL to search for.

Name	Type	Example	Description
updateZoneName	STRING	foo	The Zone name to replace into the searched rows.
updateZoneSerial	INTEGER	2012033001	The Zone Serial to replace into the searched rows.
updateZoneRefresh	INTEGER	36000	The Zone Refresh to replace into the searched rows.
updateZoneRetry	INTEGER	800	The Zone Retry to replace into the searched rows..
updateZoneExpire	INTEGER	6090000	The Zone Expire to replace into the searched rows.
updateZoneMinimum	INTEGER	10	The Zone Minimum to replace into the searched rows.
updateZoneSOA	STRING	200	The Zone SOA to replace into the searched rows.
updateZoneTTL	INTEGER	3600	The Zone TTL to replace into the searched rows.
updateZoneEnableDNSSEC	INTEGER	1	Update DNSSEC Settings.
updateRecordHost	STRING	@	The Record Host to replace into the searched rows.
updateRecordType	STRING	NS	The Record Type to replace into the searched rows.
updateRecordValue	STRING	ns1.dns. 6connect.com.	The Record Value to replace into the searched rows.
updateRecordDescription	STRING	Description	Update Record Descriptions.
updateRecordTTL	STRING	3600	The Record TTL to replace into the searched rows.
updateZoneAutoCheck	BOOL	1	Whether or not this zone is configured to be automatically validated on load/edit.

Name	Type	Example	Description
recordZoneId	INTEGER	123	The parent zone ID

Example URL	/api/v1/api.php?target=zone&action=update&searchZoneId=123&updateZoneExpire=6090000

add

URL	/api/v1/api.php?target=zone&action=add
Description	Adds a new DNS Zone.
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Add Successful.","data":123}
ERROR:	{"success":0, "message":"error message"}

Data Detail:

Name	Type	Description
data	INTEGER	The Id of the new Zone entry.

Required Parameters

Name	Type	Example	Description
zoneName	STRING	254.221.67.in-addr.arpa	The name for the new Zone.

Optional Parameters

Name	Type	Example	Description
likeFlag	BOOL	1	When 1, string searches are done via LIKE with wildcards at both ends. When 0, strict comparison is used.
zoneIpver	STRING	IPv6	The IP Version.
zoneLocalSigning	BOOL	1	Whether or not this zone should be signed by the ProVision server when DNSSEC is enabled. If set to false, ProVision will deliver the zone unsigned to the DNS server and the signing / updating process should be triggered by the post-push command
zoneSerial	INTEGER	2012033001	Serial for the new Zone.
zoneRefresh	INTEGER	36000	Refresh for the new Zone.
zoneRetry	INTEGER	800	Retry for the new Zone.
zoneExpire	INTEGER	6090000	Expire for the new Zone.
zoneMinimum	INTEGER	10	Minimum for the new Zone.
zoneSOA	STRING	200	SOA for the new Zone.
zoneTTL	STRING	3600	TTL for the new Zone.
zoneEnableDNSSEC	INTEGER	1	Whether or not this new zone uses DNSSEC.

Example URL: /api/v1/api.php?target=zone&action=add&zoneName=254.221.67.in-addr.arpa&zoneSerial=2012033001

delete

URL	/api/v1/api.php?target=zone&action=delete
Description	Performs a search over the Zones and Records dataset and deletes all found Zones, plus all associated Records of those Zones.
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Zones and Associated Records Deleted."}
ERROR:	{"success":0, "message":"error message"}

Required Parameters	No specific parameter is required, however, one or more optional parameters must be used for a successful return

Optional Parameters

Name	Type	Example	Description

deleteZoneId	INTEGER	123	The Zone Id to search for.
deleteZoneName	STRING	foo	The Zone Name to search for.
deleteZoneResourceId	INTEGER	5	The Resource Id to search for.
deleteZoneSerial	INTEGER	2012033001	The Zone Serial to search for.
deleteZoneRefresh	INTEGER	36000	The Zone Refresh to search for.
deleteZoneRetry	INTEGER	800	The Zone Retry to search for.
deleteZoneExpire	INTEGER	6090000	The Zone Expire to search for.
deleteZoneMinimum	INTEGER	10	The Zone Minimum to search for.
deleteZoneSOA	STRING	200	The Zone SOA to search for.
deleteZoneTTL	INTEGER	3600	The Zone TTL to search for.
deleteZoneEnableDNSSEC	INTEGER	1	Search based on DNSSEC settings.
deleteRecordId	INTEGER	123	The Record Id to search for.
deleteRecordHost	STRING	@	The Record Host to search for.
deleteRecordType	STRING	NS	The Record Type to search for.
deleteRecordValue	STRING	ns1.dns.6connect.com.	The Record Value to search for.
deleteRecordDescription	STRING	Description	Search based on Record Description.
deleteRecordTTL	STRING	3600	The Record TTL to search for.
deleteRecordZoneId	INTEGER	123	The parent zone ID

Example URL	/api/v1/api.php?target=zone&action=delete&deleteZoneId=123

getRecordTypes

URL	/api/v1/api.php?target=zone&action=getRecordTypes
Description	Returns a list of all Record Types allowed by the system.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Search Successful.","data":[{"recordType":"A"},{"recordType":"AAAA"},{"recordType":"MX"},{"recordType":"CNAME"},{"recordType":"PTRG"},{"recordType":"NS"},{"recordType":"TXT"},{"recordType":"DNSKEY"},{"recordType":"SRV"},{"recordType":"DS"},{"recordType":"TEST"}]} ERROR: {"success":0, "message":"error message"} **Data Detail:** **Name** / **Type** / **Description** recordType / STRING / A Record Type
Required Parameters	None
Optional Parameters	None
Example URL	/api/v1/api.php?target=zone&action=getRecordTypes

getFile

URL	/api/v1/api.php?target=zone&action=getFile&zoneId=50
Description	Returns a fully written zone file. If one does not exist, returns false.
Returns	A Zone File
Required Parameters	

Name	Type	Example	Description
zoneId	INTEGER	50	The Id of the zone to retrieve.
format	ENUMERATED	'html' or ''	If html, the zone file will be formatted for display via a web browser. If blank or omitted, the zone file will be formatted for display in a file system.
unsigned	BOOL	1	For a DNSSEC-enabled zone, determines whether or not the system retrieves the signed or unsigned zone file. Ignored for non-DNSSEC zones.

Optional Parameters	None
Example URL	/api/v1/api.php?target=zone&action=getFile&zoneId=50&zoneId=50&format=html&unsigned=1

getDSFile

URL	/api/v1/api.php?target=zone&action=getDSFile
Description	Returns a fully written zone DS key file. If one does not exist, returns false.
Returns	A Zone DS Key File
Required Parameters	

Name	Type	Example	Description
zoneId	INTEGER	50	The Id of the zone whose DS keys are to be retrieved.

Optional Parameters	None
Example URL	/api/v1/api.php?target=zone&action=getDSFile&zoneId=50

checkZone

URL	/api/v1/api.php?target=zone&action=checkZone
Description	Runs a zone file through Named checkzone
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"No errors found."}
ERROR:	{"success":0,"message":"21: ignoring out-of-zone data (veggie.com) 22: ignoring out-of-zone data (veggie.com) dns_rdata_fromtext: 23: near '2001:db8:': bad IPv6 address dns_rdata_fromtext: 24: near '1.2.3.': bad dotted quad dns_rdata_fromtext: 25: near '2001::db8::\/32': bad IPv6 address "}

Required Parameters	

Name	Type	Example	Description
zoneId	INTEGER	50	The Id of the zone to check.

Optional Parameters	None
Example URL	/api/v1/api.php?target=zone&action=checkZone&zoneId=50

getArchivedZone

URL	/api/v1/api.php?target=zone&action=getArchivedZone
Description	Searches for all archived versions of the a zone. Zones are archived every time changes are pushed to their DNS Server.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Search Successful.","data":[{"zoneArchiveId" :"2768","zoneId":"1227", "zoneArchiveTimestamp":"1375298692", "zoneArchiveFingerprint":" d060e59d69606326d80b2e55b50f0bc9","zoneName":"6connect.com","zoneIpver":null, "zoneMask":null," zoneSerial": "2013073105","zoneRefresh":"14400","zoneRetry":"2000","zoneExpire":"604800", "zoneMinimum":"3600", "zoneSOA":null,"zoneTTL":"3600","zoneEnableDNSSEC":"1", "zoneResourceId":" 1013","zonePreviousViewLinkage":"[]"}]} ERROR: {"success":0, "message":"error message"} **Data Detail:**

Name	Type	Description
zoneId	INTEGER	The Id of the Zone entry to find archived versions of.
zoneArchiveId	INTEGER	The ID of the Archive Entry
zoneArchiveTimestamp	INTEGER	A timestamp marking when this zone was archived.
zoneArchiveFingerprint	STRING	A hash value identifying this zone. Used for comparing versions.
zoneName	INTEGER	Zone Name.
zoneSerial	INTEGER	Zone Serial.
zoneRefresh	INTEGER	Zone Refresh.
zoneRetry	INTEGER	Zone Retry.
zoneExpire	INTEGER	Zone Expire.
zoneMinimum	INTEGER	Zone Minimum.
zoneSOA	STRING	Zone SOA.
zoneTTL	INTEGER	Zone TTL.
zoneEnableDNSSEC	STRING	Whether or not this version had DNSSEC enabled.
zoneResourceId	STRING	Zone Resource ID
zonePreviousViewLinkage	JSON	A JSON-encoded array of views this zone was linked to.

Required Parameters	None
Optional Parameters	

Name	Type	Example	Description
zoneId	INTEGER	123	The Zone Id to search for.
zoneArchiveId	INTEGER	123	The Zone Archive Id
zoneArchiveTimestamp	INTEGER	2012033001	The Zone Archive Timestamp
fetchArchiveFile	BOOL	1	Whether or not to return the full Zone file with the result set..

Example URL	/api/v1/api.php?target=zone&action=getArchivedZone&zoneId=123

DNS Record Control

get

URL	/api/v1/api.php?target=record&action=get
Description	Accepts search criteria to retrieve a list of all matching DNS Records. Search can be performed on any combination of Zone and Record attributes.

Returns

Examples:

SUCCESSFUL:	{"success":1,"message":"Search Successful.","data":[{"recordId":"30894","recordZoneId":"229","recordHost":"@","recordType":"NS","recordValue":"ns1.domain.com.","recordDescription":"","recordTTL":""}]}
ERROR:	{"success":0, "message":"error message"}

Data Detail:

Name	Type	Description
recordId	INTEGER	The ID of this Record Entry. It is always included with its parent Zone.
recordZoneId	INTEGER	The ID of this Record's parent Zone.
recordHost	STRING	The Hostname of this Record.
recordType	STRING	The Record Type (MX,NS,A,PTR,etc)
recordValue	STRING	The Value of this Record.
recordDescription	STRING	A short description of this Record.
recordTTL	STRING	The TTL of this Record.

Required Parameters: None

Optional Parameters

Name	Type	Example	Description
likeFlag	BOOL	1	When 1, string searches are done via LIKE with wildcards at both ends. When 0, strict comparison is used.
selectCount	INTEGER	30	When supplied only returns the first X entries
selectOffset	INTEGER	10	When supplied, only returns entries after record X

Name	Type	Example	Description
recordId	INTEGER	123	The Record ID to search for.
recordZoneId	INTEGER	123	The parent Zone to search for.
recordHost	STRING	@	The Record Host to search for.
recordType	STRING	NS	The Record Type to search for.
recordValue	STRING	ns1.dns.6connect.com.	The Record Value to search for.
recordDescription	STRING	Description	Search based on Record Description.
recordTTL	STRING	3600	The Record TTL to search for.

Name	Type	Example	Description
zoneId	INTEGER	123	The Zone Id to search for.
zoneName	STRING	foo	The Zone Name to search for.

zoneResourceId	INTEGER	5	The Resource Id to search for.
zoneCustName	STRING	foo	The Customer Name to search for.
zoneIpver	STRING	IPv6	The IP Version to search for.
zoneSerial	INTEGER	2012033001	The Zone Serial to search for.
zoneRefresh	INTEGER	36000	The Zone Refresh to search for.
zoneRetry	INTEGER	800	The Zone Retry to search for.
zoneExpire	INTEGER	6090000	The Zone Expire to search for.
zoneMinimum	INTEGER	10	The Zone Minimum to search for.
zoneSOA	STRING	200	The Zone SOA to search for.
zoneTTL	INTEGER	3600	The Zone TTL to search for.
zoneEnableDNSSEC	INTEGER	1	Search based on DNSSEC settings.

Example URL	/api/v1/api.php?target=record&action=get&selectCount=30&zoneId=123

update

URL	/api/v1/api.php?target=record&action=update
Description	First performs a search based on the submitted Zone and Record criteria, then performs an Update across those entries based on new values.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Update Successful."} ERROR: {"success":0, "message":"error message"}
Required Parameters	None
Optional Parameters	

Name	Type	Example	Description
likeFlag	BOOL	1	When 1, string searches are done via LIKE with wildcards at both ends. When 0, strict comparison is used.
generalFlag	BOOL	1	When 1, searches over the provided parameters using OR. If 0 or omitted, uses AND.

Name	Type	Example	Description
searchZoneId	INTEGER	123	The Zone ID to search for.
searchZoneName	STRING	foo	The Zone Name to search for.
searchZoneCustId	INTEGER	5	The Customer ID to search for.
searchZoneSerial	INTEGER	2012033001	The Zone Serial to search for.
searchZoneRefresh	INTEGER	36000	The Zone Refresh to search for.
searchZoneRetry	INTEGER	800	The Zone Retry to search for.
searchZoneExpire	INTEGER	6090000	The Zone Expire to search for.
searchZoneMinimum	INTEGER	10	The Zone Minimum to search for.
searchZoneSOA	STRING	200	The Zone SOA to search for.
searchZoneTTL	INTEGER	3600	The Zone TTL to search for.
searchZoneEnableDNSSEC	INTEGER	1	Search based on DNSSEC settings.

searchRecordId	INTEGER	123	The Record ID to search for.
searchRecordHost	STRING	@	The Record Host to search for.
searchRecordType	STRING	NS	The Record Type to search for.
searchRecordValue	STRING	ns1.dns.6connect.com.	The Record Value to search for.
searchRecordDescription	STRING	Description	Search based on Record Description.
searchRecordTTL	STRING	3600	The Record TTL to search for.
searchZoneResourceId	INTEGER	5	The Resource Id to search for.
searchRecordZoneId	INTEGER	123	The Zone ID of the Record to search for.

Name	Type	Example	Description
updateZoneName	STRING	foo	The Zone name to replace into the searched rows.
updateZoneSerial	INTEGER	2012033001	The Zone Serial to replace into the searched rows.
updateZoneRefresh	INTEGER	36000	The Zone Refresh to replace into the searched rows.
updateZoneRetry	INTEGER	800	The Zone Retry to replace into the searched rows..
updateZoneExpire	INTEGER	6090000	The Zone Expire to replace into the searched rows.
updateZoneMinimum	INTEGER	10	The Zone Minimum to replace into the searched rows.
updateZoneSOA	STRING	200	The Zone SOA to replace into the searched rows.
updateZoneTTL	INTEGER	3600	The Zone TTL to replace into the searched rows.
updateZoneEnableDNSSEC	INTEGER	1	Update DNSSEC Settings.
updateRecordHost	STRING	@	The Record Host to replace into the searched rows.
updateRecordType	STRING	NS	The Record Type to replace into the searched rows.
updateRecordValue	STRING	ns1.dns. 6connect.com.	The Record Value to replace into the searched rows.
updateRecordDescription	STRING	Description	Update Record Descriptions.
updateRecordTTL	STRING	3600	The Record TTL to replace into the searched rows.
updateZoneResourceId	INTEGER	5	The Resource Id to replace into the searched rows.
updateZoneAutoCheck	BOOL	1	Whether or not this zone is configured to be automatically validated on load/edit.

Example URL	/api/v1/api.php?target=record&action=update&searchZoneId=123&updateZoneTTL=3600

add

URL	/api/v1/api.php?target=record&action=add
Description	Adds a new Record to a supplied Zone.
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Add Successful.","data":123}
ERROR:	{"success":0, "message":"error message"}

Data Detail:

Name	Type	Description
data	INTEGER	The ID of the new Record entry.

Required Parameters

Name	Type	Example	Description
newRecordZoneId	INTEGER	123	The Zone ID of the new Record.
newRecordHost	STRING	@	New Host Name.
newRecordType	STRING	PTR	New Record Type.
newRecordValue*	STRING	123	New Record Value.
*newRecordValue required only for certain Record Types			

Optional Parameters

Name	Type	Example	Description
likeFlag	BOOL	1	When 1, string searches are done via LIKE with wildcards at both ends. When 0, strict comparison is used.
newRecordDescription	STRING	Description.	Notes for the Record.
newRecordTTL	INTEGER	3600	Record TTL.

Example URL: /api/v1/api.php?target=record&action=add&newRecordZoneId=123&newRecordHost=@host&newRecordType=PTR&newRecordTTL=3600

delete

URL: /api/v1/api.php?target=record&action=delete

Description: Performs a search over the Zones and Records dataset and deletes all found Records, but leaves their parent Zones intact.

Returns

Examples:

SUCCESSFUL:	{"success":1,"message":"Deletion Successful."}
ERROR:	{"success":0, "message":"error message"}

Required Parameters: None

Optional Parameters

Name	Type	Example	Description
deleteZoneId	INTEGER	123	The Zone ID to search for.
deleteZoneName	STRING	foo	The Zone Name to search for.
deleteZoneCustId	INTEGER	5	The Customer ID to search for.
deleteZoneIpver	STRING	IPv6	The IP Version to search for.
deleteZoneSerial	INTEGER	2012033001	The Zone Serial to search for.
deleteZoneRefresh	INTEGER	36000	The Zone Refresh to search for.
deleteZoneRetry	INTEGER	800	The Zone Retry to search for.
deleteZoneExpire	INTEGER	6090000	The Zone Expire to search for.
deleteZoneMinimum	INTEGER	10	The Zone Minimum to search for.
deleteZoneSOA	STRING	200	The Zone SOA to search for.
deleteZoneTTL	INTEGER	3600	The Zone TTL to search for.
deleteZoneEnableDNSSEC	INTEGER	1	Search based on DNSSEC settings.
deleteRecordId	INTEGER	123	The Record ID to search for.
deleteRecordHost	STRING	@	The Record Host to search for.

deleteRecordType	STRING	NS	The Record Type to search for.
deleteRecordValue	STRING	ns1.dns.6connect.com.	The Record Value to search for.
deleteRecordDescription	STRING	Description	Search based on Record Description.
deleteRecordTTL	STRING	3600	The Record TTL to search for.
deleteZoneResourceId	INTEGER	5	The Resource Id to search for.
deleteZoneCustName	STRING	foo	The Customer Name to search for.

Example URL	/api/v1/api.php?target=record&action=delete&deleteZoneName=foo

switch

URL	/api/v1/api.php?target=record&action=switch
Description	Switches the order of two record entries.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Record Moved."} ERROR: {"success":0, "message":"error message"}
Required Parameters	**Name** / **Type** / **Example** / **Description** moveWhichId / INTEGER / 123 / The Record Id to be moved. moveAfterId / INTEGER / 42 / The Id of the Record the first Record is to be moved after.
Optional Parameters	None
Example URL	/api/v1/api.php?target=record&action=switch&moveWhichId=123&moveAfterId=42

Server-Zone Linkage

get

URL	/api/v1/api.php?target=zoneLinkage&action=get
Description	Searches for Server-Zone Linkages. If no search parameters are supplied, all linkages are returned.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"2 rows retrieved.","data":[{"id":"285","zoneId":"64","serverId":"1","serverName":"173.164.182.169","serverType":"SCP","serverMasterType":"master","zoneName":"bind.com","resourceId":"483"},{"id":"287","zoneId":"371","serverId":"1","serverName":"173.164.182.169","serverType":"SCP","serverMasterType":"master","zoneName":"132.235.198.in-addr.arpa","resourceId":"577"}} ERROR: {"success":0, "message":"error message"} **Data Detail:** **Name** / **Type** / **Description** id / INTEGER / The Linkage Id. zoneId / INTEGER / The ZoneId involved in this link.

serverId	INTEGER	The ServerId involved in this link.
serverName	STRING	The server name
serverType	STRING	The server transfer type
serverMasterType	STRING	Whether this server is a master or a slave.
zoneName	STRING	The zone name
resourceId	INTEGER	The Resource Id the Zone is attached to.

Required Parameters	None

Optional Parameters

Name	Type	Example	Description
id	INTEGER	15	Fetches the linkage with the matching id.
serverId	INTEGER	15	Fetches all linkages with the matching serverId.
zoneId	INTEGER	15	Fetches all linkages with the matching zoneId.

Example URL	/api/v1/api.php?target=zoneLinkage&action=get&id=15

add

URL	/api/v1/api.php?target=zoneLinkage&action=add
Description	Adds a new link between a DNS Server and a Zone

Returns

Examples:

SUCCESSFUL:	{"success":1,"message":"Link Added."}
ERROR:	{"success":0, "message":"error message"}

Required Parameters

Name	Type	Example	Description
serverId	INTEGER	16	The DNS Server Id.
zoneId	INTEGER	105	The Zone Id.
serverSlave	BOOL	1	Whether or not this zone is a master or a slave on the linked server. Values are: 1 for slave, 0 for master.

Optional Parameters	None
Example URL	/api/v1/api.php?target=zoneLinkage&action=add&serverId=16&zoneId=105&serverSlave=0

delete

URL	/api/v1/api.php?target=zoneLinkage&action=delete
Description	Deletes a link between a DNS Server and a Zone

Returns

Examples:

SUCCESSFUL:	{"success":1,"message":"Link Deleted."}
ERROR:	{"success":0, "message":"error message"}

Required Parameters	None
Optional Parameters	

Name	Type	Example	Description
id	INTEGER	15	Fetches the linkage with the matching id.
serverId	INTEGER	15	Fetches all linkages with the matching serverId.
zoneId	INTEGER	15	Fetches all linkages with the matching zoneId.

Example URL	/api/v1/api.php?target=zoneLinkage&action=delete

Name Server Control

get

URL	/api/v1/api.php?target=nameServer&action=get
Description	Fetches a list of all stored Name Servers
Returns	**Examples:**

SUCCESSFUL:	*{"success":1,"message":"Fetch Sucessful.","data":[{"id":"1","nameserver":"ns1.dns.6connect.net","add_to_zones_default":"1","ordering":"10","uses":"34"},{"id":"10","nameserver":"ns2.dns.6connect.net","add_to_zones_default":"1","ordering":"11","uses":"46"},{"id":"9","nameserver":"ns4.dns.6connect.net","add_to_zones_default":"1","ordering":"14","uses":"12"},{"id":"3","nameserver":"ns3.dns.6connect.net","add_to_zones_default":"1","ordering":"15","uses":"46"}]}*
ERROR:	*{"success":0, "message":"error message"}*

Data Detail:

Name	Type	Description
id	INTEGER	Server ID
nameserver	STRING	Server Name
add_to_zones_default	BOOL	Whether or not this is a default server.
ordering	INTEGER	Display order
uses	INTEGER	How many zones have been assigned to this NameServer

Required Parameters	None
Optional Parameters	

Name	Type	Example	Description
default	INTEGER	1	Set server as default

Example URL	/api/v1/api.php?target=nameServer&action=get&default=1

add

URL	/api/v1/api.php?target=nameServer&action=add
Description	Adds a new DNS Server
Returns	**Examples:**

	SUCCESSFUL: *{"success":1,"message":"Add Successful."}* ERROR: *{"success":0, "message":"error message"}*
Required Parameters	**Name** | **Type** | **Example** | **Description** newServer | STRING | ns.yourdomain.com | Name of the NameServer
Optional Parameters	None
Example URL	/api/v1/api.php?target=nameServer&action=add&newServer=ns.yourdomain.com

delete

URL	/api/v1/api.php?target=nameServer&action=delete
Description	Deletes a NameServer
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Server Deleted."}* ERROR: *{"success":0, "message":"error message"}*
Required Parameters	**Name** | **Type** | **Example** | **Description** id | INTEGER | 5 | ID of server to delete.
Optional Parameters	None
Example URL	/api/v1/api.php?target=nameServer&action=delete&id=5

setDefault

URL	/api/v1/api.php?target=nameServer&action=setDefault
Description	Default NameServers have all new zones added to them as they are created. Multiple NameServers can be classified as Default.
Returns	**Examples:** SUCCESSFUL: *{"success":1, "message":"Success."}* ERROR: *{"success":0, "message":"error message"}*
Required Parameters	**Name** | **Type** | **Example** | **Description** id | INTEGER | 5 | ID of server to modify. value | INTEGER | 1 | 1 = Default, 0 = Normal
Optional Parameters	None
Example URL	/api/v1/api.php?target=nameServer&action=setDefault&id=3&value=1

orderUp

URL	/api/v1/api.php?target=nameServer&action=orderUp
Description	Swaps the index order of the targeted NameServer with that of the one above it.
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Reordering Successful."}* ERROR: *{"success":0, "message":"error message"}*
Required Parameters	**Name** / **Type** / **Example** / **Description** id / INTEGER / 5 / ID of server to modify.
Optional Parameters	None
Example URL	/api/v1/api.php?target=nameServer&action=orderUp&id=3

orderDown

URL	/api/v1/api.php?target=nameServer&action=orderDown
Description	Swaps the index order of the targeted NameServer with that of the one below it.
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Reordering Successful."}* ERROR: *{"success":0, "message":"error message"}*
Required Parameters	**Name** / **Type** / **Example** / **Description** id / INTEGER / 5 / ID of server to activate.
Optional Parameters	None
Example URL	/api/v1/api.php?target=nameServer&action=orderDown&id=5

API Module - IPAM

IP Address Management (IPv4 and IPv6)

ProVision's APIv1 system has been replaced by APIv2, and is now considered deprecated.

- IP Address Management (IPv4 and IPv6)
  - IP Block Management
    - Get
    - Add
    - Update
    - Delete
    - Add Tag
    - Delete Tag
    - Smart Assign
    - Direct Assign
    - Unassign
    - Aggregate
    - Split
    - Scan Block
    - Get Scan Results
    - Get Options
    - Get VLAN
    - Get Resource Hierarchy
  - IP Subnets List
    - Get Subnet List
  - IP Tag List
    - Get Tags List
    - Add Tag To List
    - Delete Tag From List
  - IP Regions List
    - Get Regions List
    - Add Region To List
    - Get Utilization
    - Get Host Utilization
  - Holding Tank
    - Override Holding
    - Process Holding Tank
  - Reports
    - Mask Report
- IPAM SWIP Calls:
  - Deassign
  - Get RIR List
  - Simple Reassign
- IPAM API Calls Subject to Change:
  - Get Attribute List

IP Block Management

Get

URL	/api/v1/api.php?target=ipam&action=get
Description	Returns a list of IP blocks. Use optional parameters to filter the list. If multiple parameters are specified, only blocks matching all parameters will be returned.
Returns	**Examples:**

SUCCESSFUL	*{ "success": 1, "message": "1 blocks found. ", "data": [{ "id": 5890, "type": "ipv4", "top_aggregate": null, "cidr": "192.168.0.0\/24", "formatted_ip": "192.168.0.0\/24", "address": "3232235520", "end_address": "3232235775", "mask": 24, "child1": null, "child2": null, "is_assigned": 0, "is_swipped": 0, "is_aggregate": 1, "custid": 81, "resource_id": 81, "resource_name": "Available", "last_updated_time": null, "description": null, "parent": null, "rir": "1918", "lir_id": null, "notes": null, "generic_code": null, "code": null, "region": "SFO", "vlan": 100, "arin_net_id": null, "arin_cust_id": null, "org_id": null, "arin_swip_time": null, "assigned_time": null, "asn": null, "allowSubAssignments": false, "permissions": { "permissionIPAMRead": "1",*

	"permissionIPAMUpdate": "1", "permissionIPAMCreate": "1", "permissionSWIP": "1", "permissionAdmin": "1" }, "range": "192.168.0.0 - 192.168.0.255", "tags": ["Customer", "PTP"] }] }
ERROR	*{'success':0, 'message':'error message'}*

Required Parameters: None

Optional Parameters:

Name	Type	Example	Description
address	INTEGER	1125449728	IP address of the block in decimal format
asn	INTEGER	1000	Filters blocks based on their ASN
allowSubAssignments	BOOL	true	Filters blocks based on wether they allow sub-assignments or not. Acceptable values: "true" or "false"
block	STRING	213.37.29.0 /24	CIDR block description
code	STRING	Code X	User-defined block code as defined in Admin-IPAM settings: Generic Code Per Block Name
endAddress	INTEGER	1125453823	End IP address of the block in decimal format
id	INTEGER	1234	The ID of the block
includeAttributes	BOOL	true	Allows loading and display of the attributes for all of the blocks in the collection.
isAggregate	BOOL	true	Indicates if the block has been split into children or not. A value of 'true' will return blocks with no children.
isAssigned	BOOL	true	Acceptable values: "true" or "false"
isSwipped	BOOL	true	Acceptable values: "true" or "false"
lastUpdateTime	DATETIME	=2015-8-19 21:08:54	SQL Datetime format, prefaced by an "=" for exact time updated, "=" for blocks updated after the given time, or "=" for blocks updated before the given time.
lirId	INTEGER	101	The numeric ID of an LIR resource the block should be linked to
mask	INTEGER	24	Integer bitmask
notes	STRING	note123	Returns blocks with exact matches in the notes field against the provided "notes" string.
region	STRING	SFO	The value from the list of name/value pairs which make up the list of available regions
resourceHolderId	STRING	`cust-001`	(**Deprecated**: Use resourceQuery instead) A custom ID which can be used to link resources in the 6Connect database back to your organization.
resourceId	INTEGER	1234	The ID of the resource the block is assigned to
resourceQuery	JSON	{"parent_id": 15}	A JSON object representing a valid resource query. Any parameters that can be used for a Resource GET API call can be used. Use of the resourceQuery parameter will return blocks assigned to any of the resources returned by that query.
rir	STRING	ARIN	Acceptable values: ARIN, RIPE, APNIC, AfriNIC, LACNIC, 1918
search	STRING	192.168	If a search term is provided, all IPAM fields including assigned Resource Holder name will be checked with a LIKE comparison to find matching blocks
selectCount	INTEGER	50	# of blocks to get
selectOffset	INTEGER	25	Offset for results set; useful for paging (e.g. selectCount = 50, selectOffset = 100 would return the 3rd page of 50 results)

	sortField	STRING	cidr	Attribute to sort blocks by. Accepable values: cidr, mask, rir, vlan, code, updateTime
	sortOrder	INTEGER	ASC	ASC or DESC
	tags	STRING	customer,vpn	Comma-separated list of tags to filter by. If used in conjunction with 'search', performs the search operation and then filters results by the provided tag. Use with tagsMode to specify filter approach.
	tagsMode	STRING	"strict"," exclude", "intersection", or "union".	Denotes how the "tags" parameter is handled: "strict" - matches only blocks that have the exact set of tags of specified. "exclude" - matches only blocks which are note tagged with any of the blocks specified. "intersection" - matches any blocks which has all of the tags. "union" - matches all blocks which has any one of the tags. If not otherwise specified, tagsMode defaults to "intersection".
	topAggregateId	INTEGER	1234	The ID of the aggregate block to which the block belongs
	type	STRING	"ipv4" or "ipv6"	IP type
	vlan	INTEGER	123	VLAN for the block
Example URL	/api/v1/api.php?target=ipam&action=get&rir=ARIN&tags=customer,vpn			

Add

URL	/api/v1/api.php?target=ipam&action=add
Description	Adds an IPv4 or IPv6 block
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Block 192.168.0.0/24 (12345) added", "id":12345, "data":{ "id":12345, "cidr": 192.168.0.0/24", ...} }* ERROR: *{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Description
block	STRING	213.37.29.0/24	CIDR block description
rir	STRING	ARIN	Acceptable values: ARIN, RIPE, APNIC, AfriNIC, LACNIC, 1918

Optional Parameters

Name	Type	Example	Description
allowDuplicate	BOOL	true	Allow the creation of duplicate blocks. The default behavior is to reject duplicates.
allowSubAssignments	BOOL	true	Does the block allow sub-assignments? If the block is assigned and allowSubAssignments is "true", children split from this block will be able to be assigned to different resources. Acceptable values: "true" or "false"
asn	INTEGER	1000	ASN for the block
code	STRING	Code X	User-defined block code as defined in Admin-IPAM settings: Generic Code Per Block Name
region	STRING	SFO	The value from the list of name/value pairs which make up the list of available regions

	resourceId	INTEGER	1234	The ID of the resource the block is assigned to
	tags	STRING	customer, vpn	Comma-separated list of tags
	vlan	INTEGER	123	VLAN for the block

Example URL	/api/v1/api.php?target=ipam&action=add&block=213.37.29.0/24&rir=ARIN

Update

URL	/api/v1/api.php?target=ipam&action=update
Description	Updates detail data about an IP block.
Returns	**Examples:**

SUCCESSFUL	SINGLE BLOCK	*{"success":1,"message":"Block 192.168.0.0/24 (12345) updated", "data":{ "id":12345, "cidr": 192.168.0.0/24", ...} }*
SUCCESSFUL	MULTIPLE BLOCKS	*{"success":1,"message":"3 blocks updated", "data":[{ "id":12345, "cidr":192.168.0.0/24", ...}, {"id":12346, "cidr", "192.168.0.1/32", ...}] }*
ERROR		*{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Allow Multiple	Description
id*	INTEGER	125	Yes	ID of the IP block. Multiple block IDs can be specified in a comma-separated list.
block*	STRING	192.0.0.0 /24	Yes	CIDR or the block. Multiple CIDRs can be specified in a comma-separated list.
*Either block or id can be used, but only one must be provided				

Optional Parameters

Name	Type	Example	Description
allowSubAssignments	BOOL	true	Does the block allow sub-assignments? If the block is assigned and allowSubAssignments is "true", children split from this block will be able to be assigned to different resources. Acceptable values: "true" or "false"
asn	INTEGER	1000	ASN for the block
code	STRING	Code X	Arbitrary user-defined block code
lirId	INTEGER	101	The numeric ID of an LIR resource the block should be linked to
notes	STRING	Words	Misc. Notes
region	STRING	Chicago, IL	The region this IP block is assigned to.
propagate	BOOL	true	Propagates all attribute values to any smaller child blocks of the block being updated. ***Available in version 5.1.0***
rir	STRING	ARIN	Acceptable values: ARIN, RIPE, APNIC, AfriNIC, LACNIC, 1918
tags	STRING	Customer, vpn	Comma-separated list of tags
tags_action	STRING	replace	What action to take on the supplied tags. This action must be taken in conjunction with the tags parameter. Valid settings for tags_action are: replace, add, delete. When tags_action is set to 'replace', all tags on

				an IP block are replaced with those
	vlan	NUMERIC	123	VLAN for the block

Example URL	/api/v1/api.php?target=ipam&action=update&block=192.0.0.0/24&notes=Notes_here

Delete

URL	/api/v1/api.php?target=ipam&action=delete
Description	Deletes an aggregate block
Returns	Examples

SUCCESSFUL	*{"success":1,"message":"Aggregate deleted: 192.168.0.0/24", "data":{ "id":12345, "cidr":192.168.0.0/24", ...} }*
ERROR	*{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Description
block*	STRING	213.37.29.0/24	CIDR block description
id*	INTEGER	125	ID of the IP block
*Either block or id can be used, but only one must be provided			

Optional Parameters

Name	Type	Example	Description
force	BOOL	true	Forces the aggregate block to be deleted even if the block is split or contains sub blocks which are assigned. The default behavior is to reject attempts to delete blocks which have been split or are assigned.

Example URL	/api/v1/api.php?target=ipam&action=delete&block=213.37.29.0/24

Add Tag

URL	/api/v1/api.php?target=ipam&action=addTag
Description	Adds a tag to an IP block.
Returns	**Examples:**

SUCCESSFUL	*{ "success":1,"message":"Tag Added.", "data":{ "id":12345, "cidr":192.168.0.0/24", ...} }*
ERROR	*{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Description
id*	INTEGER	125	ID of the block
block*	STRING	192.0.0.0/24	CIDR of the block
*Either block or id can be used, but only one must be provided			
tag	STRING	Customer	The tag to add

Optional Parameters	None
Example URL	/api/v1/api.php?target=ipam&action=addTag&id=125&tag=Customer

Delete Tag

URL	/api/v1/api.php?target=ipam&action=deleteTag
Description	Removes a tag from an IP block.
Returns	**Examples:** SUCCESSFUL: *{ "success":1,"message":"Tag Removed.", "data":{ "id":12345, "cidr":192.168.0.0/24", ...} }* ERROR: *{ "success":0, "message":"error message" }*
Required Parameters	**Name** / **Type** / **Example** / **Description** id* / INTEGER / 125 / ID of the block block* / STRING / 192.0.0.0/24 / CIDR of the block *Either block or id can be used, but only one must be provided tag / STRING / Customer / The tag to delete
Optional Parameters	None
Example URL	/api/v1/api.php?target=ipam&action=deleteTag&id=125&tag=Customer

Smart Assign

URL	/api/v1/api.php?target=ipam&action=smartAssign
Description	Selects a block based on supplied parameters (rir, tags, mask size, etc.) and assigns it to a Resource Holder.
Returns	**Examples:** SUCCESSFUL: *{ "success":1,"message":"Assigned 192.168.0.0/24 to Resource (1234) via Smart Assign", "id":12345, "data": { "id":12345, "cidr":192.168.0.0/24", ...} }* ERROR: *{ "success":0, "message":"error message" }*
Required Parameters	**Name** / **Type** / **Example** / **Description** mask / INTEGER / 24 / The size of the block to be assigned rir / STRING / ARIN / Acceptable values: ARIN, RIPE, APNIC, AfriNIC, LACNIC, 1918 resourceId* / INTEGER / 1234 / Integer ID of the resource to assign the block to resourceQuery* / JSON / `{"custom_id":"cust-001"}` / A JSON object representing a valid resource query. Any parameters that can be used for a Resource GET API call can be used. Use of the resourceQuery parameter will return blocks assigned to any of the resources returned by that query. *Either resourceId or resourceQuery can be used, but only one must be provided resourceHolderId / STRING / `cust-001` / (**Deprecated**: Use resourceQuery instead) A custom ID which can be used to link resources in the 6Connect database back to your organization. type / STRING / "IPv4" or "IPv6" / The type of block to assign
Optional Parameters*	

Name	Type	Example	Description
assignedResourceId	STRING	"123" or "ignore"	The ID of the resource the block is assigned to, or the string "ignore". If assignedResourceId is set to "ignore", then a matching IP block is selected from the Available pool or any sub-assignable block on any resource.
code	STRING	Code X	Arbitrary user-defined block code
lirId	INTEGER	101	The ID of an LIR resource
region	STRING	Ashburn	Region to assign from
tags	STRING	customer,vpn	Comma separated string of tags. Matches blocks which have at least the set of tag specified by this parameter
tagsMode	STRING	"strict"," exclude", "intersection", or "union".	Denotes how the "tags" parameter is handled: "strict" - matches only blocks that have the exact set of tags of specified. "exclude" - matches only blocks which are note tagged with any of the blocks specified. "intersection" - matches any blocks which has all of the tags. "union" - matches all blocks which has any one of the tags. If not otherwise specified, tagsMode defaults to "intersection".
vlan	INTEGER	1023	VLAN designated to a given block

*Additional or fewer "optional" parameters may be required in order to result in a successful assignment, depending on the attributes of available blocks.

Example URL	/api/v1/api.php?target=ipam&action=smartAssign&mask=24&type=IPv4&resourceId=250&rir=ARIN

Direct Assign

URL	/api/v1/api.php?target=ipam&action=directAssign
Description	Assigns a block to an Resource Holder

Returns

Examples:

SUCCESSFUL	SINGLE BLOCK	*{ "success":1,"message":"Assigned 192.168.0.0/24 to Resource (1234)", "id":12345, "data": { "id":12345, "cidr":192.168.0.0/24", ...} }*
SUCCESSFUL	MULTIPLE BLOCKS	*{ "success":1,"message":"Assigned 5 blocks to Resource (1234) via Direct Assign", "data":{ "ids":[12345, 12346, 12347, ...] } }*
ERROR		*{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Description
block*	STRING	213.37.29.0/24	CIDR block description
id*	INTEGER	125	ID of the IP block, comma separated list of ids, or json encoded array of ids
*Either block or id can be used, but only one must be provided			
resourceHolderId**	STRING	`cust-001`	(**Deprecated**: Use resourceQuery instead) A custom ID which can be used to link resources in the 6Connect database back to your organization.
resourceId**	INTEGER	1234	Integer ID of the resource to assign the block to

	resourceQuery**	JSON	`{"custom_id":"cust-001"}`	A JSON object representing a valid resource query. Any parameters that can be used for a Resource GET API call can be used. Use of the resourceQuery parameter will return blocks assigned to any of the resources returned by that query.
	**Either resourceId, resourceQuery, or resourceHolderId can be used, but only one must be provided			

Optional Parameters*

Name	Type	Example	Description
code	STRING	Code X	Arbitrary user-defined block code
lirId	INTEGER	101	The ID of an LIR resource
region	STRING	Ashburn	Region to assign from
rir	STRING	ARIN	Acceptable values: ARIN, RIPE, APNIC, AfriNIC, LACNIC, 1918
tags	STRING	customer,vpn	Comma separated string of tags. Matches blocks which have at least the set of tag specified by this parameter
tagsMode	STRING	"strict","exclude", "intersection", or "union".	Denotes how the "tags" parameter is handled: "strict" - matches only blocks that have the exact set of tags of specified. "exclude" - matches only blocks which are note tagged with any of the blocks specified. "intersection" - matches any blocks which has all of the tags. "union" - matches all blocks which has any one of the tags. If not otherwise specified, tagsMode defaults to "intersection".
vlan	INTEGER	1023	VLAN designated to a given block

*Additional or fewer "optional" parameters may be required in order to result in a successful assignment, depending on the attributes of available blocks.

Example URL: /api/v1/api.php?target=ipam&action=directAssign&block=213.37.29.0/24&resourceId=1234

Unassign

URL: /api/v1/api.php?target=ipam&action=unassign

Description: Reclaims the specified block to be reassigned in the future

Returns

Examples:

SUCCESSFUL	*{ "success":1,"message":"192.168.0.0/24 unassigned", "id":12345, "data":{ "id":12345, "cidr":192.168.0.0/24", ...} }*
ERROR	*{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Description
block*	STRING	213.37.29.0/24	CIDR block description
id*	INTEGER	125	ID of the IP block
*Either block or id can be used, but only one must be provided			

Optional Parameters

Name	Type	Example	Description

	skipHolding	BOOL	true	If set to true (skipHolding=true) then the holding tank is skipped. If set to false, or not included, normal holding tank rules apply. Acceptable values: "true" or "false"
Example URL	/api/v1/api.php?target=ipam&action=unassign&block=213.37.29.0/24			

Aggregate

URL	/api/v1/api.php?target=ipam&action=aggregate
Description	Aggregates a selected block to the mask specified. If no mask specified, re-aggregates blocks to next parent. IE. calling aggregate on a /25 will aggregate both children back to the parent /24. All child blocks must be Available for aggregation to succeed.
Returns	**Examples:** SUCCESSFUL: `{"success":1,"message":"10.2.0.128\/25 aggregated into 10.2.0.0\/24","id":16326}` ERROR: *{'success':0, 'message':'error message'}*
Required Parameters	**Name** / **Type** / **Example** / **Description** id* / INTEGER / 125 / ID of the IP block. block* / STRING / 213.37.29.0/24 / CIDR block. *Either block or id can be used, but only one must be provided
Optional Parameters	**Name** / **Type** / **Example** / **Description** autoAggregateToMask / INTEGER / 24 / All blocks and IPs smaller than this netmask will be aggregated. ignoreAssignments / BOOL / TRUE / If the ignoreAssignment flag is not set the aggregation operation will fail if any children beneath the supplied autoAggregateToMask are assigned or otherwise unavailable. If this option is set, it will unassign blocks prior to reaggregation.
Example URL	/api/v1/api.php?target=ipam&action=aggregate&id=125&autoAggregateToMask=24

Split

URL	/api/v1/api.php?target=ipam&action=split
Description	Splits a selected block to the mask specified. If no mask specified, it split blocks to next child. IE. calling aggregate on a /24 will split both parent to the child /25s. All parent blocks must be Available, or have Allow Sub Assignments on for a split to succeed.
Returns	**Examples:** SUCCESSFUL: `{"success":1,"message":"10.1.0.0\/24 split into 10.1.0.0\/25 and 10.1.0.128\/25","data":{"child1":23441 ,"child2":23451}}` ERROR: *{'success':0, 'message':'error message'}*
Required Parameters	**Name** / **Type** / **Example** / **Description** id* / INTEGER / 125 / ID of the IP block. block* / STRING / 213.37.29.0/24 / CIDR block.

*Either block or id can be used, but only one must be provided

Optional Parameters

Name	Type	Example	Description
autoSplitToMask	INTEGER	24	Auto aggregate the block back to this mask size. Note all blocks up this mask size must be Available or call will fail.
autoSplitLimit	INTEGER	4	A number the power of 2 (^2).

Example URL: /api/v1/api.php?target=ipam&action=split&block=213.37.29.0/24&autoSplitLimit=4

Scan Block

URL: /api/v1/api.php?target=ipam&action=scanBlock

Description: Initiates an asynchronous ping (ICMP) scan of the target block specified. Results of the scan can be checked with get.

Returns:

Examples:

SUCCESSFUL	`{"success":1,"message":"Ping scan started for 8.8.8.0\ /27"}`
ERROR	*{'success':0, 'message':'error message'}*

Required Parameters

Name	Type	Example	Description
id*	INTEGER	125	ID of the IP block.
block*	STRING	213.37.29.0/24	CIDR block.
*Either block or id can be used, but only one must be provided			

Optional Parameters: None

Example: /api/v1/api.php?target=ipam&action=scanBlock&block=213.37.29.0/24

Get Scan Results

URL: /api/v1/api.php?target=ipam&action=getScanResults

Description: Initiates an asynchronous ping (ICMP) scan of the target block specified. Results of the scan can be checked with get

Returns:

Examples:

SUCCESSFUL	`{"success":1,"data":{"block":"8.8.8.0\/27","date":"07\/14\/2014 11:07:10",` `"data":[{"address":"8.8.8.8","host":"google-public-dns-a.google.com","status":" Up"}],"status":"completed","hostsScanned":4,"activeHosts":4}}`
ERROR	*{'success':0, 'message':'error message'}*

Required Parameters

Name	Type	Example	Description
block	STRING	213.37.29.0/24	CIDR block.

Optional Parameters: None

Example: /api/v1/api.php?target=ipam&action=getScanResults&block=213.37.29.0/24

Get Options

URL	/api/v1/api.php?target=ipam&action=getOptions
Description	Returns a list of options available for the block
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Options for 14.0.0.0\/25 (125)","options":{"actions":["aggregate"],"templates":[{"name":"Auto Split","masks":[26,27,28,29,30,31,32]}]}} ERROR: *{'success':0, 'message':'error message'}*
Required Parameters	**Name** / **Type** / **Example** / **Description** id / INTEGER / 125 / ID of the IP block
Optional Parameters	None
Example URL	/api/v1/api.php?target=ipam&action=getOptions&id=125

Get VLAN

URL	/api/v1/api.php?target=ipam&action=getVlan
Description	Returns the VLAN for the block
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Found VLAN 1002 (14.0.0.0\/25)","data":{"id":125,"type":"ipv4","top_aggregate":81532,"cidr":"14.0.0.0\/25","formatted_ip":"14.0.0.0\/25","address":"234881024","end_address":"234881151","mask":25,"netmask":"255.255.255.128","child1":null,"child2":null,"is_assigned":0,"is_swipped":0,"is_aggregate":1,"custid":402,"resource_id":402,"resource_name":"6connect Labz","last_updated_time":"2015-01-22 12:30:37","description":null,"parent":81532,"rir":"ARIN","lir_id":"1062","notes":"Test Notes","generic_code":"Datacenter2","code":"Datacenter2","region":"ATL","region_name":"Atlanta, GA","vlan":1002,"arin_net_id":null,"arin_cust_id":null,"org_id":null,"arin_swip_time":null,"assigned_time":"2015-01-14 10:30:31","asn":"143","allowSubAssignments":true,"permissions":{"permissionIPAMRead":"1","permissionIPAMUpdate":"1","permissionIPAMCreate":"1","permissionIPAMDelete":"1","permissionSWIP":"1","permissionAdmin":"1"},"range":"14.0.0.0 - 14.0.0.127","tags":["Customer"]}} ERROR: *{'success':0, 'message':'error message'}*
Required Parameters	**Name** / **Type** / **Example** / **Description** id* / INTEGER / 125 / ID of the IP block block* / STRING / 213.37.29.0/24 / CIDR block. *Either block or id can be used, but only one must be provided
Optional Parameters	None
Example URL	/api/v1/api.php?target=ipam&action=getVlan&id=125

Get Resource Hierarchy

URL	/api/v1/api.php?target=ipam&action=getResourceHierarchy&id=79124

Description	Returns the Parent Resource and Parent Resource id for the provided block.
Returns	**Examples:** SUCCESSFUL: {"success":"1","data":[{"id":"4208","name":"a6connectEntry"}]} ERROR: *{'success':0, 'message':'error message'}*
Required Parameters	**Name** / **Type** / **Example** / **Description** id / INTEGER / 125 / ID of the IP block
Optional Parameters	None
Example URL	/api/v1/api.php?target=ipam&action=getResourceHierarchy&id=79124

IP Subnets List

Get Subnet List

URL	/api/v1/api.php?target=ipam&action=getSizes
Description	Returns the IPv4 or IPv6 Subnet Lists
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Lookup was successful","data":["36","48","56","64","126","127","128"]}* ERROR: *{'success':0, 'message':'error message'}*
Required Parameters	**Name** / **Type** / **Example** / **Description** size / INTEGER / "4" or "6" / The IP Subnet list to return - "4" for IPv4 subnets, or "6" for IPv6 subnets.
Optional Parameters	None
Example URL	/api/v1/api.php?target=ipam&action=getSizes&size=6

IP Tag List

Get Tags List

URL	/api/v1/api.php?target=ipam&action=getTagList
Description	Returns a list of all valid IP Tags in the database.
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Tags Retrieved. ","data":["ActiveE DIA","Colo DIA","Customer","DSL","Fiber DIA","GPON DIA","Infra","Inhouse","LAN","LBIntf","POP","PTP","Prod","VPN","WEBHOST","Cable","Internal"]}* ERROR: *{'success':0, 'message':'error message'}*

Add Tag To List

URL	/api/v1/api.php?target=ipam&action=addTagToList

Description	Adds a tag to the IPAM tag list
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Tag Added."}* ERROR: *{'success':0, 'message':'error message'}*
Required Parameters	**Name** / **Type** / **Example** / **Description** newTag / STRING / Loopback C / The value to add to the list of name/value pairs which make up the list of available regions
Optional Parameters	None
Example URL	/api/v1/api.php?target=ipam&action=addTagToList&newTag=Loopback C

Delete Tag From List

URL	/api/v1/api.php?target=ipam&action=deleteTagFromList
Description	Deletes a tag from the IPAM tag list
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Tag Deleted."}* ERROR: *{'success':0, 'message':'error message'}*
Required Parameters	**Name** / **Type** / **Example** / **Description** tag / STRING / tag123 / The name of the tag to be deleted.
Optional Parameters	None
Example URL	/api/v1/api.php?target=ipam&action=deleteTagFromList&tag=tag123

IP Regions List

Get Regions List

URL	/api/v1/api.php?target=ipam&action=getRegionList
Description	Returns a list of all valid Regions in the database.
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Regions Retrieved.","data":[{"value":"ANY","name":"Any Region"},{"value":"ASH1","name":"Ashburn, VA"},{"value":"BOS","name":"Boston, MA"},{"value":"CHI","name":"Chicago, IL"},{"value":"DAL","name":"Dallas, TX"},{"value":"DEN","name":"Denver, CO"},{"value":"FRKT","name":"Frankfurt, DE"},{"value":"LON1","name":"London, UK"},{"value":"MIA","name":"Miami, FL"},{"value":"PAR","name":"Paris, FR"},{"value":"SFO","name":"San Francisco, CA"},{"value":"SEA","name":"Seattle, WA"},{"value":"Tokyo","name":"Tokyo"},{"value":"Singapore","name":"Singapore"},{"value":"Jakarta","name":"Jakarta"}]}* ERROR: *{'success':0, 'message':'error message'}*

Add Region To List

URL	/api/v1/api.php?target=ipam&action=addRegionToList
Description	Adds a region to the IPAM region list.
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Region Added."}* ERROR: *{'success':0, 'message':'error message'}*
Required Parameters	**Name** / **Type** / **Example** / **Description** newRegion / STRING / SFO / The value to add to the list of name/value pairs which make up the list of available regions
Optional Parameters	None
Example URL	/api/v1/api.php?target=ipam&action=addRegionToList&newRegion=SFO

Utilization

Get Utilization

URL	/api/v1/api.php?target=ipam&action=utilization
Description	Gets the utilization percentages for a specific ip block or ip block and mask combination.
Returns	**Examples:** SUCCESSFUL:

```
{
"success": 1,
"totalBlocks": 1,
"totalHosts": "256",
"hostsAssigned": 0,
"hostsAllocated": "256",
"hostsAvailable": "256",
"hostsInHolding": 0,
"availablePercentage": "100.00",
"assignedPercentage": "0.00",
"allocatedPercentage": "100.00",
"inHoldingPercentage": "0.00",
"resources": [{
"id": 351,
"name": "Customer 1",
"type": "entry",
"hosts": "256",
"blocks": "1",
```

		"percentage": "100.00" }], "blocksAssigned":0, "blocksAllocated": 1, "blocksAvailable": "1", "blocksInHolding": null, "blocksAssignedPercentage": "0.00", "blocksAllocatedPercentage": "100.00", "blocksAvailablePercentage": "100.00", "blocksInHoldingPercentage": "0.00" }
	ERROR	*{'success':0, 'message':'error message'}*

Required Parameters

Name	Type	Example	Description
block*	STRING	213.37.29.0/24	CIDR block description
id*	INTEGER	125	ID of the IP block
*Either block or id can be used, but only one must be provided			

Optional Parameters

Name	Type	Example	Description
mask	INTEGER	24	The specific mask size to retrieve utilization for. If using this parameter, the id parameter should be the id of the aggregate.

Example URL	/api/v1/api.php?target=ipam&action=utilization&id=125

Get Host Utilization

URL	/api/v1/api.php?target=ipam&action=getHostUtilization
Description	Gets the host utilization statistics with support for filters.
Returns	**Examples:**

SUCCESSFUL	{ "success": 1, "totalHosts": "256", "hostsAssigned": 0, "hostsAllocated": "256", "hostsAvailable": "256", "hostsInHolding": 0, "availablePercentage": "100.00", "assignedPercentage": "0.00", "allocatedPercentage": "100.00",

	"inHoldingPercentage": "0.00", "resources": [{ "id": 351, "name": "Customer 1", "type": "entry", "hosts": "256", "blocks": "1", "percentage": "100.00" }] }
ERROR	*{'success':0, 'message':'error message'}*

Required Parameters

Name	Type	Example	Description
type	STRING	"ipv4" or "ipv6"	IP type

Optional Parameters

Name	Type	Example	Multiple Values	Description
code	STRING	"code-1"	Yes	User-defined block code as defined in Admin-IPAM settings: Generic Code Per Block Name
region	STRING	"SFO"	Yes	Region to assign from
rir	STRING	ARIN	No	Acceptable values: ARIN, RIPE, APNIC, AfriNIC, LACNIC, 1918
tags	STRING	"Customer"	Yes	Comma separated string of tags
vlan	INTEGER	1000	Yes	VLAN designated to a given block

NOTE: to filter using multiple values, pass the values as a JSON-encoded string representation of an array.

For example, to get utilization data for multiple tags, you could use the following URL:

/api/v1/api.php?target=ipam&action=getHostUtilization&type=ipv4&tags=["Customer","PTP"]

Example URL: /api/v1/api.php?target=ipam&action=getHostUtilization&type=ipv4&tags=["Customer","PTP"]&region=SMF

Holding Tank

Override Holding

URL	/api/v1/api.php?target=ipam&action=processHoldingTank
Description	Overrides holding for a specific block, returning the block to available status
Returns	**Examples:**

SUCCESSFUL	*{"success":1,"message":"15.15.15.128\/30 unassigned and returned to resource a6connectEntry","id":79134,"data":{"id":79134,"type":"ipv4","top_aggregate":79121,"cidr":"15.15.15.128\/30","formatted_ip":"15.15.15.128\/30","address":"252645248","end_address":"252645251","mask":30,"netmask":"255.255.255.252","child1":null,"child2":null,"is_assigned":0,"is_swipped":0,"is_aggregate":1,"custid":4208,"resource_id":4208,"resource_name":"a6connectEntry","last_updated_time":"2017-11-20 12:35:08","description":null,"parent":79132,"rir":"ARIN","lir_id":null,"notes":null,"generic_code":null,"code":null,"region":"STL","region_name":"St.*

		Louis","vlan":null,"arin_net_id":null,"arin_cust_id":null,"org_id":null,"arin_swip_time":null,"assigned_time":" 2017-11-20 12:35:08","asn":null,"allowSubAssignments":true,"permissions":{"permissionIPAMRead":"1","permissionIPAMUpdate":"1","permissionIPAMCreate":"1","permissionIPAMDelete":"1","permissionSWIP":"1","permissionAdmin":"1"},"range":"15.15.15.128 - 15.15.15.131","tags":[],"attributes":{"custody_chain":"[]"}}}
	ERROR	*{'success':0, 'message':'error message'}*

Required Parameters

Name	Type	Example	Description
block*	STRING	213.37.29.0/24	CIDR block description
id*	INTEGER	125	ID of the IP block
*Either block or id can be used, but only one must be provided			

Optional Parameters	None.
Example URL	/api/v1/api.php?target=ipam&action=overrideHolding&block=213.37.29.0/24&preview=true

Process Holding Tank

URL	/api/v1/api.php?target=ipam&action=processHoldingTank
Description	Processes the Holding Tank, returning held blocks to available status

Returns

Examples:

SUCCESSFUL	{"success":1,"message":"1 IPv4 and 0 IPv6 blocks would be moved to the available pool. ","data":[{"id":77712,"type":"ipv4","top_aggregate":77552,"cidr":"23.92.0.64\/26","formatted_ip":"23.92.0.64\/26","address":"391905344","end_address":"391905407","mask":26,"netmask":"255.255.255.192","child1":null,"child2":null,"is_assigned":0,"is_swipped":0,"is_aggregate":1,"custid":188,"resource_id":188,"resource_name":"6connect holding","last_updated_time":"2014-10-29 11:25:41","description":null,"parent":77682,"rir":"ARIN","lir_id":"451","notes":null,"generic_code":null,"code":null,"region":"PHX","region_name":"Phoenix, AZ","vlan":null,"arin_net_id":null,"arin_cust_id":null,"org_id":null,"arin_swip_time":null,"assigned_time":"2014-10-29 11:20:34","asn":null,"allowSubAssignments":false,"permissions":{"permissionIPAMRead":"1","permissionIPAMUpdate":"1","permissionIPAMCreate":"1","permissionIPAMDelete":"1","permissionSWIP":"1","permissionAdmin":"1"},"range":"23.92.0.64 - 23.92.0.127","tags":["Customer","DSL"]}]}
ERROR	*{'success':0, 'message':'error message'}*

Required Parameters	None

Optional Parameters

Name	Type	Example	Description
preview	BOOL	true	Acceptable values: "true" or "false" If set to "true", returns a list of blocks that would be removed from the holding tank, but does not complete the process holding tank action. If set to "false", processes the holding tank and returns a list of blocks returned to available status.

Example URL	/api/v1/api.php?target=ipam&action=processHoldingTank&preview=true

Reports

Mask Report

URL	/api/v1/api.php?target=ipam&action=maskReport
Description	Returns a JSON report breakdown of by-mask use statistics
Returns	**Examples:** SUCCESSFUL: {"success":1,"data":{"IPv4":{"total":576,"available":21,"assigned":555,"holding":0,"allocated":446,"prefixes":{"32":{"assigned_percentage":91.666666,"holding_percentage":0,"available_percentage":8.333333,"allocated_percentage":0,"total":12,"available":1,"assigned":11,"holding":0,"allocated":0},"31":{"assigned_percentage":100,"holding_percentage":0,"available_percentage":0,"allocated_percentage":30,"total":20,"available":0,"assigned":20,"holding":0,"allocated":6},"30":{"assigned_percentage":50,"holding_percentage":0,"available_percentage":50,"allocated_percentage":0,"total":8,"available":4,"assigned":4,"holding":0,"allocated":0},"29":{"assigned_percentage":100,"holding_percentage":0,"available_percentage":0,"allocated_percentage":20,"total":40,"available":0,"assigned":40,"holding":0,"allocated":8},"28":{"assigned_percentage":66.666666,"holding_percentage":0,"available_percentage":33.333333,"allocated_percentage":33.333333,"total":48,"available":16,"assigned":32,"holding":0,"allocated":16},"27":{"assigned_percentage":100,"holding_percentage":0,"available_percentage":0,"allocated_percentage":50,"total":64,"available":0,"assigned":64,"holding":0,"allocated":32},"26":{"assigned_percentage":100,"holding_percentage":0,"available_percentage":0,"allocated_percentage":100,"total":128,"available":0,"assigned":128,"holding":0,"allocated":128},"25":{"assigned_percentage":100,"holding_percentage":0,"available_percentage":0,"allocated_percentage":100,"total":256,"available":0,"assigned":256,"holding":0,"allocated":256}},"assigned_percentage":96.354166,"holding_percentage":0,"available_percentage":3.645833,"allocated_percentage":77.430555},"IPv6":{"total":16777216,"available":0,"assigned":16777216,"holding":0,"allocated":0,"prefixes":{"41":{"assigned_percentage":100,"holding_percentage":0,"available_percentage":0,"allocated_percentage":0,"total":16777216,"available":0,"assigned":16777216,"holding":0,"allocated":0}},"assigned_percentage":100,"holding_percentage":0,"available_percentage":0,"allocated_percentage":0}}} ERROR: *{ "success":0, "message":"error message" }*
Required Parameters	None
Optional Parameters	**Name** / **Type** / **Example** / **Description** resource_id / INTEGER / 1234 / Integer value of a Resource ID. If provided, the system will display an IPAM Mask Usage report limited to blocks associated with a single resource. tags / STRING / "Customer" / Comma separated list of tags. If provided, limits the IPAM Mask Usage report to certain tags (standard tag mode). regions / STRING / "DEN" / Comma separated list of regions. If provided, limits the IPAM Mask Usage Report to blocks associated with the provided region(s).
Example URL	/api/v1/api.php?target=ipam&action=maskReport&regions=DEN

IPAM SWIP Calls:

Deassign

URL	/api/v1/api.php?target=ipam&action=deassign
Description	Performs a SWIP deassignment for the indicated IPAM block.
Returns	**Examples:** SUCCESSFUL: *{ "success":1,"message":"success message" }* ERROR: *{ "success":0, "message":"error message" }*
Required	

Parameters

Name	Type	Example	Description
blockId	INTEGER	1234	ID of the block to deassign
block	STRING	67.221.241.0/24	the CIDR of the block being de-assigned
resourceId	INTEGER	1234	ID of resource representing the customer to deassign
lirId	INTEGER	1234	The ProVision id of the LIR which is performing the de-assignment
entityHandle	STRING	CONNE-81	The Org ID for the LIR.

Optional Parameters

Name	Type	Example	Description
netName	STRING	6CONN-67-221-241-0-24	Optional name for the network to override the default. The default net name will be created using the Net Name Prefix and IP address for the block.

Example URL

/api/v1/api.php?target=ipam&action=deassign&resourceId=1234&blockId=1234&lirId=1234&entityHandle=CONNE-81&block=67.221.241.0/24&netName=6CONN-67-221-241-0-24

Get RIR List

URL

/api/v1/api.php?target=ipam&action=getRIRList

Description

Returns a list of all valid RIRs in the database.

Returns

Examples:

SUCCESSFUL	*{"success":1,"message":"RIRs Retrieved.","data":[{"value":"ARIN","name":"ARIN"},{"value":"1918","name":"1918"},{"value":"AfriNIC","name":"AfriNIC"},{"value":"APNIC","name":"APNIC"},{"value":"LACNIC","name":"LACNIC"},{"value":"RIPE","name":"RIPE"},{"value":"1918-SJC","name":"1918-SJC"}]}*
ERROR	*{'success':0, 'message':'error message'}*

Simple Reassign

URL

/api/v1/api.php?target=ipam&action=simpleReassign

Description

ARIN SWIP - simple reassign. Creates an ARIN customer record for the assigned resource and reassigns the block to the ARIN customer record.

Returns

Examples:

SUCCESSFUL	*{ "success":1,"message":"Sent ARIN SWIP with action simpleReassign for 67.221.244.0/28 for Acme, Message: Success" }*
ERROR	*{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Description
blockId	INTEGER	1234	ID of the block to reassign
resourceId	INTEGER	1234	ID of resource representing the customer to reassign to
lirId	INTEGER	1234	The ProVision id of the LIR to use for reassignment
entityHandle	STRING	CONNE-81	The Org ID for the LIR.

Optional Parameters

Name	Type	Example	Description
netName	STRING	NET-ACME-67-	Optional name for the network to override the default. The default net name will be

		221-244-0-28	created using the Net Name Prefix and IP address for the block.

Example URL	/api/v1/api.php?target=ipam&action=simpleReassign&resourceId=121&blockId=31559&lirId=95&entityHandle=CONNE-81&&netName=NET-ACME-67-221-244-0-28

IPAM API Calls Subject to Change:

Calls below this point are subject to change, and are not recommended for use in production code.

Get Attribute List

URL	/api/v1/api.php?target=ipam&action=getAttributeLists
Description	Returns a list of attributes
Returns	**Examples:** SUCCESSFUL: {"asns":[],"masks":["24"],"rirs":["1918"],"lirs":[],"tags":["DHCP"],"codes":[],"vlans":[],"regions":["Quito"],"resources":[{"id":"1302","name":"Quito Lab 1","slug":"quito-lab-1","type":"dhcp_pool","parent_id":"1","category_id":null,"attr":{"_dhcp_type":"subnet","_dhcp_pool_attributes":"{\"mac\":\"\",\"rangeStart\":\"10.8.0.0\",\"rangeEnd\":\"10.8.0.255\",\"freeLines\":0}","_dhcp_ip_id":"125"}}]} ERROR: *{'success':0, 'message':'error message'}*
Required Parameters	**Name** / **Type** / **Example** / **Description**: id / INTEGER / 125 / ID of the IP block
Optional Parameters	None
Example URL	/api/v1/api.php?target=ipam&action=getAttributeLists&id=125

API Module - LIR

LIR Management

ProVision's APIv1 system has been replaced by APIv2, and is now considered deprecated.

- LIR Management
  - Get
  - Delete
  - Add
  - Update

Get

URL	/api/v1/api.php?target=lir&action=get
Description	Returns a list of LIRs
Returns	**Examples:**

SUCCESSFUL

```
{
    "success": 1,
    "message": "2 objects found",
    "data": [
        {
            "id": "100",
            "name": "RIPE Test LIR",
            "slug": "ripe-test-lir",
            "entities": [
                {
                    "mnt_by": "mntner@email.com"
                    "mnt_by_password": "password",
                    "admin_c": "test-admin-c",
                    "tech_c": "test-tech-c",
                    "api_key": null
                }
            ],
            "rir": "RIPE"
        },
        {
            "id": "101",
            "name": "ARIN Test LIR",
            "slug": "arin-test-lir",
            "entities": [
                {
                    "org_handle": "TEST-10",
                    "admin_poc": "TEST-ARIN",
                    "net_poc": "TEST-ARIN",
                    "abuse_poc": "",
                    "net_name_prefix": "PRFX",
                    "api_key": "API-XXXX-YYYY-ZZZZ-1234"
                }
            ],
            "rir": "ARIN",
            "asn": "1000"
        }
    ]
}
```

ERROR

```
{
    "success":0,
    "message":"error message"
}
```

Example URL	/api/v1/api.php?target=lir&action=get

Delete

URL	/api/v1/api.php?target=lir&action=delete&id=ID
Description	Deletes an LIR
Returns	**Examples:**

SUCCESSFUL	{ "success": 1, "message": "LIR deleted." }
ERROR	{ "success":0, "message":"error message" }

Example URL	/api/v1/api.php?target=lir&action=delete&id=100

Add

URL	/api/v1/api.php?target=lir&action=add
Description	Adds a new LIR. LIR creation utilizes the Resource system - see API Module - Resource - Add for details on adding a resource via the API.
Returns	**Examples:**

SUCCESSFUL	{ "success":1, "message":"Resource added", "data": { "id":14063, "name":"TestLIR", "slug":"testlir", "type":"entry", "parent_id":1, "category_id":null, "date":1517513319, "modified":1517513319, "attr": { "_section":"94", "rir":"ARIN", "asn":"20202", "org-handle":"org1", "admin-poc":"admin1",

```
"net-poc":"tech1",
"abuse-poc":"abuse1",
"net-name-prefix":"test-",
"api-key":10,
"mnt-by":"",
"admin-c":"",
"tech-c":"",
"_gadget_data":false
},
"section":
{
"id":"94",
"name":"LIR",
"slug":"lir",
            "type":"section",
            "parent_id":"1",
            "category_id":null,
            "date":1375846025,
            "modified":1375846025,
            "attr":[]
        },
        "gadgets":false
    }
}
```


ERROR


```
{
    "success":0,
    "message":"error message"
}
```


Required Parameters

(meta[ ] =)

Name	Type	Example	Notes
meta[name]	STRING	TestLIR	Name of the new LIR resource.
meta[type]	STRING	entry	Type of resource - Adding a LIR will **always** be "entry".
meta[section]	STRING	lir	Section of the resource object. - Adding a LIR will **always** have "lir" as the section.

Fields Information

Detail on the "fields" array:		
fields []	ARRAY	Entry field values (for fields that have already been assigned to the section) can be populated when the entry is created. The format is field[field-slug][field-instance]. If the field instance is left blank, it will simply be the next value in the instance array. For example: *fields[network-fqdn][]=example.com&fields[network-fqdn][]=test.com* would be written in JSON as

```
var fields = {
     "network-fqdn": [
          "example.com",
          "test.com"
     ]
}
```

Please note that the Field Slug might differ from the Field Name! To find the correct slug to use in adding resources with field values go the Section of the Resource you are adding, click 'Edit', then click the name of the Fields you will be populating. An Edit Field box will pop up which displays the Field's slug.

A field can be added to a section multiple times. The field instance is used to keep track of which field occurrence we are referring. In this example, the network-fqdn field had been added twice to the section so we were able to store two values for it.

Required Parameters

(fields[ ][] =)

Name	Type	Example	Notes
fields[rir][]	STRING	ARIN	The RIR for the LIR. Accepted values are "ARIN", "RIPE", "LACNIC", "AfriNIC", "APNIC", and "1918".
fields[asn][]	STRING	20202	The ASN (Autonomous System Number) for the LIR.

Optional Parameters

(fields[ ][] =)

For LIRs with RIR = "ARIN":

Name	Type	Example	Notes
fields[org-handle][]	STRING	org1	Organization Handle. **NOTE:** When providing field information, Organization handle is **required** in order for the remaining fields to populate.
fields[admin-poc][]	STRING	admin1	The admin point of contact object name.
fields[net-poc][]	STRING	tech1	The network point of contact for this object.
fields[abuse-poc][]	STRING	abuse1	The abuse point of contact object name.
fields[net-name-prefix][]	STRING	test-	The network name prefix.
fields[api-key][]	STRING	akakakakakaka	API key used to interface with RIR services

For LIRs with RIR = "RIPE", "LACNIC", "AfriNIC", "APNIC", and "1918". :

Name	Type	Example	Notes
fields[mnt-by][]	STRING	maint1	The name of the maintainer object. **NOTE:** When providing field information, Maintainer name is **required** in order for the remaining fields to populate.
fields[mnt-by-password][]	STRING	passwordabcd	The maintainer password.
fields[admin-c][]	STRING	admin1	Administrative contact for this object.
fields[tech-c][]	STRING	tech1	Technical contact for this object

Example URL	**ARIN example with only minimum required information:** /api/v1/api.php?target=lir&action=add&meta[name]=TestLIR1&meta[type]=entry&meta[section]=lir&fields[rir][]=ARIN&fields[asn][]=20202 **ARIN example with full Organization field details:** /api/v1/api.php?target=lir&action=add&meta[name]=TestLIR2&meta[type]=entry&meta[section]=lir&fields[rir][]=ARIN&fields[asn][]=20202&fields[org-handle][]=org1&fields[admin-poc][]=admin1&fields[net-poc][]=tech1&fields[abuse-poc][]=abuse1&fields[net-name-prefix][]=test-&fields[api-key][]=akakakakakaka **Non-ARIN example with only minimum required information:** /api/v1/api.php?target=lir&action=add&meta[name]=TestLIR3&meta[type]=entry&meta[section]=lir&fields[rir][]=RIPE&fields[asn][]=20202 **Non-ARIN example with full Organization field details:** /api/v1/api.php?target=lir&action=add&meta[name]=TestLIR4&meta[type]=entry&meta[section]=lir&fields[rir][]=1918&fields[asn][]=20202&fields[mnt-by][]=maint1&fields[mnt-by-password][]=passwordabcd&fields[admin-c][]=admin1&fields[tech-c][]=tech1

Update

URL	/api/v1/api.php?target=lir&action=update
Description	Updates a LIR. LIR updates utilize the Resource system - see API Module - Resource - Update for details on editing a resource via the API.
Returns	**Examples:**

SUCCESSFUL


```
{
 "success":1,
 "message":"Resource Updated",
 "data":
 {
 "id":"206",
 "name":"TestName",
 "slug":"dstl-reserved",
 "type":"entry",
 "parent_id":"191",
 "category_id":null,
 "date":1470755920,
 "modified":1517513903,
 "attr":
 {
 "mnt-by-password":11,
 "rir":"RIPE",
 "asn":"30303",
 "mnt-by":"Maint2",
 "admin-c":"admin4",
 "tech-c":"Tech5",
 "_section":"162",
```

```
"_custom_id":"",
"_gadget_data":[]
},
"section":
{
"id":"162",
"name":"4BCH",
"slug":"4bch",
"type":"section",
"parent_id":"1",
"category_id":null,
"date":1468356788,
"modified":1468356788,
"attr":[]
},
"gadgets":[]
}
}
```


ERROR


```
{
    "success":0,
    "message":"error message"
}
```


Required Parameters

(meta[ ] =)

Name	Type	Example	Notes
meta[id]	INTEGER	1234	ID of the LIR resource to update.
meta[type]	STRING	entry	Type of resource - Updating a LIR will **always** be "entry".

Optional Parameters

(meta[ ] =)

Name	Type	Example	Notes
meta[name]	STRING	TestLIR	Name of the LIR resource.

Required Parameters

(fields[ ][] =)

None.

Optional Parameters

(fields[ ][] =)

For LIRs with RIR = "ARIN":

Name	Type	Example	Notes
fields[rir][]	STRING	ARIN	The RIR for the LIR. Accepted values are "ARIN", "RIPE", "LACNIC", "AfriNIC", "APNIC", and "1918".
fields[asn][]	STRING	20202	The ASN (Autonomous System Number) for the LIR.

fields[org-handle][]	STRING	org1	Organization Handle. **NOTE:** When providing field information, Organization handle is **required** in order for the remaining Org. object fields to populate.
fields[admin-poc][]	STRING	admin1	The admin point of contact object name.
fields[net-poc][]	STRING	tech1	The network point of contact for this object.
fields[abuse-poc][]	STRING	abuse1	The abuse point of contact object name.
fields[net-name-prefix][]	STRING	test-	The network name prefix.
fields[api-key][]	STRING	akakakakakaka	API key used to interface with RIR services

For LIRs with RIR = "RIPE", "LACNIC", "AfriNIC", "APNIC", and "1918". :

Name	Type	Example	Notes
fields[rir][]	STRING	RIPE	The RIR for the LIR. Accepted values are "ARIN", "RIPE", "LACNIC", "AfriNIC", "APNIC", and "1918".
fields[asn][]	STRING	20202	The ASN (Autonomous System Number) for the LIR.
fields[mnt-by][]	STRING	maint1	The name of the maintainer object. **NOTE:** When providing field information, Maintainer name is **required** in order for the remaining maintainer object fields to populate.
fields[mnt-by-password][]	STRING	passwordabcd	The maintainer password.
fields[admin-c][]	STRING	admin1	Administrative contact for this object.
fields[tech-c][]	STRING	tech1	Technical contact for this object

Example URL

Update example with only the minimum required information:

This sends only the meta data required for a success response, but it does not actually change any values.

/api/v1/api.php?target=lir&action=update&meta[id]=14068&meta[type]=entry

Update example with changing RIR, ASN, and updating all field information:

This example changes a non-ARIN LIR to an ARIN LIR, and provides all updated information for the new RIR type.

/api/v1/api.php?target=lir&action=update&meta[id]=14068&meta[type]=entry&meta[name]=TestLIR4b&fields[rir][]=ARIN&fields[asn][]=30303&fields[org-handle][]=OrgABC&fields[admin-poc][]=AdminABC&fields[tech-c][]=TechABC&fields[abuse-poc][]=AbuseABC&fields[net-name-prefix][]=TestABC-&fields[api-key][]=abcdabcd

API Module - Peering

Peering

ProVision's APIv1 system has been replaced by APIv2, and is now considered deprecated.

- Peering
  - getCommunications
  - getPeers
  - getRequests
  - getSessions
  - addSession
  - configureSession
  - deleteSession
  - updateSession
  - resestPeerStatus
  - sendRequest
  - sendEmail
  - updatePeer

getCommunications

Base URL	/api/v1/api.php?target=peering&action=getCommunications
Description	Returns all communication data on peers at a particular exchange.
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"8 records found.","data":[{"name":"1&1 Internet","asn":"8560","request_status":null,"qualified":null,"is_peer":false,"id":"262","log_data":[]},{"name":"Akamai Technologies","asn":"20940","request_status":null,"qualified":null,"is_peer":false,"id":"2","log_data":[]},{"name":"Amazon.com","asn":"16509","request_status":null,"qualified":null,"is_peer":false,"id":"1418","log_data":[]},{"name":"Atrato IP Networks","asn":"5580","request_status":null,"qualified":null,"is_peer":false,"id":"2283","log_data":[]},{"name":"OVH","asn":"16276","request_status":null,"qualified":null,"is_peer":false,"id":"1264","log_data":[]},{"name":"Verisign","asn":"7342","request_status":null,"qualified":null,"is_peer":false,"id":"873","log_data":[]},{"name":"Walmart.com","asn":"17374","request_status":null,"qualified":null,"is_peer":false,"id":"627","log_data":[]},{"name":"Windstream Communications","asn":"7029","request_status":null,"qualified":null,"is_peer":false,"id":"1820","log_data":[]},{"name":"Yahoo!","asn":"10310","request_status":null,"qualified":null,"is_peer":false,"id":"27","log_data":[]},{"name":"Zayo","asn":"19092","request_status":null,"qualified":null,"is_peer":false,"id":"3611","log_data":[]},{"name":"Zayo (Abovenet Communications Inc.)","asn":"6461","request_status":null,"qualified":null,"is_peer":false,"id":"541","log_data":[]},{"name":"tw telecom","asn":"4323","request_status":null,"qualified":null,"is_peer":false,"id":"540","log_data":[]}]} ERROR: *{'success':0, 'message':'error message'}*
Required Parameters	**Name** / **Type** / **Example** / **Description** public_id / INTEGER / 1 / The unique numerical identifier of the exchange to retrieve peering communicaiton records for.
Optional Parameters	None
Example URL	/api/v1/api.php?target=peering&action=getCommunications&public_id=1

getPeers

URL	/api/v1/api.php?target=peering&action=getPeers
Description	Returns a list of all peers available at an exchange

Returns

Examples:
SUCCESSFUL: {"success":1,"message":"184 peers found.","data":[{"id":"262","public_id":"1","asn":"8560","name":"1&1 Internet","qualified":true,"is_peer":0,"request_status":"sent","info_prefixes":"150","public_ips":[],"contacts":[],"log_data":[]},"id":"286","public_id":null,"asn":"3856","name":"Packet Clearing House","qualified":true,"is_peer":0,"request_status":null,"info_prefixes":"100","public_ips":[],"contacts":[],"log_data":[]},{"id":"890","public_id":null,"asn":"13768","name":"PEER 1 Hosting","qualified":true,"is_peer":0,"request_status":null,"info_prefixes":"3000","public_ips":[],"contacts":[],"log_data":[]},{"id":"1676","public_id":null,"asn":"3737","name":"PenTeleData","qualified":true,"is_peer":0,"request_status":null,"info_prefixes":"80","public_ips":[],"contacts":[],"log_data":[]},{"id":"1560","public_id":null,"asn":"23265","name":"Pocketinet Communications, Inc.","qualified":true,"is_peer":0,"request_status":null,"info_prefixes":"200","public_ips":[],"contacts":[],"log_data":[]},{"id":"576","public_id":null,"asn":"32787","name":"Prolexic","qualified":true,"is_peer":0,"request_status":null,"info_prefixes":"500","public_ips":[],"contacts":[],"log_data":[]},"id":"353","public_id":null,"asn":"27524","name":"Xeex Communications","qualified":true,"is_peer":0,"request_status":null,"info_prefixes":"3000","public_ips":[],"contacts":[],"log_data":[]},{"id":"27","public_id":null,"asn":"10310","name":"Yahoo!","qualified":true,"is_peer":0,"request_status":null,"info_prefixes":"500","public_ips":[],"contacts":[],"log_data":[]},{"id":"1751","public_id":null,"asn":"13238","name":"Yandex LLC","qualified":true,"is_peer":0,"request_status":null,"info_prefixes":"60","public_ips":[],"contacts":[],"log_data":[]},{"id":"4078","public_id":null,"asn":"19468","name":"YieldBuild Inc","qualified":true,"is_peer":0,"request_status":null,"info_prefixes":"5","public_ips":[],"contacts":[],"log_data":[]},{"id":"541","public_id":null,"asn":"6461","name":"Zayo (Abovenet Communications Inc.)","qualified":true,"is_peer":0,"request_status":null,"info_prefixes":"20000","public_ips":[],"contacts":[],"log_data":[]},{"id":"2351","public_id":null,"asn":"14824","name":"Zynga Game Network, Inc.","qualified":true,"is_peer":0,"request_status":null,"info_prefixes":null,"public_ips":[],"contacts":[],"log_data":[]}]}
ERROR: {"success":1,"message":"No peers found."}

Required Parameters

None

Optional Parameters

Name	Type	Example	Description
public_id	INTEGER	1	The unique numerical identifier of the exchange to retrieve peering communication records for.
id	INT	1	The unique numerical identifier of the peer in peeringDB.
asn	INT	4436	
name	STRING	GTT	
aka	STRING	nLayer	
website	STRING	http://www.gt-t.net	
notes_public	STRING		
notes_private	STRING		
irr_as_set	STRING	AS-NLAYER	
info_traffic	ENUM	1 Tbps+	enum('Not Disclosed','0-20 Mbps','20-100Mbps','100-1000Mbps','1-5Gbps','5-10Gbps','10-20Gbps','20-50 Gbps','50-100 Gbps','100+ Gbps','100-200 Gbps','200-300 Gbps','300-500 Gbps','500-1000 Gbps','1 Tbps+') DEFAULT 'Not Disclosed'
info_ratio	ENUM	Mostly Outbound	enum('Not Disclosed','Heavy Outbound','Mostly Outbound','Balanced','Mostly Inbound','Heavy Inbound') DEFAULT 'Not Disclosed'
info_scope	ENUM	Global	enum('Not Disclosed','Regional','North America','Asia Pacific','Europe','Africa','South America','Global') DEFAULT NULL
info_type	ENUM	NSP	enum('Not Disclosed','NSP','Content','Cable/DSL /ISP','Enterprise','Educational/Research','Non-Profit') DEFAULT 'Not Disclosed'
info_prefixes	INT	10000	
info_lookingglass	STRING	http://lg.nlayer.net/	
info_routeserver	STRING	telnet://route-server.nlayer.net	
info_unicast	CHAR	1	
info_multicast	CHAR		
info_ipv6	CHAR	1	

	policy_url	STRING	http://www.gt-t.net/Peering_policies.aspx	
	policy_general	ENUM	Selective	enum('Open','Selective','Restrictive','No') DEFAULT NULL
	policy_locations	ENUM	Required - International	enum('Not Required','Preferred','Required - US','Required - International') DEFAULT NULL
	policy_ratio	ENUM	No	enum('Yes','No') DEFAULT NULL
	policy_contracts	ENUM	Not Required	enum('Not Required','Private Only','Required') DEFAULT NULL
	policy_nopublic	ENUM	N	enum('Y','N') NOT NULL DEFAULT 'N'
	policy_noprivate	ENUM	N	enum('Y','N') NOT NULL DEFAULT 'N'
	date_created	DATETIME	2013-03-21 15:36:42	Date the peeringdb entry was created
	date_lastupdated	DATETIME	2013-03-21 15:36:42	Date the peeringdb entry was last updated
	include_public_ips	BOOL	TRUE	Returns a list of all public facing IPs
	include_contacts	BOOL	TRUE	Returns a list of all contacts associated with peer(s)
	include_log_data	BOOL	TRUE	Returns a list of all log data associated with the peer(s) (use with care)
Example URL	/api/v1/api.php?target=peering&action=getPeers&public_id=1			

getRequests

URL	/api/v1/api.php?target=peering&action=getRequests
Description	Returns a list of all peering requests issued
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"1 request found.","data":[{"id":"131","public_id":"5","source_participant_id":"2335","source_asn":"8038","peer_participant_id":"1418","peer_asn":"16509","peer_name":"Amazon.com","email_type":"text","email_from":"ops@6connect.com","email_to":"nalinmk@gmail.com","subject":"Peering request from 6connect, Inc.","body":"Peering,\r\n\r\n6connect, Inc., 8038, would like to peer with Amazon.com at our common locations.\r\n\r\nFacility, IP Address\r\nEquinix Ashburn - 206.126.236.68\r\nEquinix Palo Alto - 198.32.176.36\r\nEquinix Ashburn - 206.126.236.35 \r\nEquinix San Jose - 206.223.116.177\r\nLINX Juniper LAN - 195.66.225.175\r\n\r\nSincerely,\r\nOperations\r\nops@6connect.com\r\n\r\n\r\n6connect, Inc. information:\r\nEquinix Palo Alto, 2001:504:d::33\r\nEquinix Palo Alto, 198.32.176.51 \r\n\r\nPeeringDB: http:\/\/as8038.peeringdb.com\/\r\n","status":null,"created":"2014-04-23 10:31:33","modified":"2014-04-23 10:31:33"}]} ERROR: {"success":1,"message":"No request found.","data":[]}
Required Parameters	None
Optional Parameters	**Name** / **Type** / **Example** / **Description** peer_participant_id / INTEGER / 1 / The numerical id of the peer
Example URL	/api/v1/api.php?target=peering&action=getRequests&peer_participant_id=1

getSessions

URL	/api/v1/api.php?target=peering&action=getSessions
Description	Returns a list of all bgp peering sessions
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"1 sessions found.","data":[{"id":"51","source_asn":"32787","source_ipaddr":"1.2.3.4","

resource_id":"422","resource_name":"ar1.inoc.com","peer_asn":"20940","peer_name":"Akamai Technologies","
peer_participant_id":"2","peer_ipaddr":"206.126.236.102","peer_hostname":null,"peer_group":"group b","public_id":"1","
public_name":"Equinix Ashburn","ip_type":"ipv4","type":"Peer","state":"not configured","prfx_max":"20","prfx_received":null,"
password":"0","note":null},]}

ERROR: {"success":1,"message":"No peers found."}

Required Parameters

Name	Type	Example	Description
public_id	INTEGER	1	The unique numerical identifier of the exchange to retrieve peering communicaiton records for.

Optional Parameters

Name	Type	Example	Description
id	INTEGER	41	
public_id	INTEGER		
source_asn	INTEGER		
source_ipaddr	STRING		
resource_id	INTEGER		
peer_asn	INTEGER		
peer_name	STRING		
peer_participant_id	INTEGER		
peer_ipaddr	STRING		
peer_hostname	STRING		
peer_group	STRING		
password	INTEGER		
type	STRING		
state	STRING		
prfx_max	INTEGER		
prfx_received	INTEGER		
ip_type	ENUM		enum('ipv4','ipv6') NOT NULL DEFAULT 'ipv4'
note	STRING		
created	TIMESTAMP		
modified	TIMESTAMP		
deleted	INTEGER		
public_id	INTEGER		

Example URL: /api/v1/api.php?target=peering&action=getPeers&public_id=1

addSession

URL	/api/v1/api.php?target=peering&action=addSession
Description	Adds a bgp session
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Session added: Amazon.com (AS8038\/1.2.3.5) - (AS16509\/206.126.236.68)","data":{"id":111,"source_asn":"8038","source_ipaddr":"1.2.3.5","resource_id":"422","resource_name":null,"peer_asn":"16509",""

	peer_name":"Amazon.com","peer_participant_id":"1418","peer_ipaddr":"206.126.236.68","peer_hostname":null,"peer_group":"LAME-PEERS","public_id":"1","public_name":null,"ip_type":"ipv4","type":"Peer","state":"not configured","prfx_max":"200","prfx_received":null,"password":"ace12345","note":"I'm a fancy note."}} ERROR: {"success":1,"message":"No request found.","data":[]}
Required Parameters	None
Optional Parameters	

Name	Type	Example	Description
source_asn	INTEGER	1	The numerical id of the peer
source_ipaddr	STRING		
resource_id	INTEGER		
peer_asn	INTEGER		
peer_name	STRING		
peer_participant_id	INTEGER		
peer_ipaddr	STRING		
peer_hostname	STRING		
peer_group	STRING		
public_id			
type	STRING		
ip_type	ENUM		enum('ipv4','ipv6')
state	STRING		
prfx_max	INTEGER		
note	STRING		

Example URL	/api/v1/api.php?target=peering&action=getRequests&peer_participant_id=1

configureSession

URL	/api/v1/api.php?target=peering&action=configureSession
Description	Configure a BGP session on the router
Returns	**Examples:** SUCCESSFUL: ERROR: {"success":0,"message":"Unable to authenticate "}
Required Parameters	

Name	Type	Example	Description
session_id	INTEGER	1	

Optional Parameters

Name	Type	Example	Description
session_id	INTEGER	1	The numerical id of the peer
source_ipaddr	STRING		
resource_id	INTEGER		
peer_asn	INTEGER		
peer_name	STRING		

	peer_participant_id	INTEGER		
	peer_ipaddr	STRING		
	peer_hostname	STRING		
	peer_group	STRING		
	public_id			
	type	STRING		
	ip_type	ENUM		enum('ipv4','ipv6')
	state	STRING		
	prfx_max	INTEGER		
	note	STRING		

Example URL	/api/v1/api.php?target=peering&action=configureSession&session_id=51&username=&config=conf+t%0A%0Arouter+bgp+32787%0A%0Ano+neighbor+206.126.236.102%0A%0Aneighbor+206.126.236.102+remote-as+20940%0Aneighbor+206.126.236.102+peer-group+group+b%0Aneighbor+206.126.236.102+description+Akamai+Technologies%0Aneighbor+206.126.236.102+maximum-prefix+20+%0Aneighbor+206.126.236.102+password+0+0%0A%0Aend%0Awrite

deleteSession

URL	/api/v1/api.php?target=peering&action=deleteSession
Description	Delete sessions matching criteria
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"1 sessions deleted."} ERROR: {"success":0,"message":"No sessions found to delete."}
Required Parameters	None
Optional Parameters	

Name	Type	Example	Description
id	INTEGER	41	
public_id	INTEGER		
source_asn	INTEGER		
source_ipaddr	STRING		
resource_id	INTEGER		
peer_asn	INTEGER		
peer_name	STRING		
peer_participant_id	INTEGER		
peer_ipaddr	STRING		
peer_hostname	STRING		
peer_group	STRING		
password	INTEGER		
type	STRING		
state	STRING		
prfx_max	INTEGER		
prfx_received	INTEGER		
ip_type	ENUM		enum('ipv4','ipv6') NOT NULL DEFAULT 'ipv4'

	note	STRING		
	created	TIMESTAMP		
	modified	TIMESTAMP		
	deleted	INTEGER		
	public_id	INTEGER		

Example URL	/api/v1/api.php?target=peering&action=deleteSession&id=171

updateSession

URL	/api/v1/api.php?target=peering&action=updateSession
Description	Updates session values with any new values specified
Returns	**Examples:** SUCCESSFUL:{"success":1,"message":"Session updated: 123.net (AS32787\/1.2.3.4) - (AS12129\/206.126.236.70)","data":{"id":"41","source_asn":"32787","source_ipaddr":"1.2.3.4","resource_id":"422","resource_name":"ar1.inoc.com","peer_asn":"12129","peer_name":"123.net","peer_participant_id":"3899","peer_ipaddr":"206.126.236.70","peer_hostname":null,"peer_group":"group a","public_id":"1","public_name":"Equinix Ashburn","ip_type":"ipv4","type":"Peer","state":"not configured","prfx_max":"10","prfx_received":null,"password":"0","note":"Adding an awesome note."}} ERROR:
Required Parameters	None
Optional Parameters	

Name	Type	Example	Description
id	INTEGER	41	
public_id	INTEGER		
source_asn	INTEGER		
source_ipaddr	STRING		
resource_id	INTEGER		
peer_asn	INTEGER		
peer_name	STRING		
peer_participant_id	INTEGER		
peer_ipaddr	STRING		
peer_hostname	STRING		
peer_group	STRING		
password	INTEGER		
type	STRING		
state	STRING		
prfx_max	INTEGER		
prfx_received	INTEGER		
ip_type	ENUM		enum('ipv4','ipv6') NOT NULL DEFAULT 'ipv4'
note	STRING		
created	TIMESTAMP		
modified	TIMESTAMP		
deleted	INTEGER		
public_id	INTEGER		

Example URL	/api/v1/api.php?target=peering&action=updateSession&note=Adding+an+awesome+note.&peer_group=group+a

resestPeerStatus

URL	/api/v1/api.php?target=peering&action=resetPeerStatus
Description	
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"1&1 Internet status reset","data":{"id":"262","public_id":"1","asn":"8560","name":"1&1 Internet","qualified":true,"is_peer":0,"request_status":"none","info_prefixes":null,"public_ips":[],"contacts":[],"log_data":[{"message":"Peer status reset","time":"2014-05-22 23:14:54","request_id":null,"session_id":null,"public_id":"1"},{"message":"Peer status reset","time":"2014-05-22 23:14:18","request_id":null,"session_id":null,"public_id":"1"},{"message":"Session deleted: 1&1 Internet (AS32787\V1.2.3.4) - (AS8560\V206.126.236.200)","time":"2014-05-22 22:39:43","request_id":null,"session_id":"71","public_id":"1"},{"message":"Request sent: ","time":"2014-04-12 13:24:43","request_id":"121","session_id":null,"public_id":"1"},{"message":"Session added: 1&1 Internet (AS32787\V1.2.3.4) - (AS8560\V206.126.236.200)","time":"2014-04-07 11:32:37","request_id":null,"session_id":"71","public_id":"1"}]}} ERROR: {"success":0,"message":"Could not find peer matching parameters"}
Required Parameters	**Name** / **Type** / **Example** / **Description** participant_id / INTEGER / 262 / The id of the peer in from the peeringDB peerParticipants table. public_id / INTEGER / 1 / The id of the exchange point from the peeringDB mgmtPublics table.
Optional Parameters	None
Example URL	/api/v1/api.php?target=peering&action=resetPeerStatus&participant_id=262&public_id=1

sendRequest

URL	/api/v1/api.php?target=peering&action=sendRequest
Description	Send a peering request (email) to a prospective peer. This will be deprecated in the next version for a simpler call, strongly suggest
Returns	**Examples:** SUCCESSFUL: {"success":1,"message":"Request sent","data":{"id":"922","public_id":"1","asn":"10933","name":"ATX Communicatio is_peer":0,"request_status":"sent","info_prefixes":null,"public_ips":[],"contacts":[],"log_data":[{"message":"Request sent to ","time":"2 request_id":"181","session_id":null,"public_id":"1"},{"message":"Request sent to ","time":"2014-05-27 16:49:30","request_id":"171"," public_id":"1"}]}} ERROR: {"success":0,"message":"Internal error"}
Required Parameters	**Name** / **Type** / **Example** / **Description** public_id / INTEGER / / peer_participant_id / INTEGER / / source_participant_id / INTEGER / / peer_name / STRING / / peer_asn / INTEGER / / email_from / STRING / 262 / email_to / STRING / 1 / subject / STRING / / body / STRING / /

	type	ENUM	html	enum('text','html')
	status	ENUM	sent	enum('sent','accepted','rejected')

Optional Parameters	None
Example URL	https://ops.6connect.com/peering-demo/api/v1/api.php?target=peering&action=sendRequest&peer_participant_id=1909&peer_asn=28929&peer_name=ASDASD+srl&source_participant_&public_id=1&type=text&email_from=ops%406connect.com&email_to=operations%40as28929.net&cc=&bcc=&subject=Peering+re2C+Inc. &body=%0D%0APeering%2C%0D%0A%0D%0A6connect%2C+Inc.%2C+8038%2C+would+like+to+peer+with+ASDASD+srl+at+our+common+locations.%3A%0D%0APeeringDB%3A+http%3A%2F%2Fas8038.p0A

sendEmail

URL	/api/v1/api.php?target=peering&action=sendEmail
Description	Send a peering request (email) to a prospective peer. This will be deprecated in the next version for a simpler call, strongly suggest against using.
Returns	**Examples:** SUCCESSFUL: ERROR:
Required Parameters	**Name** | **Type** | **Example** | **Description** participant_id | INTEGER | 262 | public_id | INTEGER | 1 |
Optional Parameters	None
Example URL	

updatePeer

URL	/api/v1/api.php?target=peering&action=updatePeer
Description	
Returns	**Examples:** SUCCESSFUL: ERROR:
Required Parameters	**Name** | **Type** | **Example** | **Description** participant_id | INTEGER | 262 | public_id | INTEGER | 1 |
Optional Parameters	None
Example URL	

API Module - Resource

Resources

ProVision's APIv1 system has been replaced by APIv2, and is now considered deprecated.

- Resources
  - get
  - add
  - update
  - delete
  - get resource link
  - get resource search

get

URL	/api/v1/api.php?target=resource&action=get
Description	Get a resource or resources
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Search successful","data":[{"id":"57","name":"2nd Email","slug":"6c-contact-email2","type":"field","parent_id":"1","category_id":null,"attr":[]}]}* ERROR: *{"success":0,"message":"Search failed"}*
Optional Parameters	**General Parameters:**

Name	Type	Notes/Example
name	STRING	Name of the resource. Example: 6Connect, Inc.
slug	STRING	The unique URL friendly name of the resource. Example: 6connect-inc
type	STRING	Type of resource (eg. *entry*, *field*, *category*, *dnsmodule*)
search	STRING	Search the resource system for the provided term. Performs a "LIKE" search to return similar results. Similar to GET Resource SEARCH call.
search_column	STRING	Column to perform a 'search' on.
permissions__true	STRING	Set the permissions that must be true. Typically only used for UI / Gadget permissions.
permissions__false	STRING	Set the permissions that must be false. Typically only used for UI / Gadget permissions.
getFromBackup	INTEGER	Use data from the resource_archive table instead of the standard resource table, used with "orig_id" identifying parameter.

Limit Results by ID:

At most, one of the following:

Name	Type	Notes/Example
id	INTEGER	Get the resource which has this ID
orig_id	INTEGER	The resource id from the standard resource table, used in conjunction with 'getFromBackup'.
custom_id	INTEGER	The resource custom id provided by the user for the resource.
resource__in	ARRAY	Get any resource which has any of these IDs Syntax: &resource__in[]=1771&resource__in[]=14238 (Each resource id you wish to search over gets its own phrase.)

resource__not_in	ARRAY	Get all the resources which do not have any of these IDs Syntax: &resource__not_in[]=1771&resource__not_in[]=14238 (Each resource id you wish to exclude gets its own phrase.)

At most, one of the following:

Name	Type	Notes/Example
parent_id	INTEGER	Get the resources whose parent has this ID
parent__in	ARRAY	Get any resource whose parents have any of these IDs. Syntax: &parent__in[]=162&parent__in[]=299 (Each parent id you wish to search over gets its own phrase.)
parent__not_in	ARRAY	Get all resources whose parents do not have any of these IDs Syntax: &parent__not_in[]=1771&parent__not_in[]=14238 (Each parent id you wish to exclude gets its own phrase.)

At most, one of the following:

Name	Type	Notes/Example
category_id	INTEGER	Get the resources of the category that has this ID
category__in	ARRAY	Get any resources whose categories have any of these IDs. Syntax: &category__in[]=11002&category__in[]=11003 (Each category id you wish to search over gets its own phrase.)
category__not_in	ARRAY	Get the resources of all the categories that do not have any of these IDs Syntax: &parent__not_in[]=11002&parent__not_in[]=11003 (Each category id you wish to exclude gets its own phrase.)

Limit Results by Resource Link:

For resources for which exist a Resource Link, you may limit by resource link data:

Name	Type	Notes/Example
resource_link_type	STRING	The resource linkage relation name. Valid values include: For *type = dnsmodule:*

Valid Value	Notes
dnsViewACL	Links a ACL and a Group. The View (Group) must be resource1, resource id and the ACL resource must be resource2 in the linkage table
dnsViewServer	Links a View (Group) with Server (DNS Connector), and the Group resource must be as resource1 and DNS Module as resource2. Used for attaching DNS servers to DNS Groups.
dnsZoneMaster	Links a DNS Zone resource with the Server that will be exported as Master. The DNS Zone must be in resource1 and the server as resource2. Used for Directly attaching zones to servers.
dnsZoneSlave	Links a DNS Zone resource with the Server that will be exported as Slave. The DNS Zone must be in resource1 and the server as resource2. Used for Directly attaching zones to servers.
dnsZoneServer	

		Links a DNS Zone resource with a Server resource. The DNS Zone must be in resource1 and the server as resource2. Used to directly attach servers to zones.
		dnsZoneView: Links a DNS Zone resource with a Group. The DNS Zone must be resource1, the Group resource as resource 2.
resource_link_column	INTEGER	The column to be used for the parameter in "resource_link_value". Valid integer values are: '1' = to use resource1 in the first column '2' = to use resource2 in the second column
resource_link_value	INTEGER	The resource id for the resource_linkage table to search (Example: "10697")

Limit Results by Attributes:

You can further limit the results based on attributes the resources may have:

Name	Type	Notes/Example
attributes	ARRAY	You can search on multiple attributes by including an array of attribute options: `var data = {` `"type: "entry",` `"attributes": [` `{` `"attr_key": "_section",` `"attr_value": "105",` `},` `{` `"attr_key": "address-mail-state",` `"attr_value": "CA",` `}` `],` `"resources_per_page: 10` `}`
attr_key	STRING	The name of the attribute. Example: network-fqdn
attr_value	STRING	The value of any attribute, or if attr_key is specified, the value of the attribute defined in attr_key.
attr_compare	STRING	If both attr_key and attr_value are given, the results are by default compared based on the value given as attr_value being equal to the value stored in the database. You can optionally change this by setting the STRING value of attr_compare to one of the following: • = *(default)* • != • • = • • = • LIKE • NOT LIKE • IN • NOT IN • BETWEEN • NOT BETWEEN

		When attr_compare is set to IN, NOT IN, BETWEEN, NOT BETWEEN, then attr_value must either be an array or a comma separated string.
attr_load	BOOL	Load resource attributes along with the resource entry

Result Ordering:

Name	Type	Notes/Example
order	STRING	Set the direction of the ordering of the results by ascending or descending order. Valid values are: • ASC *(default)* • DESC
orderby	STRING	The parameter to order results by. Valid values include: • none • id • name *(default)* • slug • type • parent_id • date • resource__in *(preserve order given in the resource__in array)*

Range Selection / Paging:

You can restrict the range of the resources returned.

Name	Type	Notes/Example
resources_per_page	INTEGER	How many resources to return per page, e.g.: '10' .
offset	INTEGER	How many resources to offset from the initial resource, to use as the first resource provided in the return list (the initial resource is 0, not 1).
paged	INTEGER	The page to return (starts at 1, not 0). This parameter is provided for convenience and is used to calculate the offset where: offset=(paged-1)*resources_per_page

Example URL	/api/v1/api.php?target=resource&action=get&id=7

add

URL	/api/v1/api.php?target=resource&action=add
Description	Add a resource.
Returns	**Examples:** */api/v1/api.php?target=resource&action=add&meta[name]=apitest&meta[type]=entry&meta[section]=firewall&fields[network-fqdn][]=www.example.com* SUCCESSFUL: {"success":1,"message":"Resource added","data":{"id":1077,"name":"apitest","slug":"apitest","type":"entry","parent_id":1,"category_id":"NULL","attr":{"_section":"70","network-fqdn":"www.example.com"},"section":{"id":"70","name":"Firewall","slug":"firewall","type":"section","parent_id":"1","category_id":null,"attr":{}}}} */api/v1/api.php?target=resource&action=add&meta[name]=apitest&meta[type]=entry&fields[network-fqdn][]=www.example.com* ERROR:{"success":0,"message":"Entries must be assigned to a section"}
Required Parameters	

Name	Type	Notes/Example

meta[name]	STRING	Name of the resource
meta[type]	STRING	Type of resource (entry, section, field, etc.)

Optional Parameters

Name	Type	Notes/Example
meta[parent_id]	INTEGER	ID of the parent resource
meta[category_id]	INTEGER	ID of the category

Required Parameters

(meta [type] = entry)

One of the following:

Name	Type	Notes/Example
meta[section_id]	INTEGER	ID of the section that the entry will be assigned to
meta[section]	STRING	Slug of the section that the entry will be assigned to

Optional Parameters

(meta [type] = entry)

Name	Type	Notes/Example
fields[]	ARRAY	Entry field values (for fields that have already been assigned to the section) can be populated when the entry is created. The format is field[field-slug][field-instance]. If the field instance is left blank, it will simply be the next value in the instance array. For example: *fields[network-fqdn][]=example.com&fields[network-fqdn][]=test.com* would be written in JSON as `var fields = {` `"network-fqdn": [` `"example.com",` `"test.com"` `]` `}` **Please note that the Field Slug might differ from the Field Name!** To find the correct slug to use in adding resources with field values go the Section of the Resource you are adding, click 'Edit', then click the name of the Fields you will be populating. An Edit Field box will pop up which displays the Field's slug. A field can be added to a section multiple times. The field instance is used to keep track of which field occurrence we are referring. In this example, the network-fqdn field had been added twice to the section so we were able to store two values for it.
meta [custom_id]	STRING	A custom ID for the entry. In the past this has been called the Resource Holder ID or Customer ID. Most recently it was implemented as a text field with the slug "6c-resourceholder-id." Now it is a fundamental part the entry type resources.

Required Parameters

(meta [type] = field)

Name	Type	Notes/Example
meta[field_type]	STRING	Type of field • text • textarea • radios • checkboxes • choicebox

Optional Parameters

(meta [type] = field)

Name	Type	Notes/Example
meta [help_block]	STRING	Fields can have a line of text under them with instructions
meta [options]	ARRAY	Fields of type radios, checkboxes, or choicebox can have multiple options. This could be multiple radio buttons or a choicebox (dropdown) with several options. For example: meta[type]=field&meta[name]=Colors&meta[field_type]=choicebox&meta[options][]=Blue&meta [options][]=Green Will create a choicebox with dropdown options of Blue and Green.

Required Parameters

(meta [type] = gadgets)

Name	Type	Notes/Example
gadgets[x][uuid]	INTEGER	x: The nth gadget being described in the call ('0' for the first gadget, '1' for the second, and so on). uuid: User-generated ID of the gadget to be created.
gadgets[x] [code]	STRING	x: The nth gadget being described in the call ('0' for the first gadget, '1' for the second, and so on). code: Slug of the gadget code to be created. List of valid Gadget codes: • Contact Info: "_contact_info" • Contacts: "_contacts" • DHCP Server: "_dhcp_server" • DNS: "_dns" • Document Storage: "_document_storage" • IPAM: "_ipam" • Peer Groups: "_peering_peer_groups" • Peering Sessions: "_peering_sessions" • VRFs: "_peering_vrfs" • Resource Linkage: "_resource_linkage" • Resource View: "_resource_view" • Reverse API Console: "_reverse_api" • Tech Info: "_tech_info"

Example - Adding the IPAM Gadget to a Section:

api.php?target=resource&action=add&meta[type]=section&meta[name]=TestSection_1&meta[parent_id]=1&gadgets[0][uuid] =uuid-586dbd260d6ef&gadgets[0][code]=_ipam

update

URL	/api/v1/api.php?target=resource&action=update
Description	Update a resource.
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Resource Updated","data":{"id":"1055","name":"87-child-1","slug":"87-child-1","type":" entry","parent_id":"87","category_id":"65","attr":{"_section":"70"},"section":{"id":"70","name":"Firewall","slug":"firewall","type":" section","parent_id":"1","category_id":null,"attr":{}}}}* ERROR: *{"success":0,"message":"No resource found with ID: 1079"}*

Required Parameters

Name	Type	Notes/Example
meta[id]	INTEGER	ID of resource
meta[type]	STRING	Type of resource (entry, section, field, ect)

Optional Parameters

(meta [type] = entry)

Name	Type	Notes/Example
fields[]	ARRAY	See "add" documentation

Optional Parameters

(meta [type] = section)

Name	Type	Notes/Example
fields []	ARRAY	The fields value should be all the fields that are assigned to the section. Giving an empty array as the fields value will remove all fields from the section. The format is: fields[position][key] The position value is the position that the field will appear in (0 is first). The position value must always be included. An example field format for an existing field could be: fields[0][id]=2 fields[0][slug]=asset-serial-number fields[0][help_block]=something fields[0][new]=false ■ Either the id or the slug is required, not both. ■ When the "new" parameter is not included, FALSE is assumed If you want to create a new field and assign it to the section, use a format like this: fields[10][name]=TextArea fields[10][field_type]=textarea fields[10][new]=true

delete

URL	/api/v1/api.php?target=resource&action=delete
Description	Delete a resource.
Returns	**Examples:** SUCCESSFUL: *{"success":1,"message":"Resource deleted."}* ERROR: *{"success":0,"message":"No resource found with ID: 57"}*
Required Parameters	

Name	Type	Notes/Example
id	INTEGER	ID of the resource

Optional Parameters

Name	Type	Notes/Example
recursive	BOOL	When 1, deletes parent and child entries for the resource

A recursive delete will delete all resources, which are permitted to be deleted, from the bottom up.

Imagine the following hierarchy:

```
              A
     B1                B2
 C11    C12        C21    C22
```

If a recursive delete is performed on A, but C21 is not deletable, the following

resources would still be deleted: (B1, C11, C12, C22).

	B2 would not be deleted because it depends on C21 and A would not be deleted because it depends on B2.
Example URL	/api/v1/api.php?target=resource&action=delete&id=57

get resource link

Description	Get available resource links. If no resource links exist for the given resource, an empty object is returned.
URL	/api/v1/api.php?target=resource&action=getLink
Returns	**Examples:**

SUCCESSFUL:	{"success":1 ,"message":"Search successful", "data":{"meta":{"totalRecords":"3", "retrieved":3}, "0":{"id":"22", "resource_id1":"1292", "resource_id2":"1302", "relation":"dhcpPoolLink"}, "1":{"id":"2", "resource_id1":"1292", "resource_id2":"1452", "relation":"dhcpPoolLink"}, "2":{"id":"12", "resource_id1":"1422", "resource_id2":"1482", "relation":"dhcpPoolLink"}}}
ERROR:	{"success":0, "message":"error message"}

Return Detail:

Name	Type	Description
id	INTEGER	Id of the resource linkage
resource_id1	INTEGER	The id of the parent resource
resource_id2	INTEGER	The id of the linked resource
relation	STRING	The relation type. Relation types include: contact, dhcpPoolLink, dnsViewACL, dnsViewServer, dnsZoneMaster, dnsZoneServer, dnsZoneView

Meta Attributes:

Name	Type	Description
totalRecords	INTEGER	How many records were found by this query, without pagination.
retrieved	INTEGER	How many records were returned by this query, with pagination.

Optional Attributes:

Name	Type	Description
resultsPerPage	INTEGER	How many records to include per page display.*
page	INTEGER	Which page to display, when used with "resultsPerPage"*
*Example pagination: api.php?target=resource&action=getLink&relation=dhcpPoolLink&resultsPerPage=100&page=2		

get resource search

Description	Search the resource system for the provided term. Performs a "LIKE" search to return similar results.
URL	/api/v1/api.php?target=resource&action=get&search=
Returns	**Examples:**

SUCCESSFUL:	{"success":1,"message":"Search successful","data":[{"id":"11011","name":"a6connectchildentry","slug":"a6connectchildentry","type":"entry","parent_id":"4210","category_id":null,"date":1499106555,"modified":1499106555,"attr":{"_section":"4214"},"section":{"id":"4214","name":"aQA Section","slug":"aqa-section","type":"section","parent_id":"1","category_id":null,"date":1498775688,"modified":1499106630,"attr":[]},"gadgets":[]}],"result_count":1,"found_count":1}

ERROR:	{"success":0, "message":"error message"}

Return Detail:

Name	Type	Description
id	INTEGER	Id of the resource linkage
name	STRING	The resource name
slug	STRING	The resource slug
type	STRING	The resource type.
parent_id	INTEGER	ID of the parent resource
category_id	INTEGER	ID of the resource category type
date	INTEGER	Resouce creation date
modified	INTEGER	Resource last modified date
attr	JSON	A JSON list of resource attributes

Required Attributes:

Name	Type	Description
search	STRING	The search term

Example URL	/api/v1/api.php?target=resource&action=get&search=6connect

API Module - VLAN

VLAN

ProVision's APIv1 system has been replaced by APIv2, and is now considered deprecated.

- getById
- getDomains
- enable
- addDomain
- getAvailable
- get
- deleteDomain
- updateDomain
- update
- removeTags
- addTags
- smartAssign

getById

URL	api/v1/api.php?target=vlan&action=getById
Description	get information of a vlan
Returns	Examples

SUCCESSFUL	{"success":1,"message":"1 VLAN found. ","data":[{"id":"11190","vlan":"176","domain_id":"1","resource_id":null,"name":"","domain_name":"DefaultDomain","tags":[],"tagsString":[]}]}
ERROR	*{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Description
id	INTEGER	11190	ID of the VLAN

Optional Parameters	None
Example URL	api/v1/api.php?target=vlan&action=getById&id=11190

getDomains

URL	api/v1/api.php?target=vlan&action=getDomains
Description	get list and info of all domains or a specific domain. When specifying the domain the results will include tag info
Returns	Examples

SUCCESSFUL	{"success":1,"message":"6 Domains found. ","data":[{"id":"1","domain":"DefaultDomain","attr_6c":{"range":"S","restricted":[1,1002,1003,1004,1005]},"vlans":[{"id":"22866","vlan":"10","name":""},{"id":"1","vlan":"101","name":""},{"id":"3","vlan":"102","name":""},{"id":"22865","vlan":"104","name":""},{"id":"4","vlan":"105","name":"NewName"},{"id":"5","vlan":"106","name":"ThisIsAName"},{"id":"2","vlan":"107","name":""},{"id":"11189","vlan":"175","name":"SomeWhoCallMeTim"},{"id":"11190","vlan":"176","name":""},{"id":"11191","vlan":"177","name":""},{"id":"11192","vlan":"178","name":""},{"id":"7","vlan":"996","name":""},{"id":"8","vlan":"997","name":""},{"id":"9","vlan":"998","name":""},{"id":"10","vlan":"999","name":"CORP-DMZ"},{"id":"6","vlan":"1021","name":""}],"vlans_unnamed":null,"type":"domain","util":{"S":{"used":15,"total":1000}}},{"id":"2","domain":"6connect.com","attr_6c":{"range":"S","restricted":[1,1002,1003,1004,1005]},"vlans":[{"id":"19","vlan":"10","name":""},{"id":"20","vlan":"11","name":""},

		... {"id":"12755","vlan":"70","name":""},{"id":"12756","vlan":"71","name":""},{"id":"12757","vlan":"72","name":""},{"id":"12758","vlan":"73","name":""},{"id":"12759","vlan":"74","name":""},{"id":"12760","vlan":"75","name":""}],"vlans_unnamed":null,"type":"domain","util":{"S":{"used":38,"total":1000},"E":{"used":0,"total":3089}}}]}
	ERROR	*{ "success":0, "message":"error message" }*
Required Parameters	None	
Optional Parameters	**Name** / **Type** / **Example** / **Description** id / INTEGER / 2 / ID of the domain	
Example URL	api/v1/api.php?target=vlan&action=getDomains&id=2	

enable

URL	api/v1/api.php?target=vlan&action=enable		
Description	enable vlans in a domain		
Returns	Examples		
	SUCCESSFUL	{"success":1,"message":"Success. ","data":"3 in request (0 were found already namedVavailable and 3 found as unavailable). 3 VLANs have been updated to unnamed available entries."}	
	ERROR	*{ "success":0, "message":"error message" }*	
Required Parameters	**Name**	**Type**	**Example** / **Description**
	domainId	INTEGER	1 / the domain ID in the domain table
	vlan	INTEGER or STRING	18,19,20 / vlan for this domain that we want enabled
Optional Parameters	None		
Example URL	api/v1/api.php?target=vlan&action=enable&domainId=1&vlan=18,19,20		

addDomain

URL	api/v1/api.php?target=vlan&action=addDomain	
Description	add a domain	
Returns	Examples	
	SUCCESSFUL	{"success":1,"message":"domain 10 added","id":10,"data":[{"id":"10","domain":"sdfasfaf","attr_6c":{"range":"S","restricted":[1,1002,1003,1004,1005]},"vlans":[],"vlans_unnamed":{"1":null,"2":null,"3":null,"4":null,"5":null,"6":null,"7":null,"8":null,"9":null,"10":null,"11":null,"12":null,"13":null,"14":null,"15":null,"16":null,"17":null,"18":null,"19":null,"20":null,"21":null,"22":null,"23":null,"24":null,"25":null,"26":null,"27":null,"28":null,"29":null,"30":null,"31":null,"32":null,"33":null,"34":null,"35":null,"36":null,"37":null,"38":null,"39":null,"40":null,"41":null,"42":null,"43":null,"44":null,"45":null,"46":null,"47":null,"48":null,"49":null,"50":null,"51":null,"52":null,"53":null,"54":null,"55":null,"56":null,"57":null,"58":null,"59":null,"60":null,"61":null,"62":null,"63":null,"64":null,"65":null,"66":null,"67":null,"68":null,"69":null,"70":null,"71":null,"72":null,"73":null,"74":null,"75":null,"76":null,"77":null,"78":null,"79":null,"80":null,"81":null,"82":null,"83":null,"84":null,"85":null,"86":null,"87":null,"88":null,"89":null,"90":null,"91":null,"92":null,"93":null,"94":null,"95":null,"96":null,"97":null,"98":null,"99":null,"100":null,"101":null,"102":null,"103":null,"104":null,"105":null,"106":null,"107":null,"108":null,"109":null,"110":null,"111":null,"112":null,"113":null,"114":null,"115":null,"116":null,"117":null,"118":null,"119":null,"120":null,"121":null,"122":null,"

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ERROR	*{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Description
domain	STRING	6connect.com	Name to call new domain
range	STRING	S	'S' or 'E', depending on VLAN range: extended or standard

Optional Parameters

None

Example URL

api/v1/api.php?target=vlan&action=addDomain&domain=6connect.com&range=S

getAvailable

URL

api/v1/api.php?target=vlan&action=getAvailable

Description

get VLANs in a domain that have not been named yet (even names that are '', or just uses their number as a name)

Returns

Examples

SUCCESSFUL	{"success":1,"message":"16 VLANs found. ","data":{"1":{"2":null,"3":null,"4":null,"5":null,"6":null,"7":null,"8":null,"9":null,"12":null,"13":null,"15":null,"16":null,"17":null,"21":null,"22":null,"23":null}}}
ERROR	*{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Description
domainId	INTEGER or STRING	'1,2'	ID of the domains to search for

Optional Parameters

Name	Type	Example	Description
tags	INTEGER or STRING	'111,112'	ID of the tags to search for
min	INTEGER	24	VLAN to start search
max	INTEGER	200	VLAN to end search

Example URL

api/v1/api.php?target=vlan&action=getAvailable&domainId=1&tags=111,112&min=2&max=23

get

URL

api/v1/api.php?target=vlan&action=get

Description

Searches enabled VLANs. When not given options, returns all enabled VLANs. Note: an optional parameter, unavailable, is used to get available (un-enabled) VLANs as well

Returns

Examples

SUCCESSFUL	{"success":1,"message":"2 domains found. ","data":{"1":{"id":"1","domain":"DefaultDomain","attr_6c":null,"attr_custom":null,"vlans":[{"id":"4","vlan":"105","name":"NewName"}]},"2":{"id":"2","domain":"6connect.com","attr_6c":null,"attr_custom":null,"vlans":[{"id":"20","vlan":"11","name":""}]}}}
ERROR	*{ "success":0, "message":"error message" }*

Required Parameters	None

Optional Parameters

Name	Type	Example	Description
unavailable	STRING	true	Will return available, instead of enabled, VLANs
domainId	INTEGER	1	domain ID
id	INTEGER	21	VLAN ID in the vlan table

Example URL	api/v1/api.php?target=vlan&action=get&id=4&unavailable=true

deleteDomain

URL	api/v1/api.php?target=vlan&action=deleteDomain
Description	Deletes a VLAN domain.

Returns

Examples

SUCCESSFUL	*{"success":1,"message":"Domain #7 successfully deleted."}*
ERROR	*{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Description
domainId	INTEGER	7	domain ID

Optional Parameters	None
Example URL	api/v1/api.php?target=vlan&action=deleteDomain&domainId=7

updateDomain

URL	api/v1/api.php?target=vlan&action=updateDomain
Description	Updates a VLAN domain.

Returns

Examples

SUCCESSFUL	{"success":1,"message":"Domain 2 updated","id":"2","data":[{"id":"2","domain":"44.6connect.com","attr_6c":{"range":"S","restricted":[1,1002,1003,1004,1005]},"vlans":[{"id":"19","vlan":"10","name":"","tags":["105"]},{"id":"20","vlan":"11","name":"","tags":["105"]},{"id":"21","vlan":"12","name":"","tags":["105"]},{"id":"22","vlan":"13","name":"","tags":["105"]},{"id":"23","vlan":"14","name":"","tags":["105"]},{"id":"24","vlan":"15","name":"","tags":["105"]},{"id":"25","vlan":"16","name":"","tags":["105"]},{"id":"26","vlan":"17","name":"","tags":["105"]},{"id":"27","vlan":"18","name":"","tags":["105"]},{"id":"29","vlan":"20","name":"","tags":["105"]},{"id":"30","vlan":"21","name":"","tags":["105"]},{"id":"3286","vlan":"3281","name":"Bob","tags":["105"]},{"id":"3287","vlan":"3282","name":""},{"id":"3288","vlan":"3283","name":""},{"id":"3289","vlan":"3284","name":""},{"id":"3290","vlan":"3285","name":""},{"id":"3291","vlan":"3286","name":""},{"id":"3292","vlan":"3287","name":""},{"id":"3293","vlan":"3288","name":""},{"id":"3294","vlan":"3289","name":""}],"vlans_unnamed":{"1":null,"2":{"tags":["105"]},"3":{"tags":["105"]}, ... "1002":null,"1003":null,"1004":null,"1005":null},"type":"domain","util":{"S":{"used":11,"total":1000}}}]}
ERROR	*{ "success":0, "message":"error message" }*

Required Parameters	**Name** / **Type** / **Example** / **Description** domain / STRING / 6connect.com / Name of VLAN Domain range / STRING / E / VLAN range. E for Extended or S for Standard
Optional Parameters	None.
Example URL	api/v1/api.php?target=vlan&action=updateDomain&domain=DefaultDomainnn&range=S&id=1

update

URL	api/v1/api.php?target=vlan&action=update
Description	Update properties of a VLAN: name, tags, or both.
Returns	Examples SUCCESSFUL: *{"success":1,"message":"VLAN (table ID 11735) updated","id":"11735","data":[{"id":"11735","vlan":"50","domain_id":"7","resource_id":null,"name":"","domain_name":"lax.com","tags":[],"tagsString":[]}]}* ERROR: *{ "success":0, "message":"error message" }*
Required Parameters	**Name** / **Type** / **Example** / **Description** id / INTEGER / 11735 / VLAN record ID (which is “id” of the VLANs in “get” action results)
Optional Parameters	**Name** / **Type** / **Example** / **Description** name / STRING or empty string / HQ / name of the VLAN tags / INTEGER or STRING or empty string / 111,112 / ID of tags to be assigned to this VLAN. Multiple tags IDs are assignable with a comma delimiter. Empty parameter will result in no tags being assigned. enabled / BOOLEAN / false / Set the VLAN as enabled (true) or disabled (false).
Example URL	api/v1/api.php?target=vlan&action=update&id=11735&name=OReilly&tags=156,159 api/v1/api.php?target=vlan&action=update&id=11735&name=OReilly api/v1/api.php?target=vlan&action=update&id=11735&tags=156,159 api/v1/api.php?target=vlan&action=update&id=11735&name= api/v1/api.php?target=vlan&action=update&id=11735&tags=

removeTags

URL	api/v1/api.php?target=vlan&action=removeTags
Description	Remove tags from a domain's VLAN(s).
Returns	Examples SUCCESSFUL: *{"success":1,"message":"VLAN tags for VLANs updated","id":"1","data":[]}* ERROR: *{ "success":0, "message":"error message" }*
Required	

Parameters

Name	Type	Example	Description
domainId	INTEGER	1	domain ID for domain whose VLANs will be un-tagged
vlan	INTEGER or STRING	500 500-510	a single VLAN (not the record ID from the get action results, but actual VLAN ID), OR range of VLANs (using hyphen for minimum through maximum), OR comma-delimited list of VLANs and/or VLAN ranges
tagId	INTEGER or STRING	150,99	a single tag ID or comma-delimited list of tag ID's

Optional Parameters: None

Example URL:

api/v1/api.php?target=vlan&action=removeTags&domainId=1&vlan=500-510&tagId=159

api/v1/api.php?target=vlan&action=removeTags&domainId=1&vlan=400,406,500-510&tagId=159,160

addTags

URL: api/v1/api.php?target=vlan&action=addTags

Description: Add tags to a domain's VLAN(s).

Returns

Examples

SUCCESSFUL	*{"success":1,"message":"VLAN tags for VLANs updated","id":"1","data":[]}*
ERROR	*{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Description
domainId	INTEGER	1	domain ID for domain whose VLANs will be un-tagged
vlan	INTEGER or STRING	515 500-510	a single VLAN (not the record ID from the get action results, but actual VLAN ID), OR range of VLANs (using hyphen for minimum through maximum), OR comma-delimited list of VLANs and/or VLAN ranges
tagId	INTEGER or STRING	150,99	a single tag ID or comma-delimited list of tag ID's

Optional Parameters: None

Example URL:

api/v1/api.php?target=vlan&action=addTags&domainId=1&vlan=500-510&tagId=159

api/v1/api.php?target=vlan&action=addTags&domainId=1&vlan=400,406,500-510&tagId=159,160

smartAssign

URL: api.php?target=vlan&action=smartAssign

Description: Finds and enables an unassigned VLAN matching the provided search parameters and optionally renames it.

Returns

Examples

SUCCESSFUL	Return Data: the full domain description, plus the chosen VLAN with its new name (optional) *{"success":1,"message":"VLAN enabled. ","data":{"21":{"id":"21","domain":"Swisscom Demo","attr_6c":"{\" range\":\"E\"}","attr_custom":null,"vlans":[{"id":"46183","vlan":"1808","name":"RESERVED_DEV"}]}}}*
ERROR	*{ "success":0, "message":"error message" }*

Required Parameters

Name	Type	Example	Description
domainId	INTEGER	15	The Id number of the domain you would like to Smart Assign from.

Optional Parameters

Name	Type	Example	Description
tags	INTEGER	5,7,12	A comma-separated list of the Tag Ids being used for the Smart Assign.
name	STRING	CustomerName_13 , RESERVED_DEV	The name that will be assigned to the VLAN matching the given search parameters.

Example URL

api.php?target=vlan&action=smartAssign&domainId=21&name=RESERVED_DEV&tags=5,7,12

3 - SDK

6connect APIv1 - Getting Started with the SDK

> ProVision's APIv1 system has been replaced by APIv2, and is now considered deprecated.

The 6connect API allows you to access to data and functions of the 6connect web tools. The SDK for PHP or Python will help you get this setup quickly by outlining the requirements, prerequisites and provide sample code.

- SDK for PHP
  - Prerequisites
  - Requirements
  - Install the SDK
- SDK for Python
  - Install the SDK
- Need More Information?

SDK for PHP

Prerequisites

The API only comes with a licensed 6connect ProVision application. If you would like access to a ProVision license please contact sales@6connect.com.

Create Your API Credentials

To use the 6connect SDK for PHP, you will need a 6connect API Key and Secret Key.

To create your API Key and Secret Key:

- Log into your 6connect instance (hosted or local)
- Click on the Admin icon, and go into the Administration section.
- Click on the "API" tab.
- Select the user from the drop down you want to enable API access for, and click "Generate Keys".
- The API Key and the Secret Key will now appear directly below that.

*Note that generating a new API will automatically revoke an older API Key.

> 6connect recommends that each user accessing the API have their own API key configured. However, you can alternatively setup API users by functionality or roles. While the platform is flexible, you should follow your organizations security policies.

Important!

> Your Secret Key is a secret! Only you and 6connect should ever know this information. It is important to keep it confidential to protect the privacy of your data. Store it securely and never share this key with other users or place it on other systems. Never include the secret key in requests to 6connect, support requests to 6connect, and never e-mail it to anyone. Do not share it outside your organization. No one who legitimately represents 6connect will ever ask you for your Secret Key.

Requirements

Aside from following the prerequisites, you will need a basic understanding of object oriented programming in PHP and the right tools installed on your system to use the API.

Minimum Requirements

- PHP 5.5 or newer.
- PHP JSON and PCRE extensions (XML will be coming soon).
- Curl PHP extension compiled with OpenSSL libraries. Click here for more information on curl.

If you aren't sure what is running on your system, you can create a php page on your system and call phpinfo() and view this page in a browser, or run php -i on the command line.

Install the SDK

Download the file "6connect_ProVision_PHP_SDK_5_1_4.tar" from the attachments list below:

File	Modified
File 6connect-PHP-SDKv2.tar.gz v2 Update - Q3 2014	Jan 16, 2020 by The Force
File 6connect_ProVision_PHP_SDK_5_1_4.tar v5.1.4 c.2015	Jan 16, 2020 by The Force

Download All

Configure the SDK Security Credentials

- Extract the zipped tar file to a directory.
- Open the api-config.php located in the downloaded SDK files.
- Read through the file and place in your instance name (or path for local installs), API Key and Secret Key information as specified.
- Make sure all files are in the same directory (the core class looks for a config file in the same directory by default).
- Run the sample code api-examples.php!

Important!

You must setup user API access before running the sample. See the previous section "Create Your API Credentials" for more information.

SDK for Python

In Progress

This section is in progress. More information will be added as we improve and refine our new Python SDK!

Install the SDK

Download the file "6c-api-examples-python.zip" from the attachments list below:

File	Modified
ZIP Archive 6c-api-examples-python.zip v5.1.x c.2015	Jan 16, 2020 by The Force

Configure the SDK Security Credentials

- Extract the zipped tar file to a directory.
- Open the apiclient.py located in the downloaded SDK files.
- Read through the file and place in your instance name (or path for local installs), API Key and Secret Key information as specified.
- Make sure all files are in the same directory (the core class looks for a config file in the same directory by default).
- Run the sample code api-examples.php!

Important!

You must setup user API access before running the sample. See the previous section "Create Your API Credentials" for more information.

Need More Information?

If you need more general information on the API, see ProVision Developer Tools.

The SDK also contains a README file with other useful information particular to php.

If you need information on methods available via the API, see the individual APIv1 Module Documentation pages:

- API Module - Admin and Audit
- API Module - DHCP
- API Module - DNS
- API Module - IPAM
- API Module - LIR
- API Module - Peering
- API Module - Resource
- API Module - VLAN
- APIv1 SDK
- How Do I...

How Do I...

How Do I... (Use Cases)

> ProVision's APIv1 system has been replaced by APIv2, and is now considered deprecated.

If you want to get a jumpstart on common API use cases, you came to the right place! Expand the text areas below for walkthroughs and code samples of API calls...

- How Do I... (Use Cases)
    - IP Blocks - Update Fields
    - IP Blocks - Assign / Subassign
    - DNS
    - DHCP
  - Python SDK:
    - IP Blocks

IP Blocks - Update Fields

Context: How do I update the notes field of an IP block using the API in PHP?

1) Start with providing instance information, API key, Secret Key, and DNS Server IP; set up the connection

```
<?php
//
// This file walks through an example of how to look up a block id number
// in ProVision, and then use it to attach a notes field
//
// supply the URL of your ProVision instance, your API key and your Secret key.
$proVisionURL = "https://ops.6connect.com/qa-4.2.2";
$apiKey = "32-5DAYTJEE2TZHOFOB";
$apiSecretKey = "48b278ec873bda473a323dbc467f8669";
// this example uses 6connect's PHP APIClient
require_once("APIClient.php");
// set up the connection
$apiClient = new APIClient($proVisionURL, $apiKey, $apiSecretKey);
```

2) Split the metadata you want to have showing in the notes, and find the block with which it should associate

```
// lets imagine we have some metadata in the following format:
//
$string = "10.1.245.5||DFW7|HP a5820x|its-erp.dfw7.us.corp||";
//
// And we want to insert the Colo, Server type, and hostname into the Notes field of the IP block

// first we split everything up
$pieces = explode("|", $string);
$ip = $pieces[0];
$colo = $pieces[2];
$type = $pieces[3];
$host = $pieces[4];

// then we pull the IP block using the API.
$params = array();
$params['block'] = "$ip/32";                                    // the IP block we're looking for, with netmask
// make the call to the IPAM-GET endpoint
$apiResponse = $apiClient->sendRequest('ipam', 'get', $params);
if ($apiResponse->status != 1) {
        echo "Could not pull information for block: $ip/32 !\n";
        die();
}
if (trim($apiResponse->message) == "No blocks found.") {
        echo "IP block $ip/32 not found in ProVison!\n";
    die();
```

```
}

// we now have the ipObject associated with this IP block.  Lets get its block id.
$blockId = $apiResponse->data[0]['id'];
echo "IP block id: $blockId \n";
```

3) Update the block with the notes

```
// it is time to update the block with the new notes.
$notes = "$colo,$type,$host";
$params = array();
$params['id'] = $blockId;
$params['notes'] = $notes;
// make the call to the IPAM-UPDATE endpoint
$apiResponse = $apiClient->sendRequest('ipam', 'update', $params);

// and done!
echo $apiResponse->message . "\n";
```

IP Blocks - Assign / Subassign

Context: I unassigned an IP address and now it's in the Holding Tank. Now I want to assign an IP from the Holding Tank. I don't want to unassign an IP randomly, in case it is allocated to a Resource. What are my options?

There are 3 options:

1) If you know the specific IP, you can use use the ipam-get api call to determine if it is in Holding:

```
/api/v1/api.php?target=ipam&action=get&cidr=1.2.3.4/32

{
  id:1234,
  cidr:"1.2.3.4",
  ...
  resource_name:"Holding"
}
```

2) If you want to show all blocks/IPs in Holding, you can use the following ipam-get API call:

```
/api/v1/api.php?target=ipam&action=get&resourceQuery={"name":"Holding"}
```

3) If you know the block is in Holding, you can issue another ipam-unassign API call to move it from Holding to Available:

```
/api/v1/api.php?target=ipam&action=unassign&block=1.2.3.4/32
```

Context: I need to create a Resource Holder, assign them an IP block, then subassign some IPs out of that block to two new Resource Holders. What does this look like in Python?

We broke this up in a few steps so it's easier to link together.

1) Let's create a Resource Holder called "Ned"

```
query_string    = 'target=resource&action=add&meta[type]=entry&meta[section]=resource-holder&meta[name]=Ned'
query_string    += '&apiKey=' + api_key
hash            = base64.b64encode( hmac.new(api_secret_key, query_string, hashlib.sha256).digest() )
url               = base_url + '?' + query_string + '&hash=' + hash
print 'Create Ned resource holder'
print url, "\n"
data = json.load(urllib2.urlopen(url))
ned_resource_id = data['data']['id']
```

2) Now let's add the 213.29.27.0/24 IP block

```
query_string =    'target=ipam&action=add&rir=RIPE&block=213.29.27.0/24'
query_string    += '&apiKey=' + api_key
hash            = base64.b64encode( hmac.new(api_secret_key, query_string, hashlib.sha256).digest() )
url               = base_url + '?' + query_string + '&hash=' + hash
```

```
print 'Create 213.29.27.0/24 block'
print url, "\n"
data = json.load(urllib2.urlopen(url))
```

3) With the block in the system, we can assign 213.29.27.0/24 to "Ned" the Resource Holder

```
query_string =    "target=ipam&action=directAssign&block=213.29.27.0/24&resourceId=%d" % (ned_resource_id)
query_string    += '&apiKey=' + api_key
hash            = base64.b64encode( hmac.new(api_secret_key, query_string, hashlib.sha256).digest() )
url               = base_url + '?' + query_string + '&hash=' + hash
print 'Assign 213.29.27.0/24 block to Ned'
print url, "\n"
data = json.load(urllib2.urlopen(url))
```

4) Since we plan on assigning IPs out of this block, we should enable subassignments for 213.29.27.0/24

```
query_string =    'target=ipam&action=update&block=213.29.27.0/24&allowSubAssignments=true'
query_string    += '&apiKey=' + api_key
hash            = base64.b64encode( hmac.new(api_secret_key, query_string, hashlib.sha256).digest() )
url               = base_url + '?' + query_string + '&hash=' + hash
print 'Update 213.29.27.0/24 to allow sub assignments'
print url, "\n"
data = json.load(urllib2.urlopen(url))
```

5) Now let's create a Resource Holder "Tara"

```
query_string =    "target=resource&action=add&meta[type]=entry&meta[section]=resource-holder&meta[name]
=Tara&meta[parent_id]=%d" % (ned_resource_id)
query_string    += '&apiKey=' + api_key
hash            = base64.b64encode( hmac.new(api_secret_key, query_string, hashlib.sha256).digest() )
url               = base_url + '?' + query_string + '&hash=' + hash
print 'Create Tara resource holder'
print url, "\n"
data = json.load(urllib2.urlopen(url))
tara_resource_id = data['data']['id']
```

6) To keep it interesting, let's create another Resource Holder "Una"

```
query_string =    "target=resource&action=add&meta[type]=entry&meta[section]=resource-holder&meta[name]
=Una&meta[parent_id]=%d" % (ned_resource_id)
query_string    += '&apiKey=' + api_key
hash            = base64.b64encode( hmac.new(api_secret_key, query_string, hashlib.sha256).digest() )
url               = base_url + '?' + query_string + '&hash=' + hash
print 'Create Una resource holder'
print url, "\n"
data = json.load(urllib2.urlopen(url))
una_resource_id = data['data']['id']
```

7) Assign a /28 block from Ned's 213.29.27.0/24 to Tara

```
query_string =    "target=ipam&action=smartAssign&type=ipv4&rir=RIPE&mask=28&&resourceId=%
d&assignedResourceId=%d" % (tara_resource_id, ned_resource_id)
query_string    += '&apiKey=' + api_key
hash            = base64.b64encode( hmac.new(api_secret_key, query_string, hashlib.sha256).digest() )
url               = base_url + '?' + query_string + '&hash=' + hash
print 'Assign block from Ned\'s 213.29.27.0/24 to Tara'
print url, "\n"
data = json.load(urllib2.urlopen(url))
```

8) Then assign another /28 block from Ned's 213.29.27.0/24 to Una

```
query_string =    "target=ipam&action=smartAssign&type=ipv4&rir=RIPE&mask=28&&resourceId=%
d&assignedResourceId=%d" % (una_resource_id, ned_resource_id)
query_string    += '&apiKey=' + api_key
hash            = base64.b64encode( hmac.new(api_secret_key, query_string, hashlib.sha256).digest() )
url               = base_url + '?' + query_string + '&hash=' + hash
print 'Assign block from Ned\'s 213.29.27.0/24 to Una'
print url, "\n"
data = json.load(urllib2.urlopen(url))
```

DNS

Context: I need to set up a DNS server using ProVision's API in PHP, create a zone with a few simple records, and push it to the server.

1) Start with providing instance information, API key, Secret Key, and DNS Server IP

```
<?php
//
//
// supply the URL of your ProVision instance, your API key and your Secret key.
$proVisionURL = "https://ops.6connect.com/qa-4.2.2";
$apiKey = "Nnvz8xKZDQUWke6gDxb";
$apiSecretKey = "2YojRbrHnToPZ7cDeFBzcTAvcfMbPVmX";
// this example uses 6connect's PHP APIClient
require_once("APIClient.php");
// set up the connection
$apiClient = new APIClient($proVisionURL, $apiKey, $apiSecretKey);

// save this.  IP of the DNS Server we're creating.
$serverIp = "208.39.106.184";
```

2) Add a DNS server

```
// begin making api calls.  We begin by adding a simple DNS server.
$params = array();
$params['displayName'] = "Example Server";                                                    // the
pretty name of the DNS server
$params['server'] = "208.39.106.184";                                                           // the
IP of the DNS Server
$params['active'] =
1;                                                                                            // whether
or not this server is currently enabled
$params['transferType'] = "SCP";                                        // we are using an ISC Bind server which
we will communicate with via SCP
$params['username'] = "6connect";                                                                //
the username used to SCP zones to this server
$params['password'] = "password";                                                                //
the password used to SCP zones to this server
$params['port'] = 22;                                                   // the port used to SCP zones to this
server
$params['serverType'] = "master";                                                                //
whether this server is a master or a slave
$params['SOA'] = "ns1.dns.6connect.net. hostmaster.6connect.net.";         // the default SOA
$params['remoteDirectory'] = "/tmp/";                                                           //
where to place the zone files on the server
$params['namedConfPath'] = "/tmp/";
// the path to the zones within the configuration file.  Usually the same as 'remoteDirectory'
$params['postCommand'] = "touch /tmp/allFinished";                                          // the command to
execute on the server after the transfer is complete.
// add the server
$apiResponse = $apiClient->sendRequest('dnsServer', 'add', $params);
if ($apiResponse->status == 1) {
        echo "Successfully added DNS Server '" . $params['displayName'] . "'\n";
} else {
        echo "Could not add DNS Server '" . $params['displayName'] . "' !\n";
        die();
}

// now we fetch the id of our newly created server
$params = array();
$apiResponse = $apiClient->sendRequest('dnsServer', 'get', $params);
$data = $apiResponse->data;
for ($i = 0; $i < count($data); $i++) {
        if ($data[$i]['server'] == $serverIp) {
                        // we save the id for later.
                        $serverId = $data[$i]['id'];
                        break;
        }
}
echo "Server Id is: $serverId \n";
```

3) Create a zone

```
// okay, DNS server is set up -- time to create a zone.
$params = array();
$params['zoneName'] = "atestzone.com";                                  // zone name
$params['zoneResourceId'] = 1;                                                  // the owner of the zone; 1 is
default
$apiResponse = $apiClient->sendRequest('zone', 'add', $params);
if ($apiResponse->status == 1) {
    echo "Successfully added DNS Zone '" . $params['zoneName'] . "'\n";
} else {
    echo "Could not add DNS Zone '" . $params['zoneName'] . "' !\n";
    die();
}
// snag the zoneId for later.
$zoneId = $apiResponse->data;
```

4) Add Zone records

```
// Lets add some records to our new zone!
$params = array();
$params['newRecordZoneId'] = $zoneId;                               // parent zone id
$params['newRecordType'] = 'A';                                             // record type
$params['newRecordHost'] = "www";                       // the host field of the record
$params['newRecordValue'] = "1.2.3.4";                  // the value field of the record
$params['newRecordTTL'] = "3600";                       // the value of the TTL field
$apiResponse = $apiClient->sendRequest('record', 'add', $params);
if ($apiResponse->status == 1) {
    echo "Successfully added Record to zone #$zoneId\n";
} else {
    echo "Could not add Record to zone #$zoneId!\n";
    die();
}

$params = array();
$params['newRecordZoneId'] = $zoneId;                    // parent zone id
$params['newRecordType'] = 'A';                          // record type
$params['newRecordHost'] = "dev";                        // the host field of the record
$params['newRecordValue'] = "2.3.4.5";                       // the value field of the record
$params['newRecordTTL'] = "3600";                                       // the value of the TTL field
$apiResponse = $apiClient->sendRequest('record', 'add', $params);
if ($apiResponse->status == 1) {
    echo "Successfully added Record to zone #$zoneId\n";
} else {
    echo "Could not add Record to zone #$zoneId!\n";
    die();
}

$params = array();
$params['newRecordZoneId'] = $zoneId;                   // parent zone id
$params['newRecordType'] = 'A';                         // record type
$params['newRecordHost'] = "cloud";                     // the host field of the record
$params['newRecordValue'] = "3.4.5.6";                  // the value field of the record
$params['newRecordTTL'] = "3600";                       // the value of the TTL field
$apiResponse = $apiClient->sendRequest('record', 'add', $params);
if ($apiResponse->status == 1) {
    echo "Successfully added Record to zone #$zoneId\n";
} else {
    echo "Could not add Record to zone #$zoneId!\n";
    die();
}
```

4) Link the Zone to the new DNS server and push

```
// Okay, we have some zones with records.  Time to link this zone to the new DNS Server
$params = array();
$params['serverId'] = $serverId;                                                 // the server id
$params['zoneId'] = $zoneId;                                                        // the zone id
$params['serverSlave'] = 0;                                                                 // not a slave
zone
$apiResponse = $apiClient->sendRequest('zoneLinkage', 'add', $params);
```

```
if ($apiResponse->status == 1) {
    echo "Successfully linked Zone #$zoneId to server #serverId\n";
} else {
    echo "Could not link Zone #$zoneId to server #serverId!\n";
    die();
}
// now we can push the zone to the server
$params = array();
$params['zoneId'] = $zoneId;                              // the zone id to push
$apiResponse = $apiClient->sendRequest('dnsServer', 'transferSingle', $params);
if ($apiResponse->status == 1) {
    echo "Zone pushed!\n";
} else {
    echo "Could not push zone!\n";
    die();
}
?>
```

DHCP

Context: I need to attach the DHCP module as a child

DHCPv2 functionality is enabled on a particular resource by attaching a DHCP Module as a child. A command to do this is as follows:

```
            [ProVision root]/api/v1/api.php?target=resource&action=add

            data:
meta[type]: dhcp_module
meta[name]: [parent resource id] DHCP Module
meta[parent_id]: [parent resource id]
```

The special resource type “dhcp_module” indicates to ProVision that the DHCP system is enabled for the parent object. The attributes associated with the “dhcp_module” resource govern the DHCP system's behavior.

Updating the attributes of a DHCP Server uses a Resource Update command:

```
[ProVision root]/api/v1/api.php?target=resource&action=update&meta[id]=2178 &meta[type]=dhcp_module&fields
[_dhcp_attributes][]={"type":"ISC","notes":"notes go here","username":"username","port":"port","
config_test":"/etc/init.d/dhcpd configtest","server_stop":"/etc/init.d/dhcpd stop","server_start":"/etc/init.
d/dhcpd start","config_path":"/tmp/dhcpd.conf","option_routers":"192.168.0.0","option_domain_name_servers":"
ns1.6connect.com","option_domain_name":"6connect.com","authoritative":"1","default_lease_time":"600","
max_lease_time":"7200","local_port":"67","log_facility":"local7","password":"password","server_ip":"
192.168.0.1","freeLines":3,"freeLine1":"free line 1","freeLine2":"free line 2","freeLine3":"free line 3"}
```

This command appears rather complicated, but can be broken apart into reasonable pieces. The first section:

```
target=resource&action=update&meta[id]=2178&meta[type]=dhcp_module
```

is familiar from other parts of ProVision. We are updating a resource of type “dhcp_module” whose resource id is 2178. The second section of the command details the update values, starting with

```
 fields[_dhcp_attributes][]=
```

which contains a JSON-encoded string of all the fields specific to a DHCP server's function. When expanded into its full object form it is substantially easier to digest:

```
{
            "type":"ISC",
            "notes":"notes go here",
            "username":"username",
            "port":"port",
            "config_test":"/etc/init.d/dhcpd configtest",
            "server_stop":"/etc/init.d/dhcpd stop",
            "server_start":"/etc/init.d/dhcpd start",
            "config_path":"/tmp/dhcpd.conf",
            "option_routers":"192.168.0.0",
            "option_domain_name_servers":"ns1.6connect.com",
            "option_domain_name":"6connect.com",
            "authoritative":"1",
            "default_lease_time":"600",
            "max_lease_time":"7200",
            "local_port":"67",
            "log_facility":"local7",
            "password":"password",
            "server_ip":"192.168.0.1",
            "freeLines":3,
            "freeLine1":"free line 1",
            "freeLine2":"free line 2",
            "freeLine3":"free line 3"
}
```

This object describes all the most common DHCP server configuration options. For a full explanation of each of the fields, see the Detailed API Specification later in this document.

Please note that the object above must be passed to the DHCP system as a JSON-encoded string. It must be passed into the special "_dhcp_attributes" attribute for it to be functional, as in the example URL.

Context: I need to add a DHCP aggregate

An example command to add a DHCP Aggregate is:

```
[ProVision root]/api/v1/api.php?target=ipam&action=add&block=192.168.0.0/24&rir=
1918&vlan=&tags=&region=&resourceId=1282&allowSubAssignments=true
```

The important part to note is that the IP block is being assigned to resourceId 1282, which corresponds to the DHCP Available resource. The DHCP Available resource is a system-level resource which is used to hold all unassigned DHCP IP addresses. Every instance has its own DHCP Available resource, whose id can be found with the following command:

```
[ProVision root]/api/v1/api.php?target=resource&action=get&slug=dhcp-available
```

New DHCP subnets and hosts draw their IPs from this pool. If there are no IPs in the DHCP Available pool new subnets and hosts will not be able to be created.

DHCP IP aggregates are fetched, updated, split, and deleted using the standard IPAM management API endpoints. Please see the IPAM API Documentation. for details.

Context: I need to add a DHCP Pool

Similar to how the "dhcp_module" resource was created above, the command to create a DHCP Pool is as follows:

```
[ProVision root]/api/v1/api.php?target=resource&action=add&meta[type]=dhcp_pool &meta[name]=New Subnet&fields
[_dhcp_type][]=subnet&fields[_dhcp_pool_attributes][]={"mac":"","rangeStart":"","rangeEnd":"","freeLines":3,"
freeLine1":"Free Line 1","freeLine2":"Free Line 2","freeLine3":"Free Line 3"}
```

The first half of this command is relatively straightforward:

```
target=resource&action=add&meta[type]=dhcp_pool&meta[name]=New Subnet
```

This section informs the API that we wish to create a new, empty “dhcp_pool” resource whose name is “New Subnet.”

```
fields[_dhcp_type][]=subnet&fields[_dhcp_pool_attributes][]={"mac":"","rangeStart":"", "rangeEnd":"","
freeLines":3,"freeLine1":"Free Line 1","freeLine2":"Free Line 2","freeLine3":"Free Line 3"}
```

The second half of the command behaves in a similar manner to the “dhcp_module.” The “_dhcp_pool_attributes” field holds a JSON-encoded string which describes the dhcp_pool resource. When expanded, the JSON string becomes the following object:

```
{
            "mac":"",
            "rangeStart":"",
            "rangeEnd":"",
            "freeLines":3,
            "freeLine1":"Free Line 1",
            "freeLine2":"Free Line 2",
            "freeLine3":"Free Line 3"
}
```

For a full explanation of each of the fields, see the Detailed API Specification.

> Please note that the object above must be passed to the DHCP system as a JSON-encoded string. It must be passed into the “_dhcp_pool_attributes” attribute for it to be functional, as in the example URL.

Once a dhcp_pool resource is in the system it can be updated with IP data obtained from the IP Management system. Under DHCPv2, the DHCP system uses all the standard IPAM API endpoints and can make use of both the smartAssign and the directAssign methods. Please see the IPAM API documentation for details.

Context: I need to link a DHCP pool to a DHCP server

An example of building a link between a dhcp_pool and a DHCP Server is:

```
[ProVision root]/api/v1/api.php?target=resource&action=addLink&resource_id1=2178&
resource_id2=1452&relation=dhcpPoolLink
```

The Resource Linkage system controls which DHCP Pools are associated with a given DHCP Server. In the case of linking a DHCP Pool to a DHCP Server, the relation used is “dhcpPoolLink”. This is a directional link, so it is important that resource_id1 and resource_id2 do not get confused.

```
relation:  "dhcpPoolLink"
resource_id1:  the id of the dhcp_module this pool is being linked to
resource_id2:  the id of the dhcp_pool being linked
```

It is very important that resource_id1 not be confused with resource_id2. The link will not function with the values reversed.

To undo the above and break a DHCP Pool link, use the same command but substitute “deleteLink” for the action “addLink”.

```
[ProVision root]/api/v1/api.php?target=resource&action=deleteLink&resource_id1=2178&
resource_id2=2179&relation=dhcpPoolLink
```

Context: I need to push a DHCP config file

Once the server has been configured according to the previous sections, hitting the following API endpoint will trigger a DHCP push:

```
[ProVision root]/api/v1/api.php?target=dhcp&action=push&id=2178
```

The “id” in the above string is the id of the dhcp_module resource attached to the server you whose configuration is to be pushed. The API return payload will contain success or failure codes, as well as a description of any errors which might have occurred.

When a DHCP configuration file is pushed an SSH connection is opened to the configured server using the user, password, and port supplied to the '_dhcp_attributes' attribute on the dhcp_module resource. If the system successfully connects, it will assemble a DHCP configuration from the information given to the dhcp_module's '_dhcp_attribute' attribute and then parse and add in all linked dhcp_pool resources.

After the assembled file has been transferred to the DHCP server it will be placed in the location given by 'config_path' on the dhcp_module, and then the command described in 'config_test' will be run to determine whether or not this new file parses correctly. If 'config_test' is blank or omitted, this step is skipped.

If the file parses correctly the DHCP will be stopped and restarted according to the 'server_stop' and 'server_start' commands on the DHCP module. If there are errors at any point the system backs out, replaces old config files, and reports the errors via the 'message' return field of the API call.

Python SDK:

IP Blocks

Context: How do I create aggregates, get block information, and delete aggregates using the API / python SDK?

```
#!/usr/bin/python
from apiclient import APIClient, APIResponse

# REPLACE WITH CORRECT VALUES FOR YOUR INSTANCE

base_url                = 'https://<ProVision Instance URL>'

api_key                         = '00-ABCDEFGHIJ123456'

api_secret_key        = '0123456789abcdef0123456789abcdef'


# create the APIClient

client = APIClient(base_url, api_key, api_secret_key)



# create aggregate 1.2.3.0/24
```

```
target = 'ipam'

action = 'add'

params = {'block': '1.2.3.0/24', 'rir':'ARIN'}

url = client.get_request_url(target, action, params)

print url

response = client.make_api_call(target, action, params)

print response


# get block 1.2.3.0/24

target = 'ipam'

action = 'get'

params = {'block': '1.2.3.0/24'}

url = client.get_request_url(target, action, params)

print url

response = client.make_api_call(target, action, params)

print response



# delete aggregate 1.2.3.0/24

target = 'ipam'

action = 'delete'

params = {'block': '1.2.3.0/24'}

url = client.get_request_url(target, action, params)

print url

response = client.make_api_call(target, action, params)

print response
```

Portable Gadgets

Portable Gadgets

- Overview
  - Global Search:
    - Global Search Option Types:
  - IPAM Search:
    - IPAM Option Types:
  - DHCP Search:
    - DHCP Option Types:
  - Log:
    - More Options:
- Additional Information:

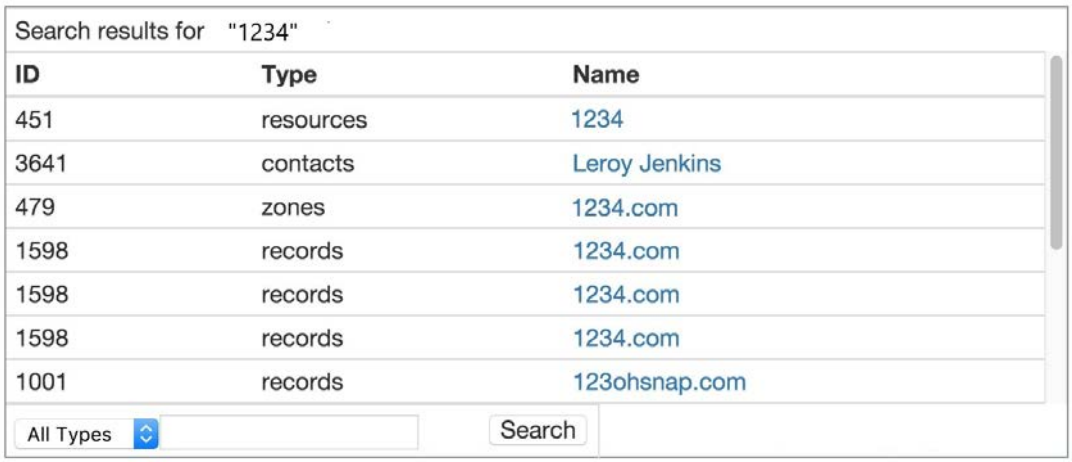
Overview

ProVision's Portable Gadgets are drop-in code snippets that use the ProVision API to bring in data to other systems or web pages. Portable Gadgets allow for quick data access and increased integration.

Currently, four Gadgets are available: Global Search, IPAM Search, DHCP Search, and Log. Each Gadget comes in various default option types for display style, number of records return, or behavior. Additional client-side style customizations may be made to further integrate the gadget with company styles.

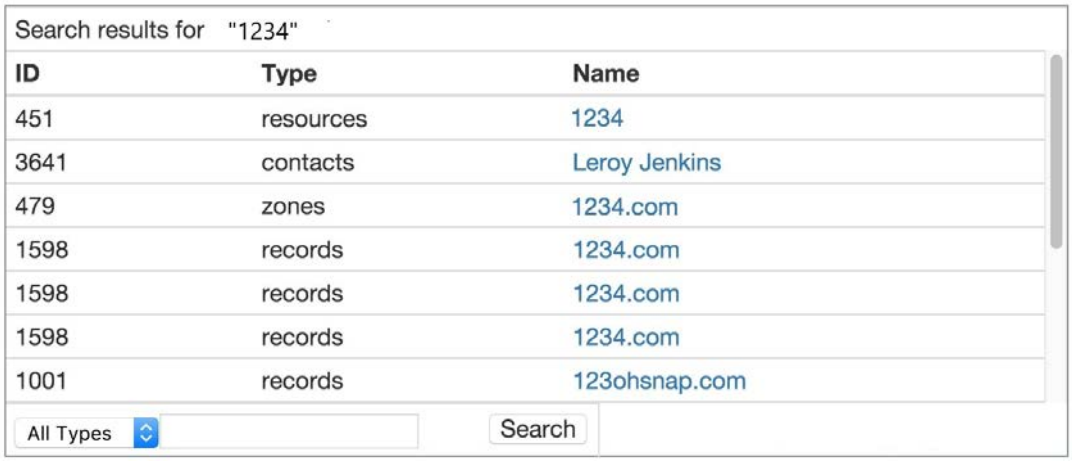
Global Search:

The Global Search Gadget utilizes ProVision's global search API to searching by name string and return ID, Type, and the Name. The search may be limited to specific types (IPAM, Resources, Zones, Records, Contacts, or All Types) if desired.



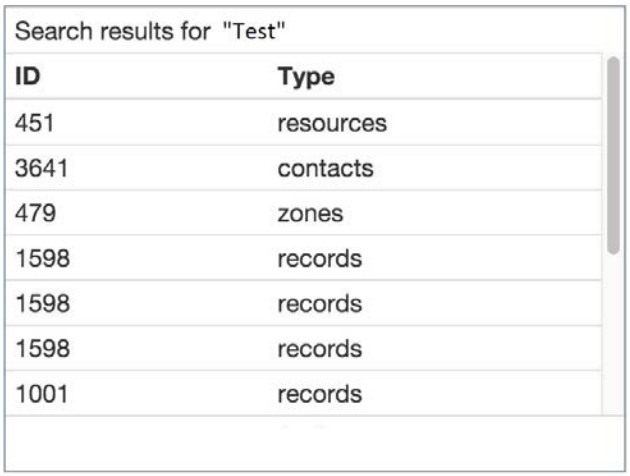
Global Search Option Types:

Type I.



- Returns 5 records per Type
- Auto Width, height set to 300px

Type II.



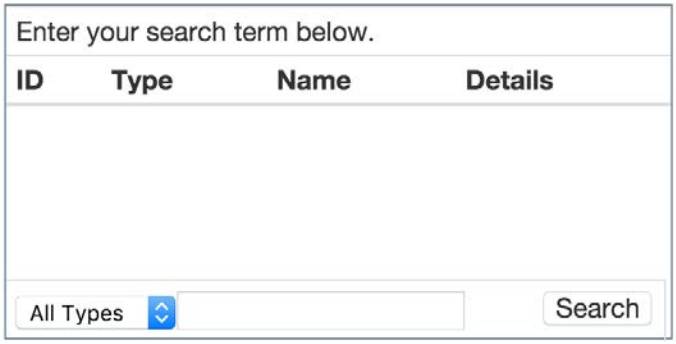
- Returns 5 records per Type
- No search input provided
- Fixed size (400px wide x 300px high)

Type III.



- Returns 3 records per Type
- Auto Width, height set to 200px

Type IV.



- No search on load
- Links stay in current window
- Fixed size (400px wide x 200px high)

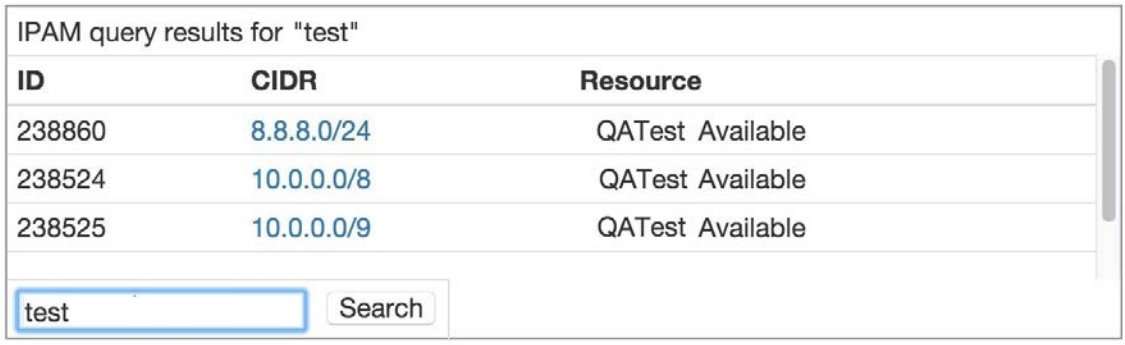
Type V.



- Type I functionality restyled with CSS

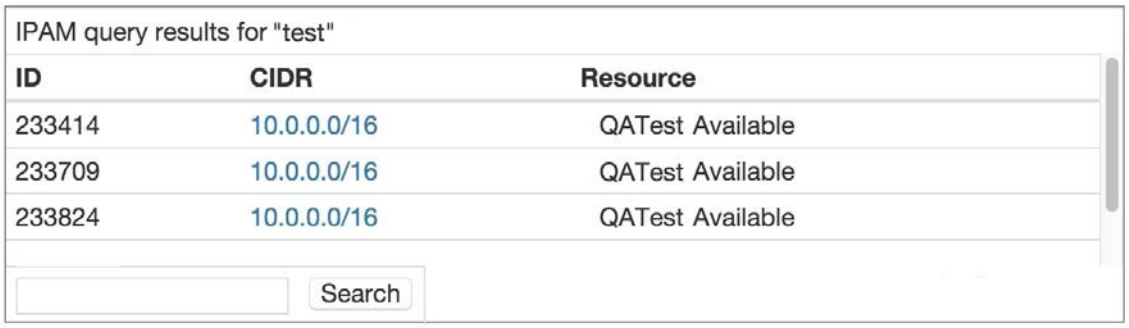
IPAM Search:

The IPAM Search Gadget utilizes ProVision's IPAM API to return ID, CIDR, and Resource Name results searching by an IPAM Resource name string.



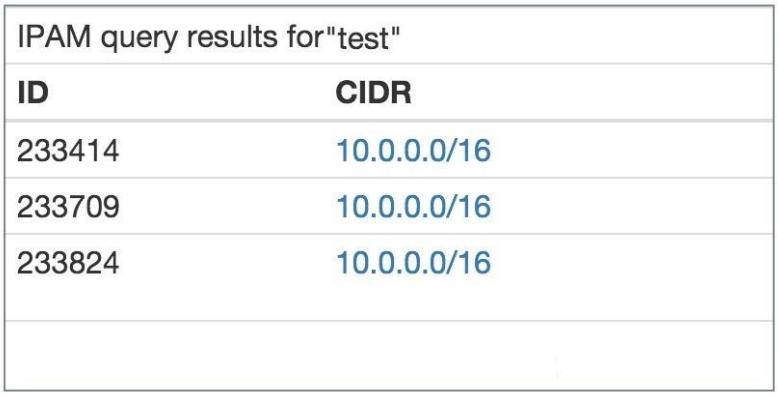
IPAM Option Types:

Type I.



- Returns 5 records per Type
- Auto Width, height set to 200px

Type II.



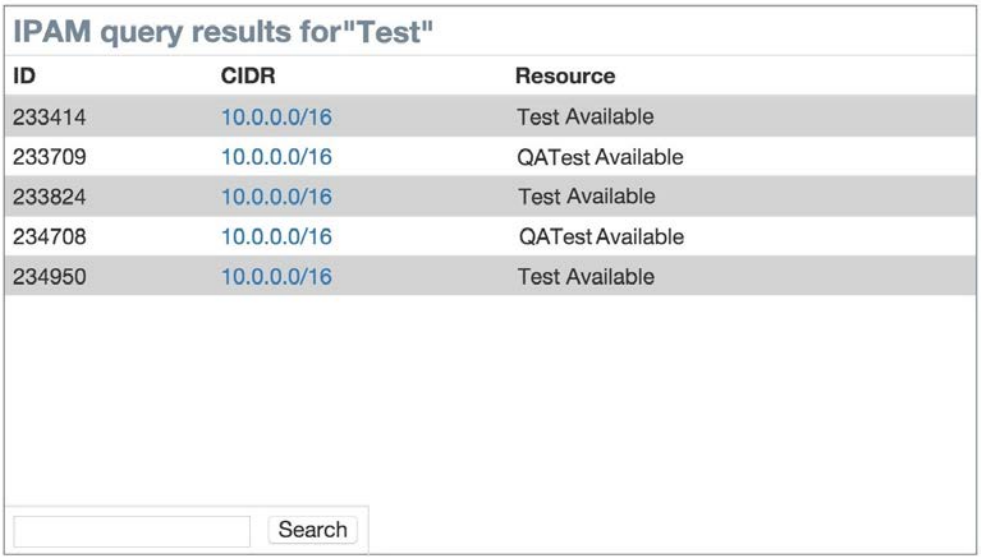
- Returns 3 records per Type
- No search input provided
- Fixed size (400px wide x 200px high)

Type III.



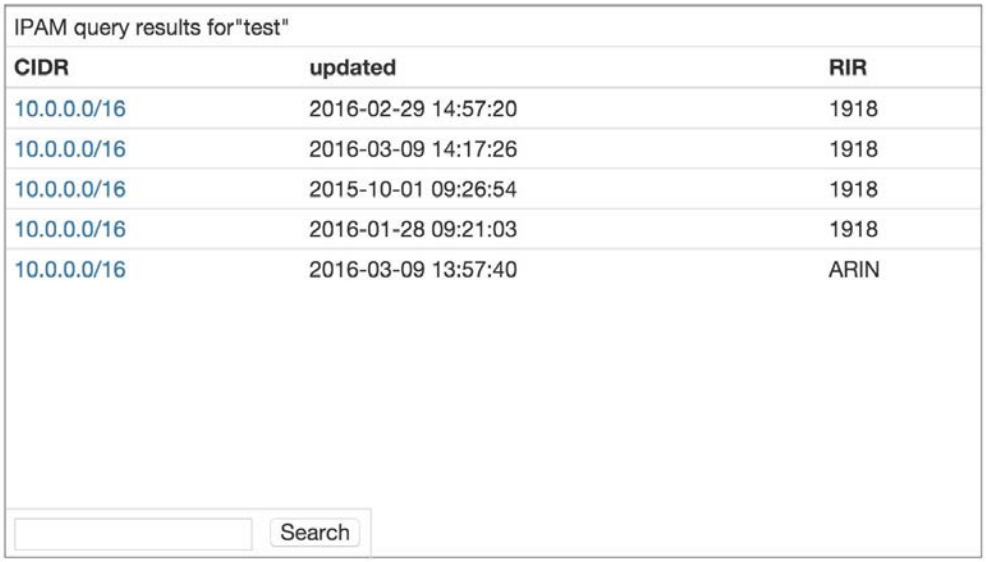
- No search on load
- Links stay in current window
- Auto Width, height set to 300px

Type IV.



- Type I functionality restyled with CSS
- Auto Width, height set to 400px

Type V.



- Customizable Fields
- Auto Width, height set to 300px

DHCP Search:

The DHCP Search Gadget utilizes ProVision's DHCP API to return results of varying types when searching for a name string. The search may be limited to specific types if desired.



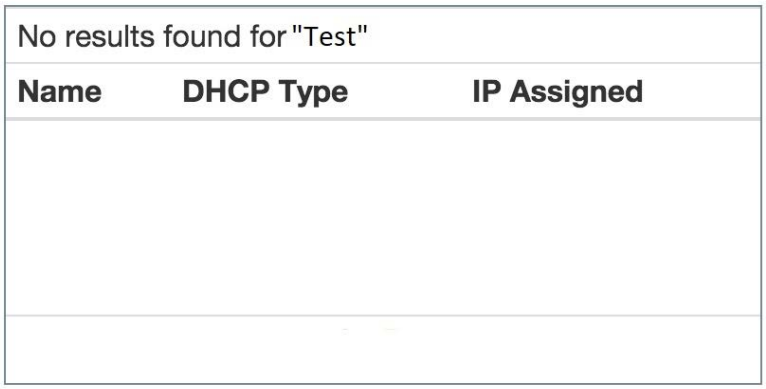
DHCP Option Types:

Type I.



- Returns 5 records per Type
- Auto Width, height set to 300px

Type II.



- Returns 3 records per Type
- No search input provided
- Fixed size (400px wide x 200px high)

Type III.



- No search on load
- Links stay in current window
- Returns 5 records per Type
- Auto Width, height set to 300px

Type IV.

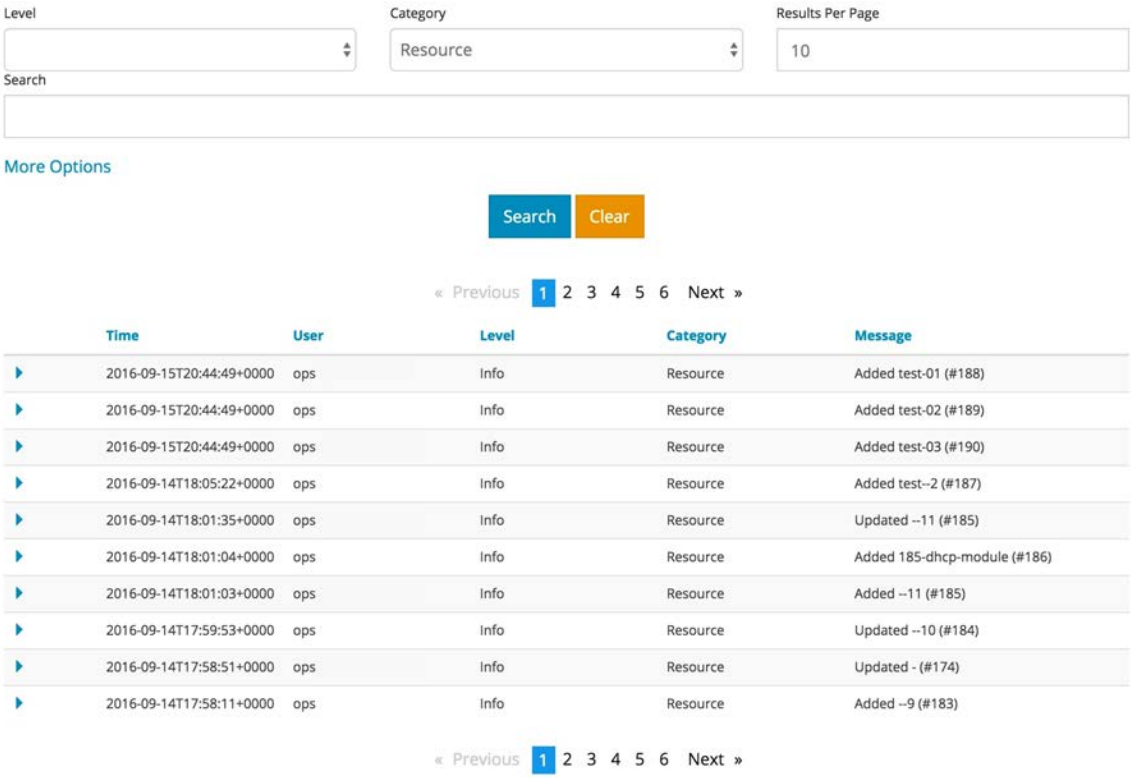


- Type I functionality restyled with CSS
- Returns 5 records per Type
- Auto Width, height set to 300px

Log:

The Log Gadget provides detailed information on actions performed in ProVision. Actions may be filtered by Level, Category, Log ID, User, and Time (specific or a range), as well as results-per-page option set. Additional filtering options allow targeting of specific log entries.

Clicking on the blue arrow at the beginning of each log entry shows additional details about that log item.



The following filters and options are available:

Level: Under the "Level" dropdown box, select "All Levels", "Emergency", "Alert", "Critical", "Error", "Warning", "Notice", "Info", or "Debug".

Category: Under the "Category" dropdown box, select "All Categories", "User", "IPAM", "Resource", "Resource Holder", "DNS", "Peering", "Assistant", "API", "NTP", "Device", or "Reporting".

Results per page: In the "Results per page" text box, type the desired number of log entries to see per page. By default, this value is set to 100.

Search: Type a search string, such as the name of a resource, then click the "Search" button.

More Options:

Additional detailed filter and search options are available under the "More Options" link.

Log ID: Retrieve a specific log entry from its log_id parameter.

IP: Search by IP of the machine that created the event in the log.

Username: Filter logs by ProVision username, or by "Unknown" user.

Time: Filter log entries by exact time created. Must be in datetime format (2016-08-14 16:41:18).

Time Minimum: The earliest day and time of log entries to show in results. Must be in datetime format (2016-08-14 16:41:18).

Time Maximum: The latest day and time of log entries to show in results. Must be in datetime format (2016-08-14 16:41:18).

Additional Information:

- Getting Started With Portable Gadgets
- Portable Gadget Customization

Getting Started With Portable Gadgets

Getting Started

- Adding a Portable Gadget to a Web Page
  - Requirements
  - Before You Begin
  - Step 1: Reference dependency files
  - Step 2: Create Gadget div
  - Step 3: Initialize the Gadget
    - a) Preparing the settings
    - b) Initialize the gadget HTML element
  - Basic Page Example

Adding a Portable Gadget to a Web Page

Requirements

Setting up Portable Gadgets requires a ProVision instance URL and valid API credentials (API key and secret key), as well as some familiarity with HTML, CSS, and Javascript.

Before You Begin

Before you begin, make sure you have access to the source code for the web page on which you want the portable gadget to appear, or create a simple new web page for testing purposes with minimal tags like this (with the location of steps included as comments):

```
<html>
        <head>
                <!-- STEP 1 WILL GO HERE -->

                <!-- STEP 3a WILL GO HERE -->
                <!-- STEP 3b WILL GO HERE -->
        </head>
        <body>
                <!-- STEP 2 WILL GO HERE -->
        </body>
</html>
```

Step 1: Reference dependency files

Include the following two scripts the HEAD block. They should reference your provision installation.

In this example, "https://cloud.example.com/6c_123" is the root folder of a 6connect installation, so replace that with your own 6connect instance URL.

```
<script type='text/javascript' src="https://cloud.example.com/6c_123/portable/init.js"></script>
<link rel="stylesheet" type="text/css" href="https://cloud.example.com/6c_123/portable/css/provision-
portable.css">
```

Step 2: Create Gadget div

Place the html div tag for your gadget where you want it to appear in the page body, and give it a unique id.

Your gadget should be an html element in your page body (any contents inside the element will be removed). This example has a div referred to as "gadget" (as the ID).

```
<!-- provision gadget -->
<div id="gadget"></div>
```

Step 3: Initialize the Gadget

a) Preparing the settings

First, a settings variable must be prepared with the details of the gadget.

It must have the following keys for the provision url and api keys:

- provision_location
- provision_api_key
- provision_secret_key

...as well as the name of one of the gadget to load:

- search -- does a search with the global search API
- dhcp -- does a search with the DHCP API
- ipam -- does a search with the IPAM API
- pv-logs – details actions taken in ProVision.

Here is an example for a search gadget, loading with the search term "test". By default it will load up to five results per type.

```
<script type='text/javascript'>
var settings = {
provision_location: "https://cloud.example.com/6c_123",
provision_api_key: "00-ABCDEFGHIJKLMN00",
provision_secret_key: "00abcd11ef22ghij3300klmno123",

search: "test",
};
</script>
```

Here is an example to load as an IPAM gadget, with an option to limit results to 10 records:

```
<script type='text/javascript'>
var settings = {
provision_location: "https://cloud.example.com/6c_123",
provision_api_key: "00-ABCDEFGHIJKLMN00",
provision_secret_key: "00abcd11ef22ghij3300klmno123",

ipam: "test",
limit: 10
};
</script>
```

An example with the DHCP gadget:

```
<script type='text/javascript'>
var settings = {
provision_location: "https://cloud.example.com/6c_123",
provision_api_key: "00-ABCDEFGHIJKLMN00",
provision_secret_key: "00abcd11ef22ghij3300klmno123",

dhcp: "Test",
};
</script>
```

b) Initialize the gadget HTML element

The gadget will initialize when scripted to do so with the provision() command. For the example html in section II, we can instantiate this gadget by running the following (as long as settings was prepared):

```
<script type='text/javascript'>
provision('#gadget', settings)
</script>
```

The first parameter targets the html element that is the gadget, using jQuery's selector format. In this case, it is an element with the ID "gadget".

Basic Page Example

Here is a simple example html page with a search gadget. In this example, a default search term of "test" is included, and the return limited 10 records.

```
<html>
        <head>
                <script type='text/javascript' src="https://cloud.example.com/6c_123/portable/init.js"><
/script>
                <link rel="stylesheet" type="text/css" href="https://cloud.example.com/6c_123/portable/css
/provision-portable.css">
                <script type='text/javascript'>
                        var settings = {
                                provision_location: "https://cloud.example.com/6c_123",
                                provision_api_key: "00-ABCDEFGHIJKLMN00",
                                provision_secret_key: "00abcd11ef22ghij3300klmno123",

                                search: "test",
                                limit: 10
                        };
                        provision('#search_gadget', settings);
                </script>
        </head>
        <body>
                <div id="search_gadget"></div>
        </body>
</html>
```

Portable Gadget Customization

Customizing Portable Gadgets

- Customization Options
  - Required Settings:
  - Optional Settings:
- Sample CSS Customization
  - Alternating Row Formatting:

Customization Options

Portable Gadgets come with both built-in customization options as well as the ability to edit styles locally through CSS.

Required Settings:

The required fields are:

provision_location: the location of the provision installation
provision_api_key: available from the Admin API Tab in ProVision
provision_secret_key: available from the Admin API Tab in ProVision

Other required fields (by gadget)

```
Search:
    search: "string"
IPAM:
   ipam:  "string"
DHCP:
   dhcp:  "string"
```

Where, in each case, "string" is the search term used on the initial loading of the gadget. If it is an empty string (literally, ""), then gadget will load without a pre-defined search.

Optional Settings:

These settings must be included as parameters when initializing the gadget. See Getting Started With Portable Gadgets.

limit: positive integer, or -1

The record return limit of the gadget. In some gadgets (search and DHCP) there are multiple types, so it limits per type. The default limit, if this option is not provided, is 5. If you specify limit a -1 (or basically any negative number), it will not enforce a limit.

links_change_window: true

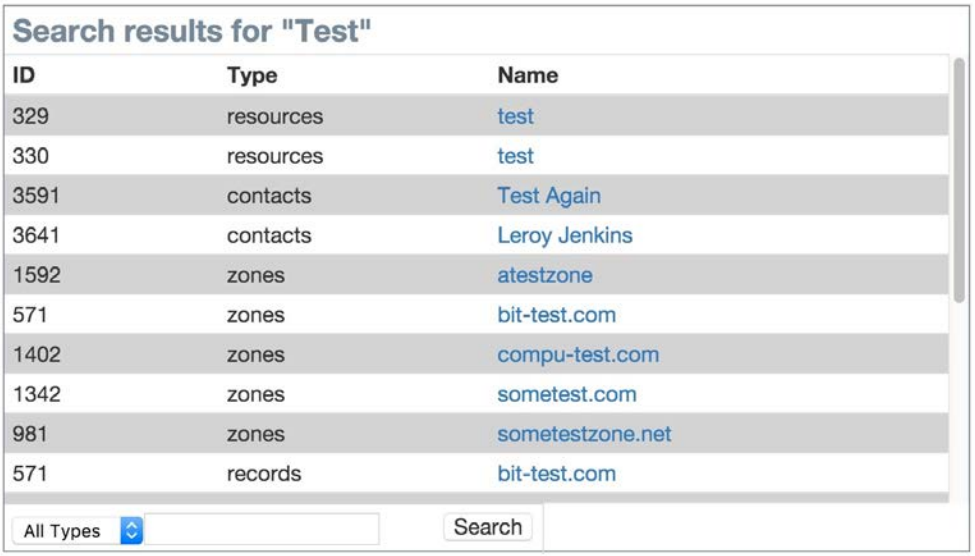
setting this to true (not string "true" but actual true type in javascript) will make links change the current window. The default behavior (not having this option or false), would have links open a new tab.

interact: false

By default, there will be a search box on all these gadgets. But with this option set to false (again, using false not string "false") will remove that box so search cannot be changed.

Sample CSS Customization

Alternating Row Formatting:




```
<style>
.pg-subtitle {
    color: lightslategrey;
    font-size:1.4em;
    font-weight: bold;
}

.pg-field-name a:hover {
    text-decoration: none;
    color: white;
    background-color: gray;
}

.pg-results tr:nth-child(2n+1) {
    background: white;
}
.pg-results tr:nth-child(2n+0) {
    background: lightgray;
}
</style>
```

Toolkit

Toolkit Modules

6connect provides customers with additional CLI modules for ProVision power users in the /tools directory. These tools are outlined below.

- Users / Permissions
  - Add User
  - Rebuild Permissions
- DNS
  - Audit Forward DNS
  - Audit Reverse DNS
- Database
  - Database Analyzer
  - Database Reset
- Import
  - IPPlan Importer:
  - PHPIPAM Importer:
- Internal Tools
- Additional Information:

Users / Permissions

Add User

File: add-user.php

Description: Adds a new user to Provision. Especially useful if an admin has locked themselves out and has access to the local server, or for adding additional credentials to a new local installation. The tool walks through the required information.

Command: “php add-user.php"

Rebuild Permissions

File: rebuild-permissions.php

Description: Will rebuild the cached permissions for the specified resource id. Should not be used outside of a db reset, or a corruption of the permissions cache.

Command: “php rebuild-permissions.php"

DNS

Audit Forward DNS

File: audit_forward_dns.php

Description: Audits the forward DNS for a specified IP block, comparing the DNS records in ProVision to a publicly facing server. Will provide detail output showing resolved records, if records conflict and why.

Command: “php audit_forward_dns.php”

Options:

-v Sets verbose mode to print debug information

-a message key run as asycronous request (note: you should not use this, it is for the GUI)

-b ip block IP block in cird notation to audit dns for.

-n name server FQDN or IP address of specific name server to resolve records against. Defaults to 8.8.8.8.

-h print help

Audit Reverse DNS

File: audit_reverse_dns.php

Description: Audits the reverse DNS for a specified IP block, comparing the DNS records in ProVision to a publicly facing server. Will provide detail output showing resolved records, if records conflict and why.

Command: "php audit_reverse_dns.php"

Options:

-v Sets verbose mode to print debug information

-a message key run as asycronous request (note: you should not use this, it is for the GUI)

-b ip block IP block in cird notation to audit dns for.

-n name server FQDN or IP address of specific name server to resolve records against. Defaults to 8.8.8.8.

-h print help

Database

Database Analyzer

File: databaseAnalyzer.php

Description: Takes two MySQL dump files for input, one thought to be the “good” database, and one the “bad” to compare against each other for differences. Is used internally to audit database changes after an upgrade to ensure all changes for the upgrade were committed by comparing against the template database for that release. Can be useful for diagnosing missed upgrades, or other database issues. Could be used on any set of databases, and is not ProVision specific.

Command: "php databaseAnalyzer.php"

Options:

-v Sets verbose mode to print debug information

-a database name Required - the 'good' database to comapre against.

-b database name Required - the 'bad' database to check for incorrect information.

-g globals file Optional - The script will automatically look to the globals.php file for database connection information. This option can be used to specify and alternate file, or file location.

-h print help

Database Reset

File: dbReset.php

Description: This tool resets portions or all of the database to factory defaults. Can reset only IP, DNS, or Resource information or all all three. If erasing resource information, you need to enter a user to assume global admin permission to log back in with. Even if this isn’t specified, the add-user tool can be used to add a user back after. We recommend creating a backup prior to using this tool, and only use if you are sure you know what you are doing!

Command:"php dbReset.php"

Options:

-v Sets verbose mode to print debug information

-i Erases any and all IP information. Tags, regions, and other IPAM preference settings are not changed.

-d Erases any and all DNS information including zones, records, and archive data. Does not affect DNS perference settings, or configured DNS servers.

-r Resets all resource information back to the factory defaults, and removes all associated information (user groups, files, etc).

-u user name User name that will have Global Admin permissions restored on the default resources

-h print help

Import

IPPlan Importer:

File: ipplan_import.php

Description: The IPPlan Importer is a command-line tool to import IPs from an IPPlan database into ProVision. Details on how to use this tool are available at IPPlan Importer.

Command: "php ipplan_import.php"

Options:

For options, refer to IPPlan Importer.

PHPIPAM Importer:

File: phpipam_import.php

Description: Generates a CSV or imports data from a phpipam instance

Command: "php phpipam_import.php"

Options: Contact support if you have any questions

Internal Tools

The following tools contained in the /tools folder are for 6connect internal use only:

File: scp_wrapper.php - Internal tool, not meant for command line use.

File: s64_restart_master - Internal tool, not meant for command line use.

File: s64_restart_slave - Internal tool, not meant for command line use.

File: async_import.php - Internal tool, not meant for command line use.

File: importBigDump.php - Internal tool supporting IPPlan Importer, not meant for command line use.

File: ipplan_functions.php - Internal tool supporting IPPlan Importer, not meant for command line use.

File: dns_transfer_server.php - Internal tool, not meant for command line use.

File: observium_import.php - Internal tool, not meant for command line use.

File: digAndLookup.php

File: pullLAMPInfo.php

Additional Information:

- IPPlan Importer

IPPlan Importer

IPPlan Importer

- Overview
- Before you begin:
- Connector Method (Results in .csv files only):
- Importer Method (Results in full import):
    - Run & Set the RIR:
- Additional Run Options:
    - Load SQL Without Importing
    - Generate CSV Without Loading SQL
    - Generate CSV No Overwrite
    - Generate CSV With RIR
    - Run Only Import
    - Run Import No Overwrite

Overview

The IPPlan Importer is a command-line tool to import IPs from an IPPlan database into ProVision. This tool can be used via two approaches: generating .csv files via the tool only, then using the ProVision IP Import UI to import the csv files (Connector), or as a full command-line import solution, bypassing the ProVision UI entirely (Importer).

Options:

1) Generate .csv files to use with the IP Import - Upload/Import from CSV tool through the ProVision UI.

2) Import IPs directly into ProVision without accessing the UI.

Before you begin:

You will need:

- A MySQL export of IPPlan created from mysqldump, located on the same server / accessible from the IPPlan Importer tool.
- Administrative access to your ProVision instance folder

Accessing the Tool and Showing Help Instructions:

The tool is located in tools/ipplan_import.php. A help document is provided listing example commands and detailed situation-specific options.

To execute it, you must preface it with "php" program. From from your instance's root folder, the command would be:

"php tools/ipplan_import.php --help"

If you are in the tools folder, the command would be:

"php ipplan_import.php --help"

This will bring up the help / instruction document. It is also provided below.

Help File Text

```
usage: php ipplan_import.php [options] <SQL dump file>

Examples:

For creating CSV's for use in ProVision IP importer:
    php ipplan_import.php filename.SQL --csv

For creating CSV's, but do not load SQL file if one already has been:

    php ipplan_import.php filename.SQL --csv --no-overwrite

For importing data from SQL dump. Note that you must specify RIR:
    php ipplan_import.php filename.SQL --rir=1918
```

```
For importing data from SQL dump, if one hasn't been loaded already:
    php ipplan_import.php filename.SQL --rir=1918 --no-overwrite

Caution: By default, SQL dump will be loaded into database 'provision_import_ipplan'. If database already
exists it will be dropped, unless --no-overwrite option is specified.

options:

  --only-import - Skip loading SQL file. Instead, import existing data in database 'provision_import_ipplan'.

  --only-sql - Load SQL dump into database 'provision_import_ipplan'. --only-import can be run at a later
time to use loaded database.

  --rir=RIR - (required for import) RIR for IP's

  OPTIONS IF LOADING SQL FILE:

  --no-overwrite - Load SQL dump only if database 'provision_import_ipplan' is currently non-existent.
Otherwise, drop existing database.

  OPTIONS IF IMPORTING DATA:

  --csv - generate CSV's instead of importing directly to ProVision.
```

Connector Method (Results in .csv files only):

This method creates .csv files that you can use with the IP Import - Upload/Import from CSV tool through the ProVision UI.

1. From the tools/ folder, run the tool with the --csv option. Be sure to reference your sql export file name and location:

   "php ipplan_import.php ../ipplanv6.sql --csv"

   (where '../ipplanv6.sql' is the path to your SQL file)
   This will generate two files: ipplan_aggregates.csv and ipplan_hosts.csv. Both can be used to import in the IP import section of ProVision.
2. Copy / Download the generated .csv files to a browsable directory on your local machine, to be accessed by the ProVision UI.
3. Through the ProVision UI, import the ipplan_aggregates.csv file as described in IP Import - Upload/Import from CSV.
4. Through the ProVision UI, import the ipplan_hosts.csv file as described in IP Import - Upload/Import from CSV.

> Note that you must import ipplan_aggregates first. into IP Import - Upload/Import from CSV to create the aggregates ipplan_hosts.csv will use.
>
> Then, import ipplan_hosts.csv as described in IP Import - Upload/Import from CSV.

Importer Method (Results in full import):

This method has the tool process the import task. Using this case, you must set the RIR in the command line for all of the IP's.

Run & Set the RIR:

1. From the tools/ folder, run the tool with the --rir option, referencing your SQL file location:

   "php ipplan_import.php ../ipplanv6.sql --rir=1918"
   (where '../ipplanv6.sql' is the path to your SQL file)

This will load your IPPlan database file into your mysql server and then import the hosts into ProVision. They will each be given the RIR you specified, as well as this text in the Notes field: 'IPPlan import'

The import may need to run for a number of minutes, depending on the size of your data. For reference, an import of 2100 hosts inside of 150 aggregates took approximately 10 minutes to complete during our testing.

Additional Run Options:

Additional run options for various combination of conditions are detailed below. The command is the text within the quotes only.

Load SQL Without Importing

You can load the SQL file, but NOT run an import, with the --only-sql option (feel free to include --no-overwrite option as well in case you don't want to overwrite a prior loaded SQL file):

"ipplan_import.php ../ipplanv6.sql --only-sql"

"ipplan_import.php ../ipplanv6.sql --only-sql --no-overwrite"

Generate CSV Without Loading SQL

If you have already loaded the sql file previously, you can generate CSV files without having to load the SQL file:

"ipplan_import.php --only-import --csv"

Generate CSV No Overwrite

If you want to just generate CSV files without re-loading the database file, you can as well:

"ipplan_import.php ../ipplanv6.sql --no-overwrite --csv"

Generate CSV With RIR

You can also generate csv files with the rir option:

"ipplan_import.php ../ipplanv6.sql --no-overwrite --csv --rir=1918"

Run Only Import

If you have already loaded your IPPlan database with the tool before, you can do --only-import:

"php ipplan_import.php --rir=1918 --only-import"

Run Import No Overwrite

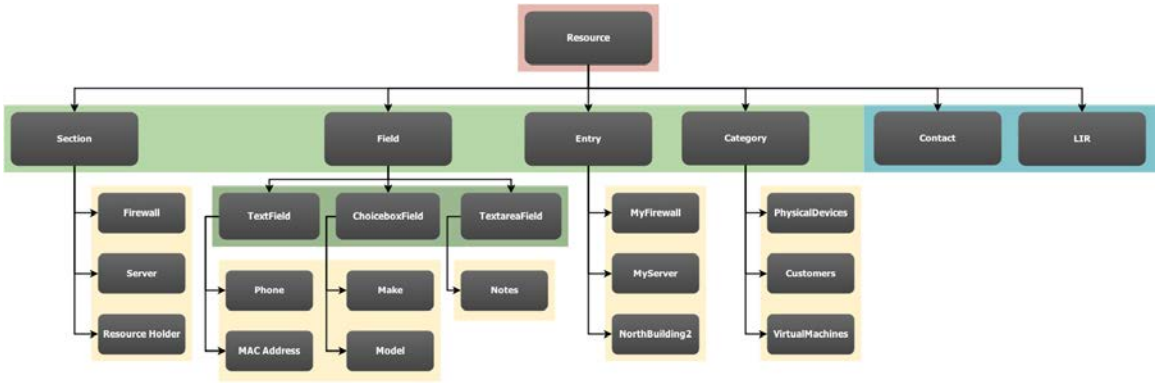
If you are not sure whether you have already loaded your IPPlan database with the tool before, you can specify --no-overwrite to NOT load the sql file if it was loaded already, or do load if it wasn't:

"ipplan_import.php ../ipplanv6.sql --rir=1918 --no-overwrite"

Resource Concepts 1

Overview

In Provision, the Resource System (RS) is an expression of object-oriented programming. In this context, the term “resource” is equivalent to the term “object”, where an object is an instance of a class. Traditionally in OOP, there is an Object class that is the root of the class hierarchy. In the RS, the Resource class is the root class. Every class in the system has Resource as a superclass and all resource objects implement the methods of that class.



The diagram above shows examples of resource sub-types. The items on a green or blue background are types of resources; they each have their own corresponding Class. An item on a yellow background is an example of an object that could have been instantiated from the class (resource type) that it's part of.

Additional Information:

- Resource Classes
- The Database Layout
- Asset System

Resource Classes Doc

Classes

> "A class--the basic building block of an object-oriented language such as Java--is a template that describes the data and behavior associated with instances of that class. When you instantiate a class you create an object that looks and feels like other instances of the same class."
>
> *Mary Campione and Kathy Walrath, The Java Tutorial: Object-Oriented Programming for the Internet, The Java Series (Reading, Mass.: Addison Wesley, 1996)*

- Class Resource
  - Properties
- Examples
  - 1 - PHP
  - 2 - API request

Class Resource

```
class Resource {
    public int    $id;
    public string $name;
    public string $slug;
    public string $type;
    public int    $parent_id;
    public int    $category_id;

    protected array $attr   = array();
    protected bool  $loaded = FALSE;

    public object get_attr( string $key );
    public void   set_attr( string $key, object $value );
    public bool   loaded();
}
```

Properties

As you can see from the database layout, the public properties of the Resource class are all part of the main **resource** table. The two protected properties **attr** and **loaded** are created at runtime. There are many situations where only the core information is required. To improve performance, attribute data is ignored when it is not required. Attributes are stored in the database as longtext; non-primitive types (such as arrays) are serialized and stored as a string.

```
$attr
A key-value store of the attributes that exist in the resource_attr table.

$loaded
A boolean value which is used to indicate whether or not the attributes have been loaded.
```

Why do some attributes have names that start with an underscore?

This is the convention for storing metadata. Most attributes are for storing data that is created by the user and is available to be directly edited by the user. When we want to store system data, configuration options, or just data that isn't meant for human consumption - we store it as metadata. An attribute is identified as being metadata by the convention of starting the name/key of the attribute with an underscore character (e.g. _meta). If you are interfacing with the API, you will frequently come across metadata. You're welcome to modify the metadata of a resource (if you know what you're doing) or add metadata attributes for known metadata keys, but you shouldn't create your own attributes with keys that begin with an underscore. Future versions of ProVision will use new metadata keys without warning, and if there is a naming conflict, your data could be lost.

Examples

These examples show the different methods that can be used to find and load a Resource object. They also show different data structures that are used to represent the object.

1 - PHP

> **Internal code example**
>
> To help users better understand how ProVision works, some of the examples in this documentation are of internal processes. They can contain code that only works when used as part of the core system and thus is not applicable to 3rd party development. The API is currently the only way for external tools to integrate with ProVision. Any example that contains internal code should be clearly labeled. Some common characteristics of these examples are code that doesn't use the API and code written in PHP (most example code will be in JavaScript).

This example uses the ResourceQuery class to find a resource object and then prints the result. It is included to show the similarity between finding a resource via the API and what happens under the hood.

```
$params = array(
    'slug' => 'tlr'
);
$resourceQuery = new ResourceQuery();
$resource = $resourceQuery->query($params);

var_dump($resource);
/*
array (size=1)
  0 =>
    object(Resource)[27]
      protected 'id' => string '1' (length=1)
      protected 'name' => string 'TLR' (length=3)
      protected 'slug' => string 'tlr' (length=3)
      protected 'type' => string 'resource' (length=8)
      protected 'parent_id' => null
      protected 'category_id' => null
      protected 'attr' =>
        array (size=0)
          empty
      protected 'loaded' => boolean true
*/
```

2 - API request

This is a standard API request, the request data is urlencoded and the result is JSON

/api/v1/api.php?target=resource&action=get&slug=TLR

```
{
  "success": 1,
  "message": "Search successful",
  "data": [
    {
      "id": "1",
      "name": "TLR",
      "slug": "tlr",
      "type": "resource",
      "parent_id": null,
      "category_id": null,
      "attr": {}
    }
  ]
}
```

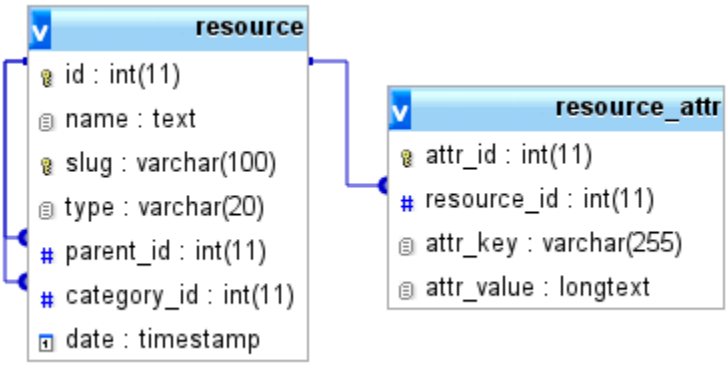
Database Layout 1

Database Layout

Details of the database and tables used by the RS are not necessary and should have no bearing on usage or API based development. However, a visualization of these tables may help some users better understand how the RS works, so they are provided below.

- Figure
- Relations
- Structure in SQL

Figure



Relations

`resource`.`category_id` -> `resource`.`id`

`resource`.`parent_id` -> `resource`.`id`

`resource_attr`.`resource_id` -> `resource`.`id`

Structure in SQL

resource

```
--
-- Table structure for table `resource`
--
CREATE TABLE IF NOT EXISTS `resource` (
`id` int(11) NOT NULL,
  `name` text NOT NULL,
  `slug` varchar(100) NOT NULL,
  `type` varchar(20) NOT NULL,
  `parent_id` int(11) DEFAULT NULL,
  `category_id` int(11) DEFAULT NULL,
  `date` timestamp NOT NULL DEFAULT CURRENT_TIMESTAMP
) ENGINE=InnoDB  DEFAULT CHARSET=utf8 AUTO_INCREMENT=1115 ;
--
-- RELATIONS FOR TABLE `resource`:
--   `category_id`
--       `resource` -> `id`
--   `parent_id`
--       `resource` -> `id`
--
--
```

```
-- Indexes for dumped tables
--
--
-- Indexes for table `resource`
--
ALTER TABLE `resource`
 ADD PRIMARY KEY (`id`), ADD UNIQUE KEY `slug` (`slug`), ADD KEY `category_id` (`category_id`), ADD KEY
`parent_id` (`parent_id`);
--
-- AUTO_INCREMENT for dumped tables
--
--
-- AUTO_INCREMENT for table `resource`
--
ALTER TABLE `resource`
MODIFY `id` int(11) NOT NULL AUTO_INCREMENT,AUTO_INCREMENT=1115;
--
-- Constraints for dumped tables
--
--
-- Constraints for table `resource`
--
ALTER TABLE `resource`
ADD CONSTRAINT `resource_ibfk_1` FOREIGN KEY (`category_id`) REFERENCES `resource` (`id`) ON DELETE SET NULL
ON UPDATE CASCADE,
ADD CONSTRAINT `resource_ibfk_2` FOREIGN KEY (`parent_id`) REFERENCES `resource` (`id`) ON DELETE SET NULL
ON UPDATE CASCADE;
```

resource_attr

```
--
-- Table structure for table `resource_attr`
--
CREATE TABLE IF NOT EXISTS `resource_attr` (
`attr_id` int(11) NOT NULL,
  `resource_id` int(11) NOT NULL,
  `attr_key` varchar(255) NOT NULL,
  `attr_value` longtext NOT NULL
) ENGINE=InnoDB  DEFAULT CHARSET=utf8 AUTO_INCREMENT=6744 ;
--
-- RELATIONS FOR TABLE `resource_attr`:
--   `resource_id`
--       `resource` -> `id`
--
--
-- Indexes for dumped tables
--
--
-- Indexes for table `resource_attr`
--
ALTER TABLE `resource_attr`
 ADD PRIMARY KEY (`attr_id`), ADD KEY `item_id` (`resource_id`);
--
-- AUTO_INCREMENT for dumped tables
--
--
-- AUTO_INCREMENT for table `resource_attr`
--
ALTER TABLE `resource_attr`
MODIFY `attr_id` int(11) NOT NULL AUTO_INCREMENT,AUTO_INCREMENT=6744;
--
-- Constraints for dumped tables
--
--
-- Constraints for table `resource_attr`
--
ALTER TABLE `resource_attr`
ADD CONSTRAINT `resource_attr_ibfk_1` FOREIGN KEY (`resource_id`) REFERENCES `resource` (`id`) ON DELETE
CASCADE ON UPDATE CASCADE;
```

Asset System

The Asset System

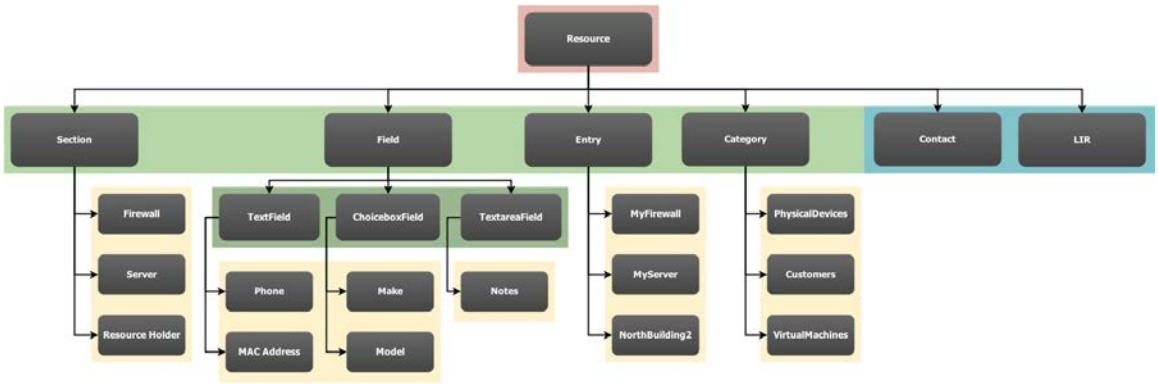
- Prerequisites
- Overview
- Introduction
- Components
    - Section
    - Entry
    - Field
    - Category
    - Gadgets

Prerequisites

Some knowledge of object orientated programming (OOP) is recommend to understand the following description of the Asset System. If you are unfamiliar with OOP concepts, I would recommend reading a tutorial such as this one (http://docs.oracle.com/javase/tutorial/java/concepts/index.html) provided by Oracle or this one (http://msdn.microsoft.com/en-us/library/ca22fyhc(v=vs.90).aspx) provided by Microsoft, to help you understand terms like class, object, instantiate, property, method, and others.

Overview

The asset system is a content management system (CMS) that is built as an extension to the resource system. It's the main use of the resource system, and to many, the terms "asset system" and "resource system" can seem synonymous. In the diagram below, the Resource class is at the top in red. The child-classes that make up the asset system are in green. Yellow is used for examples of objects (not classes) that could/would have been instantiated from their Class. And the items in blue are examples of resource child-classes (resource types) that exist outside of the asset system.



Introduction

When writing software, the developer creates classes. A class is like a blueprint for objects. The class defines the properties and methods that the future objects will have, and like blueprints, multiple objects can be created from a single class. The Resource Class is a class, and each resource "type" (e.g. Section, Field, Contact, ect.) has a class, something which has been written in core code and cannot be changed by the user. The purpose of the asset system is to reproduce this fundamental low-level class-object system in such a way that the user can create their own classes, properties, methods, and objects without needing to dive into the code.

Components

Section

Sections are like classes, they are the templates/blueprints of the asset system. To create the structure of the blueprint, the user assigns fields (i. e. properties) and sometimes gadgets (i.e. methods) to the section.

Entry

Entries are the objects of the asset system. An entry cannot be created without a section to use as its blueprint. Creating an entry from a section is like instantiating an object from a class.

Field

Fields are the properties of the class. Field has its own child-classes; this is to accommodate the different types of fields. For example, when creating a class *Car*, the developer might give the *Car* class the property *String color*. In a similar fashion, a user of the Asset System could create a Section called *Truck*, a TextField called *color*, and then assign that textfield to the section. When the user goes to create an entry from the section *Truck*, they'll be given the option to include a text value for the field *color*.

Fields also have a use beyond acting as properties for classes. The field object (in this case *color*) is a resource object in it's own right. This means it can be modified independently of the sections that have assigned it and the entries that are using it. For example, a field which shows a dropdown box of several options could be modified to include more options; any entry which is using that field would automatically receive those new changes. Or consider a simple textfield object called "MAC Address" that is used by several sections and entries. If that field was modified to include a filter that checks the input for a valid MAC string, any entry using that field would get those improved validation checks.

Also, because the same field object can be assigned to multiple sections, it's easier to find entries by their values because they're all using the exact same field object. The alternative would have to be a blind text search to try and find different objects but with contextually similar values, and that method is notoriously unreliable.**This is why it's encouraged to assign the same field object to different sections as opposed to just making new fields each time.**

Fields are like what you might call class properties or class variables, but they've also got a lot more functionality available for when you need it.

Category

Categories are just an organizational tool. There is a clearly defined relationship between Sections, Entries, and Fields, but Categories exist on their own. If you look on the Classes page, you'll see that every Resource has the same 6 fundamental properties and 3 of them are ID values. The first is the ID that belongs to the resource itself, the second is the ID of the resource's parent, and the third is the ID of the Category that the resource belongs to (if any). There isn't a strict hierarchy here, how you use categories is entirely up to you. You can create categories, child categories, and careful plan exactly how you want the resources in your system to be organized. Or you can ignore the whole thing completely and just let every resource have the default category of "uncategorized." Many user find that the ability to create hierarchal parent-child relationships with entries, and then filter down results even further by Section, leaves the use of Categories unnecessary. But if you want to use them, it's there.

Gadgets

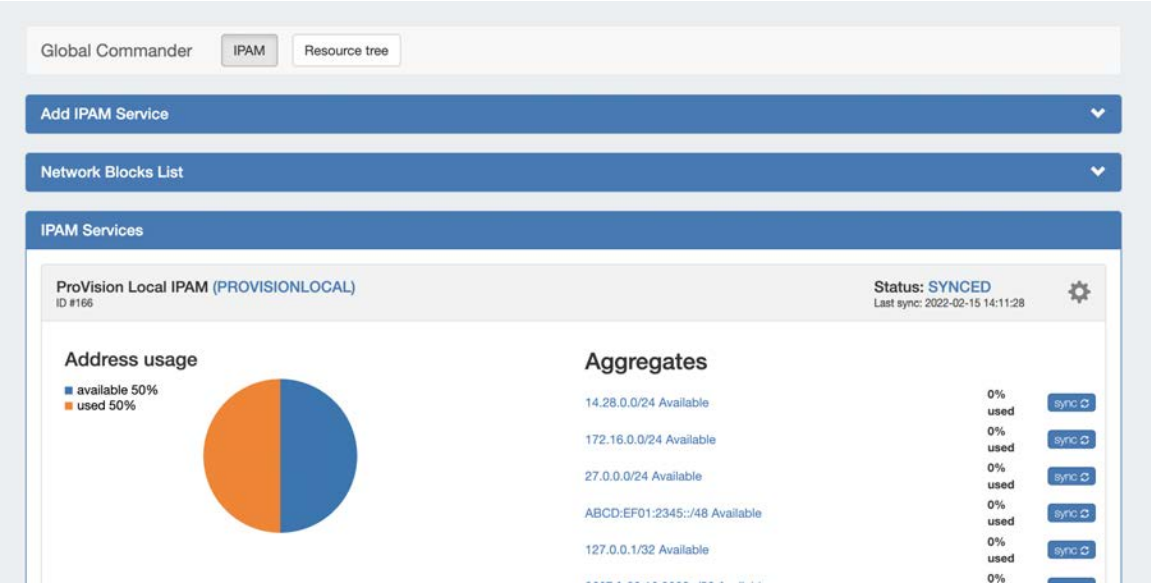
Gadgets are not resources, which is why they're not included in the chart at the top of the page. Gadgets are self contained applications and are limited to only using HTML, CSS, and JavaScript. All they know about the page that they're loaded on is the ID of the resource. However, because gadgets can interact with the API via JavaScript/AJAX, they're the perfect way to add new features to the asset system in a maintainable and modular way. At it's core, the asset system just allows users to create entries and then modify their text based attributes through a simple form. The ability for gadgets (such as the IPAM-Gadget) to interact with the API, is what makes the asset system so powerful.

Currently, the only gadgets that can be assigned to sections are gadgets that have been created by 6Connect. However our API is robust enough that almost anything you can do through ProVision could be recreated in the form of an isolated gadget. And because they're just made from html and javascript, it shouldn't be too strenuous for anyone to write a gadget of their own. If you want to create your own gadgets, it would be recommended to email us first with an outline of what you're trying to do. Then the recommended procedure would be to first create it as a standalone HTML/Javascript webpage that connects to our API (you may need to disable cross domain request security in your browser to make the AJAX connections work). Once you have your standalone page working, the process to turn that into an embeddable gadget is trivial.

Note: Gadgets are initialized as AngularJS applications. Both the AngularJS and jQuery libraries will be loaded on the page and available to use, but it is highly recommend to make the entire gadget in the form of an AngularJS app. But as noted above, it's best to contact us first so we can help you in the right direction.

Global Commander

Global Commander



6connect Global Commander (GC) is a ProVision add-on module which allows for remote monitoring & control of distributed IP management systems. Global Commander can be enabled by procuring a license key from 6connect ProVision Support. Once you have the key, apply it to ProVision using the "Manage Licenses" area on the ProVision Admin page. This will enable the Global Commander navigation tab, containing two Global Commander sub-tabs: **IPAM** and **Resource Tree.**

Use Case

6connect Global Commander (GC) is a ProVision add-on module which allows for remote monitoring & control of distributed IP management systems. The core use-case for Global Commander is a large organization whose departments all operate independently, and have developed their own internal IT systems, standards, and practices. This scenario is common for companies whose growth is driven by acquisition, and it is often very difficult to justify a departure from established, known-good practices to impose a single methodology company-wide. With so many actors working with mutually-incompatible systems it can be a challenge to know what is truly going on within an organization.

With this in mind, we present 6connect Global Commander to address the following problems:

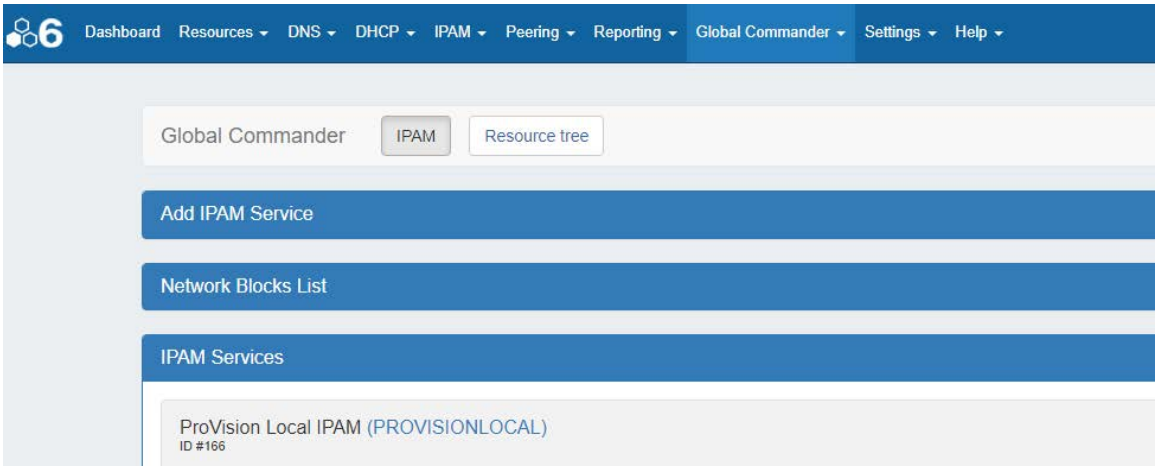
- You want a single overview of all IPAM activity in an organization regardless of what IPAM technologies are being used.
- You want a central location from which all IP information can be queried now matter how many IPAM systems manage fragments of the total landscape.
- You want to standardize IT systems, standards, and practices across a disparate internal landscape and need a bridge technology.
- You want to establish a centralized IP authority from which downstream groups request IP resources from, and return IP resources to.
- Your organization has a limited amount of public IP space distributed across many departments and you want identify where it is being used inefficiently.

Overview

Global Commander allows you to establish a single, centralized IP Management plane whose purpose is the orchestration and distribution of large IP blocks throughout the organization. Global Commander utilizes a stable of API connectors to popular IPAM systems (6connect ProVision, BlueCat, Infoblox, Netbox, Device42, etc.) to import and integrate IP data to present a unified view of IP utilization across the entire landscape. Global Commander can also act as an IP broker for the organization and use its connectors to either push or pull IP blocks on the daughter IPAMs to allow for effective management by IP Architects. Additionally, once established Global Commander can act as a bridge technology to transition departments onto a centrally-approved IPAM solution.

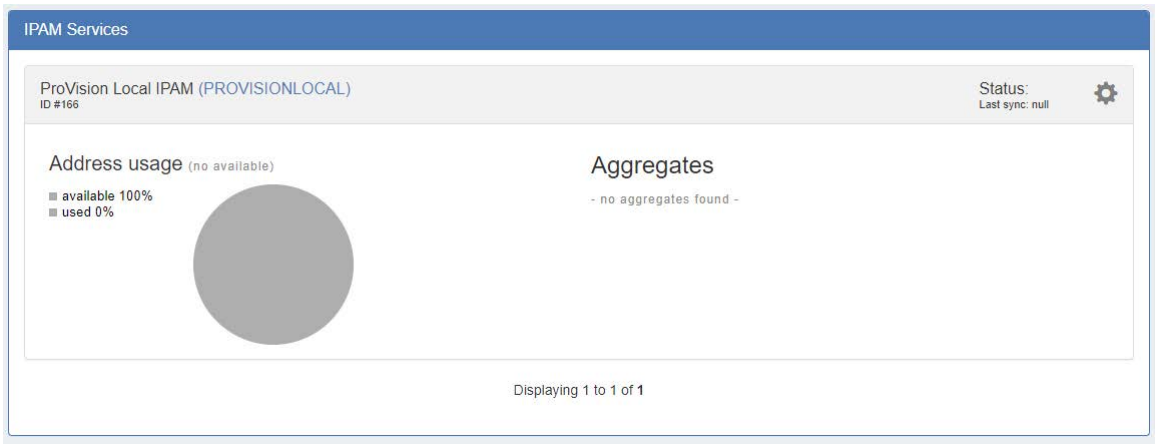
Enabling Global Commander

Once you have the have applied the license key for Global Commander to the Manage Licenses area, the Global Commander navigation tab will be enabled. There are two Global Commander sub-tabs: **IPAM** and **Resource Tree.**

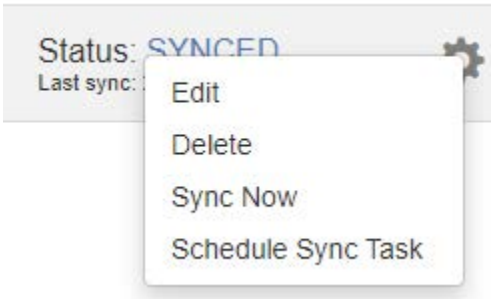


Synchronizing Global Commander

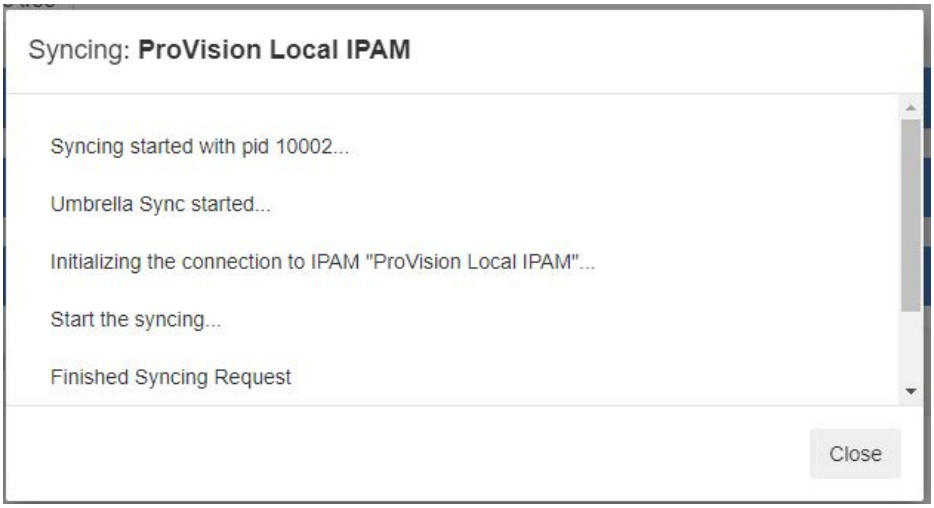
Global Commander comes pre-loaded with a "ProVision Local" IPAM Service which represents the IPAM Module of the local ProVision instance.



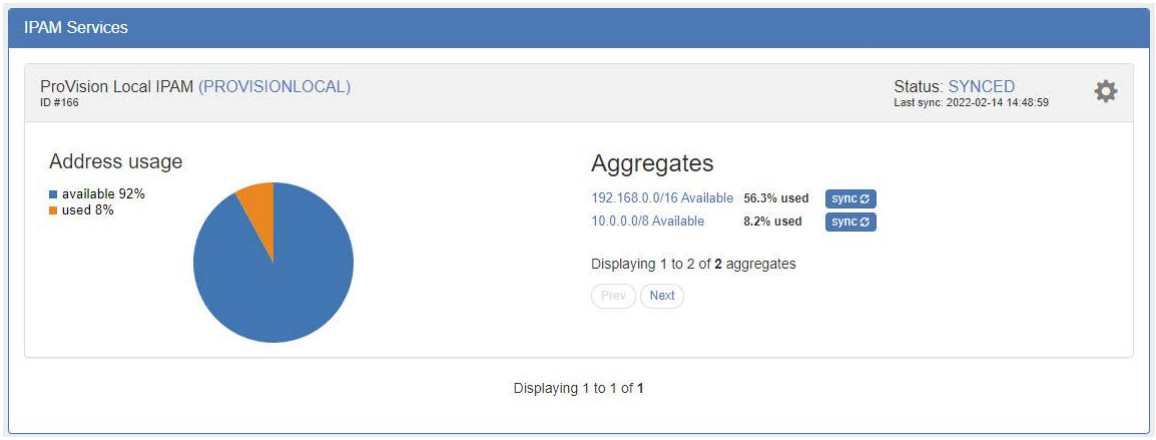
This is initially blank. Global Commander must synchronize itself with a daughter IPAM in order to pull in its IP state and detect changes. The 'Sync' command can be found under the gear wheel in the upper-left hand corner of the services card.



Here you can also Edit the connector to rename it, change its connector type, or connection credentials. You can also use the ProVision Scheduler system to queue up automatic synchronization tasks. Triggering an immediate Sync starts a synchronization job which pulls in IP information from the daughter system.



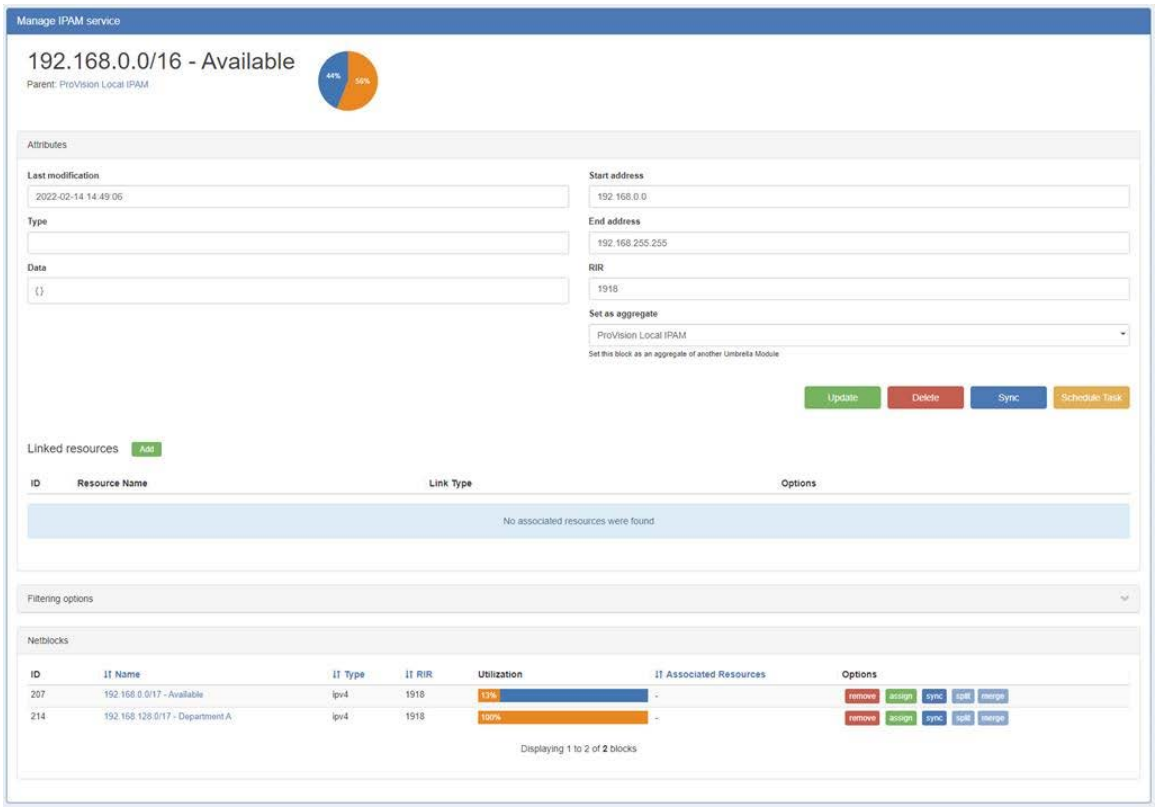
After, the IPAM Service card will show up-to-date information on the IP space managed by this service and its current utilization state.



Notice the "Status:" area has changed to "SYNCED", alongside a date of the last Sync. The service card now shows the Aggregates available in the IPAM system. For convenience we also offer the ability to sync individual aggregates on demand.

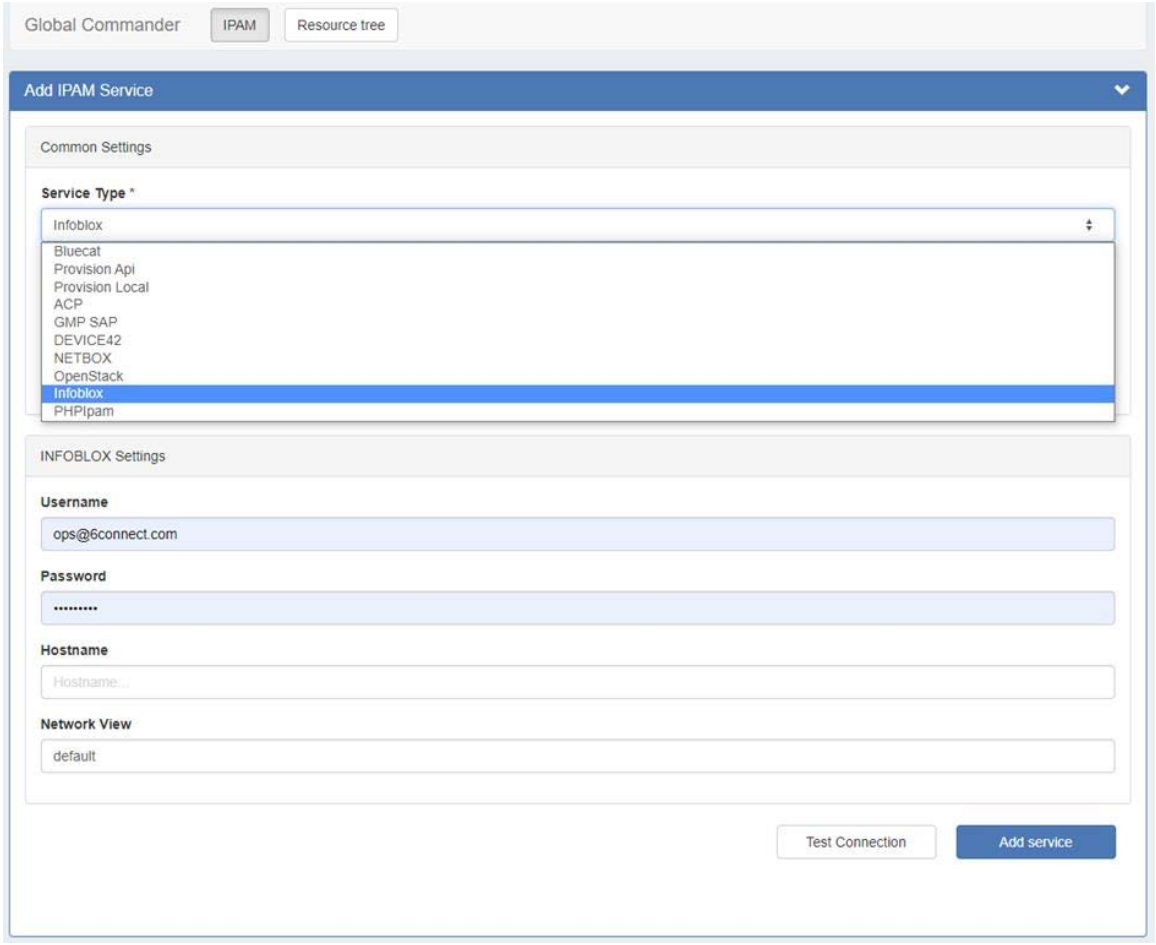
Viewing an Aggregate

Clicking on an aggregate will allow you to see its details:



Here we can see that an entire /17 has been assigned to "Department A" by the daughter IPAM. Clicking on the /17 allows you to explore further. Depending on the functions provided by the daughter IPAM, you can use Global Commander to split, merge, assign, or reclaim this IP block from the daughter IPAM. This allows a central IP administrator to push IP resources directly to the departments that will be using them, or recall the same blocks when they are no longer needed.

Additional IPAM Services can be added with the "Add IPAM Service" tab on the main Global Commander page:



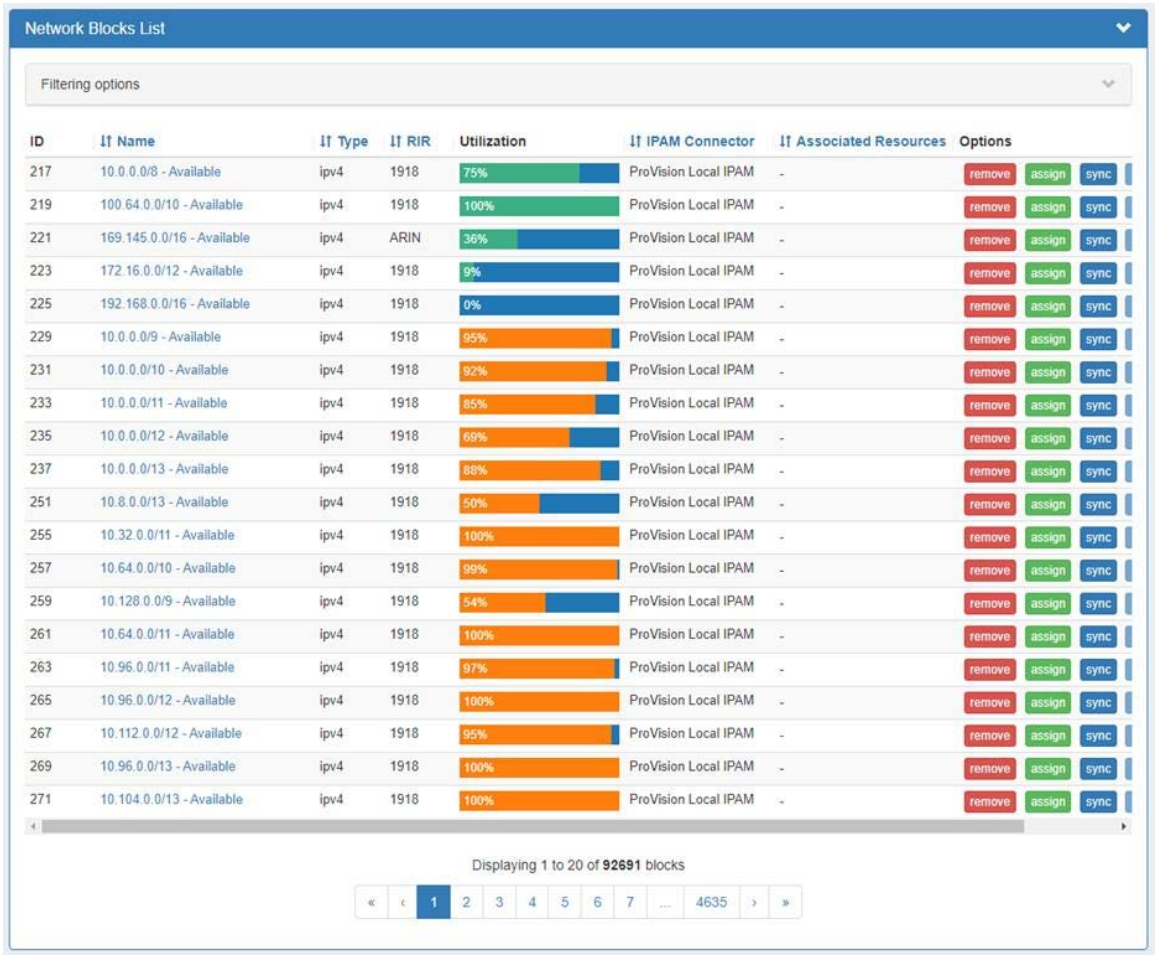
Each IPAM service has their own distinct method of communication and will require different credentials to properly connect. Once connection is established and Syncronization enabled, Global Commander will show a thorough listing of the IP resources on each service.



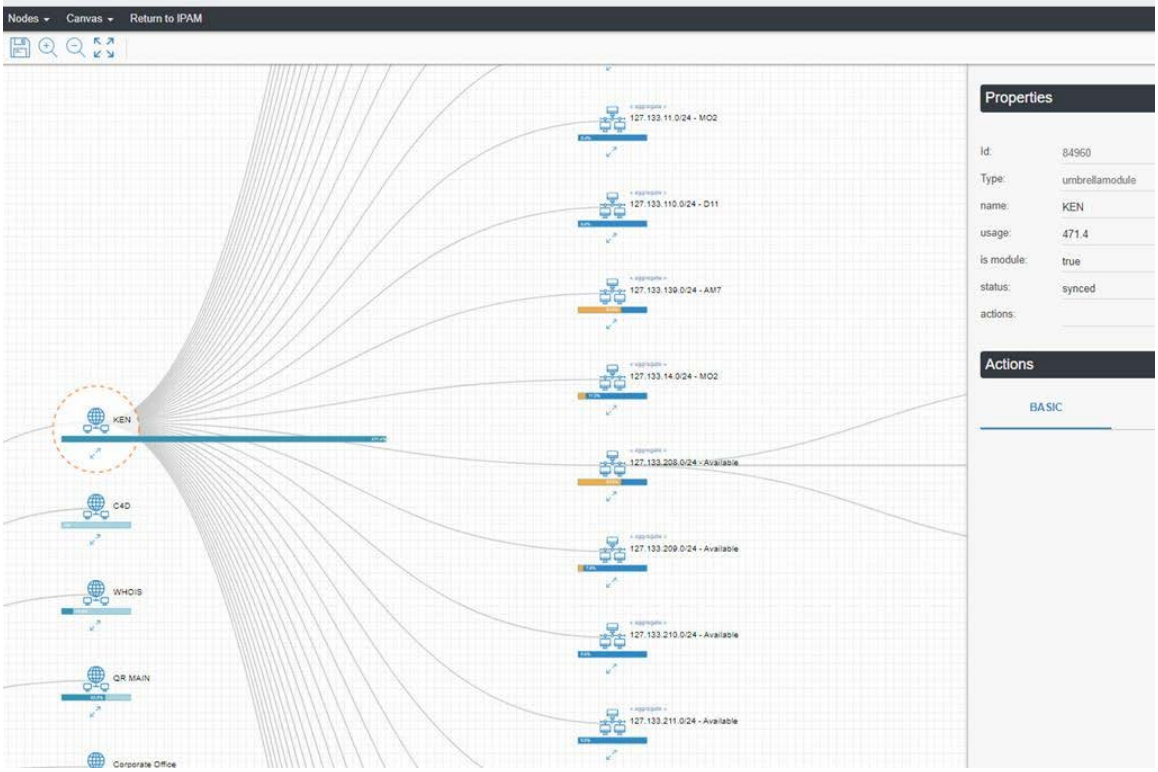
Each daughter IPAM can be put on its own synchronization schedule, or manual-only if needed. Additionally, the Global Commander system can be configured so that only manually-added IP Aggregates are tracked. This will allow you to track critical IP blocks in Global Commander, but allow departments to manage their own 1918 space without it cluttering the central control plane.

Network Blocks List

The Network Blocks List provides a centralized view of all the IPAM blocks organized by the system. It can be used to filter for a specific IP or range regardless of what IPAM system directly controls it.



The relationship between aggregates, IPAMs, and the Global Commander system can also be visualized as a tree by clicking the "Resource Tree" button:



Help and Support

Help & Support

For setup assistance, issues, or to request additional information, you can contact our support team at support@6connect.com.

For feedback items, please see Feedback and Feature Requests.

- Issue Reporting
- Initial Troubleshooting Steps
- Sending Help Requests
    - General Issue / Bug Report:
    - API Call Issue:
    - Support Email Template
- Additional Resources

Issue Reporting

If you come across an issue or bug, please report it to support@6connect.com.

Here are some steps that you can perform in advance to gather data or troubleshoot prior to sending a report:

1. As soon as an issue appears, grab screenshots!
    - Getting screenshots of the ProVision error and related areas (e.g., affected resource or module, Javascript console errors, log errors) helps us pin down the source of the issue more quickly
2. Read through "Initial Troubleshooting Steps", below, and note any that you have already tried and the outcome
3. Review the "Sending Help Requests" section and gather the information listed to provide in your email to support. You may copy and paste the provided template, if desired.

Initial Troubleshooting Steps

Here are some initial troubleshooting steps that are useful to try prior to sending a support request, and that may fix the issue entirely:

- Browser:
    - Reload the page ("Soft Reload")
    - Clear your browser cache and reload ("Hard Reload")
    - Try Incognito / Private Browsing mode - this can fix any clashing javascript occurring client-side
    - Check against a different browser - some bugs or display issues are browser-specific

  ProVision:
    - Verify whether the error is reproducible, and whether it also occurs on other similar resources / servers / aggregates
        - This helps us determine whether the error may be a corrupted database entry vs. a wider bug
    - Confirm that relevant module settings are set correctly for the desired behavior (i.e., check IPAM Column visibility settings for a missing column, DNS push settings, etc.)
    - Check against user permissions - does the user have correct permissions for the action? Can an admin level user successfully perform the action?
    - Does the error show in Admin Logs? (screenshot if so)

Sending Help Requests

When sending a help request for an issue, please include as much detail as possible about the issue. Examples of the type of information to provide are listed below, under "General Information", "Issue Details", and "Supporting Documents".

If you need assistance with an API call, please include the information under "API Call Issue".

You may also copy and paste the provided template into your support email, if desired.

General Issue / Bug Report:

Please include as much of the following information as possible:

General information:

Product, version, and device information:

- Product Version number
  - *ProVision v7.4.5 / ACP 1.0 / GNI 2.0*
- Operating System / Browser(s):
  - *Hosted instance using Chrome on a Mac (Big Sur)*
  - *Local installation running CentOS 7, PHP 8.0, using Firefox on a PC w Windows 11*
  - *Hosted instance using up-to-date Safari on an iPad Pro 11" , 2388 x 1668-px resolution (Note: screen resolution is only needed for ui display issues, such as a modal or button located offscreen)*

Issue Details:

Provide as much detail as possible about the issue:

- Module Area and page link:
  - *Had an issue with the Field Gadget on the Resource Entry Page at [page url]*
- Describe the issue, including what action(s) you were taking when the error occurred (if reproducible, please include detailed steps):
  - *Received an error when pushing a Knot DNS server with the following settings...*
  - *Import failed when attempting to import this file (provide file) to Resource ABC...*
  - *Was able to reproduce on Resource ABC by 1) opening the IPAM Gadget 2) entering x,y,z, filters 3) clicking "Smart Browse"...*
- Provide the error code or message (ideally, in a screenshot)
  - Tip: Additional errors may be visible in the Browser "Developer Tools" "Javascript Console"
- Note any troubleshooting steps taken and outcomes, for example:
  - *Cleared Chrome's browser cache and hard reloaded*
  - *Error occurred in both Chrome and Firefox*
  - *Restarted Apache*
- Confirm Urgency Tier:
  - *Low - Cosmetic Only, workaround available, or only affects a test environment*
  - *Medium - No workaround available, causes delays in internal operations but little to no impact on customers*
  - *Severe - Dramatic impact to production environment, high customer impact*
- Additional Information
  - Note any related server settings, permissions, etc. If configuration changes were made to the Host environment, we should be aware of them as well.

Supporting Documents:

Gather screenshots, related files, and supporting information from the ProVision instance or system logs:

API Call Issue:

If you experience an issue or failure with an API call, please include as much of the following information as possible:

General information:

- Confirm ProVision version number
- Confirm Urgency Tier
- Send expected outcome/description

API Call Detail:

- Send the actual API Call used, with header /payload information if applicable
- Provide the resulting error code
- Send the actual output of the API call, if applicable

From Logs:

- Send Apache and MySQL logs showing failure

- The error code(s) or messages that appeared, if any
- Send one or more screenshot(s) that show the issue, such as:
    - ProVision interface, ideally showing the error occurring and on what page it occurred
    - Devtools / Javscript Console output during the error, if open at the time or reproducible
    - ProVision log events, if applicable
- Provide Information or screenshots of related settings or configurations (server settings, user permissions, resource information, etc).
- Include files necessary to replicate the issue, such as import or zone files.
- Screenshot or paste failure alerts from
    - System Logs
    - Apache
    - MySQL

Support Email Template

Expand the area below for a simple template that you can copy and paste into an email / support request:

Template:

General Information:

ProVision/ Product Version:

Operating System / Browser(s) / Device used:

Issue Details:

Module Area & affected page link:

- .

Description of Issue / Steps to Reproduce:

- .
- .
- .

Error code or message: (ideally, include a screenshot)

- .

Troubleshooting steps already attempted:

- .
- .

Urgency Level / Operation Impact:

- .

Additional Information: (e.g. configuration changes applied to the host environment, relevant server settings, permission settings, or other notes)

- .

Provide Supporting Documents

- Screenshot(s) of the error message or issue and related context (e.g., The affected module area/ resource / server settings, Provision error messages, Devtools/ Javascript Console errors, ProVision Logs for the error)
- Relevant Apache, MySQL, or System log errors
- Copies of any relevant files needed to reproduce the error (e.g., DNS Zone file, Import / Export files)

Additional Resources

For tutorials, frequently asked questions, feedback, or additional resources such as import templates and previous documentation versions, please follow the links listed below.

- Tutorials
- FAQ
- Additional Resources
- Feedback and Feature Requests

Tutorials

Tutorials

Here we have grouped together video tutorials for various tasks and UI components. We link to these in the Getting Started area in the documentation, but you can also browse them individually depending on your needs. If you have suggestions for content - please send them to support@6connect.com.

Table of Contents

- Common Tasks
- UI Tours

Common Tasks

Here is a list of shortcuts to walkthroughs and information on performing common tasks in ProVision:

IPAM

IP Blocks

Adding/Editing blocks

Aggregating/Splitting blocks

SWIP configuration and use

RPSL configuration and use

IP Import

Import Aggregate Blocks

IP Import from CSV

DNS

Importing DNS Data

Import DNS Zones

BIND DNS Zone Upload and Import

PowerDNS Zone Import

Peering

Peering Common Tasks

Adding routers

Adding sessions

Importing sessions

Resources

Importing Resource Data

Resource Import from CSV

Resource Importer Walkthrough

UI Tours

- General
  - Getting to know ProVision: First Steps - Part1
    - ProVision v5.1.x
  - Getting to know ProVision: First Steps - Part2
    - ProVision v5.1.x
- Administration
  - Admin Preferences Page Overview
    - ProVision v6.0.x
    - Previous Versions:
    - ProVision v5.1.x
  - Managing Group and User Permissions
    - ProVision v5.1.x
  - DNS BIND Zone Importing
    - ProVision v5.1.x

General

Getting to know ProVision: First Steps - Part1

ProVision v5.1.x

Getting to know ProVision: First Steps - Part2

ProVision v5.1.x

Administration

Admin Preferences Page Overview

ProVision v6.0.x

Previous Versions:

ProVision v5.1.x

Managing Group and User Permissions

ProVision v5.1.x

DNS BIND Zone Importing

ProVision v5.1.x

FAQ

FAQ

From the command line in your ProVision instance, you can get a manual SQL backup using the following way:

```
mysqldump -uUSER -pPASSWORD DATABASE > bkup.sql
```

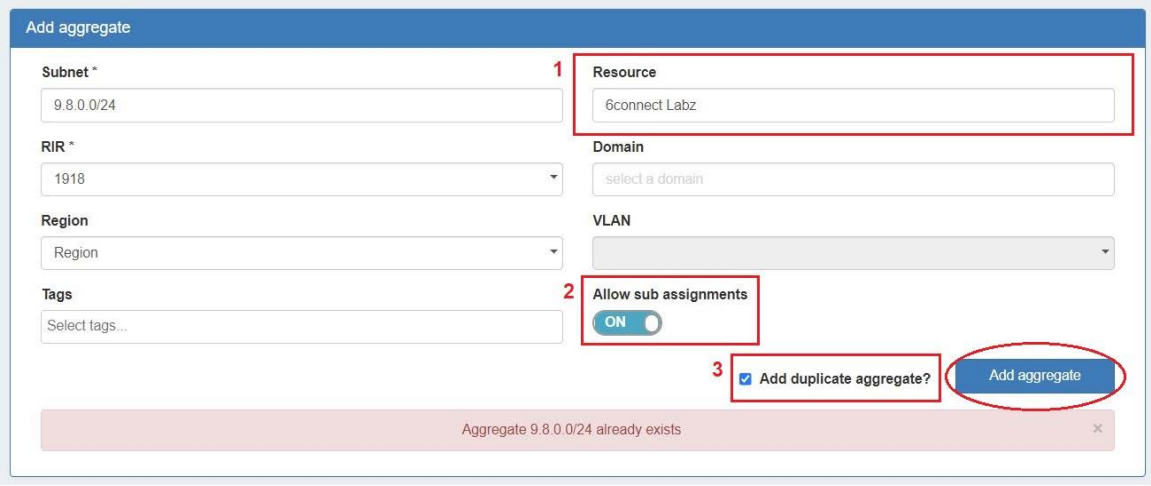
You can get the values for USER, PASSWORD, and DATABASE by reading them from the following file:

```
[ProVision Root]/data/globals.php
```

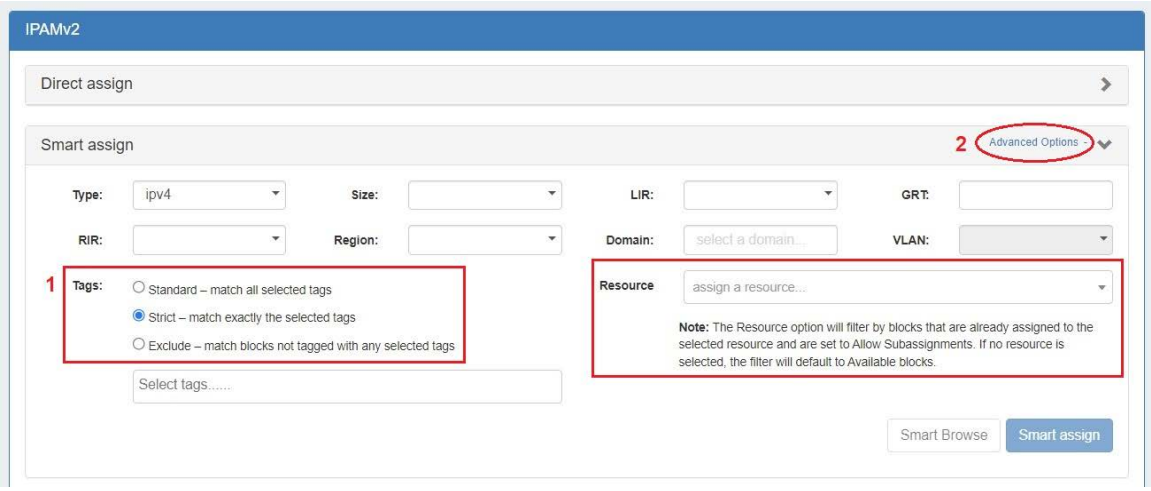
An example of a completed command:

```
mysqldump -uroot -p6connect_DBPSWD qa_5_1_5 > bkup.sql
```

You can then use this .sql file to restore the old version should you need to revert the installation.
When managing duplicate/overlapping IP ranges withing ProVision, there are several methods you can use to ensure that blocks are "unique" and still leverage functions like Smart Assign. The easiest approach is to use metadata for the aggregate (LIR, Region, Resource, etc.). From the ProVision GUI, you can use the "Add Aggregate" function on the IPAM tab (image below) to add a duplicate aggregate. By assigning the new Aggregate to a Resource (#1) you will tie the block and a Resource together. You most likely wish to make assignments out of this new aggregate, so you can enable subassignments (#2) before adding the aggregate (#3).



Now the block will be assigned to a Resource, and you can still provision smaller blocks out of these duplicate parent blocks. When using the IPAM gadget from the Resource screen, just go the Advanced section and you will have more options available for assigning IP data. If you have "strict" enabled, your Smart Assign function should work as expected when you use the LIR or Assigned Resource fields for blocks.



Yes - in DNS Admin, simple specify the DNS Servers like normal and then attach the zones as needed with the desired SOA.
The users list includes a "system user" that is only used by ProVision internally in the application.
In the case when a user already has SWIPped blocks to ARIN, 6connect checks prior to actually performing a SWIP. In the process, if the IP block is already SWIPped, it will check for existing ARIN customer data and update the 6connect data to reflect what ARIN has on file. Once that is complete, the user can then perform a de-SWIP function using ProVision.
When you make an API request to assign a block, if the block is already assigned to another resource, you will receive an error. If your process is to search for and then assign blocks, the Smart Assign API call may be very helpful. That call combines the search and assignment into one action.
Please make sure that URL rewriting is enabled in your instance (apache mod_rewrite)
In some legacy instances we have seen zone record-view linkages come out of alignment and result in unexpected behavior.

BACKUP YOUR DATABASE

Please note that the following mysql commands modify your database! Please take a backup copy of your database before performance any database modifications.

First, verify the error with the following mysql commands:

```
SELECT count(*) FROM `zone_server_linkage` as t1
INNER JOIN `records` as t2 ON t1.`zoneid` = t2.`zone_id`
INNER JOIN `dns_views` as t3 ON t1.`serverid` = t3.`server_id` AND
`name` = '_6connectDefault'
LEFT JOIN `dns_view_record_linkage` as t4 ON t2.`id` = t4.`record_id`
AND t3.`id` = t4.`view_id`
WHERE t4.`id` IS NULL;
```

If the reply comes back non-zero, then your database is most likely exhibiting unexpected behavior.

The following mysql commands will re-align all the record-view linkages:

```
INSERT INTO `dns_view_record_linkage` SELECT '', t2.`id` as `record_id`,
t3.`id` as `view_id` FROM `zone_server_linkage` as t1
INNER JOIN `records` as t2 ON t1.`zoneid` = t2.`zone_id`
INNER JOIN `dns_views` as t3 ON t1.`serverid` = t3.`server_id` AND
`name` = '_6connectDefault'
LEFT JOIN `dns_view_record_linkage` as t4 ON t2.`id` = t4.`record_id`
AND t3.`id` = t4.`view_id`
WHERE t4.`id` IS NULL;
```

Contact support(support@6connect.com) if you have any additional questions or this does not resolve the issue.

To create a reserved pool of IP space, you can create a Section called "Reserved", add the IPAM gadget to it, then create an Entry with that Section to be the address group. From there, use the IPAM gadget and the IPAM Manage page to assign and unassign IP space from that pool.

The workflow for this would be:

1. Assign IP space to the "Reserved" Section.
2. When you are ready to pull space from "Reserved", unassign the desired block. This moves it to the holding tank.
3. Override the holding tank to make the space "available". This can be done in the IPAM manager via the "Override Holding" wrench option, or a manual 'pull out of holding' API call.
4. Assign the block to the desired Resource.

Depending on your version of ProVision, you may need both steps. Edit the file 6connect web root/data/globals.php and:

1) Change the $hostname variable to the new value

2) Change the $base_url to the new value

Please note that you may also need to update the SSL certs, httpd settings, etc.

Additional Resources

- Import Templates
- List of Abbreviations

Import Templates

Import Templates

Downloadable Import Templates

Below you can find CSV templates for uploading Resource, Contact and IP data.

For DNS Import examples and a walkthrough, visit the DNS Import page.

File	Modified
File contact-import-sample_v1.csv	May 06, 2020 by The Force
Text File customer-import-sample.csv	May 06, 2020 by The Force
File import-zone-assign.csv	May 06, 2020 by The Force
File IP-import-sample_v1.csv	May 06, 2020 by The Force

Drag and drop to upload or browse for files
Download All

List of Abbreviations

List of Abbreviations:

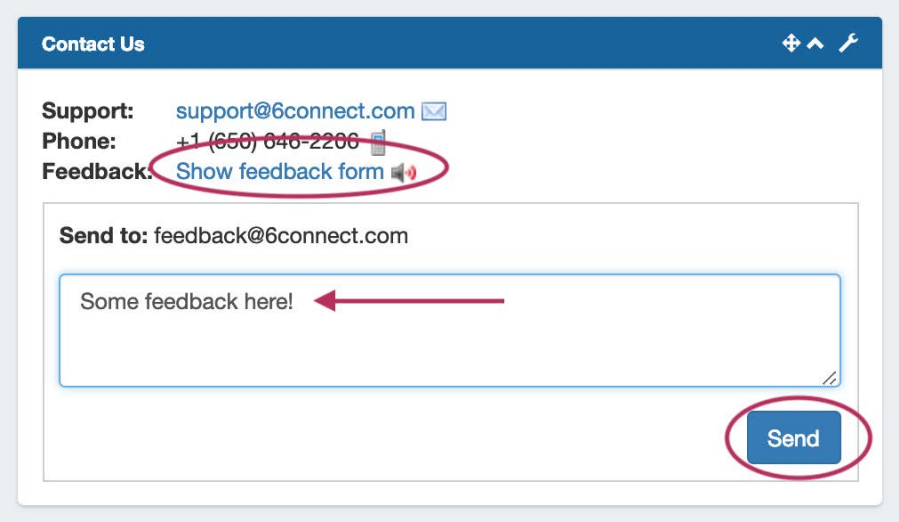
API	Application Program Interface
CLI	Command-line interface
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
DNSSec	Domain Name System Security Extensions
IP address	Internet Protocol address
IPAM	Internet Protocol address management
LDAP	Lightweight Directory Access Protocol)
SDK	software development kit
SSH	Secure Shell

Abbreviation List.xlsx

Feedback and Feature Requests

Support or Feedback

From the dashboard "Contact Us" Widget, you may click the support link to email a support request to support@6connect.com, or click "show feedback form" to open a form to send a short feedback message to feedback@6connect.com.



Of course, you may aways email support@6connect.com or feedback@6connect.com directly.