Configuring the Cisco IOS XE DHCP Client

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Cisco IOS XE Dynamic Host Configuration Protocol (DHCP) client software provides the flexibility to include various configuration options for the DHCP client. A DHCP client is defined as an Internet host using DHCP to obtain configuration parameters such as an IP address. This module describes the concepts and tasks needed to configure the Cisco IOS XE DHCP client.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Information About the DHCP Client

DHCP Client Operation

DHCP provides a framework for passing configuration information to hosts on a TCP/IP network. A DHCP client is an Internet host using DHCP to obtain configuration parameters such as an IP address. The figure

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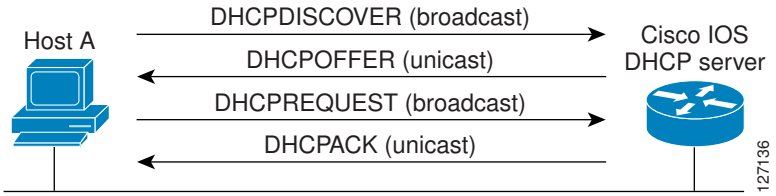
below shows the basic steps that occur when a DHCP client requests an IP address from a DHCP server. The client, Host A, sends a DHCPDISCOVER broadcast message to locate a DHCP server. A DHCP server offers configuration parameters (such as an IP address, a MAC address, a domain name, and a lease for the IP address) to the client in a DHCPOFFER unicast message.

Figure 1 DHCP Request for an IP Address from a DHCP Server



A DHCP client may receive offers from multiple DHCP servers and can accept any one of the offers; however, the client usually accepts the first offer it receives. Additionally, the offer from the DHCP server is not a guarantee that the IP address will be allocated to the client; however, the server usually reserves the address until the client has had a chance to formally request the address.

The client returns a formal request for the offered IP address to the DHCP server in a DHCPREQUEST broadcast message. The DHCP server confirms that the IP address has been allocated to the client by returning a DHCPACK unicast message to the client.

DHCP Client Overview

The configurable dynamic host configuration protocol client functionality allows a DHCP client to use a user-specified client identifier, class identifier, or suggested lease time when requesting an address from a DHCP server.

Configuration parameters and other control information are carried in tagged data items that are stored in the options field of the DHCP message. The DHCP client provides flexibility by allowing the following options to be configured for a DHCP client:

- Option 12—This option specifies the name of the client. The name may or may not be qualified with the local domain.
- Option 51—This option is used in a client request (DHCPDISCOVER or DHCPREQUEST) to allow the client to request a lease time for the IP address.
- Option 55—This option allows the DHCP client to request certain options from the DHCP server. The **ip dhcp client request** command allows the system administrator to turn off some of the requested options, thus removing them from the request list.
- Option 60—This option allows the user to configure the vendor class identifier string to use in the DHCP interaction.
- Option 61—This option is used by DHCP clients to specify their unique identifier. DHCP servers use this value to index their database of address bindings. This value is expected to be unique for all clients in an administrative domain.
- Option 120—This option is used to specify a 32-bit (binary) IPv4 address to be used by the Session Initiation Protocol (SIP) client to locate a SIP server.
- Option 121—This option is used to configure classless static routes by specifying classless network destinations; that is, each routing table entry includes a subnet mask. Upto ten classless static routes are supported using option 121 on the DHCP client.

Note If a request includes both static routes and classless static routes, the client uses only the classless static routes. If the DHCP server returns both a classless static route option and a router option, the DHCP client ignores the router option.

- Option 125—This option is used by DHCP clients and servers to exchange vendor-specific information.

How to Configure the DHCP Client

Configuring the DHCP Client

Perform this task to configure the DHCP client.

Cisco routers running Cisco IOS XE software include DHCP server and relay agent software, which are enabled by default. Your router can act as both the DHCP client and DHCP server. Use the **ip address dhcp** interface command to obtain IP address information for the configured interface.

You must configure the **ip dhcp client** commands before entering the **ip address dhcp** command on an interface to ensure that the DHCPDISCOVER messages that are generated contain the correct option values. The **ip dhcp client** commands are checked only when an IP address is acquired from DHCP. If any of the **ip dhcp client** commands are entered after an IP address has been acquired from DHCP, it will not take effect until the next time the router acquires an IP address from DHCP. This means that the new configuration will only take effect after the **ip address dhcp** command commandhas been configured.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ip dhcp client client-id** {*interface-name*| **ascii** *string*| **hex** *string*}
5. **ip dhcp client class-id** {*string*| **hex** *string*}
6. **ip dhcp client lease** *days* [*hours*][*minutes*]
7. **ip dhcp client hostname** *host-name*
8. [**no**] **ip dhcp client request** *option-name*
9. **ip address dhcp**
10. **exit**
11. **ip dhcp compatibility lease-query client** {**cisco** | **standard**}

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**interface** *type number* **Example:** `Router(config)# interface GigabitEthernet 0/0/1`	Configures an interface type and enters interface configuration mode.
Step 4	**ip dhcp client client-id** {*interface-name*| **ascii** *string*| **hex** *string*} **Example:** `Router(config-if)# ip dhcp client client-id ascii mytest1`	(Optional) Specifies the client identifier. • When you specify the **no** form of this command, the configuration is removed and the system returns to using the default form. It is not possible to configure the system to not include a client identifier.
Step 5	**ip dhcp client class-id** {*string*| **hex** *string*} **Example:** `Router(config-if)# ip dhcp client class-id my-class-id`	(Optional) Specifies the class identifier.
Step 6	**ip dhcp client lease** *days* [*hours*][*minutes*] **Example:** `Router(config-if)# ip dhcp client lease 2`	(Optional) Configures the duration of the lease for an IP address that is requested from a DHCP client to a DHCP server.

	Command or Action	Purpose
Step 7	**ip dhcp client hostname** *host-name* **Example:** `Router(config-if)# ip dhcp client hostname router1`	(Optional) Specifies or modifies the host name sent in the DHCP message.
Step 8	[**no**] **ip dhcp client request** *option-name* **Example:** `Router(config-if)# no ip dhcp client request tftp-server-address`	(Optional) Configures a DHCP client to request an option from a DHCP server. • The option name can be **tftp-server-address**, **netbios-nameserver**, **vendor-specific**, **static-route**, **domain-name**, **dns-nameserver**, or **router**. By default, all these options are requested. The **no** form of the command instructs the system to not request certain options.
Step 9	**ip address dhcp** **Example:** `Router(config-if)# ip address dhcp`	Acquires an IP address on an interface from DHCP.
Step 10	**exit** **Example:** `Router(config-if)# exit`	(Optional) Exits interface configuration mode.
Step 11	**ip dhcp compatibility lease-query client** {**cisco** | **standard**} **Example:** `Router(config)# ip dhcp compatibility lease-query client standard`	(Optional) Configures a DHCP client to send a lease query according to RFC 4388 standard.

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Troubleshooting Tips

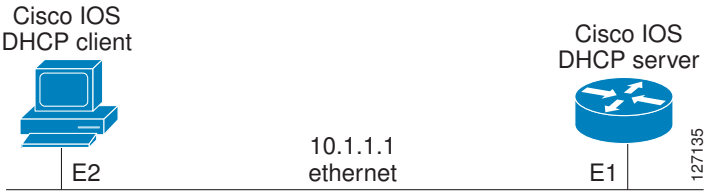
To verify the configuration, you can use the **debug dhcp detail** EXEC command to display the DHCP packets that were sent and received. To display the server side of the DHCP interaction, use the **debug ip dhcp server packets** command.

Configuration Examples for the DHCP Client

Configuring the DHCP Client Example

The figure below shows a simple network diagram of a DHCP client on an Ethernet LAN.

Figure 2 Topology Showing DHCP Client with GigabitEthernet Interface



On the DHCP server, the configuration is as follows:

```
ip dhcp pool 1
 network 10.1.1.0 255.255.255.0
 lease 1 6
```

On the DHCP client, the configuration is as follows on interface GigabitEthernet 0/0/0:

```
interface GigabitEthernet 0/0/0
 ip address dhcp
```

This configuration allows the DHCP client to acquire an IP address from the DHCP server through GigabitEthernet interface 0/0/0.

Customizing the DHCP Client Configuration Example

The following example shows how to customize the DHCP client configuration with various options on GigabitEthernet interface 0/0/1:

```
interface GigabitEthernet 0/0/1
 ip dhcp client client-id ascii my-test1
 ip dhcp client class-id my-class-id
 ip dhcp client lease 0 1 0
 ip dhcp client hostname sanfran
 no ip dhcp client request tftp-server-address
 ip address dhcp
```

Additional References

The following sections provide references related to the DHCP client.

Related Documents

Related Topic	Document Title
DHCP commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples.	*Cisco IOS IP Addressing Services Command Reference*
DHCP conceptual information	"DHCP Overview" module
DHCP server configuration	"Configuring the Cisco IOS XE DHCP Server" module
DHCP server on-demand address pools	"Configuring the DHCP Server On-Demand Address Pool Manager" module
DHCP relay agent configuration	"Configuring the Cisco IOS XE DHCP Relay Agent" module
DHCP advanced features	"Configuring DHCP Services for Accounting and Security" module

Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS XE software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFCs	Title
RFC 2131	Dynamic Host Configuration Protocol
RFC 2132	DHCP Options and BOOTP Vendor Extensions

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/techsupport

Feature Information for the Cisco IOS XE DHCP Client

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1 Feature Information for the Cisco IOS XE DHCP Client

Feature Name	Releases	Feature Configuration Information
DHCP Client	Cisco IOS XE Release 2.3	A DHCP client is defined as an Internet host using DHCP to obtain configuration parameters such as an IP address. The following command was introduced by this feature: **ip address dhcp**

Feature Name	Releases	Feature Configuration Information
Configurable DHCP Client	Cisco IOS XE Release 2.3	The configurable DHCP client functionality allows a DHCP client to use a user-specified client identifier, class identifier, or suggested lease time when requesting an address from a DHCP server. The following commands were introduced by this feature: **ip dhcp client class-id**, **ip dhcp client client-id**, **ip dhcp client hostname**, **ip dhcp client lease**, **ip dhcp client request**