



# L2VPN over SR-TE Preferred Path

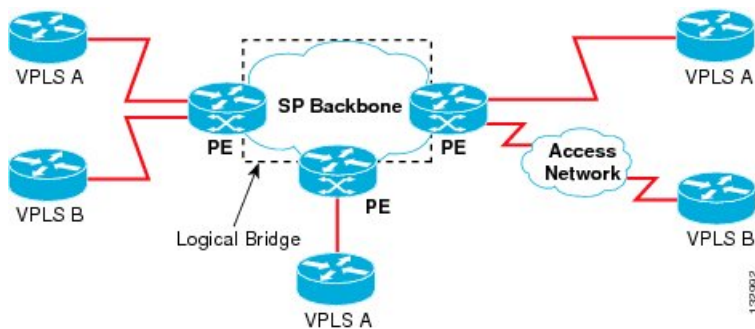
Table 1: Feature History

| 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.



**Note** For SR labels till five, on the Cisco RSP3 module, you must use the **sr\_5\_label\_push\_enable** template to enable L2VPN over SR-TE preferred path.

### 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.
- On the Cisco ASR 900 RSP3 module, you cannot use additional templates to support VPLS stats.
- 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 (PFP).
- 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: 1w4d, 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)
```

