IPv6 Neighbor Discovery Proxy

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Prerequisites for IPv6 Neighbor Discovery Proxy

The following prerequisites are applicable when configuring IPv6 neighbor discovery proxy:

- Ensure that IPv6 is enabled on the Switch Virtual Interface (SVI).
- When you configure Duplicate Address Detection (DAD) proxy, ensure that device tracking is configured on the device.

Restrictions for IPv6 Neighbor Discovery Proxy

- IPv6 routing proxy is not supported on layer 3 interfaces.
- The IPv6 DAD proxy and routing proxy features are not supported on etherchannel ports.

Information About IPv6 Neighbor Discovery Proxy

IPv6 neighbor discovery proxy restricts IPv6 hosts within a VLAN from communicating directly with each other and allows them to communicate only via the gateway. A device operating as an IPv6 neighbor discovery proxy responds to packets on behalf of the target.

IPv6 neighbor discovery proxy operations are achieved using the following implementations:

IPv6 Routing-Proxy

A device operating as an IPv6 routing proxy listens to all neighbor discovery proxy messages sent on the link and responds unconditionally to neighbor solicitation lookup and neighbor-unreachability-detection messages with neighbor advertisement (setting the SVI MAC address in the TLLA option) on behalf of the destination hosts to attract the traffic to itself.

IPv6 DAD Proxy

IPv6 DAD proxy feature responds to DAD queries on behalf of a node that owns the queried address. IPv6 DAD proxy depends on a device tracking database to ensure uniqueness of IPv6 addresses.

When receiving a DAD request from a host for a target, the DAD proxy performs a lookup into the binding table, and if the lookup returns a location, it sends an neighbor solicitation neighbor-unreachability-detection message to verify that the target is still alive.

- If the target replies to the neighbor-unreachability-detection message, the DAD proxy sends back an neighbor advertisement to the host (setting the SVI MAC address in the TLLA option).
- If the device does not respond to the neighbor-unreachability-detection message, the DAD proxy does not send any response to DAD request.

How to Configure IPv6 Neighbor Discovery Proxy

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Configuring IPv6 Routing Proxy in VLAN Configuration Mode

Before you begin

Follow these steps to enable IPv6 on an SVI:

```
Device# enable
Device# configure terminal
Device(config)# interface vlan vlan-id
Device(config-if)# no ipv6 redirects
Device(config-if)# ipv6 enable
Device(config-if)# ipv6 address ipv6-address
```

To configure IPv6 routing proxy in VLAN configuration mode, follow this procedure:

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:**	Enters global configuration mode.

	Command or Action	Purpose
	`Device# configure terminal`	
Step 3	**vlan configuration** *vlan-id* **Example:** `Device(config)# vlan configuration 15`	Enters the VLAN configuration mode. This mode allows you to name, set the state, disable, and shut down the VLAN or range of VLANs.
Step 4	**[no] ipv6 nd routing-proxy** **Example:** `Device(config-vlan)# ipv6 nd routing-proxy`	Specifies if the neighbor discovery suppress must operate in routing proxy mode.
Step 5	**end** **Example:** `Device(config-vlan)# end`	Exits VLAN configuration mode and returns to privileged EXEC mode.

Configuring IPv6 Routing Proxy on an Interface

Before you begin

Follow these steps to enable IPv6 on an SVI:

```
Device# enable
Device# configure terminal
Device(config)# interface vlan vlan-id
Device(config-if)# no ipv6 redirects
Device(config-if)# ipv6 enable
Device(config-if)# ipv6 address ipv6-address
```

To configure IPv6 routing proxy on an interface, follow this procedure:

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device# enable`	Enables privileged EXEC mode. Enter your password if prompted.

	Command or Action	Purpose
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**interface** *interface-id* **Example:** `Device(config)# interface GigabitEthernet1/0/11`	Specifies an interface type and number, and enters interface configuration mode.
Step 4	**switchport access vlan** *vlan-id* **Example:** `Device(config)# switchport access vlan 15`	Assigns the port or range of ports into access ports.
Step 5	**switchport mode access** **Example:** `Device(config-if)# switchport mode access`	Specifies which VLAN the interface belongs.
Step 6	**[no] ipv6 nd routing-proxy** **Example:** `Device(config-if)# ipv6 nd routing-proxy`	Specifies if the neighbor discovery suppress must operate in routing proxy mode.
Step 7	**end** **Example:** `Device(config-if)# end`	Exits interface configuration mode and returns to privileged EXEC mode.

Configuring IPv6 DAD Proxy in VLAN Configuration Mode

Before you begin

- Follow these steps to enable IPv6 on an SVI:

```
Device# enable
Device# configure terminal
Device(config)# interface vlan vlan-id
```

```
Device(config-if)# no ipv6 redirects
Device(config-if)# ipv6 enable
Device(config-if)# ipv6 address ipv6-address
```

- Attach a device tracking policy to the VLAN. For detailed steps, see the *Configuring Switch Integrated Security Features* chapter of the *Security Configuration Guide.*

To configure IPv6 DAD proxy in VLAN configuration mode, follow this procedure:

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	**vlan configuration** *vlan-id* **Example:** `Device(config)# vlan configuration 15`	Enters the VLAN configuration mode. This mode allows you to name, set the state, disable, and shut down the VLAN or range of VLANs.
Step 4	**[no] ipv6 nd dad-proxy** **Example:** `Device(config-vlan)# ipv6 nd dad-proxy`	Specifies if the neighbor discovery suppress must operate in DAD proxy mode.
Step 5	**end** **Example:** `Device(config-vlan)# end`	Exits VLAN configuration mode and returns to privileged EXEC mode.

Configuring IPv6 DAD Proxy on an Interface

Before you begin

- Follow these steps to enable IPv6 on an SVI:

```
Device# enable
```

```
Device# configure terminal
Device(config)# interface vlan vlan-id
Device(config-if)# no ipv6 redirects
Device(config-if)# ipv6 enable
Device(config-if)# ipv6 address ipv6-address
```

- Attach a device tracking policy to the layer 2 interface. For detailed steps, see the *Configuring Switch Integrated Security Features* chapter of the *Security Configuration Guide.*

To configure IPv6 DAD proxy on an interface, follow this procedure:

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	**interface** *interface-id* **Example:** `Device(config)# interface GigabitEthernet1/0/11`	Specifies an interface type and number, and enters interface configuration mode.
Step 4	**switchport access vlan** *vlan-id* **Example:** `Device(config)# switchport access vlan 15`	Assigns the port or range of ports into access ports.
Step 5	**switchport mode access** **Example:** `Device(config-if)# switchport mode access`	Specifies which VLAN the interface belongs.
Step 6	**[no] ipv6 nd dad-proxy** **Example:**	Specifies if the neighbor discovery suppress must operate in DAD proxy mode.

	Command or Action	Purpose
	`Device(config-if)# ipv6 nd dad-proxy`	
Step 7	**end** **Example:** `Device(config-if)# end`	Exits interface configuration mode and returns to privileged EXEC mode.

Verifying IPv6 Neighbor Discovery Proxy

Use the privileged EXEC or user EXEC commands in the table below to verify IPv6 neighbor discovery proxy information.

Table 1: Commands for Verifying IPv6 Neighbor Discovery Proxy

Commands	Description
show flooding-suppression	Displays flooding suppress policy (DAD proxy) configuration, and all the applied targets.
show ipv6 nd routing-proxy	Displays routing proxy default configuration, and all the applied targets .
show device-tracking policies	Displays device-tracking policy configuration, and all the applied targets.

Configuration Examples For IPv6 Neighbor Discovery Proxy

The following example shows the configuration of IPv6 routing proxy on a VLAN:

```
Device> enable
Device# configure terminal
Device(config)# vlan configuration  15
Device(config-vlan)# ipv6 nd routing-proxy
Device(config-vlan)# end
```

The following example shows the configuration of IPv6 DAD proxy on a VLAN:

```
Device> enable
Device# configure terminal
Device(config)# vlan configuration  15
Device(config-vlan)# ipv6 nd dad-proxy
Device(config-vlan)# end
```

The following example shows the output of the **show flooding-suppression** command in privileged EXEC mode:

```
Device# show flooding-suppression
```

```
Flooding suppress policy DAD_PROXY configuration:
  Suppressing  NDP
mode:DAD proxy- RFC6957
Policy DAD_PROXY is applied on the following targets:
Target               Type  Policy               Feature        Target range
vlan 15             VLAN  DAD_PROXY            Flooding Suppress vlan all
```

The following example shows the output of the **show ipv6 nd routing-proxy**command in privileged EXEC mode:

```
Device# show ipv6 nd  routing-proxy

Routing Proxy default configuration:
  Proxying NDP
Policy default is applied on the following targets:
Target               Type  Policy               Feature        Target range
vlan 15             VLAN  default              Routing Proxy  vlan all
```

Feature History for IPv6 Neighbor Discovery Proxy

This table provides release and related information for features explained in this module.

These features are available on all releases subsequent to the one they were introduced in, unless noted otherwise.

Release	Feature	Feature Information
Cisco IOS XE 17.13.1	IPv6 Neighbor Discovery Proxy	Support for IPv6 Neighbor Discovery Proxy was introduced on all models of Cisco Catalyst 9300 Series Switches.

Use Cisco Feature Navigator to find information about platform and software image support.