Configuring Prefix Suppression Support for OSPFv3

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Prefix Suppression Support for OSPFv3

This feature enables Open Shortest Path First version 3 (OSPFv3) to hide the IPv4 and IPv6 prefixes of connected networks from link-state advertisements (LSAs). When OSPFv3 is deployed in large networks, limiting the number of IPv4 and IPv6 prefixes that are carried in the OSPFv3 LSAs can speed up OSPFv3 convergence.

This feature can also be utilized to enhance the security of an OSPFv3 network by allowing the network administrator to prevent IP routing toward internal nodes.

Prerequisites for Prefix Suppression Support for OSPFv3

Before you can use the mechanism to exclude IPv4 and IPv6 prefixes from LSAs, the OSPFv3 routing protocol must be configured.

Information About Prefix Suppression Support for OSPFv3

OSPFv3 Prefix Suppression Support

The OSPFv3 Prefix Suppression Support feature allows you to hide IPv4 and IPv6 prefixes that are configured on interfaces running OSPFv3.

In OSPFv3, addressing semantics have been removed from the OSPF protocol packets and the main LSA types, leaving a network-protocol-independent core. This means that Router-LSAs and network-LSAs no longer contain network addresses, but simply express topology information. The process of hiding prefixes is simpler in OSPFv3 and suppressed prefixes are simply removed from the intra-area-prefix-LSA. Prefixes are also propagated in OSPFv3 via link LSAs

The OSPFv3 Prefix Suppression feature provides a number of benefits.The exclusion of certain prefixes from adverstisements means that there is more memory available for LSA storage, bandwidth and buffers for LSA flooding, and CPU cycles for origination and flooding of LSAs and for SPF computation. Prefixes are also filtered from link LSAs. A device only filters locally configured prefixes, not prefixes learnt via link LSAs.

In addition, security has been improved by reducing the possiblity of remote attack with the hiding of transit-only networks.

Globally Suppress IPv4 and IPv6 Prefix Advertisements by Configuring the OSPFv3 Process

You can reduce OSPFv3 convergence time by configuring the OSPFv3 process on a device to prevent the advertisement of all IPv4 and IPv6 prefixes by using the **prefix-suppression** command in router configuration mode or address-family configuration mode.

Note Prefixes that are associated with loopbacks, secondary IP addresses, and passive interfaces are not suppressed by the **router mode** or the **address-family** configuration commands because typical network designs require prefixes to remain reachable.

Suppress IPv4 and IPv6 Prefix Advertisements on a Per-Interface Basis

You can explicitly configure an OSPFv3 interface not to advertise its IP network to its neighbors by using the **ipv6 ospf prefix-suppression** command or the **ospfv3 prefix-suppression** command in interface configuration mode.

Note If you have globally suppressed IPv4 and IPv6 prefixes from connected IP networks by configuring the **prefix-suppression** router configuration command, the interface configuration command takes precedence over the router configuration command.

How to Configure Prefix Suppression Support for OSPFv3

Configuring Prefix Suppression Support of the OSPFv3 Process

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router ospfv3** *process-id* [**vrf** *vpn-name*]
4. **prefix-suppression**
5. **end**
6. **show ospfv3**

DETAILED STEPS

	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	**router ospfv3** *process-id* [**vrf** *vpn-name*] **Example:** `Device(config)# router ospfv3 23`	Configures an OSPFv3 routing process and enters router configuration mode.
Step 4	**prefix-suppression** **Example:** `Device(config-router)# prefix-suppression`	Prevents OSPFv3 from advertising all IPv4 and IPv6 prefixes, except prefixes that are associated with loopbacks, secondary IP addresses, and passive interfaces.
Step 5	**end** **Example:** `Device(config-router)# end`	Returns to privileged EXEC mode.
Step 6	**show ospfv3** **Example:** `Device# show ospfv3`	Displays general information about OSPFv3 routing processes. **Note** Use this command to verify that IPv4 and IPv6 prefix suppression has been enabled.

Configuring Prefix Suppression Support of the OSPFv3 Process in Address-Family Configuration Mode

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router ospfv3** *process-id* [**vrf** *vpn-name*]
4. **address-family ipv6 unicast**
5. **prefix-suppression**
6. **end**
7. **show ospfv3**

DETAILED STEPS

	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	**router ospfv3** *process-id* [**vrf** *vpn-name*] **Example:** `Device(config)# router ospfv3 23`	Configures an OSPFv3 routing process and enters router configuration mode.
Step 4	**address-family ipv6 unicast** **Example:** `Device(config-router)# address-family ipv6 unicast`	Enters IPv6 address family configuration mode for OSPFv3.
Step 5	**prefix-suppression** **Example:** `Device(config-router-af)# prefix-suppression`	Prevents OSPFv3 from advertising all IPv4 and IPv6 prefixes, except prefixes that are associated with loopbacks, secondary IP addresses, and passive interfaces.
Step 6	**end** **Example:** `Device(config-router-af)# end`	Returns to privileged EXEC mode.
Step 7	**show ospfv3** **Example:** `Device# show ospfv3`	Displays general information about OSPFv3 routing processes. **Note** Use this command to verify that IPv4 and IPv6 prefix suppression has been enabled.

Configuring Prefix Suppression Support on a Per-Interface Basis

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. Do one of the following:
   - **ipv6 ospf prefix-suppression** [**disable**]
   - **ospfv3 prefix-suppression disable**
5. **end**
6. **show ospfv3 interface**

DETAILED STEPS

	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** *type number* **Example:** `Device(config)# interface serial 0/0`	Configures an interface type and enters interface configuration mode.

Step 4	Do one of the following:
	• **ipv6 ospf prefix-suppression** [**disable**]
	• **ospfv3 prefix-suppression disable**
	Example:
	`Device(config-if)# ipv6 ospf prefix-suppression`
	Example:
	`Device(config-if)# ospfv3 1 prefix-suppression disable`
		Prevents OSPFv3 from advertising IPv4 and IPv6 prefixes that belong to a specific interface, except those that are associated with secondary IP addresses.
		• When you enter the **ipv6 ospf prefix-suppression** command or the **ospfv3 prefix-suppression** command in interface configuration mode, it takes precedence over the **prefix-suppression** command that is entered in router configuration mode.

Step 5	**end** **Example:** `Device(config-if)# end`	Returns to privileged EXEC mode.
Step 6	**show ospfv3 interface** **Example:** `Device# show ospfv3 interface`	Displays OSPFv3-related interface information. **Note** Use this command to verify that IPv4 and IPv6 prefix suppression has been enabled for a specific interface.

Troubleshooting IPv4 and IPv6 Prefix Suppression

SUMMARY STEPS

1. **enable**
2. **debug ospfv3 lsa-generation**
3. **debug condition interface** *interface-type interface-number* [**dlci** *dlci*] [**vc** {*vci* | *vpi* | *vci*}]
4. **show debugging**

5. **show logging** [**slot** *slot-number* | **summary**]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**debug ospfv3 lsa-generation** **Example:** `Device# debug ospfv3 lsa-generation`	Displays informations about each OSPFv3 LSA that is generated.
Step 3	**debug condition interface** *interface-type interface-number* [**dlci** *dlci*] [**vc** {*vci* | *vpi* | *vci*}] **Example:** `Device# debug condition interface serial 0/0`	Limits output for some **debug** commands on the basis of the interface or virtual circuit.
Step 4	**show debugging** **Example:** `Device# show debugging`	Displays information about the types of debugging that are enabled for your device.
Step 5	**show logging** [**slot** *slot-number* | **summary**] **Example:** `Device# show logging`	Displays the state of syslog and the contents of the standard system logging buffer.

Prefix Suppression Support for OSPFv3

Example: Configuring Prefix Suppression Support for OSPFv3

The following example shows how to configure prefix suppression support for OSPFv3 in router configuration mode:

```
router ospfv3 1
 prefix-suppression
 !
 address-family ipv6 unicast
  router-id 0.0.0.6
  exit-address-family
```

The following example shows how to configure prefix suppression support for OSPFv3 in address-family configuration mode:

```
router ospfv3 1
```

```
 !
 address-family ipv6 unicast
  router-id 10.0.0.6
  prefix-suppression
  exit-address-family
```

The following example shows how to configure prefix suppression support for OSPFv3 in interface configuration mode:

```
interface Ethernet0/0
 ip address 10.0.0.1 255.255.255.0
 ipv6 address 2001:201::201/64
 ipv6 enable
 ospfv3 prefix-suppression
 ospfv3 1 ipv4 area 0
 ospfv3 1 ipv6 area 0
 end
```

Feature Information for Prefix Suppression Support for OSPFv3

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 https://cfnng.cisco.com/. An account on Cisco.com is not required.

Table 1: Feature Information for Prefix Suppression Support for OSPFv3

Feature Name	Releases	Feature Information
Prefix Suppression Support for OSPFv3	Cisco IOS XE Fuji 16.8.1a	This feature enables Open Shortest Path First version 3 (OSPFv3) to hide the IPv4 and IPv6 prefixes of connected networks from link-state advertisements (LSAs). This feature can also be used to enhance the security of an OSPFv3 network by allowing the network administrator to prevent IP routing toward internal nodes. The feature was introduced.