



# Configuring the Cisco IOS DHCP Relay Agent

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Cisco routers running Cisco IOS software include Dynamic Host Configuration Protocol (DHCP) server and relay agent software. A DHCP relay agent is any host that forwards DHCP packets between clients and servers. This module describes the concepts and tasks needed to configure the Cisco IOS DHCP relay agent.

## Module History

This module was first published on May 2, 2005, and last updated on May 2, 2005.

## Finding Feature Information in This Module

Your Cisco IOS software release may not support all features. To find information about feature support and configuration, use the [“Feature Information for the Cisco IOS DHCP Relay Agent”](#) section on page 16.

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## Prerequisites for Configuring the Cisco IOS DHCP Relay Agent

Before you configure the DHCP relay agent, you should understand the concepts documented in the [“DHCP Overview”](#) module.

The Cisco IOS DHCP server and relay agent are enabled by default. You can verify if they have been disabled by checking your configuration file. If they have been disabled, the **no service dhcp** command will appear in the configuration file. Use the **service dhcp** command to reenable the functionality if necessary.

The Cisco IOS DHCP relay agent will be enabled on an interface only when the **ip helper-address** is configured. This command enables the DHCP broadcast to be forwarded to the configured DHCP server.

## Information About the DHCP Relay Agent

Before you configure the DHCP relay agent, you should understand the following concept:

- [DHCP Relay Agent Overview, page 2](#)

## DHCP Relay Agent Overview

A DHCP relay agent is any host that forwards DHCP packets between clients and servers. Relay agents are used to forward requests and replies between clients and servers when they are not on the same physical subnet. Relay agent forwarding is distinct from the normal forwarding of an IP router, where IP datagrams are switched between networks somewhat transparently. By contrast, relay agents receive DHCP messages and then generate a new DHCP message to send out on another interface. The relay agent sets the gateway address (giaddr field of the DHCP packet) and, if configured, adds the relay agent information option (option82) in the packet and forwards it to the DHCP server. The reply from the server is forwarded back to the client after removing option 82.

The Cisco IOS DHCP relay agent supports the use of unnumbered interfaces. For DHCP clients connected through the unnumbered interfaces, the DHCP relay agent automatically adds a static host route once the DHCP client obtains an address, specifying the unnumbered interface as the outbound interface. The route is automatically removed once the lease time expires or when the client releases the address.

## How to Configure the DHCP Relay Agent

This section contains the following tasks:

- [Specifying the Packet Forwarding Address, page 2](#) (required)
- [Configuring Relay Agent Information Option Support, page 4](#) (optional)
- [Configuring the Subscriber Identifier Suboption of the Relay Agent Information Option, page 7](#) (optional)
- [Configuring DHCP Relay Agent Support for MPLS VPNs, page 9](#) (optional)
- [Setting the Gateway Address of the DHCP Broadcast to a Secondary Address Using Smart Relay Agent Forwarding, page 11](#) (optional)
- [Troubleshooting the DHCP Relay Agent, page 12](#) (optional)

## Specifying the Packet Forwarding Address

Perform this task to configure the DHCP relay agent to forward packets to a DHCP server.

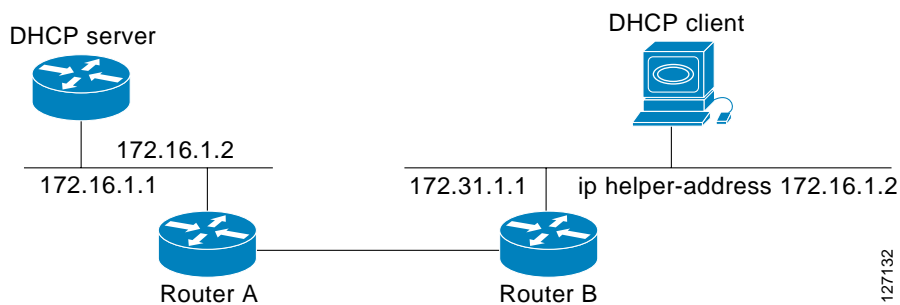
DHCP clients need to use User Datagram Protocol (UDP) broadcasts to send their initial DHCPDISCOVER messages because they don't have information about the network to which they are attached. If the client is on a network segment that does not include a server, UDP broadcasts normally are not forwarded because most routers are configured to not forward broadcast traffic.

You can remedy this situation by configuring the interface of your router that is receiving the broadcasts to forward certain classes of broadcasts to a helper address. You can use more than one helper address per interface.

When a router forwards these address assignment/parameter requests, it is acting as a DHCP relay agent. The Cisco router implementation of the DHCP relay agent is provided via the **ip helper-address** interface configuration command.

In [Figure 1](#), the DHCP client broadcasts a request for an IP address and additional configuration parameters on its local LAN. Router B, acting as a DHCP relay agent, picks up the broadcast and generates a new DHCP message to send out on another interface. As part of this DHCP message, the relay agent inserts the IP address of the interface containing the **ip helper-address** command into the gateway IP address (giaddr) field of the DHCP packet. This IP address enables the DHCP server to determine which subnet should receive the offer and identify the appropriate IP address range to offer. The DHCP relay agent sends the local broadcast, via IP unicast, to the DHCP server address 172.16.1.2 specified by the **ip helper-address** interface configuration command.

**Figure 1** Forwarding UDP Broadcasts to a DHCP Server Using a Helper Address



## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ip helper-address** *address*

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code>  <b>Example:</b> <code>Router&gt; enable</code>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
Step 2	<code>configure terminal</code>  <b>Example:</b> <code>Router# configure terminal</code>	Enters global configuration mode.
Step 3	<code>interface type number</code>  <b>Example:</b> <code>Router(config)# interface FastEthernet0/0</code>	Configures an interface and enters interface configuration mode.
Step 4	<code>ip helper-address address</code>  <b>Example:</b> <code>Router(config-if)# ip helper-address 172.16.1.2</code>	Forwards UPD broadcasts, including BOOTP and DHCP. <ul style="list-style-type: none"> <li>The <i>address</i> argument can be a specific DHCP server address, or it can be the network address if other DHCP servers are on the destination network segment. Using the network address enables other servers to respond to DHCP requests.</li> <li>If you have multiple servers, you can configure one helper address for each server.</li> </ul>

## Configuring Relay Agent Information Option Support

Perform this task to enable support for the DHCP relay agent information option.

### Relay Agent Information Option

Automatic DHCP address allocation is typically based on an IP address, whether it be the gateway IP address (giaddr field of the DHCP packet) or the incoming interface IP address. In some networks, it is necessary to use additional information to further determine which IP addresses to allocate. By using the relay agent information option (option 82), the Cisco IOS relay agent can include additional information about itself when forwarding client-originated DHCP packets to a DHCP server.

Cisco IOS supports this functionality by using the **ip dhcp relay information option** command. The relay agent will automatically add the circuit identifier suboption and the remote ID suboption to the relay agent information option and forward them to the DHCP server.

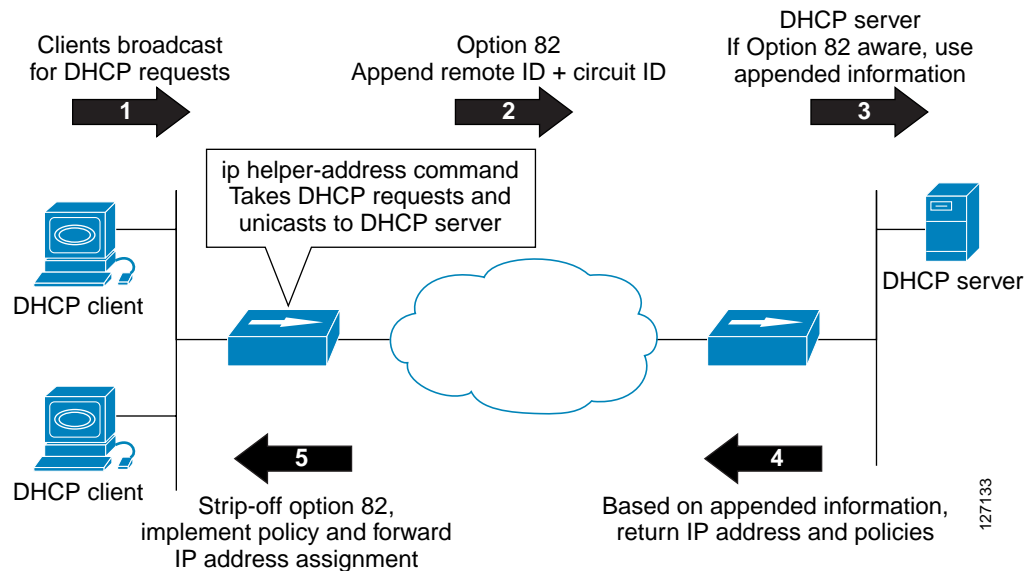
The DHCP server can use this information to assign IP addresses, perform access control, and set quality of service (QoS) and security policies (or other parameter-assignment policies) for each subscriber of a service provider network.

**Figure 2** shows how the relay agent information option is inserted into the DHCP packet as follows:

- The DHCP client generates a DHCP request and broadcasts it on the network.
- The DHCP relay agent intercepts the broadcast DHCP request packet and inserts the relay agent information option (option 82) in the packet. The relay agent information option contains the related suboptions.

3. The DHCP relay agent unicasts the DHCP packet to the DHCP server.
4. The DHCP server receives the packet and uses the suboptions to assign IP addresses and other configuration parameters and forwards them back to the client.
5. The suboption fields are stripped off of the packet by the relay agent while forwarding to the client.

Figure 2 Relay Agent Information Option Operation



## Relay Agent Information Reforwarding Policy

A DHCP relay agent may receive a message from another DHCP relay agent that already contains relay information. By default, the relay information from the previous relay agent is replaced. If this behavior is not suitable for your network, you can use the **ip dhcp relay information policy {drop | keep | replace}** global configuration command to change it.

To ensure the correct operation of the reforwarding policy, make sure to disable the relay agent information check by using the **no ip dhcp relay information check** global configuration command.

## Prerequisites

It is important to understand how DHCP options work. See the “[DHCP Overview](#)” module for more information.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip dhcp relay information option**
4. **ip dhcp relay information check**
5. **ip dhcp relay information policy {drop | keep | replace}**
6. **ip dhcp relay information trust-all**

7. **end**
8. **show ip dhcp relay information trusted-sources**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<pre>enable</pre> <p><b>Example:</b> Router&gt; enable </p>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
Step 2	<pre>configure terminal</pre> <p><b>Example:</b> Router# configure terminal </p>	<p>Enters global configuration mode.</p>
Step 3	<pre>ip dhcp relay information option</pre> <p><b>Example:</b> Router(config)# ip dhcp relay information option </p>	<p>Enables the system to insert the DHCP relay agent information option (option-82 field) in forwarded BOOTREQUEST messages to a DHCP server.</p> <ul style="list-style-type: none"> <li>This function is disabled by default.</li> </ul>
Step 4	<pre>ip dhcp relay information check</pre> <p><b>Example:</b> Router(config)# ip dhcp relay information check </p>	<p>(Optional) Configures DHCP to check that the relay agent information option in forwarded BOOTREPLY messages is valid.</p> <ul style="list-style-type: none"> <li>By default, DHCP checks that the option-82 field in DHCP reply packets it receives from the DHCP server is valid. If an invalid message is received, the relay agent drops it. If a valid message is received, the relay agent removes the option-82 field and forwards the packet. Use the <b>ip dhcp relay information check</b> command to reenables this functionality if it has been disabled.</li> </ul>
Step 5	<pre>ip dhcp relay information policy {drop   keep   replace}</pre> <p><b>Example:</b> Router(config)# ip dhcp relay information policy replace </p>	<p>(Optional) Configures the reforwarding policy for a DHCP relay agent (what a relay agent should do if a message already contains relay information).</p> <ul style="list-style-type: none"> <li>See the <a href="#">“Relay Agent Information Reforwarding Policy”</a> concept for more information.</li> </ul>

	Command or Action	Purpose
Step 6	<pre>ip dhcp relay information trust-all</pre> <p><b>Example:</b>  Router(config)# ip dhcp relay information trust-all</p>	<p>(Optional) Configures all interfaces on a router as trusted sources of the DHCP relay information option.</p> <ul style="list-style-type: none"> <li>By default, if the gateway address is set to all zeros in the DHCP packet and the relay agent information option is already present in the packet, the DHCP relay agent will discard the packet. Use the <b>ip dhcp relay information trust-all</b> command to override this behavior and accept the packets.</li> <li>This command is useful if there is a switch in between the client and the relay agent that may insert option 82. Use this command to ensure that these packets do not get dropped.</li> <li>You can configure an individual interface as a trusted source of the DHCP relay information option by using the <b>ip dhcp relay information trusted</b> interface configuration mode command.</li> </ul>
Step 7	<pre>end</pre> <p><b>Example:</b>  Router(config)# end</p>	Returns to privileged EXEC mode.
Step 8	<pre>show ip dhcp relay information trusted-sources</pre> <p><b>Example:</b>  Router# show ip dhcp relay information trusted-sources</p>	(Optional) Displays all interfaces configured to be a trusted source for the DHCP relay information option.

## Configuring the Subscriber Identifier Suboption of the Relay Agent Information Option

Perform this task to enable an Internet service provider (ISP) to add a unique identifier to the subscriber-identifier suboption of the relay agent information option.

The unique identifier enables an ISP to identify a subscriber, to assign specific actions to that subscriber (for example, assignment of host IP address, subnet mask, and domain name system [DNS]), and to trigger accounting.

Before the introduction of this feature, if a subscriber moved, each ISP had to be informed of the change and all ISPs had to reconfigure the DHCP settings for the affected customers at the same time. Even if the service was not changed, every move involved administrative changes in the ISP environment. With the introduction of this feature, if a subscriber moves from one Network Access Server to another, there is no need for a change in the configuration on the part of the DHCP server or ISP.

### Prerequisites

You should configure the unique identifier for each subscriber.

The new configurable subscriber-identifier option should be configured on the interface connected to the client. When a subscriber moves from one interface to the other, the interface configuration should also be changed.

The server should be able to recognize the new suboption.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip dhcp relay information option**
4. **interface** *type number*
5. **ip dhcp relay information option subscriber-id** *string*

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>ip dhcp relay information option</b>  <b>Example:</b> Router(config)# ip dhcp relay information option	Enables the system to insert the DHCP relay agent information option (option-82 field) in forwarded BOOTREQUEST messages to a DHCP server. <ul style="list-style-type: none"> <li>• This function is disabled by default.</li> </ul>
Step 4	<b>interface</b> <i>type number</i>  <b>Example:</b> Router(config)# interface atm4/0.1	Configures an interface and enters interface configuration mode.
Step 5	<b>ip dhcp relay information option subscriber-id</b> <i>string</i>  <b>Example:</b> Router(config-if)# ip dhcp relay information option subscriber-id newsubscriber123	Specifies that a DHCP relay agent add a subscriber identifier suboption to the relay information option. <ul style="list-style-type: none"> <li>• The <i>string</i> argument can be up to a maximum of 50 characters and can be alphanumeric.</li> </ul> <p><b>Note</b> If more than 50 characters are configured, the string is truncated.</p> <p><b>Note</b> The <b>ip dhcp relay information option subscriber-id</b> command is disabled by default to ensure backward capability.</p>



## Configuring DHCP Relay Agent Support for MPLS VPNs

Perform this task to configure DHCP relay agent support for MPLS VPNs.

### DHCP Relay Agent Support for MPLS VPNs

DHCP relay support for Multiprotocol Label Switching (MPLS) Virtual Private Networks (VPNs) enables a network administrator to conserve address space by allowing overlapping addresses. The relay agent can support multiple clients on different VPNs, and many of these clients from different VPNs can share the same IP address.

Configuring VPNs involves an adjustment to the usual DHCP host IP address designation. VPNs use private address spaces that might not be unique across the Internet.

In some environments, a relay agent resides in a network element that also has access to one or more MPLS VPNs. A DHCP server that wants to offer service to DHCP clients on those different VPNs needs to know the VPN in which each client resides. The network element that contains the relay agent typically knows about the VPN association of the DHCP client and includes this information in the relay agent information option of the DHCP packet.

DHCP relay support for MPLS VPNs allows the relay agent to forward this necessary VPN-related information to the DHCP server using the following three suboptions of the DHCP relay agent information option:

- VPN identifier
- Subnet selection
- Server identifier override

The VPN identifier suboption is used by the relay agent to tell the DHCP server the VPN for every DHCP request it passes on to the DHCP server, and it is also used to properly forward any DHCP reply that the DHCP server sends back to the relay agent. The VPN identifier suboption contains the VPN ID configured on the incoming interface to which the client is connected. If you configure the VRF name but not the VPN ID, the VRF name is used as the VPN identifier suboption. If the interface is in global routing space, the VPN suboptions are not added.

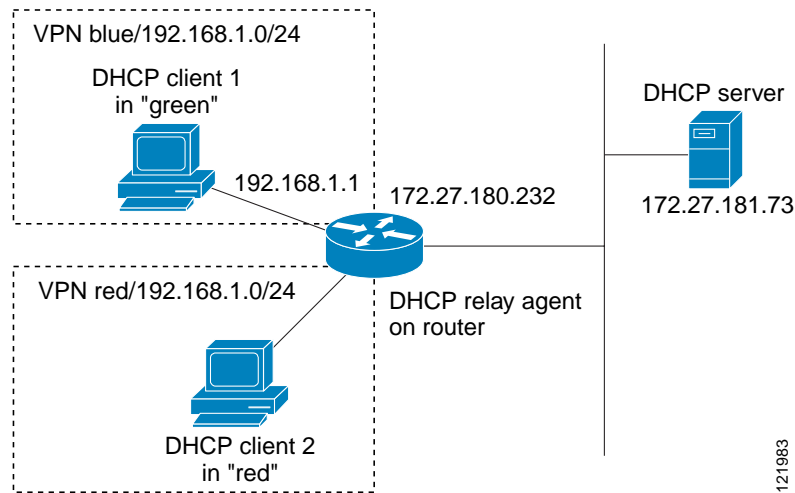
The subnet selection suboption allows the separation of the subnet where the client resides from the IP address used to communicate with the relay agent. In typical DHCP processing, the gateway address specifies both the subnet on which a DHCP client resides and the IP address that the server can use to communicate with the relay agent. Situations exist where the relay agent needs to specify the subnet on which a DHCP client resides that is different from the IP address the server can use to communicate with the relay agent. The subnet selection suboption is included in the relay agent information option and passed on to the DHCP server. The gateway address is changed to the outgoing interface of the relay agent toward the DHCP server. The DHCP server uses this gateway address to send reply packets back to the relay agent.

The server identifier override suboption value is copied in the reply packet from the DHCP server instead of the normal server ID address. The server identifier override suboption contains the incoming interface IP address, which is the IP address on the relay agent that is accessible from the client. Using this information, the DHCP client sends all renew and release packets to the relay agent. The relay agent adds all of the VPN suboptions and then forwards the renew and release packets to the original DHCP server.

After adding these suboptions to the DHCP relay agent information option, the gateway address is changed to the outgoing interface of the relay agent toward the DHCP server. When the packets are returned from the DHCP server, the relay agent removes the relay agent information options and forwards the packets to the DHCP client on the correct VPN.

Figure 3 shows a VPN scenario where the DHCP relay agent and DHCP server can recognize the VPN that each client resides within. DHCP client 1 is part of VPN *green* and DHCP client 2 is part of VPN *red* and both have the same private IP address 192.168.1.0/24. Because the clients have the same IP address, the DHCP relay agent and DHCP server use the VPN identifier, subnet selection, and server identifier override suboptions of the relay agent information option to distinguish the correct VPN of the client.

Figure 3 Virtual Private Network DHCP Configuration



## Prerequisites

Before configuring DHCP relay support for MPLS VPNs, you must configure standard MPLS VPNs.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip dhcp relay information option vpn**
4. **interface** *type number*
5. **ip helper-address vrf** *name [global] address*

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b>  Example: Router# configure terminal	Enters global configuration mode.

	Command or Action	Purpose
Step 3	<pre>ip dhcp relay information option vpn</pre> <p><b>Example:</b> Router(config)# ip dhcp relay information option vpn</p>	<p>Enables the system to insert VPN suboptions into the DHCP relay agent information option in forwarded BOOTREQUEST messages to a DHCP server and sets the gateway address to the outgoing interface toward the DHCP server.</p> <ul style="list-style-type: none"> <li>The VPN suboptions are also added to the BOOTP broadcast packets when the command is configured.</li> </ul>
Step 4	<pre>interface type number</pre> <p><b>Example:</b> Router(config)# interface FastEthernet0/0</p>	<p>Configures an interface and enters interface configuration mode.</p>
Step 5	<pre>ip helper-address vrf name [global] address</pre> <p><b>Example:</b> Router(config-if)# ip helper-address vrf blue 172.27.180.232</p>	<p>Forwards UDP broadcasts, including BOOTP, received on an interface.</p> <ul style="list-style-type: none"> <li>If the DHCP server resides in a different VPN or global space that is different from the VPN, then the <b>vrf name</b> or <b>global</b> options allow you to specify the name of the VRF or global space in which the DHCP server resides.</li> </ul>

## Setting the Gateway Address of the DHCP Broadcast to a Secondary Address Using Smart Relay Agent Forwarding

Perform this task to configure smart relay agent forwarding.

You only need to configure helper addresses on the interface where the UDP broadcasts that you want to forward to the DHCP server are being received, and you only need the **ip dhcp smart-relay** command configured if you have secondary addresses on that interface and you want the router to step through each IP network when forwarding DHCP requests. Without the smart relay agent configured, all requests are forwarded using the primary IP address on the interface.

If the **ip dhcp smart-relay** command is configured, the relay agent counts the number of times the client retries sending a request to the DHCP server when there is no DHCPOFFER message from the DHCP server. After three retries, the relay agent sets the gateway address to the secondary address. If the DHCP server still does not respond after three more retries, then the next secondary address is used as the gateway address.

This functionality is useful when the DHCP server cannot be configured to use secondary pools.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip dhcp smart-relay**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code>  <b>Example:</b> Router> <code>enable</code>	Enables privileged EXEC mode. <ul style="list-style-type: none"><li>• Enter your password if prompted.</li></ul>
Step 2	<code>configure terminal</code>  <b>Example:</b> Router# <code>configure terminal</code>	Enters global configuration mode.
Step 3	<code>ip dhcp smart-relay</code>  <b>Example:</b> Router(config)# <code>ip dhcp smart-relay</code>	Allows the DHCP relay agent to switch the gateway address (giaddr field of a DHCP packet) to secondary addresses when there is no DHCPOFFER message from a DHCP server.

## Troubleshooting the DHCP Relay Agent

Perform this task to troubleshoot the DHCP relay agent.

The **show ip route dhcp** command is useful to help you understand any problems with the DHCP relay agent adding routes to clients from unnumbered interfaces. All routes added to the routing table by the DHCP server and relay agent are displayed.

## SUMMARY STEPS

1. **enable**
2. **show ip route dhcp**
3. **show ip route dhcp *ip-address***
4. **show ip route vrf *vrf-name* dhcp**
5. **clear ip route [*vrf vrf-name*] dhcp [*ip-address*]**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code>  <b>Example:</b> Router> <code>enable</code>	Enables privileged EXEC mode. <ul style="list-style-type: none"><li>• Enter your password if prompted.</li></ul>
Step 2	<code>show ip route dhcp</code>  <b>Example:</b> Router# <code>show ip route dhcp</code>	Displays all routes added by the Cisco IOS DHCP server and relay agent.

	Command or Action	Purpose
Step 3	<code>show ip route dhcp ip-address</code>  <b>Example:</b> Router# show ip route dhcp 172.16.1.3	Displays all routes added by the Cisco IOS DHCP server and relay agent associated with an IP address.
Step 4	<code>show ip route vrf vrf-name dhcp</code>  <b>Example:</b> Router# show ip route vrf red dhcp	Displays all routes added by the Cisco IOS DHCP server and relay agent associated with the named VRF.
Step 5	<code>clear ip route [vrf vrf-name] dhcp [ip-address]</code>  <b>Example:</b> Router# clear ip route dhcp	Removes routes from the routing table added by the DHCP server and relay agent for the DHCP clients on unnumbered interfaces.

## Configuration Examples for the Cisco IOS DHCP Relay Agent

This section provides the following configuration examples:

- [DHCP Relay Agent and Relay Agent Information Option Support: Example, page 13](#)
- [Subscriber Identifier Suboption Configuration: Example, page 13](#)
- [DHCP Relay Agent Support for MPLS VPNs: Example, page 14](#)
- [DHCP Smart Relay Agent Forwarding: Example, page 14](#)

### DHCP Relay Agent and Relay Agent Information Option Support: Example

The following example shows how to enable the DHCP server, the relay agent, and the insertion and removal of the DHCP relay information option (option 82). Note that the Cisco IOS DHCP server is enabled by default. In this example, the DHCP server was disabled:

```
!reenables the DHCP server
service dhcp
ip dhcp relay information option
!
interface ethernet0/0
 ip address 192.168.100.1 255.255.255.0
 ip helper-address 10.55.11.3
!
```

### Subscriber Identifier Suboption Configuration: Example

The following example shows how to add a unique identifier to the subscriber-identifier suboption of the relay agent information option.

```
ip dhcp relay information option
!
interface Loopback0
 ip address 10.1.1.129 255.255.255.192
!
interface ATM4/0
```

```

no ip address
!
interface ATM4/0.1 point-to-point
ip helper-address 10.16.1.2
ip unnumbered Loopback0
ip dhcp relay information option subscriber-id newperson123
atm route-bridged ip
pvc 88/800
encapsulation aal5snap

```

## DHCP Relay Agent Support for MPLS VPNs: Example

In the following example, the DHCP relay agent receives a DHCP request on Ethernet interface 0/1 and sends the request to the DHCP server located at IP helper address 10.44.23.7, which is associated with the VRF named red:

```

ip dhcp relay information option vpn
!
interface ethernet 0/1
ip helper-address vrf red 10.44.23.7
!

```

## DHCP Smart Relay Agent Forwarding: Example

In the following example, the router will forward the DHCP broadcast received on Ethernet interface 0/0 to the DHCP server (10.55.11.3), inserting 192.168.100.1 in the giaddr field of the DHCP packet. If the DHCP server has a scope or pool configured for the 192.168.100.0/24 network, it will respond; otherwise it will not respond.

Because the **ip dhcp smart-relay** global configuration command is configured, if the router sends three requests using 192.168.100.1 in the giaddr field, and doesn't get a response, it will move on and start using 172.16.31.254 in the giaddr field instead. Without the smart relay functionality, the route only uses 192.168.100.1 in the giaddr field.

```

ip dhcp smart-relay
!
interface ethernet0/0
ip address 192.168.100.1 255.255.255.0
ip address 172.16.31.254 255.255.255.0
ip helper-address 10.55.11.3
!

```

# Additional References

The following sections provide references related to configuring the Cisco IOS DHCP relay agent.

## Related Documents

Related Topic	Document Title
DHCP commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	<i>Cisco IOS IP Addressing Services Command Reference</i> , Release 12.4
DHCP conceptual information	“ <a href="#">DHCP Overview</a> ” module
DHCP server configuration	“ <a href="#">Configuring the Cisco IOS DHCP Server</a> ” module
DHCP client configuration	“ <a href="#">Configuring the Cisco IOS DHCP Client</a> ” module
DHCP server on-demand address pool manager configuration	“ <a href="#">Configuring the DHCP Server On-Demand Address Pool Manager</a> ” module
DHCP advanced features	“ <a href="#">Configuring DHCP Services for Accounting and Security</a> ” module
DHCP options	“DHCP Options” appendix in the <i>Network Registrar User’s Guide</i> , Release 6.1.1

## Standards

Standards	Title
No new or modified standards are supported by this functionality.	—

## MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:  <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

## RFCs

RFCs	Title
RFC 951	<i>Bootstrap Protocol (BOOTP)</i>
RFC 1542	<i>Clarifications and Extensions for the Bootstrap Protocol</i>
RFC 2131	<i>Dynamic Host Configuration Protocol</i>

RFCs	Title
RFC 2685	<i>Virtual Private Networks Identifier</i>
RFC 3046	<i>DHCP Relay Information Option</i>

## Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	<a href="http://www.cisco.com/public/support/tac/home.shtml">http://www.cisco.com/public/support/tac/home.shtml</a>

## Glossary

**client**—A host trying to configure its interface (obtain an IP address) using DHCP or BOOTP protocols.

**DHCP**—Dynamic Host Configuration Protocol.

**MPLS**—Multiprotocol Label Switching. Emerging industry standard upon which tag switching is based.

**relay agent**—A router that forwards DHCP and BOOTP messages between a server and a client on different subnets.

**server**—DHCP or BOOTP server.

**VPN**—Virtual Private Network. Enables IP traffic to use tunneling to travel securely over a public TCP/IP network.

**VRF**—VPN routing and forwarding instance. A VRF consists of an IP routing table, a derived forwarding table, a set of interfaces that use the forwarding table, and a set of rules and routing protocols that determine what goes into the forwarding table. In general, a VRF includes the routing information that defines a customer VPN site that is attached to a PE router. Each VPN instantiated on the PE router has its own VRF.

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**Note** See [Internetworking Terms and Acronyms](#) for terms not included in this glossary.

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## Feature Information for the Cisco IOS DHCP Relay Agent

[Table 1](#) lists the features in this module and provides links to specific configuration information. Only features that were introduced or modified in Cisco IOS Release 12.2(1) or a later release appear in the table.

Not all commands may be available in your Cisco IOS software release. For details on when support for a specific command was introduced, see the command reference documentation.

For information on a feature in this technology that is not documented here, see the “[DHCP Features Roadmap](#)”.



Cisco IOS software images are specific to a Cisco IOS software release, a feature set, and a platform. Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

**Note** [Table 1](#) lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

**Table 1** *Feature Information for the Cisco IOS DHCP Relay Agent*

Feature Name	Releases	Feature Configuration Information
DHCP Relay MPLS VPN Support	12.2(8)	<p>DHCP relay support for MPLS VPNs enables a network administrator to conserve address space by allowing overlapping addresses. The relay agent can support multiple clients on different VPNs, and many of these clients from different VPNs can share the same IP address.</p> <p>The following section provides information about this feature:</p> <ul style="list-style-type: none"> <li>• <a href="#">Configuring DHCP Relay Agent Support for MPLS VPNs</a></li> </ul> <p>The following commands were modified by this feature: <b>ip dhcp relay information option</b> and <b>ip helper address</b>.</p>
DHCP Subscriber Identifier Suboption of Option 82	12.3(14)T	<p>This feature enables an ISP to add a unique identifier to the subscriber-identifier suboption of the relay agent information option.</p> <p>The following section provides information about this feature:</p> <ul style="list-style-type: none"> <li>• <a href="#">Configuring the Subscriber Identifier Suboption of the Relay Agent Information Option</a></li> </ul> <p>The following command was introduced by this feature: <b>ip dhcp relay information option subscriber-id</b>.</p>

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