



## Configuring DHCP Scopes

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## Restrictions for Configuring Internal DHCP Server

- You can configure up to 16 Internal DHCP scopes.
- Internal DHCP Server is not supported on the following controllers:
  - Cisco 8510 Wireless Controller
  - Cisco Flex 7500 Series Wireless Controller
- You must configure DHCP Proxy Mode to use the Internal DHCP Server.
- When you want to use the Internal DHCP Server, you must set the management interface IP address of the controller as the DHCP server IP address.

## Internal DHCP Server

Controllers have built-in DHCP relay agents. However, when you desire network segments that do not have a separate DHCP server, the controllers can have built-in internal DHCP server that assign IP addresses and subnet masks to wireless clients. Typically, one controller can have one or more internal DHCP server that each provide a range of IP addresses.

Internal DHCP server are needed for internal DHCP to work. Once DHCP is defined on the controller, you can then point the primary DHCP server IP address on the management, AP-manager, and dynamic interfaces to the controller's management interface.



**Note** The controller has the ability to provide internal DHCP server. This feature is very limited and considered as convenience that is often used simple demonstration or proof-of-concept, for example in a lab environment. The best practice is NOT to use this feature in an enterprise production network.

Read more about this at: <http://www.cisco.com/c/en/us/support/docs/wireless/4400-series-wireless-lan-controllers/110865-dhcp-wlc.html#anc16>

### Per WLAN DHCP Servers

By default, when using DHCP proxy mode, a WLAN's clients use the DHCP servers that are configured on the mapped interfaces. You can override the interface's DHCP servers by configuring per-WLAN DHCP servers.

This section contains the following subsections:

## Configuring DHCP Scopes (GUI)

**Step 1** Choose **Controller** > **Internal DHCP Server** > **DHCP Scope** to open the **DHCP Scopes** page.

This page lists any DHCP scopes that have already been configured.

**Note** If you ever want to delete an existing DHCP scope, hover your cursor over the blue drop-down arrow for that scope and choose **Remove**.

**Step 2** Click **New** to add a new DHCP scope. The **DHCP Scope** > **New** page appears.

**Step 3** In the **Scope Name** field, enter a name for the new DHCP scope.

**Step 4** Click **Apply**. When the **DHCP Scopes** page reappears, click the name of the new scope. The **DHCP Scope** > **Edit** page appears.

**Step 5** In the **Pool Start Address** field, enter the starting IP address in the range assigned to the clients.

**Note** This pool must be unique for each DHCP scope and must not include the static IP addresses of routers or other servers.

**Step 6** In the **Pool End Address** field, enter the ending IP address in the range assigned to the clients.

**Note** This pool must be unique for each DHCP scope and must not include the static IP addresses of routers or other servers.

**Step 7** In the **Network** field, enter the network served by this DHCP scope. This IP address is used by the management interface with Netmask applied, as configured on the **Interfaces** page.

**Step 8** In the **Netmask** field, enter the subnet mask assigned to all wireless clients.

**Step 9** In the **Lease Time** field, enter the amount of time (from 0 to 65536 seconds) that an IP address is granted to a client.

**Step 10** In the **Default Routers** field, enter the IP address of the optional router connecting the controllers. Each router must include a DHCP forwarding agent, which allows a single controller to serve the clients of multiple controllers.

**Step 11** In the **DNS Domain Name** field, enter the optional domain name system (DNS) domain name of this DHCP scope for use with one or more DNS servers.

- Step 12** In the **DNS Servers** field, enter the IP address of the optional DNS server. Each DNS server must be able to update a client's DNS entry to match the IP address assigned by this DHCP scope.
- Step 13** In the **Netbios Name Servers** field, enter the IP address of the optional Microsoft Network Basic Input Output System (NetBIOS) name server, such as the Internet Naming Service (WINS) server.
- Step 14** From the **Status** drop-down list, choose **Enabled** to enable this DHCP scope or choose **Disabled** to disable it.
- Step 15** Save the configuration.
- Step 16** Choose **DHCP Allocated Leases** to see the remaining lease time for wireless clients. The DHCP Allocated Lease page appears, showing the MAC address, IP address, and remaining lease time for the wireless clients.
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## Configuring DHCP Scopes (CLI)

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- Step 1** Create a new DHCP scope by entering this command:
- ```
config dhcp create-scope scope
```
- Note** If you ever want to delete a DHCP scope, enter this command: **config dhcp delete-scope scope**.
- Step 2** Specify the starting and ending IP address in the range assigned to the clients by entering this command:
- ```
config dhcp address-pool scope start end
```
- Note** This pool must be unique for each DHCP scope and must not include the static IP addresses of routers or other servers.
- Step 3** Specify the network served by this DHCP scope (the IP address used by the management interface with the Netmask applied) and the subnet mask assigned to all wireless clients by entering this command:
- ```
config dhcp network scope network netmask
```
- Step 4** Specify the amount of time (from 0 to 65536 seconds) that an IP address is granted to a client by entering this command:
- ```
config dhcp lease scope lease_duration
```
- Step 5** Specify the IP address of the optional router connecting the controllers by entering this command:
- ```
config dhcp default-router scope router_1 [router_2] [router_3]
```
- Each router must include a DHCP forwarding agent, which allows a single controller to serve the clients of multiple controllers.
- Step 6** Specify the optional domain name system (DNS) domain name of this DHCP scope for use with one or more DNS servers by entering this command:
- ```
config dhcp domain scope domain
```
- Step 7** Specify the IP address of the optional DNS server(s) by entering this command:
- ```
config dhcp dns-servers scope dns1 [dns2] [dns3]
```
- Each DNS server must be able to update a client's DNS entry to match the IP address assigned by this DHCP scope

**Step 8** Specify the IP address of the optional Microsoft Network Basic Input Output System (NetBIOS) name server, such as the Internet Naming Service (WINS) server by entering this command:

```
config dhcp netbios-name-server scope wins1 [wins2] [wins3]
```

**Step 9** Enable or disable this DHCP scope by entering this command:

```
config dhcp {enable | disable} scope
```

**Step 10** Save your changes by entering this command:

```
save config
```

**Step 11** See the list of configured DHCP scopes by entering this command:

```
show dhcp summary
```

Information similar to the following appears:

| Scope Name | Enabled | Address Range      |
|------------|---------|--------------------|
| Scope 1    | No      | 0.0.0.0 -> 0.0.0.0 |
| Scope 2    | No      | 0.0.0.0 -> 0.0.0.0 |

**Step 12** Display the DHCP information for a particular scope by entering this command:

```
show dhcp scope
```

Information similar to the following appears:

```
Enabled..... No
Lease Time..... 0
Pool Start..... 0.0.0.0
Pool End..... 0.0.0.0
Network..... 0.0.0.0
Netmask..... 0.0.0.0
Default Routers..... 0.0.0.0 0.0.0.0 0.0.0.0
DNS Domain.....
DNS..... 0.0.0.0 0.0.0.0 0.0.0.0
Netbios Name Servers..... 0.0.0.0 0.0.0.0 0.0.0.0
```

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