

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](#) .

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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".

DHCP Management

DHCP Services: ☒ Off ☐ On [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.

DHCP Management

+ Group Management

+ Connection Configuration

+ Server Details

+ Scan Server

+ DHCP Pools

+ Create a New DHCP Pool

Save Configuration

Push Configuration

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.

DHCP Management

+ Group Management

+ Connection Configuration

+ Server Details

+ Scan Server

+ DHCP Pools

+ Create a New DHCP Pool

Save Configuration

Push Configuration

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.

DHCP Management

+ Group Management

[Add Group](#)

DHCP Groups help you to organize all of your Pools and Servers together into a single place.

✕ Default Group (4103)

[Push](#)

Server Name	Server Backend	Server Status	Actions
7540 DHCP Module	ISC		Detach
7569 DHCP Module	ISC		Detach
7616 DHCP Module	ISC		Detach

Attach server : [Select Server](#) [Attach](#)

DHCP Failover peer name (ISC BIND Only) : [Save](#)

✕ DHCP Group1 (7581)

[Push](#)

Server Name	Server Backend	Server Status	Actions
7540 DHCP Module	ISC		Detach
7569 DHCP Module	ISC		Detach

Attach server : [Select Server](#) [Attach](#)

DHCP Failover peer name (ISC BIND Only) : [Save](#)

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 (in the format of "ResourceID - DHCP Module").

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 Manangment 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.

DHCP Management

+ Group Management

[Add Group](#)

DHCP Groups help you to organize all of your Pools and Servers together into a single place.

✕ Default Group (7623)

[Push](#)

Server Name	Server Backend	Server Status	Actions
-------------	----------------	---------------	---------

Attach server : [Select Server](#) [Attach](#)

DHCP Failover peer name (ISC BIND Only) : [Save](#)

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".

+ Group Management

Add Group

Create Group

Group Name: Some DHCP Group

Parent Resource: TLR

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. They are identified by their resource ID number, so if necessary, check the server's resource ID number in the resource information Gadget.

QA DHCP Server

ID: 7569

Section: Server

Category: Uncategorized

Select the desired server from the "Attach Server" selector, then click "Attach". The server is now attached to the group and available for pushes.

+ Group Management

Add Group

DHCP Groups help you to organize all of your Pools and Servers together into a single place.

✕ Default Group (7623) Push

Server Name	Server Backend	Server Status	Actions
Attach server : 7569 DHCP Module Attach			
DHCP Failover peer name (ISC BIND Only) :			Save

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.

X Default Group (7623)
Push

Server Name	Server Backend	Server Status	Actions
7569 DHCP Module	ISC		Detach

Attach server :
Select Server
Attach

DHCP Failover peer name (ISC BIND Only) : failover-server
Save

Saved !

Step 5: Link Pools to DHCP Groups

From the Existing Pools list under the DHCP Pools section, click the Action Menu for the pool you wish to link to a DHCP Group. From there, click "Link to Group".

+ DHCP Pools

Linked Pools
No Linked DHCP Pools Found

Linked Group Pools
No Linked DHCP Pools Found

Existing Pools

6connectqa.com [Host]
aaQAEntry [Host]
aaQAEntry B [Host]
aaQAEntry C [Host]

Link to Server
Link to Group
Delete Pool

If multiple DHCP Groups exist, a dialog 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.

Choose Group

More than one DHCP Group exists. Please choose the DHCP Group from the list:

DHCP Group :
Default Group

Confirm
Close

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".

Linked Group Pools

6connectqa.com [Host]

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.

Click on the top right corner of the gadget to see the server management and settings page.

✕ Default Group (7623)

Push

Server Name	Server Backend	Server Status	Actions
7569 DHCP Module	ISC		Detach

Attach server :

Select Server

Attach

DHCP Failover peer name (ISC BIND Only) :

Save

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.

DHCP Management

+ Connection Configuration

Manual IP:

192.168.0.1

Notes:

notes go here

SSH

Username:

username

Password:

Port:

port

Server Details

Server details and advanced options may be entered under this portion of the gadget.

+ Server Details

DHCP Vendor:

ISC DHCP

DHCP Config File Path:

/tmp/dhcpd.conf

Server Options

Routers:

Domain Name Servers:

Domain Name:

Free Lines (appended to DHCP Server Config):

1) free line 1

2) free line 2

3) free line 3

Add a new Line:

Add

Server Commands

Config Test:

/etc/init.d/dhcpd configtest

Server Stop:

/etc/init.d/dhcpd stop

Server Start:

/etc/init.d/dhcpd start

Advanced Options

Authoritative:

Yes

Default Lease Time:

600

Max Lease Time:

7200

Local Port:

67

Log Facility:

local7

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.

+ Scan Server

Scan Now

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.

+ Scan Server

Scan Now

Scan Results

Blah: 0 Hosts Found. 256 Hosts Available. **100.00% Free**
No Hosts Found

Miscellaneous Addresses: found addresses which do not match a linked DHCP Pool

Hostname	MAC	IPv4	IPv6
Unknown Host	08:d8:33:93:87:70	10.1.10.35	
sep58bfea1164be	58:bf:ea:11:64:be	10.1.10.136	
Unknown Host	00:0e:8f:88:5b:8f	10.1.10.82	
philips-hue	00:17:88:24:2e:8b	10.1.10.85	
Unknown Host	00:0c:29:62:6c:57	10.1.10.59	
directv-hr44-b1550683	10:77:b1:55:06:84	10.1.10.30	
Unknown Host	00:80:a3:91:47:ae	10.1.10.55	
lifx bulb	d0:73:d5:00:06:a6	10.1.10.86	
sonoszb	00:0e:58:1c:e0:0a	10.1.10.108	
lifx bulb	d0:73:d5:00:ae:e2	10.1.10.96	
lifx bulb	d0:73:d5:00:a8:43	10.1.10.87	
Unknown Host	f4:b8:5e:00:7b:f3	10.1.10.89	
Unknown Host	74:29:af:d6:ba:8d	10.1.10.32	
Unknown Host	ec:e0:9b:b7:f3:15	10.1.10.51	
lifx bulb	d0:73:d5:00:20:51	10.1.10.81	
sonoszp	00:0e:58:ff:8e:82	10.1.10.109	
np4305e9	4c:0f:6e:90:7a:da	10.1.10.75	
Unknown Host	74:75:48:08:bb:b1	10.1.10.77	
Unknown Host	a0:02:dc:1c:c4:aa	10.1.10.103	
Unknown Host	94:10:3e:4c:82:c9	10.1.10.79	
Unknown Host	00:25:90:02:ff:42	10.1.10.58	
living-room	c8:69:cd:2c:38:56	10.1.10.44	
kitchen	c8:69:cd:37:c9:bc	10.1.10.66	
iphone6splus	7c:01:91:d1:34:f3	10.1.10.104	
macbook	a8:66:7f:15:6b:85	10.1.10.39	
iphone1	d8:bb:2c:7a:61:8e	10.1.10.37	
mac-mini	20:c9:d0:96:4e:9d	10.1.10.107	
bedroomappleTV2	6c:94:f8:e1:b0:14	10.1.10.54	
mac-air	9c:f3:87:b1:5b:b6	10.1.10.90	
livingroom	a4:67:06:64:b3:97	10.1.10.49	
aarons-imac	b8:09:8a:ba:dd:4f	10.1.10.34	
iphone-88	5c:ad:cf:03:3b:66	10.1.10.45	
ipad2	2c:1f:23:49:1f:93	10.1.10.84	
Unknown Host	34:46:6f:0a:c5:a1	10.1.10.33	
02aa01ac351309sc	18:b4:30:0c:c5:27	10.1.10.31	
Unknown Host	00:11:32:16:29:ef		2607:fae0:6000::514c
Unknown Host	20:61:73:79:6e:ff		2607:fae0:6000::5e35
Unknown Host	88:1f:a1:2a:d7:71		2607:fae0:6000::5065

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 Existing Pools 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.

+ DHCP Pools

Linked Pools

Name Search

Bob.com [Host]

NewPool [Subnet]

Quito Lab 1 [Subnet]

Remove Link

Linked Group Pools

Name Search

6connectqa.com [Host]

Remove Link

Existing Pools

Name Search

6connectqa.com [Host]

aaQAEntry [Host]

aaQAEntry B [Host]

Link to Server

Link to Group

Delete Pool

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 Pools

Linked Pools

Name Quito Search

Quito Lab 1

Subnet Name: (ex: Lab #1)

Current IP Assignment: 10.8.0.0/24

Range: to (ex: 192.168.1.30 to 192.168.1.50)

Free Lines:

No lines saved.

Add a New Line:

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 "Search".

+ DHCP Pools

Linked Pools

Name Lab Search

Quito Lab 1 [Subnet]

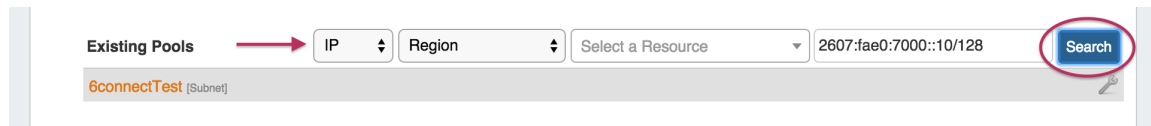
For both Linked and Existing pools, search terms include:

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 "Search", 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 Rule](#).

DHCP Pools and IP Rules

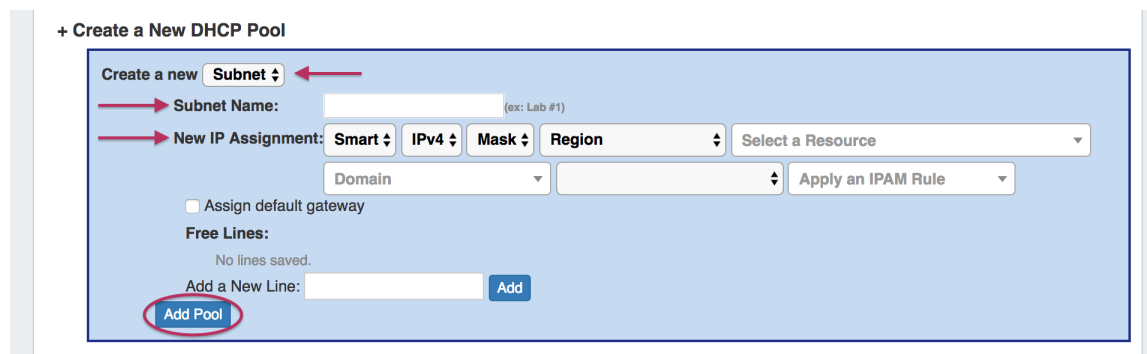
For DHCP Pools, ProVision automatically reserves the first and last address of the pool for Gateway and Broadcast addresses, respectively.

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".




+ Create a New DHCP Pool

Create a new **Host** 

→ **Hostname:** (ex: 6connect.com)

→ **MAC Address:** (ex: 00:11:22:33:44:55)


→ **New IP Assignment:** **Smart**  **IPv4**  **Region**  **Select a Resource** 

Domain   **Apply an IPAM Rule** 

☐ Assign default gateway

Free Lines:
No lines saved.

Add a New Line: **Add**

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

Create a new **Host** 

→ **Hostname:** (ex: 6connect.com)

→ **MAC Address:** (ex: 00:11:22:33:44:55:66:77)

→ **New IP Assignment:** **Direct**  **IPv4**  x.x.x.x/yy

Free Lines:
No lines saved.

Add a New Line: **Add**

Add Pool 

Save Configuration **Push Configuration**

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.

+ Current Pushed Configuration

This is the last successfully pushed configuration. It does not reflect unpushed changes or failed pushes.

```
# DHCP Config for ISC.

authoritative;
option domain-name-servers dev2.6connect.com;
default-lease-time 600;
max-lease-time 7200;
local-port 67;
log-facility local7;

subnet 10.8.0.0 netmask 255.255.255.0 {
    range 10.8.0.0 10.8.0.255;
}

subnet 10.8.1.0 netmask 255.255.255.252 {
    range 10.8.1.0 10.8.1.3;
}
```

Save Configuration **Push Configuration**

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

DHCP Customer configuration

Configuration

Assign IP

Direct Assign

ex. 192.168.0.3/32

Assign

Smart Assign

IPv4

1918

Atlanta, GA

Choose tags

Tag selection mode:

☒ Standard – match all selected tags

☐ Strict – match exactly the selected tags

☐ Exclude – match blocks not tagged with any selected tags

Select domain

Vlan

Smart Assign

Smart Browse

Linked IP Blocks

Block	Resource	Tags	
3.50.50.0/32	123 Department LAB	DHCP	Unassign
3.50.50.1/32	123 Department LAB B	DHCP	Unassign
3.50.50.8/29	123 Department LAB C	DHCP	Unassign

The DHCP Customer Configuration Gadget allows users to assign 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 (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 IPAM Aggregates with subassignable blocks from the [IPAM](#) Tab with the desired IP space type, RIR, Region(s), Tags, and any desired VLAN criteria. Regions are a required field when assigning IPs from the DHCP Customer Configuration Gadget.

Using the DHCP Customer Configuration Gadget

Step 1) Link the Gadget with the desired DHCP Server

DHCP Customer configuration

The customer resource is not assigned to a DHCP Module

Linkage with DHCP Server

DHCP Server

Continue

Step 2) Assign IP's for Pools from DHCP Aggregates

DHCP Customer configuration

Configuration
Assign IP

Direct Assign

ex. 192.168.0.3/32

Assign

Smart Assign

IPv4
1918
Atlanta, GA
Choose tags

Select domain
Vlan

Smart Assign

Smart Browse

Tag selection mode:
☒ Standard – match all selected tags
☐ Strict – match exactly the selected tags
☐ Exclude – match blocks not tagged with any selected tags

Linked IP Blocks

Block	Resource	Tags
3.50.50.0/32	123 Department LAB	DHCP Unassign
3.50.50.1/32	123 Department LAB B	DHCP Unassign
3.50.50.8/29	123 Department LAB C	DHCP Unassign

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.

DHCP Customer configuration

Configuration

Assign IP

Premium DNS

☐ test-diego
(1-dev.6connect.com)

☒ 6c BIND QA Server
(208.39.106.184)

☐ 6c S64 Auth Server QA 2
(s64-dns1.6connect.com)

☐ ssh-test
(217.18.247.197)

☐ 6c PowerDNS QA
(208.39.104.106)

☐ S64 Server 2
(s64-dns1.6connect.com)

☐ Cache Server
(216.17.194.76)

☐ 6c S64 Server1
(s64-dns1.6connect.com)

☐ NSONE Server
(dns1.p04.nsone.net.)

☐ nikov
(217.18.247.197)

☐ 6c Infoblox test VM1
(infoblox1.6connect.com)

Shrink

Option 82 Elements 1:

abc1234

Option 82 Elements 2:

MXK-ES01-1-1-1-305 or LSM-ES01-1-1-305

Option 82 Elements 3:

MXK-ES01-1-1-1-305 or LSM-ES01-1-1-305

Circuit ID:

Preview:

```
host 123_Department_LAB {
  host-identifier option agent.circuit-id "abc1234";
  fixed-address 3.50.50.0;
  option domain-name-servers 208.39.106.184;
}
```

Status:

Activate

Notes:

Some Note Here

Update configuration

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](#).