



OSPFv3 External Path Preferences

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Feature History for OSPFv3 External Path Preference

This table provides release and platform support information for the features explained in this module.

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

Release	Feature Name and Description	Supported Platform
Cisco IOS XE 17.18.1	OSPFv3 External Path Preference: OSPFv3 External Path Preference is a network optimization feature that allows a device to choose the best path to an ASBR or a forwarding address when multiple intra-AS paths are available.	Cisco C9610 Series Smart Switches

OSPFv3 External Path Preference

OSPFv3 External Path Preference is a network optimization feature that allows a device to choose the best path to an Autonomous System Boundary Router (ASBR) or a forwarding address when multiple intra-AS paths are available. This feature is based on RFC 5340.

When an OSPF device needs to reach an ASBR or a forwarding address, and there are multiple paths available within its own Autonomous System (intra-AS), RFC 5340 specifies the following preference order:

1. Intra-area paths using non-backbone areas are always the most preferred.
 - This means if a path to an ASBR or forwarding address is entirely contained within a single non-backbone OSPF area (e.g., Area 1, Area 2, etc.), that path will be chosen over any other type of intra-AS path.

2. Intra-area backbone paths and inter-area paths are of equal preference.
 - If the most preferred path (intra-area non-backbone) is not available, OSPF will then consider paths that are either:
 - Entirely within the backbone area (Area 0).
 - Inter-area paths, meaning they traverse multiple areas, typically via an Area Border Router (ABR) and the backbone.
 - Between these two types, there is no inherent preference; the path with the lowest cost will be selected.

How OSPFv3 External Path Preference works

It's crucial to note that these specific path preference rules from RFC 5340 only apply when RFC 1583 compatibility is disabled.

These rules are applied in two primary scenarios:

- Same ASBR, Multiple Areas:

When a single ASBR is reachable through interfaces in different OSPF areas. In this case, all paths lead to the same ASBR, but the OSPF device must decide which path (via which area) is optimal.

- Deciding Between AS-External-LSAs:

When the OSPF device needs to choose between several AS-external-LSAs (Type 5 LSAs). These LSAs may originate from different ASBRs or point to different forwarding addresses. The rules help determine which external route is preferred based on how the ASBRs or forwarding addresses are reached internally.

In both scenarios, each potential path is represented as a separate entry in the routing table, and these preference rules guide the selection of the best entry.

Enable OSPFv3 External Path Preference

Perform this task to enable OSPFv3 external path reference by disabling RFC 1583.

Procedure

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 **router ospfv3 process-id**

Example:

```
Device(config)# router ospf 15
```

Enables OSPFv3 routing and enters router configuration mode.

process-id: The process ID is an internally used, identification parameter that is locally assigned. Each OSPF has a unique process ID.

Process ID can be a positive integer from 1 to 65535.

Step 4 **no compatible rfc1583**

Example:

```
Device(config-router)# no compatible rfc1583
```

Changes the method used to calculate external path preferences per RFC 5340.

Configuration example to verify OSPFv3 External Path Preference

The following example shows how to verify if RFC 1583 is disabled.

```
Device# show ospfv3
Routing Process "ospfv3 1" with ID 10.1.1.1
  SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
  Minimum LSA interval 5 secs. Minimum LSA arrival 1 secs
  LSA group pacing timer 240 secs
  Interface flood pacing timer 33 msec
  Retransmission pacing timer 66 msec
  Number of external LSA 0. Checksum Sum 0x000000
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Reference bandwidth unit is 100 mbps
  RFC 1583 compatibility disabled
    Area BACKBONE(0) (Inactive)
      Number of interfaces in this area is 1
      SPF algorithm executed 1 times
      Number of LSA 1. Checksum Sum 0x00D03D
      Number of DCbitless LSA 0
      Number of indication LSA 0
      Number of DoNotAge LSA 0
      Flood list length 0
```

