



L2VPN over SR-TE Preferred Path

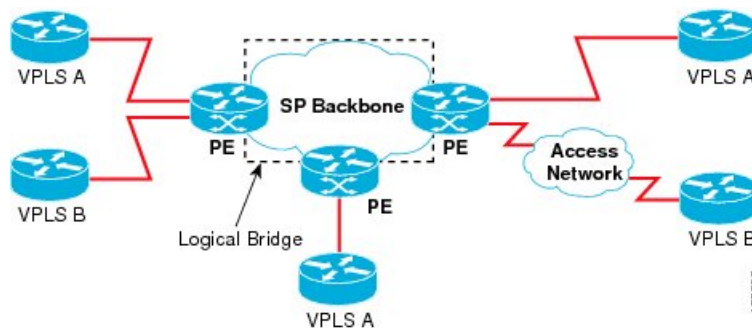
Table 1: Feature History

Feature Name	Release Information	Description
L2VPN over SR-TE Preferred Path	Cisco IOS XE Bengaluru 17.4.1	This feature allows you to configure an SR policy as the preferred path for a EoMPLS or VPLS pseudowire. EoMPLS or VPLS pseudowires between same PEs can be routed over different SR policies based on the requirements. Prior to this release, you could only steer the traffic using the SR policy for routing IPv4 traffic to a destination pseudowire (over IGP or BGP-LU).

Virtual Private LAN Services (VPLS) enables enterprises to link together multiple Ethernet-based LANs via the infrastructure provided by their service provider.

VPLS uses the service provider core to join multiple attachment circuits of an enterprise to simulate a virtual bridge. From the enterprise point of view, there is no topology for VPLS. All customer edge (CE) devices appear to connect to a logical bridge emulated by the service provider core.

Figure 1: VPLS Topology



Prior to Cisco IOS XE Bengaluru Release 17.4.1, L2VPN (VPLS or EoMPLS) traffic over SR policies could not be steered. You could only steer IPv4 traffic using the SR policy for routing IPv4 traffic to a destination pseudowire (over IGP or BGP-LU).

With Cisco IOS XE Bengaluru Release 17.4.1, you can now configure an SR policy as the preferred path for a EoMPLS or VPLS pseudowire. EoMPLS or VPLS pseudowires between same PEs can also be routed over different SR policies.

Disable Fallback Option

The disable fallback option disables the router from using the default path when the preferred path SR policy goes down.

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Restrictions

- A traffic loss of approximately 10 seconds is observed while removing the preferred path configuration.
- NETCONF-YANG data model does *not* support template-based configuration.
- You cannot add On-Demand (ODN) policies to the preferred path.
- The maximum number of SR labels supported is five. This includes one or two SR service labels.
- L2VPN over SR-TE preferred path is *only* supported on SR Per Destination Policy (PDP); and not on the SR Per-Flow Policy (PPF).
- L2VPN over SR-TE preferred path can *only* be configured using the pseudowire interface.

Configuring L2VPN over SR-TE Preferred Path

You must create the SR static policy to configure L2VPN over SR-TE preferred path.

To create SR static policy for MPLS label:

```
configure terminal
segment-routing traffic-eng
segment-list name segment-name
index 1 mpls label first hop label
index 2 mpls label second hop label
!
policy policy-name
color color-code end-point destination IP Address
candidate-paths
preference preference
explicit segment-list segment-name
constraints
segments
dataplane mpls
```

You can also create SR static policy for the following:

- MPLS adjacency
- MPLS prefix

L2VPN over SR-TE preferred path can be configured in the following ways:

- Non-Template based Configuration
- Template-based Configuration

Non-template Based Configuration:

- **Create Pseudowire**

To create pseudowire:

```
interface pseudowire 1
  encapsulation mpls
  neighbor peer-address vc-id
```

- **Attach Policy Using Preferred Path**

To attach a policy using the preferred path:

```
interface pseudowire1
  preferred-path segment-routing traffic-eng policy policy-name [disable-fallback]
```

Template-based Configuration:

- **Create Template Type Pseudowire**

To create template type pseudowire:

```
template type pseudowire name
  encapsulation mpls
  preferred-path segment-routing traffic-eng policy name [disable-fallback]
```

- **Attach Policy Using Preferred Path**

To attach a policy using the preferred path:

```
interface pseudowire 1
  source template type pseudowire name
```

Configuration Example: L2VPN over SR-TE Preferred Path

This example shows how to configure L2VPN over SR-TE preferred path.

```
!
segment-routing traffic-eng
segment-list name CE11-PE12-Seg
  index 1 mpls label 16005
  index 2 mpls label 16008
  index 3 mpls label 16010
!
policy CE11-PE12
color 50 end-point 12.12.12.12
candidate-paths
  preference 100
  explicit segment-list Inter_IGP
!
```

```

constraints
  segments
    dataplane mpls
!
interface pseudowire1000
  encapsulation mpls
  signaling protocol ldp
  neighbor 12.12.12.12 1000
  preferred-path segment-routing traffic-eng policy CE11-PE12
!
l2vpn vfi context VC_1000
  vpn id 1000
  member pseudowire1000
  bridge-domain 1000
  member GigabitEthernet0/1/0 service-instance 1000
  member vfi VC_1000
!

```

Verification of L2VPN over SR-TE Preferred Path Configuration

Use the **show segment-routing traffic-eng policy name *policy name* detail** command to verify the policy configuration:

```
Router#show segment-routing traffic-eng policy name CE11-PE12 detail
```

```

Name: CE11-PE12 (Color: 50 End-point: 12.12.12.12)
  Owners : CLI
  Status:
    Admin: up, Operational: up for 70:04:00 (since 08-17 07:55:36.536)
  Candidate-paths:
    Preference 100 (CLI):
      Explicit: segment-list IntraDomain (active)
      Weight: 1, Metric Type: TE
16005
16008
16010
Attributes:
  Binding SID: 20
  Allocation mode: dynamic
  State: Programmed
Tunnel ID: 65538 (Interface Handle: 0x20)
Per owner configs:
  CLI
  Binding SID: dynamic
Stats:
  Packets: 0 Bytes: 0

Event history:
  Timestamp          Client          Event type          Context:
Value
-----:-----
10-28 04:05:37.028  L2VPN          Policy created      Name: L2VPN
10-28 04:05:37.048  L2VPN          BSID allocated      FWD: label
20
10-28 04:05:37.494  L2VPN          Client removed      Owner:
Destroyed
10-28 04:05:37.494  CLI            Set colour          Colour:
230
10-28 04:05:37.494  CLI            Set end point       End-point:

```

```

12.12.12.12
  10-28 04:05:37.496      CLI      Set explicit path      Path option:
IntraDomain
  10-28 04:08:22.873      FH Resolution      Policy state UP      Status:
PATH RESOLVED
  10-28 04:08:45.630      FH Resolution      REOPT triggered      Status:
REOPTIMIZED

```

Use `show mpls l2transport vc 1000 detail` command to verify the L2VPN over SR-TE preferred path:

```

Router#show mpls l2transport vc 1000 detail
Local interface: VFI VC_1000 vfi up
  Interworking type is Ethernet
  Destination address: 12.12.12.12, VC ID: 1000, VC status: up
  Output interface: tu65538, imposed label stack {16005 16008 16010 32}
  Preferred path: not configured
  Default path: active
  Next hop: 182.168.1.1
  Create time: lw4d, last status change time: 22:50:57
  Last label FSM state change time: 22:51:46
  Signaling protocol: LDP, peer 10.0.0.1:0 up
  Targeted Hello: 2.2.2.2(LDP Id) -> 10.0.0.1, LDP is UP
  Graceful restart: not configured and not enabled
  Non stop routing: not configured and not enabled
  Status TLV support (local/remote) : enabled/supported
    LDP route watch : enabled
    Label/status state machine : established, LruRru
  Last local dataplane status rcvd: No fault
  Last BFD dataplane status rcvd: Not sent
  Last BFD peer monitor status rcvd: No fault
  Last local AC circuit status rcvd: No fault
  Last local AC circuit status sent: No fault
  Last local PW i/f circ status rcvd: No fault
  Last local LDP TLV status sent: No fault
  Last remote LDP TLV status rcvd: No fault
  Last remote LDP ADJ status rcvd: No fault
  MPLS VC labels: local 26, remote 21
  Group ID: local n/a, remote 16
  MTU: local 9000, remote 9000
  Remote interface description:
  MAC Withdraw: sent:0, received:301
  Sequencing: receive disabled, send disabled
  Control Word: On (configured: autosense)

```

