



COE-PCE Initiated SR Policy with OSPF and IS-IS SR-TE Autoroute Announce

As part of a tactical TE solution, the Path Computation Element (PCE) can provision a Segment Routing Traffic Engineering (SR-TE) policy to mitigate link congestion.

Autoroute announcement is a steering mechanism in which IGP's automatically use the policy for destination's downstream of the policy end point. Autoroute announcement is performed using Cisco Crossworks Optimization Engine (COE). COE provides real-time network optimization allowing operators to maximize network utilization effectively and increase service velocity.

You can configure COE-PCE initiated SR policy in the following ways:

- PCE Initiated SR Policy with OSPF SR-TE Autoroute Announce — It enables a steering mechanism in which IGP's automatically use the SR-TE policy for destination's downstream of the policy end point.
- PCE-Initiated SR Policy with IS-IS SR-TE Autoroute Announce — It enables System-to-Intermediate System (IS-IS) interaction with traffic engineering to receive the SR-TE policies via autoroute announcement notifications.
- [COE-PCE Initiated SR Policy with OSPF Autoroute Announce, on page 1](#)
- [SR-PCE: Support for PCE-Initiated SR Policy and ISIS Autoroute, on page 3](#)

COE-PCE Initiated SR Policy with OSPF Autoroute Announce

Table 1: Feature History

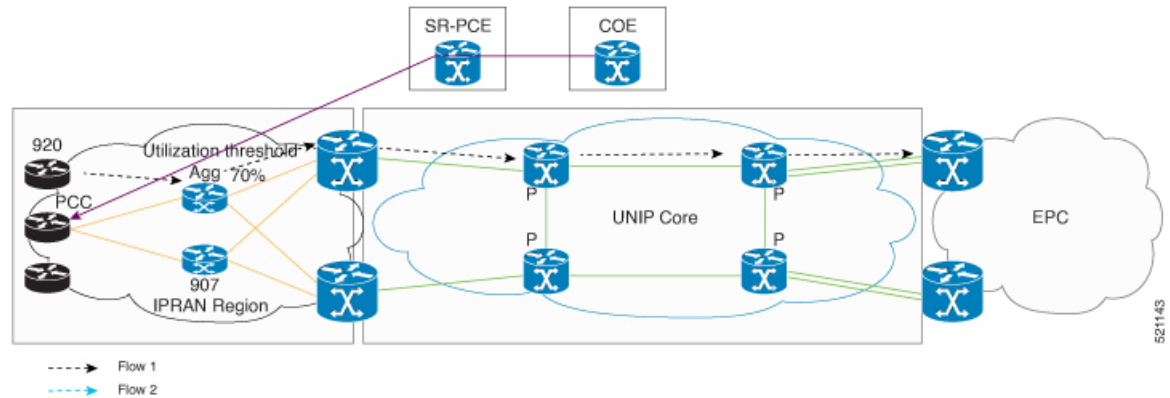
Feature Name	Release Information	Feature Description
PCE Initiated SR Policy with OSPF Autoroute Announce	Cisco IOS XE Bengaluru 17.4.1	This feature enables a steering mechanism in which IGP's automatically use the policy for destination's downstream of the policy end point.

A PCE collects various pieces of network information to determine traffic flows causing link congestion. The PCE computes a suitable path to divert those flows and to alleviate the congestion. The PCE then deploys the SR-TE policy to divert the traffic leading to the congestion using the Stateful Path Computation Element Protocol (PCEP) to provision the policy. When the congestion is alleviated, the SR-TE policy is removed.

The PCEP message contains SID list to be deployed by the head-end. Path Computation Client (PCC) profiles allow activation of autoroute announce for the policy provisioned by PCEP, using the profile IDs. The profile ID on the PCE and PCC should match, otherwise the policy is not provisioned. For example, if the PCE provisions a policy with profile ID 1 and the head-end where the policy is being provisioned also has the PCC profile ID 1 configured with autoroute announce, COE-PCE initiated SR policy is activated for that policy.

COE-PCE Initiated SR Policy

Figure 1: COE-PCE Initiated SR Policy



The preceding topology shows how an SR-PCE policy is initiated from COE:

- SR policy is configured on the COE with profile ID.
- COE pushes the SR policy to PCE and PCE forwards the SR policy to PCC.
- Profile ID on PCC is matched with the profile ID on COE-PCE.
- OSPF autoroute announce is configured on the PCC.
- The policy gets provisioned.
- The data traffic now adheres to the SR policy that is pushed from the COE.
- Complete SR Policy manipulation occurs only on COE.

Restrictions for PCE Initiated SR Policy

- A maximum of 500 SR policies are supported.
- Only native COE is supported.
- Bandwidth optimization based on SR tactical policy is not supported.
- Bandwidth optimization by using COE is not supported.
- PIC core and PIC edge are not supported over SR-TE tunnel till Cisco IOS XE Cupertino Release 17.8.1. Starting with Cisco IOS XE Release 17.9.1, PIC core is supported for short LCM policies with 0, 1, or 2 SR labels.
- ECMP over SR-TE is not supported.

- 6PE and 6VPE are not supported with three and four transport labels.
- IPv6 is not supported.
- A maximum of 10,000 VPNv4 prefix limits are supported.
- BGP LU (RFC 3107) is not supported for intra-AS and inter-AS.

SR-PCE: Support for PCE-Initiated SR Policy and ISIS Autoroute

Table 2: Feature History

Feature Name	Release Information	Description
SR-PCE: Support for PCE-Initiated SR Policy and ISIS Autoroute	Cisco IOS XE Cupertino 17.7.1	This feature enables System-to-Intermediate System (IS-IS) interaction with traffic engineering to receive the SR-TE policies via autoroute announcement notification. These notifications are used as IGP shortcuts during SPT computation and route calculation and are installed as nexthops for applicable routes in Routing Information Base (RIB) or MPLS Forwarding Infrastructure (MFI).

Prior to Cisco IOS XE Cupertino Release 17.7.1, PCE-initiated SR policy was only supported on OSPF protocol. Starting with Cisco IOS XE Cupertino Release 17.7.1, PCE-initiated SR policy is supported also on System-to-Intermediate System (IS-IS) that interacts with traffic engineering to receive the SR-TE policies via autoroute announcement notification. These notifications are used as IGP shortcuts during SPT computation and route calculation and are installed as nexthops for applicable routes in Routing Information Base (RIB) or MPLS Forwarding Infrastructure (MFI).

<need information to add network diagram>

Configure PCE-Initiated SR Policy and ISIS Autoroute

To configure PCE-initiated SR policy and ISIS autoroute:

```

policy Margin
  color 1000 end-point 12.12.12.12
  binding-sid mpls 15900
  candidate-paths
    preference 10
    constraints
      segments
        dataplane mpls
  !
dynamic
  pcep
  metric

```

```

margin
  absolute 5
segment-routing traffic-eng
  pcc
pce address 13.13.13.13 source-address 10.0.0.1
profile 100
autoroute
include all

```

Verification of IS-IS Autoroute Configuration

Use the **show isis segment-routing policy** command to verify the configuration of IS-IS segment routing policy.

```
Router2#show isis segment-routing policy
```

```

ISIS Router with ID (2.2.2.2) (Process ID 1)

Codes: SS - Strict SPF, SP - Default SPF
       r - relative, a - absolute, c - constant, n - none

Endpoint IP  Level/System-ID  Interface      Metric  Attributes      Last Updated
15.0.0.15    L1/R5.00                 Tunnel65538    0       SS:n 00:01:14   00:01:14
16.0.0.16    L1/R6.00                 Tunnel65539    -3      SS:r 00:00:03   00:01:21

```