



# IPv6 Access Services: DHCPv6 Relay Agent

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A Dynamic Host Configuration Protocol for IPv6 (DHCPv6) relay agent, which may reside on the client's link, is used to relay messages between the client and the server.

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## 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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## Information About IPv6 Access Services: DHCPv6 Relay Agent

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### DHCPv6 Relay Agent

A DHCPv6 relay agent, which may reside on the client's link, is used to relay messages between the client and the server. The DHCPv6 relay agent operation is transparent to the client. A DHCPv6 client locates a DHCPv6 server using a reserved, link-scoped multicast address. For direct communication between the DHCPv6 client and the DHCPv6 server, both of them must be attached to the same link. However, in some



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situations where ease of management, economy, or scalability is a concern, it is desirable to allow a DHCPv6 client to send a message to a DHCPv6 server that is not connected to the same link.

- [DHCPv6 Relay Agent Notification for Prefix Delegation, page 2](#)

## DHCPv6 Relay Agent Notification for Prefix Delegation

### DHCPv6 Relay Agent Notification for Prefix Delegation

The DHCPv6 relay agent notification for prefix delegation allows the router working as a DHCPv6 relay agent to find prefix delegation options by reviewing the contents of a DHCPv6 RELAY-REPLY packet that is relayed by the relay agent to the client. When a prefix delegation option is found by the relay agent, the relay agent extracts the information about the prefix that is being delegated and inserts an IPv6 static route matching the prefix delegation information onto the relay agent. Future packets destined to that prefix via relay will be forwarded based on the information contained in the prefix delegation. The IPv6 static route is then left in the routing table until the prefix delegation lease time expires or the relay agent receives a release packet from the client releasing the prefix delegation.

No user configuration is required for this feature. Static route management is done automatically by the relay agent.

IPv6 routes are added when the relay agent relays a RELAY-REPLY packet, and IPv6 routes are deleted when the prefix delegation lease time expires or the relay agent receives a release message. An IPv6 static route in the routing table of the relay agent can be updated when the prefix delegation lease time is extended.

The DHCP—DHCPv6 Relay Agent Notification for Prefix Delegation feature leaves a static IPv6 route on the routing table of the relay agent. The registered IPv6 address allows unicast reverse packet forwarding (uRPF) to work by allowing the router doing the reverse lookup to confirm that the IPv6 address on the relay agent is not malformed or spoofed. The static route that remains in the routing table of the relay agent can be redistributed to other routing protocols to advertise the subnets to other nodes. Static routes will be removed when a DHCP\_DECLINE message is sent by the client.

## DHCPv6 Relay SSO and ISSU

In specific Cisco networking devices that support dual route processors (RPs), stateful switchover (SSO) takes advantage of RP redundancy to increase network availability. The feature establishes one of the RPs as the active processor while the other RP is designated as the standby processor, and then synchronizing critical state information between them. Following an initial synchronization between the two processors, SSO dynamically maintains RP state information between them.

The Cisco IOS In Service Software Upgrade (ISSU) process allows Cisco IOS software to be updated or otherwise modified while packet forwarding continues. In most networks, planned software upgrades are a significant cause of downtime. ISSU allows the Cisco IOS software to be modified while packet forwarding continues. This increases network availability and reduces downtime caused by planned software upgrades.

The SSO and the ISSU use redundant hardware, with the active and standby RP each running an instance of the DHCPv6 relay agent. Both instances exchange run-time state data.

For further information about SSO and ISSU, see the “[Stateful Switchover](#)” and the “[Cisco IOS In Service Software Upgrade Process](#)” modules respectively, in the *Cisco IOS High Availability Configuration Guide*.

- [DHCPv6 Relay Options: Remote ID for Ethernet Interfaces, page 3](#)

- [DHCPv6 Relay Options: Reload Persistent Interface ID Option, page 3](#)

## DHCPv6 Relay Options: Remote ID for Ethernet Interfaces

This feature adds the remote identification (remote-ID) option to relayed (RELAY-FORWARD) DHCPv6 packets.

The remote-ID option provides information to the DHCPv6 server, including port information, the system's DUID, and the VLAN ID. Collectively, this information can be used to uniquely identify both the relay and the port on the relay through which the client's packet arrived. The DHCPv6 server uses this information to select parameters specific to a particular user, host, or subscriber modem. This feature works only for Ethernet interfaces at this time.

This feature introduces no user configuration. Because the addition of the remote-ID option to the RELAY-FORWARD packet occurs automatically, no user configuration is necessary.

The DHCPv6 server does not need to echo the remote-ID option in the RELAY-REPLY packet. Internet Assigned Numbers Authority (IANA) has assigned the DHCPv6 option code 37 for the relay agent remote-ID option.

If the remote-ID option is included in the RELAY-REPLY packet, the option is stripped out of the packet before the packet is relayed to the client.

## DHCPv6 Relay Options: Reload Persistent Interface ID Option

This feature makes the interface-ID option, which is used by relay agents to decide which interface should be used when forwarding a RELAY-REPLY packet, persistent. A persistent interface-ID option will not change if the router acting as a relay agent goes offline (such as during a reload or a power outage). When the router acting as a relay agent returns online, it is possible that changes to the internal interface index of the relay agent may have occurred in certain scenarios (such as cases where the relay agent reboots and has a change in the number of interfaces in the interface index, or the relay agents boots up and has more virtual interfaces than it did before the reboot). This feature prevents this scenario from causing any problems.

This feature changes the DHCPv6 interface-ID option to be expressed as simply the short form of the interface name. This syntax helps avoid potential problems that could arise due to physical or logical interfaces changing on the relay agent after a reload.

# How to Configure IPv6 Access Services: DHCPv6 Relay Agent

- [Configuring the DHCPv6 Relay Agent, page 3](#)

## Configuring the DHCPv6 Relay Agent

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ipv6 dhcp relay destination** *ipv6-address* [*interface-type interface-number*]
5. **end**

## DETAILED STEPS

| Command or Action                                                                                                                                                                                                   | Purpose                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b> <code>enable</code><br><br><b>Example:</b><br>Router> enable                                                                                                                                          | Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>             |
| <b>Step 2</b> <code>configure terminal</code><br><br><b>Example:</b><br>Router# configure terminal                                                                                                                  | Enters global configuration mode.                                                                                            |
| <b>Step 3</b> <code>interface type number</code><br><br><b>Example:</b><br>Router(config)# interface ethernet 4/2                                                                                                   | Specifies an interface type and number, and enters interface configuration mode.                                             |
| <b>Step 4</b> <code>ipv6 dhcp relay destination ipv6-address [interface-type interface-number]</code><br><br><b>Example:</b><br>Router(config-if) ipv6 dhcp relay destination FE80::250:A2FF:FEBF:A056 ethernet 4/3 | Specifies a destination address to which client packets are forwarded and enables the DHCPv6 relay service on the interface. |
| <b>Step 5</b> <code>end</code><br><br><b>Example:</b><br>Router(config-if)# end                                                                                                                                     | Returns to privileged EXEC mode.                                                                                             |

## Configuration Examples for IPv6 Access Services: DHCPv6 Relay Agent

- [Example: Configuring the DHCPv6 Relay Agent, page 4](#)

### Example: Configuring the DHCPv6 Relay Agent

```
Device# show ipv6 dhcp interface
Ethernet1/0 is in relay mode
Relay destinations:
```

```
3FFB:C00:C18:6:A8BB:CCFF:FE03:2701
Serial3/0 is in relay mode
Relay destinations:
3FFB:C00:C18:6:A8BB:CCFF:FE03:2600
FE80::A8BB:CCFF:FE03:2801 on Serial3/0
FF05::1:3
```

## Additional References

### Related Documents

| Related Topic                    | Document Title                                               |
|----------------------------------|--------------------------------------------------------------|
| IPv6 addressing and connectivity | <i>IPv6 Configuration Guide</i>                              |
| Cisco IOS commands               | <a href="#">Cisco IOS Master Commands List, All Releases</a> |
| IPv6 commands                    | <a href="#">Cisco IOS IPv6 Command Reference</a>             |
| Cisco IOS IPv6 features          | <a href="#">Cisco IOS IPv6 Feature Mapping</a>               |

### Standards and RFCs

| Standard/RFC  | Title                     |
|---------------|---------------------------|
| RFCs for IPv6 | <a href="#">IPv6 RFCs</a> |

### MIBs

| MIB | MIBs Link                                                                                                                                                                                                              |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:<br><a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a> |

### Technical Assistance

| Description                                                                                                                                                                                                                                                                                                                                                                           | Link                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password. | <a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a> |

## Feature Information for IPv6 Access Services: DHCPv6 Relay Agent

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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

**Table 1** Feature Information for IPv6 Access Services: DHCPv6 Relay Agent

| Feature Name                                          | Releases    | Feature Information                                                                                                                                                                                                                                   |
|-------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IPv6 Access Services: DHCPv6 Relay Agent              | 12.3(11)T   | A DHCP relay agent, which may reside on the client's link, is used to relay messages between the client and server.<br><br>The following commands were introduced or modified: <b>ipv6 dhcp relay destination</b> , <b>show ipv6 dhcp interface</b> . |
|                                                       | 12.4        |                                                                                                                                                                                                                                                       |
|                                                       | 12.2(46)SE  |                                                                                                                                                                                                                                                       |
|                                                       | 12.2(50)SG  |                                                                                                                                                                                                                                                       |
|                                                       | 3.2.0SG     |                                                                                                                                                                                                                                                       |
|                                                       | 15.0(2)SG   |                                                                                                                                                                                                                                                       |
|                                                       | 12.2(33)SRC |                                                                                                                                                                                                                                                       |
|                                                       | 12.2(33)SXI |                                                                                                                                                                                                                                                       |
| DHCP: DHCPv6 Relay SSO/ISSU                           | 12.2(33)SRE | SSO and ISSU use redundant hardware, with the active and standby RP each running an instance of the DHCP relay agent.                                                                                                                                 |
| DHCPv6 Ethernet Remote ID Option                      | 12.2(46)SE  | This feature adds the remote-ID option to relayed (RELAY-FORWARD) DHCPv6 packets.                                                                                                                                                                     |
|                                                       | 12.2(52)SG  |                                                                                                                                                                                                                                                       |
|                                                       | 3.2.0SG     |                                                                                                                                                                                                                                                       |
|                                                       | 15.0(2)SG   |                                                                                                                                                                                                                                                       |
|                                                       | 12.2(33)SRC |                                                                                                                                                                                                                                                       |
|                                                       | 12.2(33)SXI |                                                                                                                                                                                                                                                       |
| DHCPv6 Relay Agent Notification for Prefix Delegation | 12.2(46)SE  | DHCPv6 relay agent notification for prefix delegation allows the router working as a DHCPv6 relay agent to find prefix delegation options by reviewing the contents of a DHCPv6 packet that is being relayed by the relay agent to the client.        |
|                                                       | 12.2(33)SRC |                                                                                                                                                                                                                                                       |
|                                                       | 12.2(33)SXI |                                                                                                                                                                                                                                                       |
|                                                       | 15.0(1)S    |                                                                                                                                                                                                                                                       |

| Feature Name                                           | Releases    | Feature Information                                                                                                                                                  |
|--------------------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DHCPv6 Relay: Reload<br>Persistent Interface ID Option | 12.2(46)SE  | This feature makes the interface-ID option, which is used by relay agents to decide which interface should be used when forwarding a RELAY-REPLY packet, persistent. |
|                                                        | 12.2(52)SG  |                                                                                                                                                                      |
|                                                        | 3.2.0SG     |                                                                                                                                                                      |
|                                                        | 15.0(2)SG   |                                                                                                                                                                      |
|                                                        | 12.2(33)SRC |                                                                                                                                                                      |
|                                                        | 12.2(33)SXI |                                                                                                                                                                      |

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