

Configuring MPLS on Provider Edge Switches Using Circuit Cross-Connect (CLI Procedure)

JUNOS MPLS for EX Series switches supports Layer 2 protocols and Layer 2 virtual private networks (VPNs). You can configure MPLS on EX Series switches to increase transport efficiency in your network. MPLS services can be used to connect various sites to a backbone network and to ensure better performance for low-latency applications such as VoIP and other business-critical functions.

To implement MPLS on EX Series switches, you must configure two provider edge (PE) switches—an ingress PE switch and an egress PE switch—and at least one provider switch. You can configure the customer-edge interfaces on the PE switches of the MPLS network as either circuit cross-connect (CCC) or using MPLS over IP. For information on configuring MPLS over IP, see *Configuring MPLS on Provider Edge Switches Using IP Over MPLS (CLI Procedure)*. You can also use class of service (CoS) on MPLS networks. For further information, see *Understanding Using CoS with MPLS Networks on EX Series Switches*.

This topic describes configuring PE switches using a circuit cross-connect (CCC). The customer-edge interface can be either a simple interface or a tagged VLAN interface. In both cases, you configure the logical unit of the customer-edge interface to belong to family `ccc` and you must configure an association between that interface and two label-switched paths (LSPs)—one for transmitting MPLS packets to the remote PE and the other for receiving MPLS packets from the remote PE.

The following guidelines apply to CCC configurations:

- When an interface is configured to belong to family `ccc`, it cannot belong to any other family.
- You can send any kind of traffic over a CCC, including nonstandard bridge protocol data units (BPDUs) generated by other vendors' equipment.

If you are configuring a CCC on a tagged VLAN interface, you must explicitly enable VLAN tagging and specify a VLAN ID.



NOTE: The VLAN tag ID cannot be configured on logical interface unit 0. The logical unit number must be 1 or higher.

This procedure shows how to set up two CCCs:

- If you are configuring a CCC on a simple interface (`ge-0/0/1`), you do not need to enable VLAN tagging or specify a VLAN ID.
- If you are configuring a CCC on a tagged VLAN interface (`ge-0/0/2`), include all the steps in this procedure.

To configure a PE switch, complete the following tasks. When you have completed configuring one PE switch, perform the same tasks on the other PE switch:

1. Configure OSPF on the loopback (or switch address) and core interfaces:

```
[edit protocols]
user@switch# set ospf area 0.0.0.0 interface lo0.0
user@switch# set ospf area 0.0.0.0 interface ge-0/0/5.0
user@switch# set ospf area 0.0.0.0 interface ge-0/0/6.0
user@switch# set ospf area 0.0.0.0 interface ae0
```

2. Enable traffic engineering for the routing protocol on both PE switches:

```
[edit protocols]
user@switch# set ospf traffic-engineering
```

3. Configure an IP address for the loopback interface and for the core interfaces:

```
[edit]
user@switch# set interfaces lo0 unit 0 family inet address 127.1.1.1/32
user@switch# set interfaces ge-0/0/5 unit 0 family inet address 10.1.5.1/24
user@switch# set interfaces ge-0/0/6 unit 0 family inet address 10.1.6.1/24
user@switch# set interfaces ae0 unit 0 family inet address 10.1.9.1/24
```

4. Enable MPLS and define the LSP:

```
[edit protocols]
user@switch# set mpls label-switched-path lsp_to_pe2_ge1 to 127.1.1.3
```



TIP: `lsp_to_pe2_ge1` is the LSP name. You will need to use the specified name again when configuring the CCC.

5. Configure MPLS on the core interfaces:

```
[edit protocols]
user@switch# set mpls interface ge-0/0/5.0
user@switch# set mpls interface ge-0/0/6.0
user@switch# set mpls interface ae0
```

6. Configure RSVP on the loopback interface and the core interfaces:

```
[edit protocols]
user@switch# set rsvp interface lo0.0
user@switch# set rsvp interface ge-0/0/5.0
user@switch# set rsvp interface ge-0/0/6.0
user@switch# set rsvp interface ae0
```

7. Configure family mpls on the logical units of the core interfaces:

```
[edit]
user@switch# set interfaces ge-0/0/5 unit 0 family mpls
user@switch# set interfaces ge-0/0/6 unit 0 family mpls
user@switch# set interfaces ae0 unit 0 family mpls
```



NOTE: You can enable family `mpls` on either individual interfaces or aggregated Ethernet interfaces. You cannot enable it on tagged VLAN interfaces.

8. If you are configuring a CCC on a tagged VLAN interface, enable VLAN tagging on the customer-edge interface `ge-0/0/2` of the local PE switch:

```
[edit interfaces ge-0/0/2]
user@switch# set vlan-tagging
```

If you are configuring a CCC on a simple interface (`ge-0/0/1`), omit this step.

9. If you are configuring a CCC on a tagged VLAN interface, configure the logical unit of the customer-edge interface with a VLAN ID:

```
[edit interfaces ge-0/0/2 unit 1]
user@switch# set vlan-id 100
```

If you are configuring a CCC on a simple interface (`ge-0/0/1`), omit this step.

10. Configure the logical unit of the customer-edge interface to belong to family `ccc`:

```
[edit interfaces ge-0/0/1 unit 0]
user@switch# set family ccc
```

```
[edit interfaces ge-0/0/2 unit 1]
user@switch# set family ccc
```

11. Associate the CCC interface with two LSPs, one for transmitting MPLS packets and the other for receiving MPLS packets:

```
[edit protocols]
user@switch# set connections remote-interface-switch ge-1-to-pe2 interface
ge-0/0/1.0
user@switch# set connections remote-interface-switch ge-1-to-pe2
transmit-lsp lsp_to_pe2_ge1
user@switch# set connections remote-interface-switch ge-1-to-pe2
receive-lsp lsp_to_pe1_ge1
```

```
[edit protocols]
user@switch# set connections remote-interface-switch ge-1-to-pe2 interface
ge-0/0/2.1
user@switch# set connections remote-interface-switch ge-1-to-pe2
transmit-lsp lsp_to_pe2_ge1
user@switch# set connections remote-interface-switch ge-1-to-pe2
receive-lsp lsp_to_pe1_ge1
```



TIP: The `transmit-lsp` option specifies the LSP name that was configured on PE-1 (the local PE switch) by the `label-switched-path` statement within the `protocols mpls` stanza. The `receive-lsp` option specifies the LSP name that was configured on PE-2 (the remote PE switch) by the `label-switched-path` statement within the `protocols mpls` stanza.

When you have completed configuring one PE switch, follow the same procedures to configure the other PE switch.

- Related Topics**
- Example: Configuring MPLS on EX Series Switches
 - Configuring MPLS on Provider Switches (CLI Procedure)
 - Configuring MPLS on Provider Edge Switches Using IP Over MPLS (CLI Procedure)
 - Configuring an OSPF Network (J-Web Procedure)
 - Verifying That MPLS Is Working Correctly
 - Understanding JUNOS MPLS Components for EX Series Switches

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