

DHCPv6 Relay and Server - MPLS VPN Support

- Information About DHCPv6 Relay and Server - MPLS VPN Support, on page 1
- How to Configure DHCPv6 Relay and Server - MPLS VPN Support, on page 2
- Configuration Examples for DHCPv6 Server - MPLS VPN Support, on page 4
- Additional References, on page 5
- Feature Information for DHCPv6 Relay and Server - MPLS VPN Support, on page 6

Information About DHCPv6 Relay and Server - MPLS VPN Support

DHCPv6 Server and Relay—MPLS VPN Support

To facilitate managed central services in a Multiprotocol Label Switching (MPLS)-based network, DHCPv6 must be made MPLS-aware so that a single resource can be used to serve multiple VPNs instead of dedicating a resource to a single VPN.

The DHCPv6 server implementation of MPLS VPN allows a per-pool configuration so that DHCPv6 pools can be associated with a VPN routing and forwarding (VRF) instance. The DHCPv6 server differentiates clients from various VRFs and assigns an IPv6 prefix accordingly from the respective VRF pools. Meanwhile, the DHCPv6 bindings store the clients' VRF information.

The DHCPv6 relay implementation allows the configuration of the destination VRF instance to which the relay messages will be forwarded. The relay adds the client's VPN information while forwarding the client's DHCPv6 requests toward the server, and the relay agent then processes the client's VPN information in reply packets from the server.

The relay agent adds IPv6 static routes for delegated prefixes in corresponding clients' VRF, and the relay agent's high availability (HA) functionality synchronizes the VRF information while synchronizing static routes created by the relay process.

The DHCPv6 relay and server VRF-aware features are disabled by default.

How to Configure DHCPv6 Relay and Server - MPLS VPN Support

Configuring a VRF-Aware Relay and Server for MPLS VPN Support

Configuring a VRF-Aware Relay

Note You do not have to configure this feature on specified interfaces. If you want the feature to be enabled globally only on a device, perform steps 1, 2, and 3

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 dhcp-relay option vpn**
4. **interface** *type number*
5. **ipv6 dhcp relay option vpn**
6. **ipv6 dhcp relay destination** *ipv6-address* [*interface-type interface-number* | **vrf** *vrf-name* | **global**]
7. **end**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**ipv6 dhcp-relay option vpn** **Example:** `Device(config)# ipv6 dhcp-relay option vpn`	Enables the DHCP for IPv6 relay VRF-aware feature globally.
Step 4	**interface** *type number* **Example:**	Specifies an interface type and number, and enters interface configuration mode.

	Command or Action	Purpose
	`Device(config)# interface gigabitethernet 0/0/0`	
Step 5	**ipv6 dhcp relay option vpn** **Example:** `Device(config-if)# ipv6 dhcp relay option vpn`	Enables the DHCP for IPv6 relay VRF-aware feature on the specified interface. Enabling this command supersedes the configuration that is enabled by using the **ipv6 dhcp-relay option vpn** command.
Step 6	**ipv6 dhcp relay destination** *ipv6-address* [*interface-type interface-number* | **vrf** *vrf-name* | **global**] **Example:** `Device(config-if)# ipv6 dhcp relay destination FE80::250:A2FF:FEBF:A056 ethernet 0/0`	Specifies a destination address to which client messages are forwarded.
Step 7	**end** **Example:** `Device(config-if)# end`	Returns to privileged EXEC mode.

Configuring a VRF-Aware Server

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ipv6 dhcp server vrf enable**
5. **end**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose
Step 3	**interface** *type number* **Example:** `Device(config)# interface gigabitethernet 0/0/0`	Specifies an interface type and number, and enters interface configuration mode.
Step 4	**ipv6 dhcp server vrf enable** **Example:** `Device(config-if)# ipv6 dhcp server vrf enable`	Enables the DHCPv6 server VRF-aware feature on an interface.
Step 5	**end** **Example:** `Device(config-if)# end`	Returns to privileged EXEC mode.

Configuration Examples for DHCPv6 Server - MPLS VPN Support

Example: Configuring a VRF-Aware Relay

```
Router# show ipv6 dhcp relay binding

Relay Bindings associated with default vrf:
Prefix: 2001:DB8:0:1::/64 (GigabitEthernet0/0/0)
  DUID: 00030001AABBCC006500
  IAID: 196609
  lifetime: 2592000
  expiration: 12:34:28 IST Oct 14 2010
Summary:
  Total number of Relay bindings = 1
  Total number of Relay bindings added by Bulk lease = 0
```

Example: Configuring a VRF-Aware Server

```
Router# show ipv6 dhcp binding

Client: FE80::A8BB:CCFF:FE00:6400
  DUID: 00030001AABBCC006400
  VRF : global
  Interface : GigabitEthernet0/0/0
  IA PD: IA ID 0x00030001, T1 302400, T2 483840
    Prefix: 2001::1/64
            preferred lifetime 604800, valid lifetime 2592000
            expires at Oct 15 2010 03:18 PM (2591143 seconds)

Router# show ipv6 route status

IPv6 Routing Table - default - 4 entries
Codes: C - Connected, L - Local, S - Static, U - Per-user Static route
```

```
       B - BGP, R - RIP, I1 - ISIS L1, I2 - ISIS L2
       IA - ISIS interarea, IS - ISIS summary, D - EIGRP, EX - EIGRP external
       ND - Neighbor Discovery
       O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
S   2001::/64 [1/0]
     via FE80::A8BB:CCFF:FE00:6400, GigabitEthernet0/0/0
```

Additional References

Related Documents

Related Topic	Document Title
IPv6 addressing and connectivity	*IPv6 Configuration Guide*
Cisco IOS commands	*Cisco IOS Master Commands List, All Releases*
IPv6 commands	*Cisco IOS IPv6 Command Reference*
Cisco IOS IPv6 features	Cisco IOS IPv6 Feature Mapping

Standards and RFCs

Standard/RFC	Title
RFCs for IPv6	*IPv6 RFCs*

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: http://www.cisco.com/go/mibs

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.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for DHCPv6 Relay and Server - MPLS VPN Support

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 DHCPv6 Relay and Server - MPLS VPN Support

Feature Name	Releases	Feature Information
DHCPv6 Relay - MPLS VPN Support	Cisco IOS XE Release 3.3S	The DHCPv6 relay implementation allows the configuration of the destination VRF instance to which the relay messages will be forwarded. The following commands were introduced or modified: **ipv6 dhcp relay destination**, **ipv6 dhcp relay option vpn**, **ipv6 dhcp server vrf enable**, **show ipv6 dhcp relay binding**.

Feature Name	Releases	Feature Information
DHCPv6 Server - MPLS VPN Support	Cisco IOS XE Release 3.3S	The DHCPv6 server implementation of MPLS VPN support allows a per-pool configuration so DHCPv6 pools can be associated with a VRF instance. The following commands were introduced or modified: **ipv6 dhcp relay destination**, **ipv6 dhcp relay option vpn**, **ipv6 dhcp server vrf enable**, **show ipv6 dhcp relay binding**.