

Configuring MPLS on Provider Edge Switches (CLI Procedure)

JUNOS MPLS for EX-series switches supports Layer 2 protocols and Layer 2 virtual private networks (VPNs). You can configure MPLS on your switches to increase transport efficiency in your network. MPLS services can be used to connect various sites to a backbone network or 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 switches: an ingress provider edge switch and an egress provider edge switch.

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

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Enabling the OSPF Routing Protocol on the Loopback and Core Interfaces

Enable OSPF on the loopback address and on the core interface addresses.



NOTE: You can use the switch address as an alternative to the loopback address.

1. Configure OSPF on the loopback 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
```

Enabling Traffic Engineering for the Routing Protocol

Enable traffic engineering for the routing protocol (OSPF) on the loopback address and on the core interface addresses.

1. Enable traffic engineering for the routing protocol:

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

Configuring IP Addresses for the Loopback and Core Interfaces

Configure IP addresses for the loopback and core interfaces.

1. 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
```

Enabling MPLS, Defining the Label Switched Path, and Applying MPLS to the Core Interfaces

Enable MPLS within the `protocols` stanza and define a label switched path (LSP) that specifies the loopback interface address or switch address of the destination (egress) provider edge switch. You must also apply MPLS to the core interfaces.

1. 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 circuit cross-connect.

2. Configure MPLS on the core interface addresses:

```
[edit protocols]
uuser@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
```

Enabling RSVP and Applying It to the Loopback and Core Interfaces

Enable RSVP and apply it to the loopback and the core interfaces.

1. Configure RSVP on the loopback address and the core interface addresses:

```
[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
```

Enabling Family MPLS on the Core Interfaces

On the logical units of the core interface addresses, configure these interfaces to belong to **family mpls**. This configuration identifies the interfaces used for forwarding MPLS packets.

1. 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.

Configuring a Circuit Cross-Connect on a Customer Edge Interface

You must configure the customer edge interfaces of the provider edge switches as a circuit cross-connect (CCC). The customer edge interface can be either a simple interface or a tagged VLAN interface. In both cases, you must 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 LSPs—one for transmitting MPLS packets to the remote provider edge and the other for receiving MPLS packets from the remote PE.



NOTE: When an interface is configured to belong to **family ccc**, it cannot belong to any other family.

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**), omit step 1 and step 2.
 - If you are configuring a CCC on a tagged VLAN interface (**ge-0/0/2**), include all the steps in this procedure.
1. Enable VLAN tagging on the customer edge interface **ge-0/0/2** of the local provider edge switch:

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

2. 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
```

3. 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
```

4. 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 provider edge 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 provider edge switch) by the **label-switched-path** statement within the **protocols mpls** stanza.

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

- Related Topics**
- Example: Configuring MPLS on EX Series Switches
 - Configuring MPLS on Provider Switches (CLI Procedure)
 - Configuring an OSPF Network (J-Web Procedure)
 - Verifying That MPLS Is Working Correctly
 - Understanding JUNOS MPLS Components for EX Series Switches
 - For information on the interface statement for OSPF, see the *JUNOS Software Routing Protocols Configuration Guide* at <http://www.juniper.net/techpubs/software/junos/junos95/index.html>.

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