



Cisco Nexus 7000 Series NX-OS MPLS Command Reference

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Cisco Nexus 7000 Series NX-OS MPLS Command Reference
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New and Changed Information

This chapter provides release-specific information for each new and changed feature in the *Cisco Nexus 7000 Series NX-OS MPLS Command Reference*. The latest version of this document is available at the following Cisco website:

<http://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-command-reference-list.html>

To check for additional information about this Cisco NX-OS Release, see the Cisco NX-OS Release Notes available at the following Cisco website:

<http://www.cisco.com/c/en/us/support/switches/nexus-7000-series-switches/products-release-notes-list.html>

The table below summarizes the new and changed features for the *Cisco Nexus 7000 Series NX-OS MPLS Command Reference*, and tells you where they are documented.

Table 1 ***New and Changed Features***

Feature	Description	Changed in Release
A commands	allowas-in as-override autonomous-system	6.2(2)
B commands	bridge-domain	6.2(2)
C commands	control-word	6.2(2)
D commands	demand-circuit device ospf disable-peer-as-check	6.2(2)
E commands	echo revision echo vendor-extension encapsulation dot1q	6.2(2)
F commands	feature evc	6.2(2)
I commands	inherit port-profile internetworking interface pseudowire	6.2(2)

Table 1 *New and Changed Features (continued)*

Feature	Description	Changed in Release
L commands	l2vpn xconnect context l2vpn vfi context	6.2(2)
M commands	maximum-paths eibgp member encapsulation mpls member member pseudowire member vfi mpls ldp graceful-restart	8.0(1) 6.2(2)
P commands	port-profile type pseudowire	6.2(2)
R commands	redundancy remote link failure notification rewrite ingress tag push dot1q symmetric rewrite ingress tag translate 1-to-1 dot1q symmetric	6.2(2)
S commands	send-community extended signaling protocol none soo state enabled switchport allowed vlan	6.2(2)
Show commands	show bridge-domain show forwarding show ethernet service instance show ethernet service instance id interface ethernet show ethernet service instance interface ethernet show forwarding show l2vpn atom show l2vpn atom vc detail show l2vpn service xconnect all show l2vpn service vfi show l2vpn vfi show mpls ldp neighbor graceful-restart show run mpls ldp all	6.2(2)
U commands	update-source loopback	6.2(2)
V commands	vpn	6.2(2)



Preface

This preface describes the audience, organization, and conventions of the *Cisco Nexus 7000 Series NX-OS MPLS Command Reference*. It also provides information on how to obtain related documentation.

This chapter includes the following sections:

- [Audience, page 5](#)
- [Organization, page 5](#)
- [Document Conventions, page 6](#)
- [Related Documentation, page 7](#)
- [Documentation Feedback, page 8](#)
- [Obtaining Documentation and Submitting a Service Request, page 9](#)

Audience

This publication is for experienced users who configure and maintain Cisco NX-OS devices.

Organization

This reference is organized as follows:

Chapter Title	Description
A Commands	Describes the Cisco NX-OS MPLS commands that begin with A.
B Commands	Describes the Cisco NX-OS MPLS commands that begin with B.
C Commands	Describes the Cisco NX-OS MPLS commands that begin with C.
D Commands	Describes the Cisco NX-OS MPLS commands that begin with D.
E Commands	Describes the Cisco NX-OS MPLS commands that begin with E.
F Commands	Describes the Cisco NX-OS MPLS commands that begin with F.
G Commands	Describes the Cisco NX-OS MPLS commands that begin with G.
H Commands	Describes the Cisco NX-OS MPLS commands that begin with H.
I Commands	Describes the Cisco NX-OS MPLS commands that begin with I.

Chapter Title	Description
K Commands	Describes the Cisco NX-OS MPLS commands that begin with K.
L Commands	Describes the Cisco NX-OS MPLS commands that begin with L.
M Commands	Describes the Cisco NX-OS MPLS commands that begin with M.
N Commands	Describes the Cisco NX-OS MPLS commands that begin with N.
P Commands	Describes the Cisco NX-OS MPLS commands that begin with P.
R Commands	Describes the Cisco NX-OS MPLS commands that begin with R.
S Commands	Describes the Cisco NX-OS MPLS commands that begin with S.
Show Commands	Describes the Cisco NX-OS MPLS commands that begin with show.
T Commands	Describes the Cisco NX-OS MPLS commands that begin with T.
V Commands	Describes the Cisco NX-OS MPLS commands that begin with V.

Document Conventions

Command descriptions use these conventions:

Convention	Description
boldface font	Commands and keywords are in boldface.
<i>italic font</i>	Arguments for which you supply values are in italics.
[]	Elements in square brackets are optional.
[x y z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.

Screen examples use these conventions:

screen font	Terminal sessions and information that the switch displays are in screen font.
boldface screen font	Information you must enter is in boldface screen font.
<i>italic screen font</i>	Arguments for which you supply values are in italic screen font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

This document uses the following conventions:



Note

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

**Caution**

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

**Tip**

Means *the following information will help you solve a problem*.

Related Documentation

[Cisco NX-OS](#) includes the following documents:

Release Notes

Cisco Nexus 7000 Series NX-OS Release Notes, Release 6.x

NX-OS Configuration Guides

Cisco Nexus 2000 Series Fabric Extender Software Configuration Guide

Cisco Nexus 7000 Series NX-OS Configuration Examples

Cisco Nexus 7000 Series NX-OS FabricPath Configuration Guide

Configuring Feature Set for FabricPath

Cisco Nexus 7000 Series NX-OS Fundamentals Configuration Guide

Cisco Nexus 7000 Series NX-OS High Availability and Redundancy Guide

Cisco Nexus 7000 Series NX-OS Interfaces Configuration Guide

Cisco Nexus 7000 Series NX-OS IP SLAs Configuration Guide

Cisco Nexus 7000 Series NX-OS Layer 2 Switching Configuration Guide

Cisco Nexus 7000 Series NX-OS LISP Configuration Guide

Cisco Nexus 7000 Series NX-OS MPLS Configuration Guide

Cisco Nexus 7000 Series NX-OS Multicast Routing Configuration Guide

Cisco Nexus 7000 Series NX-OS OTV Configuration Guide

Cisco Nexus 7000 Series OTV Quick Start Guide

Cisco Nexus 7000 Series NX-OS Quality of Service Configuration Guide

Cisco Nexus 7000 Series NX-OS SAN Switching Configuration Guide

Cisco Nexus 7000 Series NX-OS Security Configuration Guide

Cisco Nexus 7000 Series NX-OS System Management Configuration Guide

Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide

Cisco Nexus 7000 Series NX-OS Verified Scalability Guide

Cisco Nexus 7000 Series NX-OS Virtual Device Context Quick Start

Cisco Nexus 7000 Series NX-OS Virtual Device Context Quick Start

Cisco NX-OS FCoE Configuration Guide for Cisco Nexus 5000 and Cisco MDS 9500

NX-OS Command References

Cisco Nexus 7000 Series NX-OS Command Reference Master Index
Cisco Nexus 7000 Series NX-OS FabricPath Command Reference, Release
Cisco Nexus 7000 Series NX-OS Fundamentals Command Reference
Cisco NX-OS High Availability and Redundancy Command Reference
Cisco Nexus 7000 Series NX-OS Interfaces Command Reference
Cisco Nexus 7000 Series NX-OS IP SLAs Command Reference
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Cisco Nexus 7000 Series NX-OS Security Command Reference
Cisco Nexus 7000 Series NX-OS System Management Command Reference
Cisco Nexus 7000 Series NX-OS Unicast Routing Command Reference
Cisco Nexus 7000 Series NX-OS Virtual Device Context Command Reference
Cisco NX-OS FCoE Command Reference for Cisco Nexus 7000 and Cisco MDS 9500

Other Software Documents

Cisco NX-OS Licensing Guide
Cisco Nexus 7000 Series NX-OS MIB Quick Reference
Cisco Nexus 7000 Series NX-OS Software Upgrade and Downgrade Guide
Cisco NX-OS System Messages Reference
Cisco Nexus 7000 Series NX-OS Troubleshooting Guide
Cisco NX-OS XML Interface User Guide

Documentation Feedback

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Cisco Bug Search Tool

[Cisco Bug Search Tool](#) (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.



A Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with A.

accept-lifetime

To configure the accept lifetime of a key, use the **accept-lifetime** command. To return to the default setting, use the **no** form of this command.

accept-lifetime {*start-time* | **local** *start-time*} {**duration** *seconds* | *end-time* | **infinite**}

no accept-lifetime {*start-time* | **local** *start-time*} {**duration** *seconds* | *end-time* | **infinite**}

Syntax Description		
<i>start-time</i>		Time to start. hh:mm:ss is the time format. The range is from 0 to 23: 0 and from 59: 0 to 59. The maximum size is 8 alphanumeric characters.
local <i>start-time</i>		Specifies the time in the local time zone. hh:mm:ss is the time format.
duration		Sets the key lifetime duration as follows: <ul style="list-style-type: none"> • Enter the number of days from 1 to 31. • Enter the name of the month. • Enter the year from the present to 2035.
<i>seconds</i>		Seconds. The range is from 1 to 2147483646 seconds.
<i>end-time</i>		Time to stop.
infinite		Allows the lifetime period to never expire.

Defaults None

Command Modes Keychain key configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines If you enter the **no accept-lifetime** command, the associated password is valid for authenticating incoming TCP segments.

This command requires the MPLS Services license.

Examples This example shows how to configure the accept lifetime of a key:

```
switch# configure terminal
switch(config)# key chain keychain1
switch(config-keychain)# key 10
switch(config-keychain-key)# accept-lifetime 10:00:00 Jan 13 2010 10:00:00 Jun 13 2010
```

```
switch(config-keychain-key) #
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

address-family

To configure an address family type that pertains to BGP, use the **address-family** command. To return to the default setting, use the **no** form of this command.

```
address-family {ipv4 {multicast | unicast}} {ipv6 {multicast | unicast | labeled unicast }} {vpn4
| vpn6 {unicast }}
```

```
no address-family {ipv4 {multicast | unicast}} {ipv6 {multicast | unicast | labeled unicast }}
{vpn4 | vpn6 {unicast }}
```

Syntax Description

ipv4	Specifies an IPv4 address family.
ipv6	Specifies an IPv6 address family.
multicast	Specifies a multicast address family.
unicast	Specifies a unicast address family.
vpn4	Specifies IPv4 VPN address family.
vpn6	Specifies IPv6 VPN address family.
unicast	Specifies a unicast sub address family.

Defaults

None

Command Modes

Router BGP configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

VPNv4 and VPNv6 options require MPLS Services license.

Examples

This example shows how to configure IPV4 multicast address family:

```
switch# configure t
switch(config)# router bgp 1
switch(config-router)# address-family ipv4 multicast
switch(config-router-af)#
```

This example shows how to configure IPV6 unicast address family:

```
switch# configure t
switch(config)# router bgp 1
```



```
switch(config-router)# address-family ipv6 unicast  
switch(config-router-af)#
```

This example shows how to configure unicast sub address family:

```
switch# configure t  
switch(config)# router bgp 1  
switch(config-router)# address-family VPNv4 unicast  
switch(config-router-af)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

advertise-labels

To configure label advertisements, use the **advertise-labels** command. To return to the default setting, use the **no** form of this command.

advertise-labels [**for** *prefix-list* [**to** *prefix-list*] | **interface** *interface number*]

no advertise-labels [**for** *prefix-list* [**to** *prefix-list*] | **interface** *interface number*]

Syntax Description

for	(Optional) Specifies the prefix list controls on destination prefixes.
<i>prefix-list</i>	Name of the prefix list.
to	(Optional) Specifies the prefix list controls on Label Distribution Protocol (LDP) peers.
interface	(Optional) Specifies the interface address.
<i>interface-number</i>	Interface number.

Defaults

None

Command Modes

LDP configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

To block label advertisements to the rest of the LDP peers, use the **no advertise-labels** command. This command requires the MPLS Services license.

Examples

This example shows how to configure the device to advertise the label on destination prefixes:

```
switch# configure terminal
switch(config)# mpls ldp configuration
switch(config-ldp)# advertise-labels for p1
switch(config-ldp)#
```

This example shows how to configure the device to advertise the label for designated destination prefixes to designated LDP peers:

```
switch# configure terminal
switch(config)# mpls ldp configuration
switch(config-ldp)# advertise-labels for p1 to peer1
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

affinity (LSP attribute configuration mode)

To configure attribute flags for links that comprise a label switched path (LSP), use the **affinity** command.

affinity [**mask** *value*]

Syntax Description	mask	(Optional) Link attribute to be checked. A 32-bit decimal number. Valid values are from 0x0 to 0xFFFFFFFF, representing 32 attributes (bits), where the value of an attribute is 0 or 1.
	<i>value</i>	Attribute values required for links carrying this tunnel. A 32-bit decimal number. Valid values are from 0x0 to 0xFFFFFFFF, representing 32 attributes (bits), where the value of an attribute is 0 or 1.

Defaults	Value default is 0x00000000 Mask default is 0x0000ffff
----------	---

Command Modes	LSP attributes configuration mode
---------------	-----------------------------------

SupportedUserRoles	network-admin vdc-admin
--------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	<p>The following holds true for all tunnel-te commands that can be specified both in "TE interface configuration mode" or path-option command line or "LSP attribute configuration mode":</p> <p>If a setting is specified for an LSP, either via the path-option command directly or by assigning an LSP attribute list to a path-option, takes precedence for that specific path-option.</p> <p>If no setting is specified for an LSP, then the LSP path-option inherits any setting specified in the tunnel-te configuration mode: affinity, auto-bw, priority, record-route, protection/fast-reroute.</p> <p>This command requires the MPLS Services license.</p>
------------------	---

Examples	This example shows how to configure attribute flags for links that comprise an LSP:
----------	---

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# lsp attributes 1
switch(config-lsp-attr)# affinity 0X0101 mask 0X0303
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering protocol (MPLS-TE).

affinity (TE interface configuration mode)

To configure attribute flags for links that comprise a label switched path (LSP), use the **affinity** command.

affinity [**mask** *value*]

Syntax Description	mask	(Optional) Link attribute to be checked. A 32-bit decimal number. Valid values are from 0x0 to 0xFFFFFFFF, representing 32 attributes (bits), where the value of an attribute is 0 or 1.
	<i>value</i>	Attribute values required for links carrying this tunnel. A 32-bit decimal number. Valid values are from 0x0 to 0xFFFFFFFF, representing 32 attributes (bits), where the value of an attribute is 0 or 1.

Defaults	Value default is 0x00000000 Mask default is 0x0000ffff
----------	---

Command Modes	TE interface configuration mode
---------------	---------------------------------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples This example shows how to configure attribute flags for links that comprise an LSP:

```
switch# configure terminal
switch(config)# interface tunnel-te 1
switch(config-if-te)# affinity 0x0101 mask 0x0303
switch(config-if-te)#
```

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

allowas-in

To allow an autonomous system (AS) path with the provider edge (PE) AS number (ASN) a specified number of times, use the **allowas-in** command.

allowas-in *number*

Syntax Description	<i>number</i>	Specified number to allow the AS path. The range is from 1 to 10.
--------------------	---------------	---

Defaults	None
----------	------

Command Modes	config-router-vrf-neighbor-af mode
---------------	------------------------------------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples This example shows how to allow an AS path with the PE ASN a specified number of times:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# router bgp 1.1
switch(config-router)# vrf vpn1
switch(config-router-vrf)# neighbor 209.165.201.1 remote-as 1.2
config-router-vrf-neighbor# address-family ipv4 unicast
switch(config-router-neighbor-af)# neighbor 33.0.1.63 remote-as 100
switch(config-router-vrf-neighbor)# address-family ipv4 unicast
switch(config-router-vrf-neighbor-af)# allowas-in 3
switch(config-router-vrf-af)#
```

Related Commands	Command	Description
	address-family ipv4 unicast	Enters address family configuration mode for configuring routing sessions that use standard IPv4 address prefixes.
	neighbor	Adds an entry to the BGP or multiprotocol BGP neighbor table for this VRF.

area

To configure the sham link on the provider edge (PE) interface within a specified Open Shortest Path First (OSPF) area and with the loopback interfaces specified by the IP addresses as endpoints, use the **area** command. To return to the default setting, use the **no** form of this command.

area *area-id* **sham-link** *source-address* *destination-address*

no area *area-id* **sham-link** *source-address* *destination-address*

Syntax Description

<i>area-id</i>	Area ID as an integer or IP address.
sham-link	Specifies the sham link and its parameters.
virtual-link	Specifies a virtual link and its parameters.
<i>source-address</i>	Source address.
<i>destination-address</i>	Destination address.

Defaults

None

Command Modes

Router configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to configure the maximum number of routes that can be stored in the virtual routing and forwarding (VRF) route table:

```
switch# configure t
switch(config)# feature ospf
switch(config)# router ospf p1
switch(config-router)# timer throttle lsa 0 50 500
switch(config-router)# vrf vpn1
switch(config-router-vrf)# area 1 sham-link 10.2.1.1 10.2.1.2
switch(config-router-vrf)#
```


Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

as-override

To specify to override the autonomous system number (ASN) when sending an update, use the **as-override** command.

as-override

Syntax Description This command does not have any arguments or keywords.

Defaults None

Command Modes config-router-vrf-neighbor-af mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify to override the ASN when sending an update:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# feature-set mpls
switch(config)# feature mpls l3vpn
switch(config)# feature bgp
switch(config)# router bgp 1.1
switch(config-router)# neighbor 209.165.201.1 remote-as 1.2
config-router-vrf-neighbor)# address-family ipv4 unicast
switch(config-router-neighbor-af)# send-community extended
switch(config-router-neighbor-af)# vrf 2hub
switch(config-router-vrf-neighbor)# address-family ipv4 unicast
switch(config-router-vrf-neighbor-af)# as-override
switch(config-router-vrf-af)#
```

authentication challenge

Command	Description
address-family ipv4 unicast	Enters address family configuration mode for configuring routing sessions that use standard IPv4 address prefixes.
allowas-in	Allows duplicate autonomous system number (ASN) in the AS path. Configure this parameter in the VPN address family configuration mode at the PE spokes and at the neighbor mode at the PE hub.

To perform a challenge or response handshake with the new Resource Reservation Protocol (RSVP) neighbors, use the **authentication challenge** command. To disable global authentication, use the **no** form of this command.

authentication [*neighbor address ip-address*] **challenge**

no authentication [*neighbor address ip-address*] **challenge**

Syntax Description	
neighbor	(Optional) Specifies the RSVP neighbor.
address ip-address	(Optional) Specifies the RSVP neighbor address.

Defaults None

Command Modes RSVP configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to perform a challenge handshake with the new RSVP neighbors:

```
switch# configure terminal
switch(config)# ip rsvp
switch(config-ip-rsvp)# authentication neighbor 1.1.1.1 challenge
switch(config-ip-rsvp)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

authentication key-chain

To activate the Resource Reservation Protocol (RSVP) cryptographic authentication for a neighbor, use the **authentication key-chain** command. To disable global authentication, use the **no** form of this command.

authentication [**neighbor address** *ip-address*] **key-chain** *key-chain-name*

no authentication [**neighbor address** *ip-address*] **key-chain** *key-chain-name*

Syntax Description	Parameter	Description
	neighbor	(Optional) Specifies the RSVP neighbor.
	address <i>ip-address</i>	(Optional) Specifies the RSVP neighbor address.
	<i>key-chain-name</i>	Key chain name.

Defaults None

Command Modes RSVP configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify the authentication password keychain:

```
switch# configure terminal
switch(config)# ip rsvp
switch(config-ip-rsvp)# authentication neighbor 1.1.1.1 key-chain key1
switch(config-ip-rsvp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

authentication lifetime

To control how long the Resource Reservation Protocol (RSVP) maintains security associations with a neighbor, use the **authentication lifetime** command. To revert to the default lifetime, use the **no** form of this command.

authentication [**neighbor address** *ip-address*] **lifetime** *hh:mm:ss*

no authentication [**neighbor address** *ip-address*] **lifetime** *hh:mm:ss*

Syntax Description

neighbor	(Optional) Specifies the RSVP neighbor.
address <i>ip-address</i>	(Optional) Specifies the RSVP neighbor address.
<i>hh:mm:ss</i>	Lifetime value in seconds. The range is from 30 to 86400 seconds.

Defaults

30 minutes

Command Modes

RSVP configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to specify the maximum lifetime of a neighbor authentication state:

```
switch# configure terminal
switch(config)# ip rsvp
switch(config-ip-rsvp)# authentication neighbor 1.1.1.1 lifetime 60
switch(config-ip-rsvp)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

authentication type

To configure the algorithm used to generate cryptographic signatures messages for a neighbor, use the **authentication type** command. To revert to the default type, use the **no** form of this command.

```
authentication [neighbor address ip-address] type {md5 | sha-1}
```

```
no authentication [neighbor address ip-address] type {md5 | sha-1}
```

Syntax Description	Parameter	Description
	neighbor	(Optional) Specifies the Resource Reservation Protocol (RSVP) neighbor.
	address	(Optional) Specifies the RSVP neighbor address.
	<i>ip-address</i>	RSVP neighbor address.
	md5	Specifies the Rivest, Shamir, and Adleman (RSA) Message Digest 5 hash algorithm.
	sha-1	Specifies the National Institute of Standards and Technology (NIST) Secure Hash Algorithm 1.

Defaults md5

Command Modes RSVP configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify the MD5 authentication algorithm:

```
switch# configure terminal
switch(config)# ip rsvp
switch(config-ip-rsvp)# authentication neighbor 1.1.1.1 type md5
switch(config-ip-rsvp)#
```

Related Commands#	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

authentication window-size

To configure the tolerance for the window size for an out-of-sequence message, use the **authentication window-size** command. To revert to the default type, use the **no** form of this command.

authentication [**neighbor address** *ip-address*] **window-size** *value*

no authentication [**neighbor address** *ip-address*] **window-size** *value*

Syntax Description	neighbor	(Optional) Specifies the Resource Reservation Protocol (RSVP) neighbor.
	address <i>ip-address</i>	(Optional) Specifies the RSVP neighbor address.
	<i>value</i>	Maximum number of messages allowed in a window. The range is from 1 to 64.

Defaults 1

Command Modes RSVP configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines Use **authentication window-size** command to specify the tolerance for an out-of-sequence messages for a neighbor or globally.

This command requires the MPLS Services license.

Examples This example shows how to configure the tolerance for an out-of-sequence message for a neighbor:

```
switch# configure terminal
switch(config)# ip rsvp
switch(config-ip-rsvp)# authentication neighbor 1.1.1.1 window-size 1
switch(config-ip-rsvp)#
```

Related Commands#	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

autoroute announce

To announce the traffic-engineering tunnel to an Interior Gateway Protocol (IGP), use the **autoroute announce** command. To restore the system to its default condition, use the **no** form of this command.

autoroute announce

no autoroute announce

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes TE interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to announce the tunnel to IGP:

```
switch# configure terminal
switch(config)# interface tunnel-te 1
switch(config-if-te)# autoroute announce
switch(config-if-te)#
```

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

auto-bw (LSP attribute configuration mode)

To configure the automatic bandwidth configuration, use the **auto-bw** command.

auto-bw [**frequency** *secs*] [**max-bw** *kbps*] [**min-bw** *kbps*] [**collect-bw**]

no auto-bw [**frequency** *secs*] [**max-bw** *kbps*] [**min-bw** *kbps*] [**collect-bw**]

Syntax Description

frequency	(Optional) Specifies the interval between bandwidth adjustments.
<i>secs</i>	(Optional) Seconds. The range is from 300 to 604800 seconds.
max-bw	(Optional) Specifies the maximum automatic bandwidth, in kbps, for this path option.
<i>kbps</i>	(Optional) Kilobits per second. The range is from 0 to 4294967295.
min-bw	(Optional) Specifies the minimum automatic bandwidth, in kbps, for this path option.
collect-bw	(Optional) Collects the output rate information for the path option but does not adjust the bandwidth of the path option.

Defaults

If the command is entered with no optional keywords, automatic bandwidth adjustment for the LSP is enabled, with adjustments made every 24 hours and with no constraints on the bandwidth adjustments made. If the **collect-bw** keyword is entered, the bandwidth is sampled but not adjusted, and the other options, if any, are ignored. If the **collect-bw** keyword is not entered and some, but not all of the other keywords are entered, the defaults for the keywords not entered are: **frequency**, every 24 hours; **min-bw**, unconstrained (0); **max-bw**, unconstrained.

Command Modes

LSP attribute configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

The following conditions apply for all traffic-engineering tunnel (TE) commands that can be specified both in TE interface configuration mode, **path-option** command line or LSP attribute configuration mode:

- If a setting is specified for a label switched path (LSP) either via the **path-option** command directly or by assigning an LSP attribute list to a path option, this setting takes precedence for that specific path option.

- If no setting is specified for an LSP, then the LSP/path option inherits any setting specified in the tunnel-te configuration mode such as affinity, auto-bw, priority, record-route, protection/fast-reroute.

The **bandwidth** command configures the initial tunnel bandwidth, which is adjusted by the auto bandwidth mechanism.

This command requires the MPLS Services license.

Examples

This example shows how to configure the automatic bandwidth configuration:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# lsp attributes 1
switch(config-lsp-attr)# auto-bw
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

auto-bw (TE interface configuration mode)

To configure the automatic bandwidth configuration, use the **auto-bw** command. To restore the system to its default condition, use the **no** form of this command.

```
auto-bw [frequency secs] [max-bw kbps] [min-bw kbps] [collect-bw]
```

```
no auto-bw [frequency secs] [max-bw kbps] [min-bw kbps] [collect-bw]
```

Syntax Description

frequency	(Optional) Specifies the interval between bandwidth adjustments.
<i>secs</i>	(Optional) Seconds. The range is from 300 to 604800 seconds.
max-bw	(Optional) Specifies the maximum automatic bandwidth, in kbps, for this path option.
<i>kbps</i>	(Optional) Kilobits per second. The range is from 0 to 4294967295.
min-bw	(Optional) Specifies the minimum automatic bandwidth, in kbps, for this path option.
collect-bw	(Optional) Collects the output rate information for the path option but does not adjust the bandwidth of the path option.

Defaults

If the command is entered with no optional keywords, automatic bandwidth adjustment for the LSP is enabled, with adjustments made every 24 hours and with no constraints on the bandwidth adjustments made. If the **collect-bw** keyword is entered, the bandwidth is sampled but not adjusted, and the other options, if any, are ignored. If the **collect-bw** keyword is not entered and some, but not all of the other keywords are entered, the defaults for the keywords not entered are: **frequency**, every 24 hours; **min-bw**, unconstrained (0); **max-bw**, unconstrained.

Command Modes

TE interface configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

The **bandwidth** command configures the initial tunnel bandwidth, which is adjusted by the auto bandwidth mechanism.

This command requires the MPLS Services license.

Examples

This example shows how to enable automatic bandwidth adjustment for the tunnel and controls how the bandwidth for a tunnel is adjusted:

```
switch# configure terminal  
switch(config)# interface tunnel-te 1  
switch(config-if-te)# auto-bw max-bw 2000 min-bw 1000  
switch(config-if-te)#
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

auto-bw timers

To enable automatic bandwidth adjustment on a platform and begin sampling the output rate for tunnels that have been configured for automatic bandwidth adjustment, use the **auto-bw timers** command. To restore the system to its default condition, use the **no** form of this command.

auto-bw timers [*frequency seconds*]

no auto-bw timers [*frequency seconds*]

Syntax Description

frequency	(Optional) Specifies how often tunnel-te output rates should be sampled.
<i>seconds</i>	(Optional) Interval in seconds, for sampling the output rate of each tunnel configured for automatic bandwidth. The range is 1 through 604800. The recommended value is 300.

Defaults

When the optional **frequency** keyword is not specified, the sampling interval is 300 seconds (5 minutes).

Command Modes

Traffic engineering global configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

The **bandwidth** command configures the initial tunnel bandwidth, which is adjusted by the auto bandwidth mechanism.

This command requires the MPLS Services license.

Examples

This example shows how to enable automatic bandwidth adjustment on a platform that has been configured for automatic bandwidth adjustment:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# auto-bw timers frequency 600
switch(config-te)#
```

Related Commands

Command	Description
mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

autonomous-system

To specify the autonomous system number (ASN) for this address family for the customer site, use the **autonomous-system** command.

autonomous-system *as-number*

Syntax Description	<i>as-number</i>	AS number. The AS number can be a 16-bit integer or a 32-bit integer in the form of a higher 16-bit decimal number and a lower 16-bit decimal number in the xx.xx format.
---------------------------	------------------	---

Defaults	None
-----------------	------

Command Modes	config-router-vrf mode
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Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to specify the ASN for an address family for a customer site:

```
switch# configure terminal
switch(config)# router eigrp Test1
switch(config-router)# vrf vpn1
switch(config-router-vrf)# address-family ipv4 unicast
switch(config-router-vrf-af)# redistribute bgp 1.0 route-map BGPMap
switch(config-router-vrf-af)# autonomous-system 1.3
```

Related Commands	Command	Description
	address-family ipv4 unicast	Enters address family configuration mode for configuring routing sessions that use standard IPv4 address prefixes.
	send-community extended	Specifies that a community's attribute should be sent to a BGP neighbor.



B Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with B.

backoff

To configure session setup delay parameters for the Label Distribution Protocol (LDP) backoff mechanism, use the **backoff** command. To return to the default setting, use the **no** form of this command.

backoff *initial-backoff max-backoff*

no backoff

Syntax Description		
	<i>initial-backoff</i>	Initial backoff value in seconds. The range is from 5 to 2147483.
	<i>max-backoff</i>	Maximum backoff value in seconds. The range is from 5 to 2147483.

Defaults	
	None

Command Modes	
	LDP configuration mode

Supported User Roles	
	network-admin vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	
	This command requires the MPLS Services license.

Examples This example shows how to setup delay parameters for the LDP backoff mechanism:

```
switch(config)# mpls ldp configuration
switch(config-ldp)# backoff 30 240
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

backup-bw

To specify whether this tunnel-te, when used as a backup tunnel, should provide bandwidth protection, and how much, use the **backup-bw** command. To restore the system to its default condition, use the **no** form of this command.

backup-bw *bandwidth*

no backup-bw

Syntax Description	<i>bandwidth</i>	Amount of allocatable backup bandwidth. The range is from 1 to 4294967295.
---------------------------	------------------	--

Defaults	None
-----------------	------

Command Modes	TE interface configuration mode
----------------------	---------------------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to associate the bandwidth with a backup tunnel:

```
switch# configure terminal
switch(config)# interface tunnel-te 2
switch(config-if-te)# backup-bw 1000
switch(config-if-te)#
```

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

bandwidth (LSP attribute configuration mode)

To configure the label switched path (LSP) bandwidth, use the **bandwidth** command. To restore the system to its default condition, use the **no** form of this command.

bandwidth *kbps*

no bandwidth

Syntax Description	<i>kbps</i>	Number of kilobits per second set aside for the path option. The range is from 1 to 4294967295.
---------------------------	-------------	---

Defaults	None
-----------------	------

Command Modes	LSP attribute configuration mode
----------------------	----------------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines The following conditions apply for all tunnel engineering (TE) commands that can be specified both in "TE interface configuration mode; path-option command line, or LSP attribute configuration mode:

- If a setting is specified for a label switched path (LSP), either via the path-option command directly or by assigning an LSP attribute list to a path-option, takes this setting precedence for that specific path option.
- If no setting is specified for an LSP, then the LSP/path-option inherits any setting specified in the tunnel-te configuration mode: affinity, auto-bw, priority, record-route, protection/fast-reroute.

The **bandwidth** command configures the initial tunnel bandwidth, which is adjusted by the auto bandwidth mechanism.

This command requires the MPLS Services license.

Examples This example shows how to configure the LSP bandwidth:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# lsp attributes 1
switch(config-lsp-attr)# bandwidth 5000
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

bandwidth (TE interface configuration mode)

To configure the bandwidth for a Multiprotocol Label Switching (MPLS) traffic engineering (TE) tunnel, use the **bandwidth** command. To restore the system to its default condition, use the **no** form of this command.

bandwidth *bandwidth*

no bandwidth

Syntax Description	<i>bandwidth</i>	Bandwidth in kilobits per second. The range is from 1 to 4294967295.
--------------------	------------------	--

Defaults	0
----------	---

Command Modes	TE interface configuration mode
---------------	---------------------------------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples	This example shows how to configure the bandwidth for a MPLS TE tunnel:
----------	---

```
switch# configure terminal
switch(config)# interface tunnel-te 1
switch(config-if-te)# bandwidth 250
switch(config-if-te)#
```

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

bfd interval

To set the Bidirectional Forwarding Detection (BFD) intervals for this interface, use the **bfd interval** command. To restore the system to its default condition, use the **no** form of this command.

bfd interval *milliseconds* **min_rx** *milliseconds* **multiplier** *interval-multiplier*

no bfd interval

Syntax Description		
<i>milliseconds</i>		TX interval in milliseconds, which is the required rate at which control packets can be received. The range is from 50 to 999 milliseconds.
min_rx		Specifies minimum RX interval, which is the desired rate for transmitting control packets. The range is from 50 to 999 milliseconds.
multiplier		Specifies the detect multiplier for BFD sessions.
<i>interval-multiplier</i>		Multiplier interval. The range is from 1 to 50 milliseconds.

Defaults	
	Interval milliseconds-50
	Min_rx_50
	Multiplier interval-multiplier-3

Command Modes	
	Interface configuration mode

Supported User Roles	
	network-admin vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	
	This command requires the MPLS Services license.

Examples	
	This example shows how to set the BFD intervals:
	<pre>switch# configure terminal switch# configure terminal switch(config)# interface ethernet 2/2 switch(config-if)# bfd interval 100 min_rx 100 multiplier 4</pre>

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

bfd slow-timer

To configure the slow mode timer for sessions, use the **bfd slow-timer** command. To restore the system to its default condition, use the **no** form of this command.

bfd slow-timer *milliseconds*

no bfd slow-timer *milliseconds*

Syntax Description	<i>milliseconds</i>	Slow rate timer in milliseconds. The range is from 1000 to 30000 milliseconds.
---------------------------	---------------------	--

Defaults	None
-----------------	------

Command Modes	Global configuration mode
----------------------	---------------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to configure the slow mode timer for sessions:

```
switch# configure terminal
switch(config)# bfd slow-timer 1000
switch(config)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

bridge-domain

To enter bridge-domain configuration mode and configure a bridge domain, use the **bridge-domain** command. To remove the bridge-domain configurations, use the **no** form of this command.

bridge-domain *domain-id*

no bridge-domain *domain-id*

Syntax Description	<i>domain-id</i>	Bridge-domain ID. The range is defined by the system-bridge-domain configuration.
--------------------	------------------	---

Defaults	None
----------	------

Command Modes	Global configuration mode
---------------	---------------------------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines

Removing the bridge-domain configuration does not remove the underlying VLAN. If a VLAN is associated with a bridge domain, you cannot remove the VLAN without first removing the bridge domain. To remove the underlying VLAN, use the **no vlan** command after you remove the bridge domain.

This command requires the MPLS Services license.

Examples

This example shows how to enter bridge-domain configuration mode and configure a bridge domain:

```
switch# configure terminal
switch(config)# bridge-domain 10
switch(config)#
```

This example shows how to remove the bridge-domain configuration including port associations:

```
switch(config)# no bridge-domain 10
switch(config)#
```

Related Commands	Command	Description
	system bridge-domain	Identifies the IDs that are available for bridge-domain configurations.



C Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with C.

cbts-member tunnel-te

To configure a class-based tunnel selection (CBTS) tunnel interface type, use the **cbts-member tunnel-te** command. To restore the system to its default condition, use the **no** form of this command.

cbts-member tunnel-te *number*

no cbts-member tunnel-te *number*

Syntax Description	<i>number</i>	Tunnel interface number. The range is from 0 to 65503.
---------------------------	---------------	--

Defaults	None
-----------------	------

Command Modes	TE Interface configuration mode
----------------------	---------------------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	You cannot configure the traffic engineering (TE) commands on these class-based tunnel selection (CBTS) member tunnels (auto-bw ; backup-bw ; description ; destination ; fowarding-adjacency ; inherit ; source).
-------------------------	---



Note

All the tunnel-te configured commands, except for exp and path-option, are inherited by the CBTS-member LSP when they are configured on the tunnel headend interface. If the command is entered independently of or on the CBTS-member LSP, it takes precedence and overrides the config on the tunnel headend interface for that CBTS-member LSP. When the configuration is removed from the cbts-member LSP, the configuration on the tunnel headend interface is inherited by the CBTS-member LSP.

This command requires the MPLS Services license.

Examples	This example shows how to configure a CBTS tunnel interface type:
-----------------	---

```
switch# configure terminal
switch(config)# interface tunnel-te 1
switch(config-if-te)# cbts-member tunnel-te 251
switch(config-cbts-member)
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

class

To specify the class name of the policy that you want to create or change, use the **class** command. To return to the default setting, use the **no** form of this command.

```
class [type qos] {class-map-name | class-default}
```

```
no class [type qos] {class-map-name | class-default}
```

Syntax Description

type	(Optional) Specifies the type of class.
qos	(Optional) Specifies the match on a QoS class.
<i>class-map-name</i>	Name of the class to configure or modify the policy. The maximum size is 40 alphanumeric characters.
class-default	Specifies a predefined class to which traffic is directed if that traffic does not match any of the match criteria in the configured class maps.

Defaults

None

Command Modes

Class-map configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
4.0(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to specify the class name of the policy that you want to create or change:

```
switch# configure terminal
switch(config)# policy-map type qos policy1
switch(config-pmap-qos)# class class2
switch(config-pmap-c-qos)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

class-map

To configure a class map, use the **class-map** command. To return to the default setting, use the **no** form of this command.

```
class-map [type qos] [match-all] [match-any] class-map-name
```

```
no class-map [type qos] [match-all] [match-any] class-map-name
```

Syntax Description	type	(Optional) Specifies the type of the class map.
	qos	(Optional) Specifies the QoS class.
	match-all	(Optional) Specifies logical AND for all match statements under this class map.
	match-any	(Optional) Specifies logical OR for all match statements under this class map.
	<i>class-map-name</i>	Class-map name. The maximum size is case-sensitive, alphanumeric 40 characters.

Defaults None

Command Modes Class-map configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	4.0(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify the logical AND for all match statements under this class map:

```
switch# configure terminal
switch(config)# class-map type qos match-all class-2
switch(config-cmap-qos)#
```

This example shows how to specify the logical OR for all match statements under this class map:

```
switch# configure terminal
switch(config)# class-map type qos match-any class-2
switch(config-cmap-qos)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

control-word

To enable the control word support, use the **control-word** command.

control-word {**exclude** | **include**}

Syntax Description	exclude	Specifies to exclude the control word in the pseudowire packet.
	include	Specifies to include the control word in the pseudowire packet.

Defaults None

Command Modes config-if-pseudowire mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines A device can receive a packet with or without the control word and the control word capability is negotiated with the peer. However, the device cannot generate a sequence number in the control word if the control word is added to the ingress device.

This command requires the MPLS Services license.

Examples This example shows how to enable the control word support:

```
switch# configure terminal
switch(config)# interface pseudowire 12
switch(config-if-pseudowire)# control-word include
switch(config-if-pseudowire)#
```

Related Commands	Command	Description
	interface pseudowire	Enters interface pseudowire configuration mode and configures a static pseudowire logical interface.

copy running-config startup-config

To copy the running configuration to the startup configuration, use the **copy running-config startup-config** command.

copy running-config startup-config

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines When you disable the MPLS Label Distribution Protocol (LDP) on the device, no LDP commands are available.

This command requires the MPLS Services license.

Examples This example shows how to copy the running configuration to the startup configuration:

```
switch(config)# copy running-config startup-config
[#####] 100%
switch(config)#
```

Related Commands	Command	Description
	show running-config interface	Displays information about the interface configuration.

cost-limit

To configure the cost-limit for an individual TE tunnel, use the **cost-limit** command.

```
cost-limit max-cost
```

Syntax Description	<i>max-cost</i>	The maximum permitted cost for the tunnel path.
Command Modes	TE Interface Configuration (config-if)	
Supported Use Roles	network-admin vdc-admin	
Command History	Release	Modification
	7.3(0)D1(1)	This command was introduced.

Examples

The following example shows how to configure cost limit for an individual TE tunnel:

```
switch# configure terminal
switch(config)# interface tunnel-te number
switch(config-if)# cost-limit 4
switch(config-if)#
```




D Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with D.

demand-circuit

To specify the sham link as a demand circuit (DC) by the Open Shortest Path First (OSPF) in order to reduce the traffic flow over the sham link, use the **demand-circuit** command.

demand-circuit

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes config-device-vrf-slink mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify the sham link as a DC by the OSPF in order to reduce the traffic flow over the shamlink:

```
switch# configure terminal
switch(config)# feature-set mpls
switch(config)# feature mpls l3vpn
switch(config)# feature ospf
switch(config)# device ospf test1
switch(config-device)# vrf vpn1
switch(config-device-vrf)# area 1 sham-link 10.2.1.1 10.2.1.2
switch(config-device-vrf-slink)# demand circuit
switch(config-device-vrf-slink)#
```

Related Commands	Command	Description
	area	Configures the sham link on the PE interface within a specified OSPF area and with the loopback interfaces specified by the IP addresses (source and destination) as endpoints.
	feature mpls l3vpn	Enables the MPLS Layer 3 VPN feature.
	feature-set mpls	Enables the MPLS feature-set.

destination

To configure the destination for the tunnel-te interface, use the **destination** command. To restore the system to its default condition, use the **no** form of this command.

destination *ip-address*

no destination

Syntax Description	<i>ip-address</i>	IP address is in dotted decimal notation.
Defaults	None	
Command Modes	TE interface configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to configure the destination for the tunnel: <pre>switch# configure terminal switch(config)# interface tunnel-te 1 switch(config-if-te)# destination 10.1.1.4 switch(config-if-te)#</pre>	
Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

device ospf

To enable Open Shortest Path First (OSPF) and enter device configuration mode, use the **device ospf** command.

device ospf *instance-tag*

Syntax Description

<i>instance-tag</i>	Instance-tag. It can be any case-sensitive, alphanumeric string up to 20 characters.
---------------------	--

Defaults

None

Command Modes

Global configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
6.2.2	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to enable OSPF and enter device configuration mode:

```
switch# configure terminal
switch(config)# feature-set mpls
switch(config)# feature mpls l3vpn
switch(config)# feature ospf
switch(config)# device ospf test1
switch(config)#
```

Related Commands

Command	Description
feature mpls l3vpn	Enables the MPLS Layer 3 VPN feature.
feature-set mpls	Enables the MPLS feature-set.

disable-peer-as-check

To disable checking the peer autonomous system number (ASN) during route advertisement, use the **disable-peer-as-check** command.

disable-peer-as-check

Syntax Description This command does not have any arguments or keywords.

Defaults None

Command Modes config-router-vrf-neighbor-af mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to disable checking the peer ASN during a route advertisement:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# feature-set mpls
switch(config)# feature mpls l3vpn
switch(config)# feature bgp
switch(config)# router bgp 1.1
switch(config-router)# neighbor 33.0.1.63 remote-as 100
config-router-vrf-neighbor# address-family ipv4 unicast
switch(config-router-neighbor-af)# neighbor 33.0.1.63 remote-as 100
switch(config-router-vrf-neighbor)# address-family ipv4 unicast
switch(config-router-vrf-neighbor-af)# disable-peer-as-check
switch(config-router-vrf-af)#
```

Related Commands	Command	Description
	address-family ipv4 unicast	Enters address family configuration mode for configuring routing sessions that use standard IPv4 address prefixes.

Command	Description
allows-in	Allows duplicate autonomous system number (ASN) in the AS path. Configure this parameter in the VPN address family configuration mode at the PE spokes and at the neighbor mode at the PE hub.
neighbor	Adds an entry to the BGP or multiprotocol BGP neighbor table for this VRF.

discovery hello

To configure the hold time or interval for directly connected neighbors, use the **discovery hello** command. To return to the default setting, use the **no** form of this command.

discovery hello { **holdtime** *seconds* | **interval** *seconds* }

no discovery hello { **holdtime** | **interval** }

Syntax Description	Parameter	Description
	holdtime	Specifies the period of time that a discovered LDP neighbor is remembered without receipt of an LDP hello message from the neighbor.
	interval	Specifies the interval in seconds between the sending of consecutive hello messages.
	<i>seconds</i>	Hold time in Seconds. The range is from 1 to 65535 seconds.

Defaults Default holdtime is 15 seconds, interval is 5 seconds

Command Modes LDP configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines When you disable the Multiprotocol Label Switching Label Distribution Protocol (LDP) on the device, no LDP commands are available.

This command requires the MPLS Services license.

Examples This example shows how to configure the LDP discovery hello holdtime:

```
switch(config)# mpls ldp configuration
switch(config-ldp)# discovery hello holdtime 10
switch(config-ldp)#
```

This example shows how to configure the LDP discovery hello interval:

```
switch(config)# mpls ldp configuration
switch(config-ldp)# discovery hello interval 10
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

discovery targeted-hello

To configure the router to respond to requests for targeted-hello messages from all neighbors or from neighbors specified by the optional prefix list or configure the hold time or interval for neighbors that are not directly connected, use the **discovery targeted-hello** command. To return to the default setting, use the **no** form of this command.

```
discovery targeted-hello {accept [from prefix-list] | holdtime seconds | interval seconds}
```

```
no discovery targeted-hello {accept [from prefix-list] | holdtime seconds | interval seconds}
```

Syntax Description		
accept		Specifies to accept targeted hellos.
from		(Optional) Specifies the prefix list from which you can specify acceptable targeted hello sources
<i>prefix-list</i>		(Optional) Name of the prefix list.
holdtime		Specifies the period of time that a discovered Label Distribution Protocol (LDP) neighbor is remembered without receipt of an LDP hello message from the neighbor
interval		Specifies the period of time between the sending of consecutive hello messages.
<i>seconds</i>		Hold time in seconds. The range is from 1 to 65535.

Defaults

Default value for holdtime is 90 seconds.
Default value for interval is 10 seconds.

Command Modes LDP configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure the LDP discovery targeted hello holdtime:

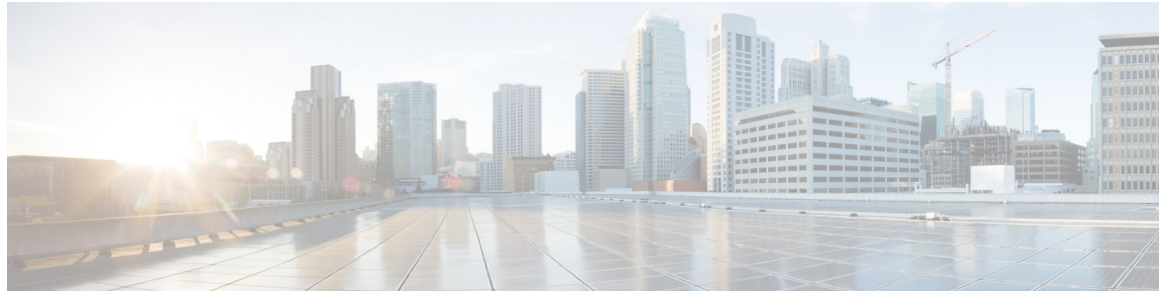
```
switch(config)# mpls ldp configuration
switch(config-ldp)# discovery targeted-hello holdtime 1
switch(config-ldp)#
```

This example shows how to configure the LDP discovery targeted hello interval:

```
switch(config)# mpls ldp configuration
switch(config-ldp)# discovery targeted-hello interval 1
switch(config-ldp)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).



E Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with E.

echo revision

To specify the revision number of the echo packet's default values, use the **echo revision** command.

echo revision{3 | 4}

Syntax Description	3	Specifies the draft-ietf-mpls-ping-03 (Revision 2).
	4	Specifies RFC 4379 compliant (default).

Defaults	4
----------	---

Command Modes	config-mpls mode
---------------	------------------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	This command requires an MPLS license.
------------------	--

Examples	This example shows how to specify the revision number of the echo packet's default values:
	<pre>switch# configure terminal switch (config)# mpls oam switch(config)# echo revision 3 switch(config)#</pre>

Related Commandss	Command	Description
	mpls oam	Enters MPLS OAM configuration mode and customizes the default behavior of echo packets.

echo vendor-extension

To send the Cisco-specific type, length, value (TLV) extension, use the **echo vendor-extension** command.

echo vendor-extension

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes config-mpls mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command requires an MPLS license.

Examples This example shows how to send the Cisco-specific type, length, value (TLV) extensions with echo packets:

```
switch# configure terminal
switch (config)# mpls oam
switch(config)# echo revision 3
switch(config)# echo vendor-extension
switch(config)#
```

Related Commands	Command	Description
	echo revision	Specifies the revision number of the echo packet's default values.
	mpls oam	Enters MPLS OAM configuration mode and customizes the default behavior of echo packets.

encapsulation dot1q

To configure the matching criteria for mapping dot1q frames on an ingress interface to this interface, use the **encapsulation dot1q** command.

encapsulation dot1q *vlan-id*

Syntax Description	<i>vlan-id</i>	VLAN ID. The range is from 2 to 967.
--------------------	----------------	--------------------------------------

Defaults	Deencapsulated
----------	----------------

Command Modes	Global configuration mode
---------------	---------------------------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	The subinterfaces between the customer-edge (CE) and provide edge (PE) routers that are running Ethernet over MPLS (EoMPLS) must be in the same subnet. All other subinterfaces and backbone devices do not need to be in the same subnet.
------------------	--

This command requires the MPLS Services license.

Examples	This example shows how to configure the matching criteria for mapping dot1q frames on an ingress interface to this interface:
----------	---

```
switch# configure terminal
switch(config)# interface ethernet 4/0/0.1
switch(config-if)# encapsulation dot1q 100
switch(config-if)#
```

Related Commands	Command	Description
	internetworking	Specifies the type of pseudowire and the type of traffic that can flow across the network
	l2vpn xconnect context	Enters Xconnect configuration mode and establishes a Layer 2 VPN (L2VPN) context for identifying the two members in a VPWS, multi segment pseudowire, or local connect service.

encapsulation mpls

To specify the Multiprotocol Label Switching (MPLS) encapsulation for a pseudowire port profile, use the **encapsulation mpls** command.

encapsulation mpls

Syntax Description This command does not have any arguments or keywords.

Defaults None

Command Modes config-if- prof configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify the MPLS encapsulation for a pseudowire port profile:

```
switch# configure terminal
switch(config)# port-profile type pseudowire AToM
switch(config-if-prof)# encapsulation mpls
switch(config-pseudowire-mpls)#
```

Related Commands	Command	Description
	interface pseudowire	Enters interface pseudowire configuration mode and configures a static pseudowire logical interface.
	port-profile type pseudowire	Enters interface port-profile configuration mode and configures a pseudowire port profile.
	state enabled	Enables the interface port profile.

exclude-address

To specify an IP address while configuring a traffic engineering (TE) explicit-path that TE should avoid using while calculating the label switched path (LSP), use the **exclude-address** command.

exclude-address *ip-address*

Syntax Description	<i>ip-address</i>	Link address or a node address (a node's TE router-ID).
---------------------------	-------------------	---

Defaults	None
-----------------	------

Command Modes	Explicit-path configuration mode
----------------------	----------------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines Both primary and backup tunnel paths can be dynamic or explicit and they do not have to use the **exclude-address**. Because backup tunnels must avoid the protected link or node, you should use the **exclude-address** command.

When using the **exclude-address** command to specify the path for a backup tunnel, you must exclude an interface IP address to avoid a link (for creating a next-hop [NHOP] backup tunnel), or a router ID address to avoid a node (for creating an next-next-hop [NNHOP] backup tunnel).

This command requires the MPLS Services license.

Examples This example shows how to specify an address to exclude while configuring an explicit-path:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# explicit-path name avoid-protected-link
switch(config-te-expl-path)# exclude-address 3.3.3.3
1: exclude-address 3.3.3.3
switch(config-te-expl-path)#
```

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

exp

To configure the EXP bits that are forwarded over the member tunnel, use the **exp** command.

exp [*list-of-exp-values*] [**default**]

Syntax Description	<i>list-of-exp-values</i>	EXP bits allowed for the interface. Enter up to eight EXP values separated by spaces. Values range from 0 to 7. The default is the EXP values that were not configured or a specific member tunnel.
	default	(Optional) Specifies the default tunnel number.

Defaults The member tunnel will forward the packets with the EXP bits that are not being forwarded by other member tunnels that are part of the same bundle.

Command Modes cbts-member configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines You cannot configure the following traffic engineering (TE) commands on a class-based tunnel selection (CBTS) member tunnels (**auto-bw**; **autoroute**; **backup-bw**; **description**; **destination**; **fowarding-adjacency**; **inherit**; **source**).

This command requires the MPLS Services license.

Examples This example shows how to configure the EXP bits that are forwarded over the member tunnel:

```
switch# configure terminal
switch(config)# interface tunnel-te 1
switch(config-if-te)# cbts-member tunnel-te 251
switch(config-cbts-member)# exp 5
```

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

explicit-null

To configure an advertised explicit null label in place of an implicit null label, use the **explicit-null** command. To return to the default setting, use the **no** form of this command.

explicit-null [**for** *prefix-list* | **to** *prefix-list* | **for** *prefix-list* **to** *prefix-list*]

no explicit-null [**for** *prefix-list* | **to** *prefix-list* | **for** *prefix-list* **to** *prefix-list*]

Syntax Description		
for	(Optional) Specifies the prefix list that specifies the controls on destination prefixes.	
<i>prefix-list</i>	(Optional) Prefix list.	
to	(Optional) Specifies the access list that specifies the controls on Label Distribution Protocol (LDP) peers.	

Defaults None

Command Modes LDP configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure an explicit null label on an egress Label Switching Router (LSR), which causes that LSR to advertise the explicit null label to all adjacent MPLS routers:

```
switch(config-ldp)# explicit-null
switch(config-ldp)#
```

This example shows how to configure an explicit null label and specify the **for** keyword with a prefix list:

```
switch(config-ldp)# explicit-null for prefix-list
switch(config-ldp)#
```

This example shows how to configure an explicit null label and specify the **to** keyword with a prefix list:

```
switch(config-ldp)# explicit-null to prefix-list
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

explicit-path

To configure an IP explicit path to be used by tunnel-te label switched path (LSPs), or a path dynamically calculated from the TE topology database, use the **explicit-path** command. To restore the system to its default condition, use the **no** form of this command.

```
explicit-path { name path-name | identifier number }
```

```
no explicit-path { name path-name | identifier number }
```

Syntax Description

name	Specifies the explicit path by name.
<i>path-name</i>	Path name. The maximum size is 63 alphanumeric characters.
identifier	Specifies the explicit path by number.
<i>number</i>	Identifier number. The range is from 1 to 65535.

Defaults

None

Command Modes

TE configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to configure the tunnel to use a named IP explicit path or a path dynamically calculated from the TE topology database:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# explicit-path name avoid-protected-link
switch(config-te-expl-path)#
```

Related Commands

Command	Description
mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).



F Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with F.

fast-reroute (TE interface configuration mode)

To enable an Multiprotocol Label Switching (MPLS) traffic engineering (TE) tunnel to request a backup tunnel to protect against a link or node failure, use the **fast-reroute** command. To restore the system to its default condition, use the **no** form of this command.

fast-reroute [bw-protect] [node-protect]

no fast-reroute

Syntax Description	bw-protect	(Optional) Sets the bandwidth protection desired bit so that backup bandwidth protection is requested at each hop that the label switched path (LSP) traverses.
	node-protect	(Optional) Sets the node protection desired bit so that node protection is requested at each hop the LSP traverses.

Defaults None

Command Modes TE interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify bandwidth protection:

```
switch# configure terminal
switch(config)# interface tunnel-te 1000
switch(config-if-te)# fast-reroute bw-protect
switch(config-if-te)#
```

This example shows how to specify node protection:

```
switch# configure terminal
switch(config)# interface tunnel-te 1000
switch(config-if-te)# fast-reroute node-protect
switch(config-if-te)#
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

fast-reroute backup-prot-preempt optimize-bw

To change the backup protection preemption algorithm from minimizing the number of label switched paths (LSPs) that are demoted to minimizing the amount of bandwidth that is wasted, use the **fast-reroute backup-prot-preempt** command.

fast-reroute backup-prot-preempt optimize-bw

Syntax Description This command has no arguments or keywords.

Defaults A minimum number of LSPs are preempted

Command Modes MPLS traffic engineering global configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to change the backup protection preemption algorithm from minimizing the number of LSPs that are demoted to minimizing the amount of bandwidth that is wasted:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# fast backup-prot-preempt optimize-bw
switch(config-te)#
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering protocol (MPLS-TE).

fast-reroute timers promotion

To specify how often the router considers switched a label switching path (LSP) to a new (better) backup tunnel if additional backup bandwidth becomes available, use the **fast-reroute timers promotion** command. To restore the system to its default condition, use the **no** form of this command.

fast-reroute timers promotion *sec*

no fast-reroute timers promotion

Syntax Description	<i>sec</i>	(Optional) Sets the interval, in seconds, between scans to determine if an LSP should use a new, better backup tunnel. Valid values are from 0 to 604800. A value of 0 disables promotions to a better LSP.
---------------------------	------------	---

Defaults	The timer is running and is set to a frequency of every 300 seconds (5 minutes)
-----------------	---

Command Modes	TE configuration mode
----------------------	-----------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to configure how often to scan for LSP backup promotion:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# fast-reroute timer promotion 10
switch(config-te)#
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering protocol (MPLS-TE).

feature bfd

To enable Bidirectional Forwarding Detection (BFD) on the router Multiprotocol Label Switching (MPLS) traffic engineering (TE) link and node protection, use the **feature bfd** command. To disable the system to its default condition, use the **no** form of this command.

feature bfd

no feature bfd

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable BFD on the device:

```
switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# feature bfd
Please disable the ICMP redirects on all interfaces
running BFD sessions using the command below

'no ip redirects '
switch(config)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

feature bgp

To enable the Border Gateway Protocol (BGP) feature, use the **feature bgp** command. To return to the default setting, use the **no** form of this command.

feature bgp

no feature bgp

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable BGP:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

feature evc

To enable Ethernet virtual circuits (EVCs) on a Cisco NX-OS device, use the **feature evc** command. To disable EVC, use the **no** form of this command.

feature evc

no feature evc

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable EVC on the Cisco NX-OS device:

```
switch# configure terminal
switch(config)# feature evc
```

This example shows how to disable EVC on the Cisco NX-OS device:

```
switch(config)# no feature evc
switch(config)#
```

Related Commands	Command	Description
	show feature	Displays the status of features on a device.

feature isis

To enable the Intermediate System-to-Intermediate System (IS-IS) feature, use the **feature isis** command. To return to the default setting, use the **no** form of this command.

feature isis

no feature isis

Syntax Description This command has no arguments or keywords.

Defaults Enable

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable the IS-IS feature:

```
switch(config-ldp)# configure terminal
switch(config)# feature isis
switch(config)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

feature mpls l3vpn

To enable the Multiprotocol Label Switching (MPLS) Layer 3 virtual private networks, use the **feature mpls l3vpn** command. To return to the default setting, use the **no** form of this command.

feature mpls l3vpn

no feature mpls l3vpn

Syntax Description This command has no arguments or keywords.

Defaults Per VDC

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable the MPLS Layer 3 virtual private networks:

```
switch# configure terminal
switch(config)# install feature-set mpls
switch(config)# feature-set mpls
switch(config)# feature mpls l3vpn
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

feature mpls ldp

To enable the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) feature on the device, use the **feature mpls ldp** command. To return to the default setting, use the **no** form of this command.

feature mpls ldp

no feature mpls ldp

Syntax Description This command has no arguments or keywords.

Defaults Per VDC

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines When you disable MPLS LDP on the device, no LDP commands are available. This command requires the MPLS Services license.

Examples This example shows how to enable IP over MPLS:

```
switch(config)# install feature-set mpls
switch(config)# feature-set mpls
switch(config)# feature mpls ldp
LAN_ENTERPRISE_SERVICES_PKG license not installed. ldp feature will be shut down
after grace period of approximately 115 day(s).
switch(config)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

feature mpls traffic-engineering

To enable Multiprotocol Label Switching (MPLS) traffic engineering (TE) on the device, use the **feature mpls traffic-engineering** command. To return to the default setting, use the **no** form of this command.

feature mpls traffic-engineering

no feature mpls traffic-engineering

Syntax Description This command has no arguments or keywords.

Defaults Per VDC

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines Unless you enable MPLS TE on the device, no TE commands are available.
The user has to enter **feature** command to enable TE.
This command requires the MPLS Services license.

Examples This example shows how to enable MPLS TE:

```
switch(config)# install feature-set mpls
switch(config)# feature-set mpls
switch(config)# feature mpls traffic-engineering
switch(config)#
```

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic-engineering (TE) interface.

feature mvpn

To enable the Multiprotocol Label Switching (MPLS) multicast virtual private network (MVPN) feature on the device, use the **feature mvpn** command. To return to the default setting, use the **no** form of this command.

feature mvpn

no feature mvpn

Syntax Description This command has no arguments or keywords.

Defaults Enabled

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable MVPN feature on the device:

```
switch(config)# feature mvpn
switch(config)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

feature ospf

To enable the Open Shortest Path First (OSPF) feature, use the **feature ospf** command. To disable this feature, use the **no** form of this command.

feature ospf

no feature ospf

Syntax Description This command has no arguments or keywords.

Defaults Enable

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable information about the OSPF configuration:

```
switch(config)# feature ospf
switch(config)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

feature-set mpls

To enable the feature set Multiprotocol Label Switching (MPLS) information, use the **feature-set mpls** command. To disable this feature, use the **no** form of this command.

feature-set mpls

no feature-set mpls

Syntax Description This command has no arguments or keywords.

Defaults Per VDC

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable the MPLS feature set information:

```
switch(config)# feature-set mpls
switch(config)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

forwarding-adjacency

To advertise a traffic engineering (TE) tunnel as a link in an Interior Gateway Protocol (IGP) network, use the **forwarding-adjacency** command. To return to the default setting, use the **no** form of this command.

forwarding-adjacency [**holdtime** *value*]

no forwarding-adjacency

Syntax Description

holdtime	(Optional) Specifies the time, in milliseconds, that a TE tunnel waits after going down before informing the network.
<i>value</i>	(Optional) Hold time. The range is from 0 to 4294967295.

Defaults

Default value is 0

Command Modes

TE tunnel configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to advertise the TE tunnel as a link in an IGP network:

```
switch# configure terminal
switch(config)# interface tunnel-te 1
switch(config-if-te)# forwarding-adjacency holdtime 1
switch(config-if-te)#
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

from

To map the value from one number to another, use the **from** command.

from *number to number*

Syntax Description	<i>number</i>	Map number. The range is from 0 to 63.
---------------------------	---------------	--

Defaults	None
-----------------	------

Command Modes	Table map configuration mode
----------------------	------------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples	This example shows how to map the value from one number to another (you can repeat this command up to 64 times):
-----------------	--

```
switch# configure terminal
switch(config)# table-map tablemap1
switch(config-tmap)# from 1 to 1
switch(config-tmap)# from 2 to 1
switch(config-tmap)# from 3 to 2
switch(config-tmap)# from 4 to 2
switch(config-tmap)# exit
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

■ from



G Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with G.

graceful-restart

To configure the graceful restart timer, use the **graceful-restart** command. To return to the default setting, use the **no** form of this command.

```
graceful-restart [timers { forwarding-holding seconds | max-recovery seconds | neighbor-liveness seconds }]
```

```
no graceful-restart [timers { forwarding-holding seconds | max-recovery seconds | neighbor-liveness seconds }]
```

Syntax Description	timers	(Optional) Specifies VPN routing.
	forwarding-holding <i>seconds</i>	Specifies the forwarding state holding time. The range is from 30 to 600 seconds.
	max-recovery <i>seconds</i>	Specifies the maximum recovery time. The range is from 15 to 600 seconds.
	neighbor-liveness <i>seconds</i>	Specifies the neighbor lifetime. The range is from 5 to 300 seconds.

Defaults Enable

Command Modes LDP configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

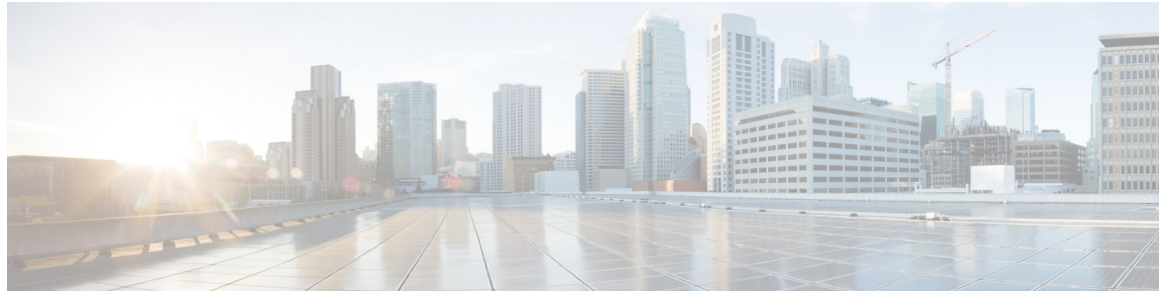
Usage Guidelines You must configure the MPLS VPN and VRFs before creating VRF-aware static labels. This command requires the MPLS Services license.

Examples This example shows how to configure the graceful restart timer:

```
switch(config-ldp)# configure terminal
switch(config)# mpls ldp configuration
switch(config-ldp)# graceful-restart timers forwarding-holding 30
switch(config-ldp)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).



H Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with H.

holdtime

To configure how long a Label Distribution Protocol (LDP) session is maintained in the absence of LDP messages from the session peer, use the **holdtime** command. To return to the default setting, use the **no** form of this command.

holdtime {*seconds* | **infinite**}

no holdtime

Syntax Description	seconds	Hold time in seconds. The range is from 15 to 65535 seconds.
	infinite	Specifies the LDP session holdtime.

Defaults 180 seconds

Command Modes LDP configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how long an LDP session is maintained in the absence of LDP messages from the session peer:

```
switch(config)# mpls ldp configuration
switch(config-ldp)# holdtime 30
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).



I Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with I.

import

To import route-map based virtual routing and forwarding (VRF) and virtual router context, use the import command.

import { **map** [*map-name* | **redist-bgp**] | **vrf default** [*maximum-prefix* | **map**]}

Syntax Description	map	Specifies route-map based VRF import.
	<i>map-name</i>	Name of the map. A map name can be a case-sensitive, alphanumeric character string with a maximum length of 63 characters.
	redist-bgp	Specifies a known route-map name.
	vrf	Specifies the virtual router context.
	default	Specifies the default VRF name.
	<i>maximum-prefix</i>	Maximum prefix. The range is from 1 to 2147483647.

Defaults 1000

Command Modes Address family configuration

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command does not require the MPLS Services license.

Examples This example shows how to import virtual router context:

```
switch# configure terminal
switch(config)# feature mpls l3vpn
switch(config)# vrf context vpn1
switch(config-vrf)# rd 1.2:1
switch(config-vrf)# address-family ipv4 unicast
switch(config-vrf-af-ipv4)# route-target import 1:101
switch(config-vrf-af-ipv4)# maximum routes 3000
switch(config-vrf-af-ipv4)# import vrf default map redist-bgp
```

```
This example shows how to remove the virtual router context:
switch(config-vrf-af-ipv4)# no import vrf default map redist-bgp
```

Related Commands

Command	Description
maximum routes	Configure the maximum number of routes to be allowed in the routing table.
route-target	Create a route-target extended community for a VRF instance.

index

To insert or modify a traffic engineering (TE) explicit path entry at a specific index, use the **index** command. To restore the system to its default condition, use the **no** form of this command.

index *index command*

no index *index command*

Syntax Description

<i>index</i>	Index number. The range is from 1 to 65535.
<i>command</i>	Command that can be the exclude-address keyword or the next-address keyword.

Defaults

None

Command Modes

TE explicit path configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to insert or modify a path entry at a specific index:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# explicit-path name link5
switch(config-te-expl-path)# index 10 next-address 10.0.0.1
Explicit Path name link5:
  10: next-address 10.0.0.1
switch(config-te-expl-path)#
```

Related Commands

Command	Description
mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

inherit port-profile

To apply an existing pseudowire port profile to an interface, use the **inherit port-profile** command.

inherit port-profile *profile-name*

Syntax Description	<i>profile-name</i>	Profile name. The string can be any alphanumeric string up to 63 characters.
---------------------------	---------------------	--

Defaults	None
-----------------	------

Command Modes	config-if-pseudowire configuration mode
----------------------	---

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines An interface can inherit only an active pseudowire port profile. To enable a pseudowire port profile, use the **state enabled** command.

This command requires the MPLS Services license.

Examples This example shows how to apply an existing port profile to an interface:

```
switch# configure terminal
switch(config)# port-profile type pseudowire AToM
switch(config-if-prof)# encapsulation mpls
switch(config-pseudowire-mpls)# interface pseudowire 100
switch(config-if-prof)# inherit port-profile AToM
```

Related Commands	Command	Description
	interface pseudowire	Enters interface pseudowire configuration mode and configures a static pseudowire logical interface.
	port-profile type pseudowire	Enters interface port-profile configuration mode and configures a pseudowire port profile.
	state enabled	Enables the interface port profile.

internetworking

To specify the type of pseudowire and the type of traffic that can flow across the network, use the **internetworking** command.

internetworking { **ethernet** | **vlan** }

Syntax Description

ethernet	Specifies the Ethernet type.
vlan	Specified the VLAN type.

Defaults

None

Command Modes

config-xconnect configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
6.2.2	This command was introduced.

Usage Guidelines

This command is required only if you are configuring a connection between two disparate attachment circuits.

- The **internetworking** type on a provider edge (PE) device must match the **internetworking** type on its peer PE device.
- The **ethernet** keyword causes Ethernet frames to be extracted from the attachment circuit and sent over the pseudowire. Ethernet end-to-end transmission is assumed. Attachment circuit frames that are not Ethernet are dropped.
- The **vlan** keyword allows the VLAN ID to be included as part of the Ethernet frame.

This command requires the MPLS Services license.

Examples

This example shows how to specify the type of pseudowire and the type of traffic that can flow across the network:

```
switch# configure terminal
switch(config)# interface ethernet 4/0/0.1
switch(config-if)# encapsulation dot1q 100
switch(config-if)# l2vpn xconnect context Test1
switch(config-xconnect)# internetworking ethernet
switch(config-xconnect)#
```

Related Commands

Command	Description
l2vpn xconnect context	Enters Xconnect configuration mode and establishes a Layer 2 VPN (L2VPN) context for identifying the two members in a VPWS, multi segment pseudowire, or local connect service.
member pseudowire	Adds an active pseudowire to the XConnect context.

interface ethernet

To configure an Ethernet interface on which you are enabling the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP), use the **interface ethernet** command. To return to the default setting, use the **no** form of this command.

interface ethernet *slot/chassis number*

no interface ethernet *slot/chassis number*

Syntax Description	<i>slot/chassis number</i> Slot or chassis number. The range is from 1 to 253.				
Defaults	None				
Command Modes	Interface configuration mode				
Supported User Roles	network-admin vdc-admin				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>5.2(1)</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	5.2(1)	This command was introduced.
Release	Modification				
5.2(1)	This command was introduced.				
Usage Guidelines	<p>When you disable the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) on the device, no LDP commands are available.</p> <p>This command requires the MPLS Services license.</p>				
Examples	<p>This example shows how to configure the Ethernet interface on which you are enabling MPLS LDP:</p> <pre>switch(config)# interface ethernet 2/2 switch(config-if)#</pre>				
Related Commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>mpls ldp configuration</td> <td>Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).</td> </tr> </tbody> </table>	Command	Description	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).
Command	Description				
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).				

interface pseudowire

To enter interface pseudowire configuration mode and configure a static pseudowire logical interface, use the **interface pseudowire** command. To delete the pseudowire interface and the associated configuration, use the **no** form of this command.

interface pseudowire *pw-id*

no interface pseudowire *pw-id*

Syntax Description	<i>pw-id</i>	Pseudowire ID. The range is from 1 to 200000. The range for a static pseudowire is from 1 to 8192.
---------------------------	--------------	--

Defaults	None
-----------------	------

Command Modes	config-if-pseudowire configuration mode
----------------------	---

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to enter interface pseudowire configuration mode and configure a static pseudowire logical interface:

```
switch# configure terminal
switch(config)# port-profile type pseudowire AToM
switch(config-if-prof)# encapsulation mpls
switch(config-pseudowire-mpls)# interface pseudowire 100
switch(config-if-prof)#
```

This example shows how to delete the pseudowire interface and the associated configuration:

```
switch(config-if-prof)# no interface pseudowire 100
switch(config-if-prof)#
```

Related Commands	Command	Description
	port-profile type pseudowire	Enters interface port-profile configuration mode and configures a pseudowire port profile.
	port-profile type pseudowire	Enters interface port-profile configuration mode and configures a pseudowire port profile.
	state enabled	Enables the interface port profile.

interface tunnel-te

To configure a traffic engineering (TE) interface, use the **interface tunnel-te** command. To restore the system to its default condition, use the **no** form of this command.

interface tunnel-te *number*

no interface tunnel-te *number*

Syntax Description	<i>number</i>	Traffic engineering interface number. The range is from 0 to 65503.
---------------------------	---------------	---

Defaults	None
-----------------	------

Command Modes	Interface configuration mode
----------------------	------------------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to configure a TE interface:

```
switch# configure terminal
switch(config)# interface tunnel-te 65
switch(config-if-te)#
```

Related Commands	Command	Description
	None	There are no related commands.

install feature-set mpls

To install feature set Multiprotocol Label Switching (MPLS), use the **install feature-set mpls** command. To restore the system to its default condition, use the **no** form of this command.

install feature-set mpls

no install feature-set mpls

Syntax Description This command has no arguments or keywords.

Defaults Only in default VDC

Command Modes Global Configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to install feature set MPLS:

```
switch# configure terminal
switch(config)# install feature-set mpls
feature set is installed already(0x40aa0011)
switch(config)#
```

Related Commands	Command	Description
	feature-set mpls	Enables the feature set Multiprotocol Label Switching (MPLS).

ip prefix-list

To create a prefix list for Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) label filtering, outbound filtering, or inbound filtering, use the **ip prefix-list** command. To return to the default setting, use the **no** form of this command.

```
ip prefix-list prefix-list { description description | seq number [deny network/length [eq eq-length | ge ge-length | le le-length ] | permit network/length [eq eq-length | ge ge-length]] | deny network/length [eq eq-length | ge ge-length | le le-length]
```

```
no ip prefix-list prefix-list { description description | seq number [deny network/length [eq eq-length | ge ge-length | le le-length ] | permit network/length [eq eq-length | ge ge-length]] | deny network/length [eq eq-length | ge ge-length | le le-length]
```

Syntax	Description
<i>prefix-list</i>	Name of the prefix list. The prefix list can be up to 63 characters.
description	Specifies the description of the IP prefix list.
<i>description</i>	IP prefix list description. The maximum size is alphanumeric 90 characters.
seq	Specifies sequence number of an entry.
<i>number</i>	Sequence number. The range is from 1 to 4294967294.
deny	(Optional) Denies access for a matching condition.
<i>network/length</i>	Network address and the length of the network mask in bits. The network number can be any valid IP address or prefix. The bit mask can be a number from 0 to 32.
eq	(Optional) Specifies the equal to operator.
<i>eq-length</i>	Prefix length to be matched.
ge	(Optional) Specifies the greater than or equal to operator.
<i>ge-length</i>	Specifies the minimum prefix length to be matched.
le	(Optional) Specifies the less than or equal to operator.
<i>le-length</i>	Maximum prefix length to be matched.
permit	Specifies the permit access for a matching condition.

Defaults None

Command Modes Global configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to create an IP prefix list and specifies the prefixes permitted by the prefix list:

```
switch# configure terminal  
switch(config)# ip prefix-list p1 permit 10.0.0.2/32 ge 10  
switch(config)#
```

```
switch# configure terminal  
switch(config)# ip prefix-list p1 permit 10.0.0.0/32  
switch(config)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ip rsvp

To configure information about the Resource Reservation Protocol (RSVP) information, use the **ip rsvp** command. To restore the system to its default condition, use the **no** form of this command.

ip rsvp

no ip rsvp

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure RSVP information:

```
switch# configure terminal
switch(config)# ip rsvp
switch(config-ip-rsvp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ip rsvp authentication challenge

To configure the Resource Reservation Protocol (RSVP) to use a challenge handshake on an interface, use the **ip rsvp authentication challenge** command. To disable the authentication on an interface, use the **no** form of this command.

ip rsvp authentication challenge

no ip rsvp authentication challenge

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Interface configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure RSVP to use a challenge handshake on an interface:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip rsvp authentication challenge
switch(config-if)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ip rsvp authentication key-chain

To activate the Resource Reservation Protocol (RSVP) cryptographic authentication on an interface, use the **ip rsvp authentication key-chain** command. To disable the authentication on an interface, use the **no** form of this command.

ip rsvp authentication key-chain *key-chain-name*

no ip rsvp authentication key-chain *key-chain-name*

Syntax Description	<i>key-chain-name</i> Key chain name.
---------------------------	---------------------------------------

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Defaults	None
-----------------	------

Command Modes	Interface configuration mode
----------------------	------------------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples	<p>This example shows how to activate RSVP cryptographic authentication on an interface:</p> <pre>switch# configure terminal switch(config)# interface ethernet 2/1 switch(config-if)# ip rsvp authentication key-chain key1 switch(config-if)#</pre>
-----------------	--

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ip rsvp authentication lifetime

To control how long the Resource Reservation Protocol (RSVP) maintains security associations on an interface, use the **ip rsvp authentication lifetime** command. To return to the default settings, use the **no** form of this command.

ip rsvp authentication lifetime *hh:mm:ss*

no ip rsvp authentication lifetime *hh:mm:ss*

Syntax Description	<i>hh:mm:ss</i>	Lifetime value in seconds. The range is from 30 to 86400 seconds.
---------------------------	-----------------	---

Syntax Description	This command has no arguments or keywords.	
---------------------------	--	--

Defaults	30 minutes	
-----------------	------------	--

Command Modes	Interface configuration mode	
----------------------	------------------------------	--

SupportedUserRoles	network-admin vdc-admin	
---------------------------	----------------------------	--

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.	
-------------------------	--	--

Examples	This example shows how to control how long RSVP maintains security associations on an interface:	
-----------------	--	--

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip rsvp authentication key-chain key1
switch(config-if)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ip rsvp authentication type

To configure the algorithm used to generate cryptographic signature messages on an interface, use the **ip rsvp authentication type** command. To return to the default settings, use the **no** form of this command.

ip rsvp authentication type {md5 | sha-1}

no ip rsvp authentication type {md5 | sha-1}

Syntax Description	md5	sha-1
	Specifies the Rivest, Shamir, and Adleman (RSA) Message Digest 5 hash algorithm.	Specifies the National Institute of Standards and Technology (NIST) Secure Hash Algorithm 1.

Syntax Description This command has no arguments or keywords.

Defaults md5

Command Modes Interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure the algorithm used to generate cryptographic signatures messages on an interface:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip rsvp authentication type md5
switch(config-if)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ip rsvp authentication window-size

To configure the tolerance for an out-of-sequence message on an interface, use the **ip rsvp authentication window-size** command. To return to the default settings, use the **no** form of this command.

ip rsvp authentication window-size *value*

no ip rsvp authentication window-size *value*

Syntax Description	<i>value</i>	Maximum number of messages allowed in receive window. The range is from 1 to 64.
---------------------------	--------------	--

Syntax Description	This command has no arguments or keywords.	
---------------------------	--	--

Defaults	1	
-----------------	---	--

Command Modes	Interface configuration mode	
----------------------	------------------------------	--

Supported User Roles	network-admin vdc-admin	
-----------------------------	----------------------------	--

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.	
-------------------------	--	--

Examples	This example shows how to specify the tolerance for an out-of-sequence message on an interface:	
-----------------	---	--

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# ip rsvp authentication window-size 3
switch(config-if)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ip rsvp signalling dscp

To set a Differentiated Services Code Point (DSCP) for Resource Reservation Protocol (RSVP) signalling messages, use the **ip rsvp signalling dscp** command. To revert to the default settings, use the **no** form of this command.

ip rsvp signalling dscp *value*

no ip rsvp signalling dscp *value*

Syntax Description	<i>value</i>	DSCP value. The range is from 0 to 63.
---------------------------	--------------	--

Defaults	48.
-----------------	-----

Command Modes	Interface configuration mode
----------------------	------------------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to set the DSCP for RSVP signalling messages:

```
switch# configure terminal
switch(config)# interface ethernet 6/1
switch(config-if)# ip rsvp signalling dscp 1
switch(config-if)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ip rsvp signalling hello dscp

To set the differentiated services code point (DSCP) value that is in the IP header of the hello message, use the **ip rsvp signalling hello dscp** command. To revert to the default settings, use the **no** form of this command.

ip rsvp signalling hello dscp *value*

no ip rsvp signalling hello dscp *value*

Syntax Description

<i>value</i>	Differentiated Services Code Point (DSCP) value. The range is from 0 to 63.
--------------	---

Defaults

48.

Command Modes

Interface configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to set the DSCP value that is in the IP header of the hello message:

```
switch# configure terminal
switch(config)# interface ethernet 2/2
switch(config-if)# ip rsvp signalling hello dscp 1
switch(config-if)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ip rsvp signalling hello reroute

To configure IP Resource reservation Protocol (RSVP) signalling hello reroute commands, use the **ip rsvp signalling hello reroute** command. To revert to the default settings, use the **no** form of this command.

ip rsvp signalling hello reroute [override-graceful]

no ip rsvp signalling hello reroute [override-graceful]

Syntax Description	override-graceful	Specifies to ignore the existence of the GR node neighbor for the Hello State Timer (HST) behavior.
---------------------------	--------------------------	---

Defaults	None
-----------------	------

Command Modes	Interface configuration mode
----------------------	------------------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to configure IP RSVP signalling hello RSVP reroute commands:

```
switch# configure terminal
switch(config)# interface ethernet 2/2
switch(config-if)# ip rsvp signalling hello reroute override-graceful
switch(config-if)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ip rsvp signalling hello reroute state-timeout refresh misses

To configure the number of consecutive missed hello message before a neighbor is declared down or unreachable for Hello State Timer (HST) functionality, use the **ip rsvp signalling hello reroute state-timeout refresh misses** command. To return to the default behavior, use the **no** form of this command.

ip rsvp signalling hello reroute state-timeout refresh misses *value*

no ip rsvp signalling hello reroute state-timeout refresh misses *value*

Syntax Description	<i>value</i>	Maximum number of messages allowed in the receive window. The range is from 1 to 64.
Defaults	4	
Command Modes	Interface configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	<p>This example shows how to configure the number of consecutive missed hello message before a neighbor is declared down or unreachable for HST functionality:</p> <pre>switch# configure terminal switch(config)# interface ethernet 2/2 switch(config-if)# ip rsvp signalling hello reroute state-timeout refresh misses 12</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ip rsvp signalling hello reroute state-timeout refresh interval

To configure the interval in which Resource Reservation Protocol (RSVP) hello messages are sent to support the HST functionality, use the **ip rsvp signalling hello reroute state-timeout refresh interval** command. To return to the default settings, use the **no** form of this command.

ip rsvp signalling hello reroute state-timeout refresh interval *time*

no ip rsvp signalling hello reroute state-timeout refresh misses *time*

Syntax Description	<i>value</i>	Maximum number of messages allowed in the receive window. The range is from 1 to 64.
---------------------------	--------------	--

Defaults	2 seconds for HST. 200 milli seconds for fast-reroute.
-----------------	---

Command Modes	Interface configuration mode
----------------------	------------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	The same form of the command with the fast-reroute keyword may be used to configure the number of missed consecutive hello messages before a neighbor is declared down for fast reroute functionality in a future phase. This command requires the MPLS Services license.
-------------------------	---

Examples	This example shows how to configure the interval in which RSVP hello message are sent to support the HST functionality: <pre>switch# configure terminal switch(config)# interface ethernet 2/2 switch(config-if)# ip rsvp signalling hello reroute state-timeout refresh interval 12</pre>
-----------------	--

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ip unnumbered loopback

To enable IP processing on an interface without assigning an explicit IP address to the interface, use the **ip unnumbered loopback** command. To restore the system to its default condition, use the **no** form of this command.

ip unnumbered loopback *number*

no ip unnumbered loopback *number*

Syntax Description

number Virtual interface number. The range is from 0 to 1023.

Defaults

None

Command Modes

TE interface configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command is not effective until you configure the specified loopback with an IP address. This command does not require an MPLS Services license.

Examples

This example shows how to configure an interface as an unnumbered loopback:

```
switch# configure terminal
switch(config)# interface tunnel-te 1
switch(config-if-te)# ip unnumbered loopback 0
switch(config-if-te)#
```

Related Commands

Command	Description
tunnel-te interface	Configures the traffic engineering (TE) interface.

isis metric

To configure the Intermediate System-to-Intermediate System (IS-IS) metric for a tunnel interface to be used as a forwarding adjacency, use the **isis metric** command.

isis metric *metric-value* {**level-1** | **level-2**}

Syntax Description		
	<i>metric-value</i>	Default metric. The range is from 0 to 16777215.
	level-1	Specifies the metric to level 1 links.
	level-2	Specifies the metric to level 2 links.

Command Modes TE interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines Specify the **isis metric** command with level-1 or level-2 to be consistent with the IGP level at which you are performing traffic engineering; otherwise, the metric default value is 10.

Use this command only if the IGP is IS-IS. If the IGP is OSPF, use the equivalent OSPF command.

This command requires the MPLS Services license.

Examples This example shows how to configure the IS-IS metric for a tunnel interface to be used as a forwarding adjacency:

```
switch# configure terminal
switch(config)# interface tunnel-te 1
switch(config-if-te)# forwarding-adjacency
switch(config-if-te)# isis metric 2 level-1
switch(config-if-te)#
```

Related Commands	Command	Description
	interface tunnel-te	Configure the traffic engineering interface.



K Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with K.

key

To configure an authentication key on a keychain, use the **key** command. To return to the default setting, use the **no** form of this command.

key *key-id*

no key *key-id*

Syntax Description	<i>key-id</i>	Key ID. The range is from 0 to 65535.
Defaults	None	
Command Modes	Keychain key configuration mode	
SupportedUserRoles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to configure an authentication key on a keychain: <pre>switch# configure terminal switch(config)# key chain keychain1 switch(config-keychain)# key 10 switch(config-keychain-key)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

key chain

To configure a group of authentication keys, use the **key chain** command. To return to the default setting, use the **no** form of this command.

key chain *keychain-name*

no key chain *keychain-name*

Syntax Description	<i>keychain-name</i>	Key chain name. The maximum size is alphanumeric 32 characters.
Defaults	None	
Command Modes	Keychain configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to configure a group of authentication keys: <pre>switch# configure terminal switch(config)# key chain keychain1 switch(config-keychain)# key 10 switch(config-keychain-key)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

key-string

To configure an authentication string for a key, use the **key-string** command. To return to the default setting, use the **no** form of this command.

key-string *key*

no key-string *key*

Syntax Description	<i>key</i>	Authentication string for a key. The key can be from 1 to 80 uppercase or lowercase alphanumeric characters. The first character cannot be a numeral.
---------------------------	------------	---

Defaults	None
-----------------	------

Command Modes	Keychain key configuration mode
----------------------	---------------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to configure an authentication string for a key:

```
switch# configure terminal
switch(config)# key chain keychain1
switch(config-keychain)# key 10
switch(config-keychain-key)# key-string pwd1
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).



L Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with L.

l2vpn vfi context

To establish a Layer 2 VPN (L2VPN) virtual forwarding interface (VFI) between two or more separate networks, use the **l2vpn vfi context** command. To delete the VFI and the associated configuration, use the **no** form of this command.

l2vpn vfi context *context-name*

no l2vpn vfi context *context-name*

Syntax Description

<i>context-name</i>	VFI context name. The range is from 0 to 65535.
---------------------	---

Defaults

None

Command Modes

Global configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
6.2.2	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to establish an L2VPN VFI between two or more separate networks:

```
switch# configure terminal
switch(config)# l2vpn vfi context vpls80
switch(config-l2vpn-vfi)#
```

This example shows how to delete the VFI and the associated configuration:

```
switch(config-l2vpn-vfi)# no l2vpn vfi context vpls80
```

Related Commands

Command	Description
member pseudowire	Binds a static pseudowire to this VFI.

l2vpn xconnect context

To enter the Xconnect configuration mode and establish a Layer 2 VPN (L2VPN) context for identifying the two members in a Virtual Private Wire Service (VPWS), multi segment pseudowire, or local connect service, use the **l2vpn xconnect context** command. To delete the Xconnect context and the associated configuration, use the **no** form of this command.

l2vpn xconnect context *context-name*

no l2vpn xconnect context *context-name*

Syntax Description	<i>context-name</i>	Xconnect context name. The maximum range is 100 alphanumeric, case-sensitive characters.
--------------------	---------------------	--

Defaults	None
----------	------

Command Modes	Global configuration mode
---------------	---------------------------

SupportedUserRoles	network-admin vdc-admin
--------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	The context name argument is a unique per-interface identifier for this context. This command requires the MPLS Services license.
------------------	--

Examples	This example shows how to enter Xconnect configuration mode and establish an L2VPN context for identifying the two members in a VPWS, multi segment pseudowire, or local connect service:
----------	---

```
switch# configure terminal
switch(config)# l2vpn xconnect context XCON1
switch(config-xconnect)#
```

This example shows how to delete the Xconnect configuration:

```
switch(config-xconnect)# l2vpn xconnect context XCON1
switch(config-xconnect)#
```

Related Commands

Command	Description
member pseudowire	Adds an active pseudowire to the XConnect context.
remote link failure notification	Enables AToM MPLS remote link failure notification and shutdown.

label allocate global

To configure local label allocation filters for the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP), use the **label allocate global** command. To return to the default setting, use the **no** form of this command.

```
label allocate global {all-routes | host-routes | prefix-list prefix-list}
```

```
no label allocate global {all-routes | host-routes | prefix-list prefix-list}
```

Syntax Description

all-routes	Specifies the allocation local labels for all routes.
host-routes	Specifies the allocation local labels for host routes only.
prefix-list	Specifies the prefix list for local label filtering.
<i>prefix-list</i>	IP prefix list.

Defaults

None

Command Modes

LDP configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to configure local label allocation filters for MPLS LDP:

```
switch# configure terminal
switch(config)# mpls ldp configuration
switch(config-ldp)# label allocate global prefix-list p1
switch(config-ldp)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

link-management timers

To configure the link management hold timers, use the **link-management timers** command. To return to the default setting, use the **no** form of this command.

link-management timers { **bandwidth-hold** *sec* | **periodic-flooding** *sec* }

no link-management timers

Syntax Description		
bandwidth-hold		Specifies the length of time that bandwidth is held for an RSVP path (setup) message while you wait for the corresponding RSVP Resv message to come back.
<i>sec</i>		Seconds. The range is from 1 to 300 seconds.
period-flooding		Specifies the link state information changes that do not trigger immediate action. For example, a change to the amount of allocated bandwidth that does not cross a threshold.
<i>sec</i>		Seconds. The range is from 0 to 3600 seconds. A value of 0 turns off periodic flooding. If you set this value from 1 to 29, it is treated as 30.

Defaults

Bandwidth hold is 15 seconds
Periodic flooding is 60 seconds

Command Modes

TE configuration mode

Supported User Roles

network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to configure the link management bandwidth hold timer:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# link management timers bandwidth-hold 200
switch(config-te)#
```

Related Commands

Command	Description
mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

list (LSP attribute configuration mode)

To display the contents of the label switched path (LSP) attribute list, use the **list** command.

list

Syntax Description This command has no arguments or keywords.

Command Modes LSP attribute configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the content of the LSP attribute list:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# lsp attributes 1
switch(config-lsp-attr)# list
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

list (TE explicit-path configuration mode)

To display the contents of the explicit-path entries, use the **list** command.

list

Syntax Description This command has no arguments or keywords.

Command Modes TE explicit-path configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the content of the LSP attribute list:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# explicit-path name test
switch(config-lsp-attr)# list
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

load-interval

To configure the interval over which the input and output rates for the interface are averaged, use the **load-interval** command. To restore the system to its default condition, use the **no** form of this command.

load-interval *seconds*

no load-interval

Syntax Description	<i>seconds</i>	Length of time for which data is used to compute load statistics. The value is a multiple of 30, from 120 to 300 (120, 150, 180, and so on).
---------------------------	----------------	--

Defaults	300
-----------------	-----

Command Modes	Interface configuration mode
----------------------	------------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	For a tunnel-te interface , the bandwidth command configures the initial tunnel bandwidth, which then can be adjusted by the auto bandwidth mechanism based on interface traffic statistics. The load-interval command specifies how often the interface traffic statistics are calculated.
-------------------------	--

Examples	This example shows how to configure the interval over which the input and output rates for the interface are averaged:
-----------------	--

```
switch# configure terminal
switch(config)# interface tunnel-te 1
switch(config-if-te)# load-interval 180
switch(config-if-te)#
```

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

lockdown

To disable reoptimization of the label switched path (LSP), use the **lockdown** command. To restore the system to its default condition, use the **no** form of this command.

lockdown

no lockdown

Syntax Description This command has no arguments or keywords.

Command Modes LSP attribute configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to disable reoptimization of the LSP:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# lsp attributes 1
switch(config-lsp-attr)# lockdown
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

logging events all

To configure the generation of system logs for all nontunnel TE events, use the **logging events all** command. To stop logging these system messages, use the **no** form of the command.

logging events all

no logging events all

Syntax Description This command has no arguments or keywords.

Command Modes TE global configuration (config-te).

SupportedUseRoles network-admin
vdc-admin

Command History	Release	Modification
	7.3(0)D1(1)	This command was introduced.

Examples The following example shows how to configure generation of system messages for all nontunnel events:.

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# logging events all
switch(config-te)#
```

logging events frr-protection all

To configure the generation of system logs when an FRR event occurs, use the **logging events frr-protection all** command. To stop logging these system messages, use the **no** form of the command.

logging events frr-protection all

no logging events frr-protection all

Syntax Description This command has no arguments or keywords.

Command Modes TE global configuration (config-te).

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	7.3(0)D1(1)	This command was introduced.

Usage Guidelines No system message is logged if this feature is not configured.

Examples The following example shows how to configure generation of system messages when an FRR event occurs:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# logging events frr-protection all
switch(config-te)#
```

logging events frr-protection backup

To configure the generation of system logs when a primary LSP is assigned an FRR backup tunnel, use the **logging events frr-protection backup** command. To stop logging these system messages, use the **no** form of the command.

logging events frr-protection backup

no logging events frr-protection backup

Syntax Description This command has no arguments or keywords.

Command Modes TE global configuration (config-te).

Supported Use Roles network-admin
vdc-admin

Command History	Release	Modification
	7.3(0)D1(1)	This command was introduced.

Usage Guidelines No system message is logged if this feature is not configured.

If this feature and FRR-ready logging are both configured, the initial backup assignment for a new primary LSP will generate two separate system logs.

Examples The following example shows how to configure FRR backup assignment.

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# logging events frr-protection backup
switch(config-te)#
```

logging events frr-protection primary active

To configure the generation of system logs when a protected primary LSP transitions to the FRR-active state, use the **logging events frr-protection primary active** command. To stop logging these system messages, use the **no** form of the command.

logging events frr-protection primary active

no logging events frr-protection primary active

Syntax Description This command has no arguments or keywords.

Command Modes TE global configuration (config-te).

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	7.3(0)D1(1)	This command was introduced.

Usage Guidelines No system message is logged if this feature is not configured.

Examples The following example shows how to configure FRR-active logging.

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# logging events frr-protection primary active
switch(config-te)#
```

logging events frr-protection primary ready

To configure the generation of system logs when a primary LSP moves to FRR-ready state on assigning a backup tunnel, use the **logging events frr-protection primary ready** command. To stop logging these system messages, use the **no** form of the command.

logging events frr-protection primary ready

no logging events frr-protection primary ready

Syntax Description This command has no arguments or keywords.

Command Modes TE global configuration (config-te).

Supported Use Roles network-admin
vdc-admin

Command History	Release	Modification
	7.3(0)D1(1)	This command was introduced.

Usage Guidelines No system message is logged if this feature is not configured.

Examples The following example shows how to configure generation of system messages when a FRR event occurs:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# logging events frr-protection primary ready
switch(config-te)#
```


logging lsp

To log label switched path (LSP) traps, use the **logging lsp** command. To return to the default setting, use the **no** form of this command.

logging lsp {**path-errors** | **preemption** | **reservation-errors** | **setups** | **teardowns**} [*prefix-list*]

no logging lsp {**path-errors** | **preemption** | **reservation-errors** | **setups** | **teardowns**}

Syntax Description

path-errors	Specifies to log LSP path error traps.
preemption	Specifies to log LSP preemption traps.
reservation-errors	Specifies to log LSP reservation error traps.
setups	Specifies to log LSP establishment traps.
teardowns	Specifies to log LSP teardown traps.
<i>prefix-list</i>	(Optional) Prefix list.

Command Modes

TE configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to log LSP path error traps:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# logging lsp path-errors prefix-list1
switch(config-te)#
```

Related Commands

Command	Description
mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

logging neighbor-changes

To log Label Distribution Protocol (LDP) neighbor state changes, use the **logging neighbor-changes** command. To return to the default setting, use the **no** form of this command.

logging neighbor-changes

no logging neighbor-changes

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes LDP configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to log Label Distribution Protocol (LDP) neighbor state changes:

```
switch# configure terminal
switch(config)# mpls ldp configuration
switch(config-ldp)# logging neighbor-changes
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

logging password configuration

To enable the display of events related to password configuration changes, use the **logging password configuration** command. To return to the default setting, use the **no** form of this command.

logging password configuration [*rate-limit number*]

no logging password configuration [*rate-limit number*]

Syntax Description	rate-limit	(Optional) Specifies rate limit logging.
	<i>number</i>	(Optional) Messages per minute. The range is from 1 to 60 messages per minute.
Defaults	None	
Command Modes	LDP configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to enable the display of events related to password changes: <pre>switch# configure terminal switch(config)# mpls ldp configuration switch(config-ldp)# logging password configuration rate-limit 20 switch(config-ldp)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

logging password rollover

To enable password rollover events, use the **logging password rollover** command. To return to the default setting, use the **no** form of this command.

logging password rollover [*rate-limit number*]

no logging password rollover [*rate-limit number*]

Syntax Description

rate-limit	(Optional) Specifies the rate limit logging.
<i>number</i>	(Optional) Messages per minute. The range is from 1 to 60 messages per minute.

Defaults

None

Command Modes

LDP configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to enable password rollover events:

```
switch# configure terminal
switch(config)# mpls ldp configuration
switch(config-ldp)# logging password rollover rate-limit 10
switch(config-ldp)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

logging tunnel

To configure the tunnel specific traps logging, use the **logging tunnel** command. To return to the default setting, use the **no** form of this command.

```
logging tunnel {lsp-selection | path change} [prefix-list]
```

```
no logging tunnel {lsp-selection | path change}
```

Syntax Description	lsp-selection	Specifies the log tunnel LSP selection traps.
	path change	Specifies the log tunnel LSP path change traps.
	<i>prefix-list</i>	(Optional) Prefix list.

Command Modes TE configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify the log tunnel LSP selection traps.

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# logging tunnel lsp-selection prefix-list1
switch(config-te)#
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

logging tunnel state

To configure the generation of system logs when a TE tunnel changes operational state, use the **logging tunnel state** command. To stop logging these system messages, use the **no** form of the command.

logging tunnel state

no logging tunnel state

Syntax Description This command has no arguments or keywords.

Command Modes TE interface configuration (config-te-if)
TE global configuration (config-te).

Supported Use Roles network-admin
vdc-admin

Command History	Release	Modification
	7.3(0)D1(1)	This command was introduced.

Usage Guidelines No system message is logged if this feature is not configured.
This feature can be configured either for an individual TE tunnel or all the TE tunnels.

Examples This example shows how to configure tunnel state logging for an individual TE tunnel.

```
switch# configure terminal
switch(config)# interface tunnel-te number
switch(config-te-if)# logging tunnel state
switch(config-te-if)#
```

logging tunnel reoptimize

To configure the generation of system logs when a TE tunnel is re-optimized successfully, use the **logging tunnel reoptimize** command.

logging tunnel reoptimize

Syntax Description This command has no arguments or keywords.

Command Modes TE interface configuration (config-te-if)
TE global configuration (config-te).

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	7.3(0)D1(1)	This command was introduced.

Usage Guidelines No system message is logged if this feature is not configured.
This feature can be configured either for an individual TE tunnel or all the TE tunnels.
No system message is logged if the reoptimization attempt is abandoned before completion or if the reoptimization attempt does not result in a better path than the current one.

Examples The following example shows how to configure system logs for an individual TE tunnel when it successfully reoptimizes:

```
switch# configure terminal
switch(config)# interface tunnel-te number
switch(config-te-if)# logging tunnel reoptimize
switch(config-te-if)#
```

logging tunnel reroute

To configure the generation of system logs when a TE tunnel's reroute pending state changes, use the **logging tunnel reroute** command. To stop logging these system messages, use the **no** form of the command.

logging tunnel reroute

no logging tunnel reroute

Syntax Description This command has no arguments or keywords.

Command Modes TE interface configuration (config-te-if)
TE global configuration (config-te).

Supported Use Roles network-admin
vdc-admin

Command History	Release	Modification
	7.3(0)D1(1)	This command was introduced.

Usage Guidelines No system message is logged if this feature is not configured.
This feature can be configured either for an individual TE tunnel or all the TE tunnels.
Reroute pending state change messages are not logged if the tunnel exits reroute pending state by going down.

Examples This example shows how to configure system logs for all TE tunnels when their reroute pending state changes.

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# logging tunnel reroute
switch(config-te)#
```


logging tunnel all

To configure the generation of system logs for all TE tunnel events, use the **logging tunnel all** command. To stop logging these system messages, use the **no** form of the command.

logging tunnel all

no logging tunnel all

Syntax Description This command has no arguments or keywords.

Command Modes TE interface configuration (config-te-if)
TE global configuration (config-te).

Supported Use Roles network-admin
vdc-admin

Command History	Release	Modification
	7.3(0)D1(1)	This command was introduced.

Usage Guidelines No system message is logged if this feature is not configured.
This feature can be configured either for an individual TE tunnel or all the TE tunnels.

Examples This example shows how to configure system logs for all TE tunnels when any event occurs.

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# logging tunnel all
switch(config-te)#
```

lsp attribute

To configure an label switched path (LSP) attribute list, use the **lsp attribute** command.

lsp attribute *string*

Syntax Description	<i>string</i>	LSP attribute list that can be any case-sensitive, alphanumeric string up to 63 characters.
---------------------------	---------------	---

Defaults	None
-----------------	------

Command Modes	TE configuration mode
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SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to configure an LSP attribute list:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# lsp attribute 1
switch(config-lsp-attr)#
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).



M Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with M.

match

To configure a classification criteria, use the **match** command. To return to the default setting, use the **no** form of this command.

```
match [not] mpls experimental topmost exp-list
```

```
no match [not] mpls experimental topmost exp-list
```

Syntax Description		
	not	(Optional) Negates this match result.
	mpls	Specifies a match on the MPLS label.
	experimental	Specifies a match on the MPLS experimental label.
	topmost	Specifies a match on the MPLS topmost label.
	<i>exp-list</i>	List that can contain values and ranges. The range is from 0 to 7.

Defaults None

Command Modes Class-map configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify that the packets should be matched (or not) on the 3-bit experimental (EXP) field in the outermost (topmost) MPLS label in the MPLS header:

```
switch# configure terminal
switch(config)# class-map type qos match-all class-2
switch(config-cmap-qos)# match mpls experimental topmost 1
switch(config-cmap-qos)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

maximum routes

To configure the maximum number of routes that can be stored in the virtual routing and forwarding (VRF) route table, use the **maximum routes** command. To return to the default setting, use the **no** form of this command.

maximum routes *max-routes* [*threshold-value* [**reinstall** *threshold-value*] | **warning-only**]

no maximum routes *max-routes* [*threshold-value* [**reinstall** *threshold-value*] | **warning-only**]

Syntax Description

<i>max-routes</i>	Maximum number of routes. The range is from 1 to 4294967295.
<i>threshold-value</i>	Threshold value at which to generate a warning message. The range is from 1 to 100.
reinstall	Reinstalls the previously rejected route that exceeded the maximum route limit.
warning-only	Generates a warning message if the maximum route limit is exceeded.

Defaults

None

Command Modes

Address-family configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

None.

Examples

This example shows how to configure the maximum number of routes that can be stored in the VRF route table:

```
switch# configure t
switch(config)# vrf context vpn1
switch(config-vrf)# address-family ipv4 unicast
switch(config-vrf-af-ipv4)# maximum routes 10000
switch(config-vrf-af-ipv4)#
```

This example shows how to reinstall the previously rejected route that exceeded the maximum route limit:

```
switch# configure t
switch(config)# vrf context vpn1
```

```
switch(config-vrf)# address-family ipv4 unicast  
switch(config-vrf-af-ipv4)# maximum routes 10000 2 reinstall 2  
switch(config-vrf-af-ipv4)#
```

Related Commands

Command	Description
address-family	Configures the address family.

maximum-paths eibgp

To specify the maximum number of BGP VPNv4 multipaths for both eBGP and iBGP paths, use the **maximum-paths eibgp** command. To remove the multipaths, use the **no** form of this command.

maximum-paths eibgp *parallel-paths*

no maximum-paths eibgp [*parallel-paths*]

Syntax Description

<i>parallel-paths</i>	Maximum number of multipaths for both eBGP and iBGP paths. The default value is 1.
-----------------------	--

Defaults

1 parallel path is configured for both eBGP and iBGP paths.

Command Modes

Global configuration mode (config)

Supported User Roles

network-admin
vdc-admin
network-operator
vdc-operator

Command History

Release	Modification
8.0(1)	This command was introduced.

Usage Guidelines

Use this command on PE devices and Route Reflectors in an MPLS topology.
This command does not require a license.

Examples

This example shows how to specify the maximum number of BGP VPNv4 multipaths for both eBGP and iBGP paths:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# router bgp 100
switch(config-router)# address-family vpnv4 unicast
switch(config-router-af)# maximum-paths eibgp 3
```

Related Commands

Command	Description
show bgp vpnv4 unicast	Display the VPNv4 routes from the BGP table..

mdt asm-use-shared-tree

To specify that a shared-tree [(*,G)] entry should be created for a default multicast distribution tree (MDT) when the default MDT group is in PIM ASM mode, use the **mdt asm-use-shared-tree** command.

mdt asm-use-shared-tree

Syntax Description This command has no arguments or keywords.

Defaults Default MDT group is in PIM ASM mode.

Command Modes VRF configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure the shared-tree [(*,G)] entry should be created for the default MDT when the default MDT group is in PIM ASM mode:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# vrf context vrf1
switch(config-vrf)# mdt asm-use-shared-tree
switch(config-vrf)#
```

Related Commands	Command	Description
	show mvpn mdt route	Displays the detail of the default and the MDT route.

mdt data

To configure a range of group addresses that are used for data multicast distribution trees (MDTs), use the **mdt data** command.

```
mdt data mdt -group-prefix [threshold threshold-value] [route-map policy-name]
```

Syntax Description

<i>mdt-group-prefix</i>	List of group range prefixes.
threshold	(Optional) Specifies the threshold in kilobits per second. The range is from 0 to 4294967.
<i>threshold-value</i>	Threshold in bytes per second when the stream is switched to the data MDT.
route-map	Specifies the route map for creating data MDTs. The map can be a case-sensitive alphanumeric string up to 63 characters.
<i>policy-name</i>	Policy file that defines which customer data streams should be considered for switching to the data MDT.

Defaults

The default value for the threshold parameter is 100 kbps

Command Modes

Configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to configure the the range of group address used for data MDTs:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# vrf context vrf1
switch(config-vrf)# mdt data 232.7.7.0/24 threshold 10 route-map rmap2mdt data
239.192.20.32 0.0.0.15 threshold 1
switch(config-vrf)#
```

Related Commands

Command	Description
show mvpn mdt route	Displays the detail of the default and the MDT route.

mdt data bidir-enable

To configure the range of group address used for data multicast distribution trees (MDTs), use the **mdt data bidir-enable** command.

mdt data bidir-enable

no mdt data bidir-enable

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command allows the user to override the default behavior that is, create data MDTs for bidir routes as well.

This command requires the MPLS Services license.

Examples This example shows how to configure the the range of group addresses used for data MDTs:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# vrf context vrf1
switch(config-vrf)# mdt data bidir-enable
switch(config-vrf)#
```

Related Commands	Command	Description
	show mvpn mdt route	Displays the details of the default and the MDT route.

mdt default

To configure the default multicast distribution tree (MDT) for a virtual routing and forwarding (VRF), use the **mdt default** command. To return to the default settings, use the **no** form of the command.

mdt default *group-address*

no mdt default *group-address*

Syntax Description	<i>address</i>	IP multicast group address.
Defaults	None	
Command Modes	Configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	<p>This example shows how to configure the default MDT for a VRF:</p> <pre>switch# config t Enter configuration commands, one per line. End with CNTL/Z. switch(config)# vrf context vrf1 switch(config-vrf)# mdt default 232.0.0.1 switch(config-vrf)#</pre>	
Related Commands	Command	Description
	show mvpn mdt route	Displays the detail of the default and the MDT route.

mdt enforce-bgp-mdt-safi

To enforce the use of multicast distribution tree (MDT) subsequent address family identifiers (SAFI) for a virtual routing and forwarding instance (VRF), use the **mdt enforce-bgp-mdt-safi** command. To interoperate with peers that do not support MDT SAFI, use the **no** form of the command. When the **no** form is used, initially only the (*,G) entry for the default MDT group is populated if it falls within the Any Source Multicast (ASM) range. Then later, based on traffic, the (S,G) entries are learned like regular ASM routes.

mdt enforce-bgp-mdt-safi

no mdt enforce-bgp-mdt-safi

Syntax Description This command has no arguments or keywords.

Defaults Enabled

Command Modes VRF configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure MDT to interoperate with peers that do not support MDT SAFI:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# vrf context vrf1
switch(config-vrf)# no mdt enforce-bgp-mdt-safi
switch(config-vrf)#
```

Related Commands	Command	Description
	show mvpn bgp mdt-safi	Displays detailed information of the BGP advertisement for MVPN MDT SAFI.

mdt mtu

To configure the maximum transmission unit (MTU) associated with the multicast tunnel interfaces created for the default and data multicast distribution tree (MDT) groups, use the **mdt mtu** command.

mdt mtu *mtu-size*

no mdt mtu *mtu-size*

Syntax Description	<i>mtu-size</i>	MTU value. The range is from 576 to 65535.
--------------------	-----------------	--

Defaults	1376
----------	------

Command Modes	Configuration mode
---------------	--------------------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples	This example shows how to configure the maximum transmission unit (MTU) associated with the multicast tunnel interfaces created for the default and data MDT groups:
----------	--

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# vrf context vrf1
switch(config-vrf)# mdt mtu 600
switch(config-vrf)#
```

Related Commands	Command	Description
	show mvpn mdt route	Displays the detail of the default and the MDT route.

mdt pim hello-interval

To configure the hello interval used between peers, use the **mdt pim hello-interval** command.

mdt ip pim hello-interval *interval*

no mdt ip pim hello-interval *interval*

Syntax Description	<i>interval</i>	Interval in milliseconds. The range is from 3000 to 18724286.
Defaults	30000 milliseconds	
Command Modes	Configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	<p>This example shows how to configure the hello interval used between peers:</p> <pre>switch# config t Enter configuration commands, one per line. End with CNTL/Z. switch(config)# vrf context vrf1 switch(config-vrf)# mdt pim hello-interval 30000 switch(config-vrf)#</pre>	
Related Commands	Command	Description
	show mvpn mdt route	Displays the detail of the default and the MDT route.

mdt pim jp-interval

To configure the PIM periodic interval associated with join or prune packet transmission over the default multicast distribution tree (MDT) tunnel interface, use the **mdt pim jp-interval** command. To return to the default settings, use the **no** form of the command.

mdt pim jp-interval *interval*

no mdt pim jp-interval *interval*

Syntax Description	<i>interval</i>	Interval in seconds. The range is from 60000 to 18724286.
Defaults	60000 milliseconds	
Command Modes	Configuration mode	
SupportedUserRoles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	<p>This example shows how to configure the PIM periodic interval associated join packet transmission over the default MDT tunnel interface:</p> <pre>switch# config t Enter configuration commands, one per line. End with CNTL/Z. switch(config)# vrf context vrf1 switch(config-vrf)# mdt pim jp-interval 60000 switch(config-vrf)#</pre>	
Related Commands	Command	Description
	show mvpn mdt route	Displays the detail of the default and the MDT route.

mdt source

To configure the interface that is used to set the multicast virtual private network (VPN) data multicast distribution tree (MDT) source address, use the **mdt source** command.

mdt source *interface*

no mdt source *interface*

Syntax Description	<i>interface</i>	Interface used to set the multicast VPN data multicast distribution tree (MDT) source address.
Defaults	None	
Command Modes	Configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	<p>This example shows how to configure the interface that is used to set the multicast VPN data multicast distribution tree (MDT) source address:</p> <pre>switch# config t Enter configuration commands, one per line. End with CNTL/Z. switch(config)# vrf context vrf1 switch(config-vrf)# mdt source interface switch(config-vrf)#</pre>	
Related Commands	Command	Description
	show mvpn mdt route	Displays the detail of the default and the MDT route.

member

To add an active Ethernet AC, with or without an Ethernet Flow Point (EFP), to the context, use the **member** command. To delete the member configuration, use the **no** form of this command.

```
member interface-type { ip-address ip-address | ethernet slot/port-number | port-channel
port-channel-number | pseudowire pw-id } [service-instance service-instance-id] [group
group-name] [priority number]
```

```
no member interface-type { ip-address ip-address | ethernet slot/port-number | port-channel
port-channel-number | pseudowire pw-id } [service-instance service-instance-id] [group
group-name] [priority number]
```

Syntax Description	
<i>interface-type</i>	Interface type.
ip-address <i>ip-address</i>	Specifies the IPv4 or IPv6 address of the peer.
ethernet <i>slot/port-number</i>	Specifies the Ethernet IEEE 802.3z interface. The range for the slot is from 1 to 253.
port-channel <i>port-channel-number</i>	Specifies the port channel interface. The range for the port channel is from 1 to 4096.
pseudowire <i>pw-id</i>	Specifies the pseudowire interface. The pw-ID is a unique per-interface identifier for this pseudowire. The range is from 1 to 200000. The range for a static pseudowire is from 1 to 8192.
service-instance <i>service-instance-id</i>	(Optional) Specifies the service instance. Service instance ID. The <i>service-instance-id</i> is a unique per-interface identifier for the EFP. The valid range is from 1 to 4000.
group <i>group-name</i>	(Optional) Specifies the group to which the member belongs. Group name. The <i>group-name</i> can be a maximum of 31 alphanumeric characters.
priority <i>number</i>	(Optional) Specifies the priority. Priority number. The range is from 1 to 10, with 1 being the highest priority. The default is 0 and is higher than 1.

Defaults None

Command Modes config-xconnect configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to add an active Ethernet AC, with or without an EFP, to the context:

```
switch# configure terminal
switch(config)# interface ethernet 4/0/0.1
switch(config-if)# encapsulation dot1q 100
switch(config-if)# l2vpn xconnect context Test1
switch(config-xconnect)# internetworking ethernet
switch(config-xconnect)# member ethernet 4/0/0.1 service-instance 100
switch(config-xconnect)#
```

This example shows how to delete the member configuration:

```
switch(config-xconnect)# no member ethernet 4/0/0.1 service-instance 100
switch(config-xconnect)#
```

Related Commands

Command	Description
internetworking	Specifies the type of pseudowire and the type of traffic that can flow across the network
l2vpn xconnect context	Enters Xconnect configuration mode and establishes a Layer 2 VPN (L2VPN) context for identifying the two members in a VPWS, multi-segment pseudowire, or local connect service.

member encapsulation mpls

To specify the devices that form a point-to-point Layer 2 VPN (L2VPN) Virtual Forwarding Interface (VFI) connection, use the **member encapsulation mpls** command.

member *ip-address* **encapsulation mpls**

Syntax Description	<i>ip-address</i>	IPv4 or IPv6 address.
---------------------------	-------------------	-----------------------

Defaults	None
-----------------	------

Command Modes	config-l2vpn-vfi mode
----------------------	-----------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to specify the devices that form a point-to-point L2VPN VFI connection:

```

switch# configure terminal
switch(config)# l2vpn vfi context vpls80
switch(config-l2vpn-vfi)# description VFIforDualHome
switch(config-l2vpn-vfi)# vpn 10
switch(config-l2vpn-vfi)# redundancy primary
switch(config-l2vpn-vfi)# member 10.0.0.3 encapsulation mpls
switch(config-l2vpn-vfi)#

```

Related Commands	Command	Description
	bridge domain	Enters bridge-domain configuration mode and configures a bridge domain.
	l2vpn vfi context	Establishes a Layer 2 VPN (L2VPN) Virtual Forwarding Interface (VFI) between two or more separate networks.
	vpn	Configures a Virtual Private Network (VPN) ID on a VFI context.

member pseudowire

To add an active pseudowire to the XConnect context, use the **member pseudowire** command. To remove the active pseudowire configuration, use the **no** form of this command.

member pseudowire *pw-id* [**group** *group-name*] [**priority** *number*]

no member pseudowire *pw-id* [**group** *group-name*] [**priority** *number*]

Syntax Description		
<i>pw-id</i>		Pseudowire ID. The range is from 1 to 200000. The range for a static pseudowire is from 1 to 8192.
group		(Optional) Specifies the group to which the member belongs.
<i>group-name</i>		Group name. The <i>group-name</i> can be a maximum of 31 alphanumeric characters.
priority		(Optional) Specifies the priority.
<i>number</i>		Priority number. The range is from 1 to 10, with 1 being the highest priority. The default is 0 and is higher than 1.

Defaults None

Command Modes config-xconnect mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to add an active pseudowire to the XConnect context:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# encapsulation mpls
switch(config-if)# no shutdown
switch(config-if)# l2vpn xconnect context redundancytest
switch(config-xconnect)# member ethernet 2/1 service-instance 1 group access-side
switch(config-xconnect)# member pseudowire 2 group access-side priority 1
```

This example shows how to remove the active pseudowire configuration:

```
switch(config-xconnect)# no member pseudowire 2 group access-side priority 1
```

```
switch(config-xconnect)#
```

Related Commands

Command	Description
l2vpn xconnect context	Enters Xconnect configuration mode and establishes a Layer 2 VPN (L2VPN) XConnect context for identifying the two members in a VPWS, multi segment pseudowire, or local connect service.

member vfi

To bind a virtual forwarding interface (VFI) to a bridge domain, use the **member vfi** command.

```
member vfi vfi-id
```

Syntax Description	<i>vfi-id</i>	VFI ID. The VFI ID can be any alphanumeric, case-sensitive up to 100 characters.
---------------------------	---------------	--

Defaults	None
-----------------	------

Command Modes	config-bdomain mode
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SupportedUserRoles	network-admin vdc-admin
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Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to bind a VFI to this bridge domain:

```
switch# configure terminal
switch(config)# bridge-domain 100
switch(config-bdomain)# member vfi vpls80
switch(config-bdomain)#
```

Related Commands	Command	Description
	bridge domain	Enters bridge-domain configuration mode and configures a bridge domain.
	l2vpn vfi context	Establishes a Layer 2 VPN (L2VPN) Virtual Forwarding Interface (VFI) between two or more separate networks.
	vpn	Configures a Virtual Private Network (VPN) ID on a VFI context.

mpls ip

To enable IP over Multiprotocol Label Switching (MPLS), use the **mpls ip** command.

mpls ip

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable IP over MPLS:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# interface ethernet 2/2
switch(config-if)# mpls ip
switch(config-if)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

mpls ip (TE configuration mode)

To enable the LDP over an MPLS TE tunnel, use the **mpls ip** command.

mpls ip

Syntax Description This command has no arguments and keywords.

Defaults None

Command Modes TE configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure the IP TTL propagation over MPLS:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# interface tunnel-te
switch(config-te)# mpls ip
switch(config-te)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

mpls ip forwarding

To enable MPLS on the specified interface, use **mpls ip forwarding** command.

mpls ip forwarding

Syntax Description This command has no arguments and keywords.

Defaults None

Command Modes Interface configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

mpls ip default-route

To allow Multiprotocol Label Switching (MPLS) forwarding for the IP default route, use the **mpls ip default-route** command. To revert to the default settings, use the **no** form of the command.

mpls ip default-route

no mpls ip default-route

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes LDP configuration interface mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to allow MPLS forwarding for the IP default route:

```
switch# config t
switch(config)# mpls ldp configuration
switch(config-ldp)# mpls ip default-route
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

mpls label range

To configure the Multiprotocol Label Switching (MPLS) label range for a static label assignment, use the **mpls label range** command. To return to the default setting, use the **no** form of this command.

mpls label range *min-value max-value* [**static** *min-static-value max-static-value*]

no mpls label range *min-value max-value* [**static** *min-static-value max-static-value*]

Syntax Description

<i>min-value</i>	Minimum label value. The range is from 16 to 471804.
<i>max-value</i>	Maximum label value. The range is from 16 to 471804.
static	(Optional) Specifies the block of labels for static bindings.
<i>min-static-value</i>	Minimum static label value. The range is from 16 to 471804.
<i>max-static-value</i>	Maximum static label value. The range is from 16 to 471804.

Defaults

None

Command Modes

Global configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(5) and higher including 6.1(1)	Changed the maximum label value from 492286 to 471804.
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to reserve a range of labels for static label assignment:

```
switch# configure terminal
switch(config)# mpls label range 200 100000 static 16 199
switch(config)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

mpls ldp autoconfig

To enable Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) autoconfiguration for all level-1, all level-2, or all level-1 and level-2 IS-IS interfaces, use the **mpls ldp autoconfig** command. To return to the default setting, use the **no** form of this command.

```
mpls ldp autoconfig {level-1 | level-1-2 | level-2}
```

```
no mpls ldp autoconfig {level-1 | level-1-2 | level-2}
```

Syntax Description	level-1	level-1-2	level-2
	Specifies the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) autoconfiguration (AC) on IS-IS level-1 only.	Specifies the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) autoconfiguration (AC) on IS-IS level-1 and level-2.	Specifies the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) autoconfiguration (AC) on IS-IS level-2 only.

Defaults None

Command Modes Router configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable MPLS LDP autoconfiguration for all level-1, all level-2, or all level-1 and level-2 IS-IS interfaces:

```
switch# configure terminal
switch(config)# router isis p1
switch(config-router)# mpls ldp autoconfig level-1
switch(config-router)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

mpls ldp autoconfig area

To enable Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) autoconfiguration for all Open Shortest Path First (OSPF) interfaces, use the **mpls ldp autoconfig area** command. To return to the default setting, use the **no** form of this command.

```
mpls ldp autoconfig area area-id
```

```
no mpls ldp autoconfig area area-id
```

Syntax Description	<i>area-id</i>	Area ID as an integer or IP address. The range is from 0 to 4294967295.
---------------------------	----------------	---

Defaults	None
-----------------	------

Command Modes	Router configuration mode
----------------------	---------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples	This example shows how to enable MPLS LDP autoconfiguration for all OSPF interfaces:
-----------------	--

```
switch# configure terminal
switch(config)# p1
switch(config-router)# mpls ldp autoconfig area 10
switch(config-router)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

mpls ldp configuration

To configure the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP), use the **mpls ldp configuration** command.

mpls ldp configuration

Syntax Description This command has no arguments or keywords.

Defaults Enabled

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines When MPLS LDP is disabled on the device, no LDP commands are available. This command requires the MPLS Services license.

Examples This example shows how to configure MPLS LDP:

```
switch(config)# mpls ldp configuration
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp sync	Enables Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) Interior Gateway Protocol (IGP) synchronization for all IS-IS interfaces.

mpls ldp discovery transport-address

To configure the transport address that is advertised in the Label Distribution Protocol (LDP) discovery hello messages sent on an interface, use the **mpls ldp discovery transport-address** command. To return to the default setting, use the **no** form of this command.

```
mpls ldp discovery transport-address {ip-address | interface}
```

```
no mpls ldp discovery transport-address {ip-address | interface}
```

Syntax Description		
	<i>ip-address</i>	IP address that is advertised as the transport address.
	interface	Specifies that the interface IP address be advertised as the transport address.

Defaults	
	None

Command Modes	
	Interface configuration mode

Supported User Roles	
	network-admin vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	
	This command requires the MPLS Services license.

Examples This example shows how to configure the transport address that is advertised in the LDP discovery hello messages sent on an interface:

```
switch(config)# interface ethernet 6/1
switch(config-if)# mpls ldp discovery transport-address 209.165.200.225
switch(config-if)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

mpls ldp graceful-restart

To enable the switch to protect the Label Distribution Protocol (LDP) bindings and Multiprotocol Label Switching (MPLS) forwarding state during a disruption in service, use the **mpls ldp graceful-restart** command.

mpls ldp graceful-restart

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes config-ldp mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to enable the switch to protect the LDP bindings and MPLS forwarding state during a disruption in service:

```
switch# configure terminal
switch (config)# mpls ldp configuration
switch(config-ldp)# mpls ldp graceful-restart
switch(config-ldp)#
```

Related Commandss	Command	Description
	show mpls ldp graceful-restart	Displays the graceful-restart parameters for a router's sessions with its LDP neighbors.

mpls ldp igp autoconfig

To enable the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) for the specified interface, use the **mpls ldp igp autoconfig** command. To return to the default setting, use the **no** form of this command.

mpls ldp igp autoconfig

no mpls ldp igp autoconfig

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Interface configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable MPLS LDP for the specified interface:

```
switch# configure terminal
switch(config)# interface ethernet 7/1
switch(config-if)# mpls ldp igp autoconfig
switch(config-if)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

mpls ldp igp sync

To configure a delay time for Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) Interior Gateway Protocol (IGP) synchronization on the specified interface, use the **mpls ldp igp sync** command. To return to the default setting, use the **no** form of this command.

```
mpls ldp igp sync [delay seconds]
```

```
no mpls ldp igp sync [delay seconds]
```

Syntax Description	delay	(Optional) Specifies LDP to IGP sync achieved notification delay time.
	seconds	(Optional) Display in seconds. The range is from 5 to 60 seconds.

Defaults	None
----------	------

Command Modes	Interface configuration mode
---------------	------------------------------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	The no mpls ldp igp sync delay command sets the delay time to 0 seconds but leaves the MPLS LDP and IGP synchronization enabled. This command requires the MPLS Services license.
------------------	---

Examples	This example shows how to configure a delay time for the MPLS LDP and IGP synchronization on the specified interface: <pre>switch# configure terminal switch(config)# feature mpls ldp switch(config)# interface ethernet 6/1 switch(config-if)# mpls ldp igp sync delay 30</pre>
----------	--

Related Commands	Command	Description
	mpls ldp sync	Enables Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) Interior Gateway Protocol (IGP) synchronization for all IS-IS interfaces.

mpls ldp sync

To enable Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) and Interior Gateway Protocol (IGP) synchronization for all Open Shortest Path First (OSPF) interfaces, use the **mpls ldp sync** command. To return to the default setting, use the **no** form of this command.

mpls ldp sync

no mpls ldp sync

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Router configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable MPLS LDP and IGP synchronization for all OSPF interfaces:

```
switch# configure terminal
switch(config)# p1
switch(config-router)# mpls ldp sync
```

Related Commands	Command	Description
	mpls ldp igp sync	Allows Label Distribution Protocol (LDP) Interior Gateway Protocol (IGP) Synchronization on this interface.

mpls oam

To configure MPLS Operations and Management (OAM) for customizing the default behavior of echo packets, use the **mpls oam** command. To return to the default setting, use the **no** form of this command.

mpls oam

no mpls oam

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure MPLS OAM:

```
switch# configure terminal
switch(config)# mpls oam
switch(conf-mpls-oam)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

mpls static binding ipv4

To configure the static binding of labels to IPv4 prefixes, use the **mpls static binding ipv4** command. To return to the default setting, use the **no** form of this command.

```
mpls static binding ipv4 prefix mask {label | input label | output nexthop {explicit-null | implicit-null | label}}
```

```
no mpls static binding ipv4 prefix mask {label | input label | output nexthop {explicit-null | implicit-null | label}}
```

Syntax Description

<i>prefix mask</i>	Destination prefix and mask.
<i>label</i>	Label value. The range is from 16 to 1048575492286.
input	Specifies the incoming local label.
output	Specifies the outgoing remote label.
<i>nexthop</i>	Destination next hop.
explicit-null	Specifies the IETF MPLS IPv4 explicit null label.
implicit-null	Specifies the IETF MPLS implicit null label.

Defaults

None

Command Modes

LDP configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to configure the static binding of labels to IPv4 prefixes:

```
switch# configure terminal
switch(config)# mpls ldp configuration
switch(config)# mpls static binding ipv4 10.2.2.0 255.255.255.255 input 17
switch(config)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

mpls static binding ipv4 vrf

To configure the Multiprotocol Label Switching (MPLS) static binding of labels to the IPv4 destination VPN routing prefix, use the **mpls static binding ipv4 vrf** command. To return to the default setting, use the **no** form of this command.

```
mpls static binding ipv4 vrf vpn-name prefix mask {input label \ label}
```

```
no mpls static binding ipv4 vrf vpn-name prefix mask {input label \ label}
```

Syntax Description

<i>vpn-name</i>	VPN name. The maximum size is alphanumeric 32 characters.
<i>prefix-mask</i>	Destination prefix and mask.
input	Specifies the incoming local label.
<i>label</i>	Label value.

Defaults

None

Command Modes

LDP configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

You must configure the MPLS VPN and VRFs before creating VRF-aware static labels.
This command requires the MPLS Services license.

Examples

This example shows how to configure static label bindings input and output labels for several prefixes:

```
switch# configure terminal
switch(config)# mpls ldp
switch(config-ldp)# mpls static binding ipv4 vrf vpn100 10.2.0.0 255.255.0.0 input 17
switch(config-ldp)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

mpls traffic-eng administrative-weight

To override the Interior Gateway Protocol (IGP) administrative weight (cost) of the link as used in traffic engineering (TE) path calculations, use the **mpls traffic-eng administrative-weight** command. To restore the system to its default condition, use the **no** form of this command.

mpls traffic-eng administrative-weight *weight*

no mpls traffic-eng administrative-weight *weight*

Syntax Description

<i>weight</i>	TE administrative weight.
---------------	---------------------------

Defaults

The TE link administrative weight defaults to the IGP cost of the link

Command Modes

Interface configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to override the IGP administrative weight (cost) of the link:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# mpls traffic-eng administrative weight 20
switch(config-if)#
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

mpls traffic-eng area

To turn on the Multiprotocol Label Switching (MPLS) traffic engineering (TE) for the indicated Open Shortest Path First (OSPF) area, use the **mpls traffic-eng area** command. To return to the default setting, use the **no** form of this command.

mpls traffic-eng area *area-id*

no mpls traffic-eng area *area-id*

Syntax Description

area-id Area ID that can be a IP address or a positive integer.

Defaults

None

Command Modes

Router configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to turn on MPLS TE for the indicated OSPF area:

```
switch(config)# router ospf 100
switch(config-router)# mpls traffic-eng area 1
switch(config-router)#
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

mpls traffic-eng attribute-flags

To set the user-defined interface attribute flags, use the **mpls traffic-eng attribute-flags** command. To return to the default setting, use the **no** form of this command.

mpls traffic-eng attribute-flags *value*

no mpls traffic-eng attribute-flags

Syntax Description	<i>value</i>	Attribute flags. Typically entered in the range 0x0 - 0xffffffff.
Defaults	None	
Command Modes	Interface configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to set the user-defined interface attribute flags: <pre>switch# configure terminal switch(config)# interface ethernet 6/1 switch(config-if)# mpls traffic-eng attribute-flags 0x3f switch(config)#</pre>	
Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

mpls traffic-eng backup-path

To assign one or more backup tunnels to a protected interface, use the **mpls traffic-eng backup-path** command. To restore the system to its default condition, use the **no** form of this command.

mpls traffic-eng backup-path tunnel-te *interface number*

no mpls traffic-eng backup-path tunnel-te *interface number*

Syntax Description	Parameter	Description
	tunnel-te	Specifies a traffic engineering (TE) interface.
	<i>interface number</i>	Interface number. The range is from 0 to 65503.

Defaults

Enter this command on the interface to be protected (Link Protection), or on the interface whose downstream node is being protected (Node Protection). You can enter this command multiple times to select multiple backup tunnels for a given protected interface. An unlimited number of backup tunnels can be assigned to protect an interface. The only limitation is memory. By entering this command on a physical interface, LSPs using this interface (sending data out of this interface) can use the indicated backup tunnels if there is a link or node failure.

Command Modes Interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure an MPLS backup for this interface:

```
switch# configure terminal
switch(config)# interface ethernet 6/1
switch(config-if)# mpls traffic-eng bandwidth-path tunnel-te 1000
switch(config-if)#
```

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

mpls traffic-eng bandwidth

To allocate the Multiprotocol Label Switching (MPLS) traffic engineering (TE) bandwidth pool for the interface, use the **mpls traffic-eng bandwidth** command. To restore the system to its default condition, use the **no** form of this command.

mpls traffic-eng bandwidth [*interface-kbps* | **percent** *percentage*]

no mpls traffic-eng tunnels

Syntax Description		
<i>interface-kbps</i>	(Optional) Maximum amount of bandwidth (in kbps) that can be allocated by TE flows. The range is from 1 to 10000000.	
percentage	(Optional) Specifies the maximum percentage of the link bandwidth that may be allocated by TE flows.	
<i>percentage</i>	(Optional) The range is from 1 to 100.	

Defaults If neither interface-kbps nor a percentage are specified, then the bandwidth pool size defaults to 75% of the interface's bandwidth.

Command Modes Interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to allocate the MPLS TE bandwidth pool for the interface:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# mpls traffic-eng bandwidth 1000
switch(config-if)#
```

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

mpls traffic-eng configuration

To configure Multiprotocol Label Switching (MPLS) traffic engineering (TE), use the **mpls traffic-eng configuration** command.

mpls traffic-eng configuration

Syntax Description This command has no arguments or keywords.

Defaults Enabled

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure MPLS TE:

```
switch(config)# mpls traffic-eng configuration
switch(config-te)#
```

Related Commands	Command	Description
	None	There are no related commands.

mpls traffic-eng flooding threshold

To set the Multiprotocol Label Switching (MPLS) flooding thresholds, use the **mpls traffic-eng flooding threshold** command. To return to the default setting, use the **no** form of this command.

```
mpls traffic-eng flooding thresholds{ down decreased reserved bw | up increased reserved bandwidth}
```

```
no mpls traffic-eng flooding thresholds{ down | up}
```

Syntax Description

down	Specifies the thresholds for decreased resource availability.
<i>decreased reserved bw</i>	Decreased bandwidth usage. The range is from 1 to 100.
up	Specifies the thresholds for increased resource availability.
<i>increased reserved bandwidth</i>	increased bandwidth usage. The range is from 1 to 100.

Defaults

None

Command Modes

Interface configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to specify the thresholds for decreased resource availability:

```
switch(config)# interface ethernet 6/1
switch(config-if)# mpls traffic-eng flooding thresholds down 90
switch(config-if)#
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

mpls traffic-eng level

To configure the Multiprotocol Label Switching (MPLS) traffic engineering (TE) for Intermediate System-to-Intermediate System (IS-IS), use the **mpls traffic-eng level** command. To return to the default setting, use the **no** form of this command.

```
mpls traffic-eng {level-1 | level-1-2 | level-2}
```

```
no mpls traffic-eng {level-1 | level-1-2 | level-2}
```

Syntax Description

level-1	Specifies MPLS TE on IS-IS level-1 only.
level-1-2	Specifies MPLS TE on IS-IS level-1 and level-2.
level-2	Specifies MPLS TE on IS-IS level-2 only.

Defaults

Enable

Command Modes

Router configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

You can enable MPLS for level-1, level-2 or level 1 and level-2 routers.
This command requires the MPLS Services license.

Examples

This example shows how to configure MPLS TE for IS-IS:

```
switch(config)# router isis p1
switch(config-router)# mpls traffic-eng level-1
switch(config-router)#
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

mpls traffic-eng router-id

To specify that the traffic engineering router identifier for the node is the IP address associated with a given interface, use the **mpls traffic-eng router-id** command. To return to the default setting, use the **no** form of this command.

mpls traffic-eng router-id *interface*

no mpls traffic-eng router-id *interface*

Syntax Description	<i>interface</i>	Virtual interface number. The range is from 0 to 1023.
--------------------	------------------	--

Defaults	Enable
----------	--------

Command Modes	Router configuration mode
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Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command is not effective until you configure the specified loopback with an IP address. This command requires the MPLS Services license.
------------------	--

Examples	This example shows how to configured the TE router-ID to be the IP address of the loopback 0 interface: <pre>switch(config)# router isis switch(config-router)# mpls traffic-eng router-id loopback0 switch(config-router)#</pre>
----------	--

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

mpls traffic-eng tunnels

To enable Multiprotocol Label Switching (MPLS) traffic engineering (TE) tunnels on an interface, use the **mpls traffic-eng tunnels** command. To restore the system to its default condition, use the **no** form of this command.

mpls traffic-eng tunnels

no mpls traffic-eng tunnels

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Interface configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable MPLS traffic engineering tunnels:

```
switch(config)# interface ethernet 2/1
switch(config-if)# mpls traffic-eng tunnels
switch(config-if)#
```

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.



N Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with N.

neighbor

To configure neighbor parameters, use the **neighbor** command. To return to the default setting, use the **no** form of this command.

```
neighbor ip-address { implicit-withdraw | labels accept prefix-list | targeted }
```

```
no neighbor ip-address implicit-withdraw | labels accept prefix-list | targeted }
```

Syntax Description

<i>ip-address</i>	IP address for the Label Distribution Protocol (LDP) neighbor.
implicit-withdraw	Specifies the LDP Implicit Withdraw Label.
labels	Specifies the label binding exchange controls.
accept	Specifies the label bindings to accept.
<i>prefix-list</i>	Name of the prefix list.
targeted	Specifies the targeted session.

Defaults

None

Command Modes

LDP configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

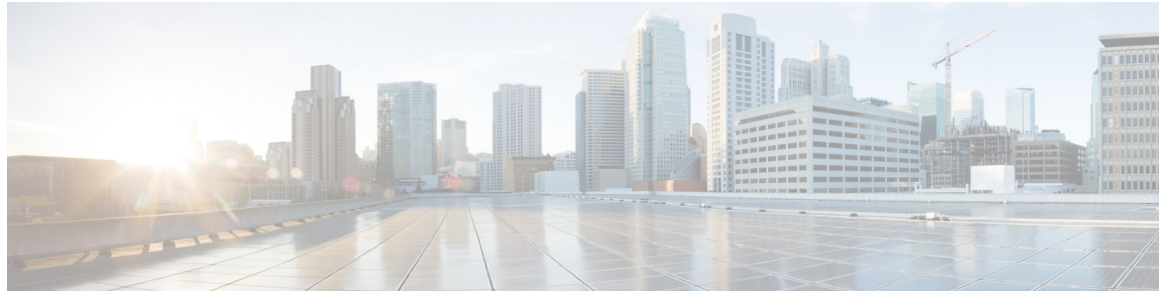
Examples

This example shows how to configure the prefix list to be used to filter label bindings for the specified LDP neighbor:

```
switch# configure terminal
switch(config)# mpls ldp configuration
switch(config-ldp)# neighbor 10.12.12.12 labels accept pl
switch(config-ldp)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).



P Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with P.

password option

To configure a Message Digest (MD5) password for Label Distribution Protocol (LDP) sessions with neighbors whose LDP router IDs are permitted by a specified prefix list, use the **password option** command. To return to the default setting, use the **no** form of this command.

password option *number* **for** *prefix-list* **key-chain** *keychain-name*

no password option *number*

Syntax Description		
	<i>number</i>	Order in which the prefix lists is evaluated when the device determines a neighbor password. The valid range is from 1 to 32767.
	for	Specifies the prefix list control on LDP peers.
	<i>prefix-list</i>	Prefix list for LDP peers.
	key-chain	Specifies a key chain name.
	<i>keychain-name</i>	Key chain name.

Defaults None

Command Modes LDP configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure an MD5 password for LDP sessions with neighbors whose LDP router IDs are permitted by a specified prefix list:

```
switch# configure terminal
switch(config)# mpls ldp configuration
switch(config-ldp)# password option 1 for peer-prefix key-chain keychain1
switch(config-ldp)#
```

Related Commandss	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

password required

To configure a Label Distribution Protocol (LDP) password when establishing a session between LDP peers, use the **password required** command. To return to the default setting, use the **no** form of this command.

password required [**for** *prefix-list*]

no password required

Syntax Description	<table border="1"> <tr> <td>for</td> <td>(Optional) Specifies a prefix list when establishing a session between a peers.</td> </tr> <tr> <td><i>prefix-list</i></td> <td>(Optional) Prefix list for LDP peers.</td> </tr> </table>	for	(Optional) Specifies a prefix list when establishing a session between a peers.	<i>prefix-list</i>	(Optional) Prefix list for LDP peers.
for	(Optional) Specifies a prefix list when establishing a session between a peers.				
<i>prefix-list</i>	(Optional) Prefix list for LDP peers.				
Defaults	None				
Command Modes	LDP configuration mode				
Supported User Roles	network-admin vdc-admin				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>5.2(1)</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	5.2(1)	This command was introduced.
Release	Modification				
5.2(1)	This command was introduced.				
Usage Guidelines	This command requires the MPLS Services license.				
Examples	<p>This example shows how to configure an LDP password when establishing a session between LDP peers:</p> <pre>switch# configure terminal switch(config)# mpls ldp configuration switch(config-ldp)# password required for password1 switch(config-ldp)#</pre>				
Related Commandss	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>mpls ldp configuration</td> <td>Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).</td> </tr> </tbody> </table>	Command	Description	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).
Command	Description				
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).				

path-option (TE interface configuration mode)

To configure a path option for a Multiprotocol Label Switching (MPLS) traffic engineering (TE) tunnel, use the **path-option** command. To restore the system to its default condition, use the **no** form of this command.

```
path-option [protect] preference-number {dynamic | explicit {identifier id | name name}
[verbatim]} [lockdown] [bandwidth kbps] [attributes listname]
```

```
no path-option
```

Syntax Description		
protect		(Optional) Specifies a secondary path option to protect an already defined primary path option. Using this keyword will cause a second protected LSP to be signalled (if the path is available) and traffic will switch to this protected LSP if the primary LSP goes down.
<i>preference-number</i>		Preference for this path option. When you configure multiple path options, lower numbered options are preferred. The range is from 1 to 1000.
dynamic		Specifies the setup based on a dynamically calculated path.
explicit		Specifies the setup based on a preconfigured path.
identifier		Specifies an TE explicit path by number.
<i>id</i>		Number of the TE explicit path. The ID range is from 1 to 65535.
name		Specifies an TE explicit path by name.
<i>name</i>		Name that is any case-sensitive, alphanumeric string.
verbatim		(Optional) Bypasses the topology database verification process.
lockdown		(Optional) Specifies that this is not a candidate for reoptimization.
bandwidth		(Optional) Overrides the bandwidth configured on the tunnel or the attribute list. The kbps is the number of kilobits per second set aside for the path option.
<i>kpls</i>		(Optional) Kilobits per second. The range is from 1 to 4294967295.
attributes		(Optional) Specifies an LSP attribute list.
<i>listname</i>		(Optional) LSP attribute list name. The listname is any case-sensitive, alphanumeric string up to 63 characters.

Defaults None

Command Modes TE interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines

You can configure multiple path options for a single tunnel. For example, there can be several explicit path options and a dynamic option for one tunnel. The path setup preference is for lower (not higher) numbers, so option 1 is preferred.

If you specify the **dynamic** keyword, the software checks both the physical bandwidth of the interface and the available TE bandwidth to be sure that the requested amount of bandwidth does not exceed the physical bandwidth of any link. To oversubscribe links, you must specify the **explicit** keyword. If you use the **explicit** keyword, the software checks only how much bandwidth is available on the link for TE; the amount of bandwidth that you configure is not limited to how much physical bandwidth is available on the link.

This command requires the MPLS Services license.

Examples

This example shows how to configure the tunnel to use a named TE explicit path and if that path is not available, then to fall back to a path dynamically calculated from the TE topology database:

```
switch# configure terminal
switch(config)# interface tunnel-te 1
switch(config-if-te)# path-option 10 explicit name Link5
switch(config-if-te)# path-option dynamic 20
switch(config-if-te)#
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

path-selection metric (TE configuration mode)

To configure the metric type to use if a metric type is not explicitly configured for a Multiprotocol Label Switching (MPLS) traffic engineering (TE) tunnel, use the **path-selection metric** command. To restore the system to its default condition, use the **no** form of this command.

path-selection metric {igp | te}

no path-selection metric

Syntax Description	igp	Specifies the Interior Gateway Protocol (IGP) metric.
	te	Specifies the traffic engineering (TE) metric.

Defaults TE

Command Modes TE configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines If you configure the TE path selection metric type, you should configure the MPLS TE administrative weight on each interface for which TE is enabled.

Use this command to specify the metric type to be used for traffic engineering (TE) tunnels for which the **tunnel path-selection metric** command has not been specified.

The metric type to be used for path calculation for a given tunnel is determined as follows:

- If you entered the **tunnel path-selection metric** command to specify a metric type for the tunnel, use that metric type.
- If you entered the TE configuration mode path-selection metric was entered to specify a metric type, use that metric type.
- If you did not do any of the above tasks, use the default (te) metric.

This command requires the MPLS Services license.

Examples This example shows how to configure the metric type to use if a metric type is not explicitly configured for an MPLS TE tunnel:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
```

```
switch(config-te)# path-selection metric te  
switch(config-te)#
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

path-selection metric (TE interface configuration mode)

To configure the metric type to be used if a metric type is not explicitly configured for an Multiprotocol Label Switching (MPLS) traffic engineering (TE) tunnel, use the **path-selection metric** command. To restore the system to its default condition, use the **no** form of this command.

path-selection metric {igp | te}

no path-selection metric

Syntax Description	igp	Specifies the Interior Gateway Protocol (IGP) metric.
	te	Specifies the traffic engineering (TE) metric.

Defaults TE

Command Modes TE interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines If you configure the TE path selection metric type, you should configure the MPLS TE administrative weight on each interface for which TE is enabled.

Use this command to specify the metric type to be used for traffic engineering (TE) tunnels for which the **tunnel path-selection metric** command has not been specified.

The metric type to be used for path calculation for a given tunnel is determined as follows:

- If you entered the tunnel path-selection metric command was entered to specify a metric type for the tunnel, use that metric type.
- If you entered the TE configuration mode path-selection metric was entered to specify a metric type, use that metric type.
- If you did not do any of the above tasks, use the default (te) metric.

This command requires the MPLS Services license.

Examples This example shows how to configure the metric type to use if a metric type is not explicitly configured for an MPLS TE tunnel:

```
switch# configure terminal
switch(config)# interface tunnel-te 1
```

```
switch(config-if-te)# path-selection metric te  
switch(config-if-te)#
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

path-selection overload allow

To allow overloaded nodes in Constrained Shortest Path First (CSPF), use the **path-selection overload allow** command. To return to the default setting, use the **no** form of this command.

```
path-selection overload allow {head [middle [tail]] | middle [tail] | tail}
```

```
no path-selection overload allow
```

Syntax Description	head	Specifies that an overloaded node can still be used as a tunnel head in the traffic engineering (TE) constrained Shortest Path First (CSPF).
	middle	(Optional) Specifies the overloaded middle node in the TE CSPF.
	tail	(Optional) Specifies the overloaded tail node in the TE CSPF.

Defaults None

Command Modes TE configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify that an overloaded node can still be used as a tunnel head in the traffic engineering (TE) constrained Shortest Path First (CSPF):

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# path-selection overload allow head
switch(config-te)#
```

Related Commandss	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

ping mpls

To test the Multiprotocol Label Switching (MPLS) label switched path (LSP) reachability, use the **ping mpls** command.

```
ping mpls {ipv4 destination-address/destination-mask-length | pseudowire ipv4-address vc-id | traffic-eng tunnel-te interface number}
```

Syntax	Description
ipv4	Specifies the target as an IPv4 address.
<i>destination-address</i>	Target Forwarding Equivalence Class (FEC) address.
<i>destination-mask-length</i>	Target FEC address with the mask length.
pseudowire	Specifies the target virtual channel (VC) as an IPv4 address and VC ID.
<i>ipv4-address</i>	IPv4 address.
<i>vc-id</i>	VC ID. The range is from 0 to 4294967295.
traffic-eng	Specifies as a traffic engineering (TE) tunnel interface.
tunnel-te	Specifies the TE interface.
<i>interface number</i>	TE interface number. The range is from 0 to 65503.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify the test MPLS LSP reachability:

```
switch# ping mpls pseudowire 1.2.3.4 200  
LSP ping for VCCV is not supported  
switch(config)#
```

This example shows how to specify an LDP IPv4 prefix FEC for validation:

```
switch# ping mpls ipv4 10.131.191.252/32 repeat 5 exp 5 verbose  
Sending 5, 100-byte MPLS Echos to 10.131.191.252/32,  
timeout is 2 seconds, send interval is 0 msec:
```

Codes: '!' - success, 'Q' - request not sent, '.' - timeout,
 'L' - labeled output interface, 'B' - unlabeled output interface,
 'D' - DS Map mismatch, 'F' - no FEC mapping, 'f' - FEC mismatch,
 'M' - malformed request, 'm' - unsupported tlvs, 'N' - no label entry,
 'P' - no rx intf label prot, 'p' - premature termination of LSP,
 'R' - transit router, 'I' - unknown upstream index,
 'X' - unknown return code, 'x' - return code 0

Type Ctrl-C to abort.

```
Q size 100
Q size 100
Q size 100
Q size 100
Q size 100
```

Success rate is 0 percent (0/5)

Total Time Elapsed 6 ms

switch#

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

ping mpls pseudowire

To target virtual circuit (VC) specified as an IPv4 address and VC ID, use the **ping mpls pseudowire** command.

```
ping mpls pseudowire ipv4-address vc-id
```

Syntax Description	Parameter	Description
	<i>ipv4-address</i>	IPv4 address.
	<i>vc-id</i>	Virtual circuit ID. The range is from 1 to 4294967295.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command requires an MPLS license.

Examples This example shows how to target a VC specified as an IPv4 address and VC ID:

```
switch# ping mpls pseudowire 33.0.1.63 100
```

Related Commandss	Command	Description
	mpls oam	Targets a VC specified as an IPv4 address and VC ID

police

To create a policy map to enforce a committed data rate of 256000 bits per second, use the **police** command. To return to the default setting, use the **no** form of this command.

```
police [cir] {x [bps | kbps | mbps | gbps] | percent x-percent} [[bc] bc [bytes | kbytes | mbytes | ms | us]] [pir y [bps | kbps | mbps | gbps] | percent y-percent] [[be] be [bytes | kbytes | mbytes | ms | us]] [conform conform-action [exceed exceed-action [violate violate-action]]]
```

```
no police [cir] {x [bps | kbps | mbps | gbps] | percent x-percent} [[bc] bc [bytes | kbytes | mbytes | ms | us]] [pir y [bps | kbps | mbps | gbps] | percent y-percent] [[be] be [bytes | kbytes | mbytes | ms | us]] [conform conform-action [exceed exceed-action [violate violate-action]]]
```

Syntax Description

cir	(Optional) Specifies the committed information rate.
<i>x</i>	Committed information rate value. The range is from 1 to 80000000000.
bps	(Optional) Specifies the rate value in bits per second.
kbps	(Optional) Specifies the rate value in kilobits per second.
mbps	(Optional) Specifies the rate value in megabits per second.
gbps	(Optional) Specifies the rate value in gigabits per second.
percent	Specifies the rate as a percentage of the interface data rate.
<i>x-percent</i>	Percentage. The range is from 1 to 100.
bc	(Optional) Specifies the committed burst.
<i>bc</i>	Burst value. The range is from 1 to 536870912.
bytes	(Optional) Specifies the burst value in bits per second.
kbytes	(Optional) Specifies the burst value in kilobits per second.
mbytes	(Optional) Specifies the burst value in megabits per second.
ms	(Optional) Specifies burst value in milliseconds.
us	(Optional) Specifies the burst value in microseconds.
pir	(Optional) Specifies the peak information rate.
<i>y</i>	Value of the peak rate.
<i>y-percent</i>	Percentage. The range is from 1 to 100.
be	(Optional) Specifies extended burst.
<i>be</i>	Extended value. The range is from 1 to 536870912.
conform	(Optional) Specifies the conform action.
<i>conform-action</i>	(Optional) Conform action value.
exceed-action	(Optional) Specifies the exceed action.
violate-action	(Optional) Specifies the violate action.
<i>violate-action</i>	(Optional) Violate action value.

Defaults

None

Command Modes Class-map configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.elli

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to create a policy map to enforce a committed data rate of 256000 bps. If the data rate is in conformance, the router sets the EXP field of the outer (topmost) label of the MPLS header. If the data rate is exceeded, the router drops packets:

```
switch# configure terminal
switch(config)# policy-map policy1
switch(config-pmap-qos)# class Class2
switch(config-pmap-c-qos)# police cir 256000 conform set-mpls-exp-topmost-transmit violate drop
switch(config-pmap-c-qos)# end
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

policy-map

To configure a policy map, use the **policy-map** command. To return to the default setting, use the **no** form of this command.

policy-map [**type qos**] *policy-map-name*

no policy-map [**type qos**] *policy-map-name*

Syntax Description	type	(Optional) Specifies the type of the policy map.
	qos	(Optional) Specifies the QoS policy.
	<i>policy-map-name</i>	Policy map name. The maximum size is 40 alphanumeric characters.

Defaults None

Command Modes Global configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure a policy map:

```
switch# configure terminal
switch(config)# policy-map policy1
switch(config-pmap-qos)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

port-profile type pseudowire

To enter interface port profile configuration mode and configure a pseudowire port profile, use the **port-profile type pseudowire** command.

port-profile type pseudowire *profile-name*

Syntax Description	<i>profile-name</i>	Name of the profile. The string can be any alphanumeric string up to 80 characters.
--------------------	---------------------	---

Defaults	None
----------	------

Command Modes	Global configuration mode
---------------	---------------------------

Supported User Roles	network-admin vdc-admin
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Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples This example shows how to specify an address to exclude while configuring an explicit path:

```
switch# configure terminal
switch(config)# port-profile type pseudowire ATOM
switch(config-if-prof)#
```

Related Commands	Command	Description
	encapsulation mpls	Specifies MPLS encapsulation for this profile.
	interface pseudowire	Enters interface pseudowire configuration mode and configures a static pseudowire logical interface.
	state enabled	Enables the interface port profile.

priority (LSP attribute configuration mode)

To configure the label switched path (LSP) priority, use the **priority** command. To restore the system to its default condition, use the **no** form of this command.

priority *setup-priority* [*hold-priority*]

no priority

Syntax Description

<i>setup-priority</i>	Setup priority. The range is from 0 to 7.
<i>hold-priority</i>	(Optional) Hold priority. The range is from 0 to 7.

Defaults

By default, the setup priority is 7. The value of hold priority is the same as the value of setup priority.

Command Modes

LSP attribute configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

Use the *setup-priority* argument when signaling an LSP to determine which existing LSPs can be preempted. The range is from 0 to 7, where a lower number indicates a higher priority. Therefore, an LSP with a setup priority of 0 can preempt any LSP with a nonzero priority.

Use the *hold-priority* argument LSP to determine if an LSP should be preempted by other LSPs that are being signaled. The range is from 0 to 7, where a lower number indicates a higher priority.

The two priorities enables the signaling of an LSP with a low setup priority (so that the LSP does not preempt other LSPs during the setup) and a high hold priority (so that the LSP is not preempted after it is established). The setup priority and hold priority are typically configured to be equal; the setup priority cannot be higher (numerically smaller) than the hold priority.

This command requires the MPLS Services license.

Examples

This example shows how to configure the LSP priority:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# lsp attributes 1
switch(config-lsp-attr)# priority 1 1
```


Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

priority (TE interface configuration mode)

To configure the label switched path (LSP) priority, use the **priority** command. To restore the system to its default condition, use the **no** form of this command.

priority *setup-priority* [*hold-priority*]

no priority

Syntax Description		
<i>setup-priority</i>		Setup priority. The range is from 0 to 7.
<i>hold-priority</i>		(Optional) Hold priority. The range is from 0 to 7.

Defaults By default, the setup priority is 7. The value of hold priority is the same as the value of setup priority.

Command Modes TE interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines

Use the *setup-priority* argument when signaling an LSP to determine which existing LSPs can be preempted. The range is from 0 to 7, where a lower number indicates a higher priority. Therefore, an LSP with a setup priority of 0 can preempt any LSP with a nonzero priority.

Use the *hold-priority* argument LSP to determine if an LSP should be preempted by other LSPs that are being signaled. The range is from 0 to 7, where a lower number indicates a higher priority.

The two priorities enable the signaling of an LSP with a low setup priority (so that the LSP does not preempt other LSPs during the setup) and a high hold priority (so that the LSP is not preempted after it is established). The setup priority and hold priority are typically configured to be equal; the setup priority cannot be higher (numerically smaller) than the hold priority.

This command requires the MPLS Services license.

Examples This example shows how to configure the LSP priority:

```
switch# configure terminal
switch(config)# interface tunnel-te 1
switch(config-if-te)# priority 1 1
switch(config-if-te)#
```

Related Commands

Command	Description
interface tunnel-te	Configures the traffic engineering (TE) interface.

protection fast-reroute

To enable a Multiprotocol Label Switching (MPLS) traffic engineering (TE) tunnel to request a backup tunnel to protect against a link or node failure, use the **fast-reroute** command. To restore the system to its default condition, use the **no** form of this command.

protection fast-reroute [bw-protect]

no protection fast-reroute

Syntax Description

bw-protect	(Optional) Sets the bandwidth protection desired bit so that backup bandwidth protection is requested at each hop that the LSP traverses.
-------------------	---

Command Modes

LSP attribute configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to enable failure protection on the LSP:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# lsp attributes 1
switch(config-lsp-attr)# protection fast-reroute
switch(config-te-lsp-attr)#
```

Related Commands

Command	Description
mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).



R Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with R.

rd

To create routing and forwarding tables, use the **rd** command. To return to the default setting, use the **no** form of this command.

rd *route-distinguisher*

no rd *route-distinguisher*

Syntax Description	<i>route-distinguisher</i>	8-byte value that is added to an IPv4 prefix to create a VPN IPv4 prefix.
--------------------	----------------------------	---

Defaults	None
----------	------

Command Modes	Global configuration mode
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Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples	This example shows how to create routing and forwarding tables:
----------	---

```
switch# configure terminal
switch(config)# vrf context vpn1
switch(config-vrf)# rd 1.2:1
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

record-route (LSP attribute configuration mode)

To record the route used by the label switched path (LSP), use the **record-route** command.

record-route

Syntax Description This command has no arguments or keywords.

Command Modes LSP attribute configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines

The following holds true for all tunnel-te commands that can be specified both in "TE interface configuration mode" or path-option command line or "LSP attribute configuration mode":

If a setting is specified for an LSP, either via the path-option command directly or by assigning an LSP attribute list to a path-option, takes precedence for that specific path-option.

If no setting is specified for an LSP, then the LSP/path-option inherits any setting specified in the tunnel-te configuration mode: affinity, auto-bw, priority, record-route, protection/fast-reroute.

This command requires the MPLS Services license.

Examples This example shows how to record the route by LSP:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# lsp attributes 1
switch(config-lsp-attr)# record-route
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

record-route (TE interface configuration mode)

To record the route used by the label switched path (LSP), use the **record-route** command.

record-route

Syntax Description This command has no arguments or keywords.

Command Modes TE interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to record the route by LSP:

```
switch# configure terminal
switch(config)# interface tunnel-te 1
switch(config-if-te)# record-route
switch(config-if-te)#
```

Related Commands	Command	Description
	interface tunnel-te	Configures the traffic engineering (TE) interface.

redistribute

To redistribute routes from one routing domain into another routing domain, use the **redistribute** command. To return to the default setting, use the **no** form of this command.

```
redistribute {bgp as | direct | {eigrp | ospf | rip} instance-tag | static} route-map map-name
```

```
no redistribute {bgp as | direct | {eigrp | ospf | rip} instance-tag | static} route-map map-name
```

Syntax Description

bgp	Specifies the Border Gateway Protocol (BGP).
<i>as</i>	16-bit integer or a 32-bit integer in the form of a higher 16-bit decimal number and a lower 16-bit decimal number in xx.xx format.
direct	Specifies directly connected routes.
eigrp	Specifies the Enhanced Interior Gateway Routing Protocol (EIGRP).
ospf	Specifies the Open Shortest Path First (OSPF).
rip	Specifies the Routing Information Protocol (RIP).
<i>instance-tag</i>	Instance-tag that can be any case-sensitive, alphanumeric string up to 20 characters.
static	Specifies static routes.
route-map	Specifies the policy to constrain redistribution.
<i>map-name</i>	Name of the map that you used to redistribute routes from one routing domain into another routing domain. The name can be any case-sensitive, alphanumeric string up to 63 characters.

Defaults

None

Command Modes

Route configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to redistribute routes from one routing domain into another routing domain:

```
switch# configure t  
switch(config)# feature rip
```

■ redistribute

```
switch(config)# router rip test1  
switch(config-router)# vrf vpn1  
switch(config-router-vrf-af)# redistribute bgp 1.0 route-map bagpipe  
switch(config-router-vrf-af)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

redistribute direct route-map

To redistribute directly connected routes using the Border Gateway Protocol (BGP), use the **redistribute direct route-map** command. To return to the default setting, use the **no** form of this command.

```
redistribute direct route-map map-tag
```

```
no redistribute direct route-map map-tag
```

Syntax Description	<i>map-tag</i>	Map name that can be any case-sensitive, alphanumeric string up to 63 characters.
Defaults	None	
Command Modes	Address family configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to redistribute directly connected routes using BGP:	
	<pre>switch# configure t switch(config)# router bgp 1.1 switch(config-router)# vrf vpn1 switch(config-router-vrf)# address-family ipv4 unicast switch(config-router-vrf-af)# redistribute direct route-map directMap switch(config-vrf-af)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

redistribute static route-map

To redistribute static routes by using the Border Gateway Protocol (BGP), use the **redistribute static-map** command. To return to the default setting, use the **no** form of this command.

redistribute static route-map *map-tag*

no redistribute static route-map *map-tag*

Syntax Description	<i>map-tag</i>	Map name that can be any case-sensitive, alphanumeric string up to 63 characters.
---------------------------	----------------	---

Defaults	None
-----------------	------

Command Modes	Address family configuration mode
----------------------	-----------------------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to redistribute static routes using BGP:

```
switch# configure t
switch(config)# router bgp 1.1
switch(config-router)# vrf vpn1
switch(config-router-vrf)# address-family ipv4 unicast
switch(config-router-vrf-af)# redistribute static route-map StaticMap
switch(config-vrf-af)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

redundancy

To configure a Layer 2 VPN (L2VPN) virtual forwarding interface (VFI) context as the primary or secondary node, use the **redundancy** command.

redundancy {primary | secondary}

Syntax Description	primary	Specifies the context as a primary node.
	secondary	Specifies the context as a secondary node.

Defaults None

Command Modes config-l2vpn-vfi mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure an L2VPN VFI context as the primary node:

```
switch# configure terminal
switch(config)# l2vpn vfi context vpls80
switch(config-l2vpn-vfi)# description VFIforDualHome
switch(config-l2vpn-vfi)# vpn 10
switch(config-l2vpn-vfi)# redundancy primary
switch(config-l2vpn-vfi)#
```

Related Commands	Command	Description
	bridge domain	Enters bridge-domain configuration mode and configures a bridge domain.
	l2vpn vfi context	Establishes a Layer 2 VPN (L2VPN) Virtual Forwarding Interface (VFI) between two or more separate networks.
	vpn	Configures a Virtual Private Network (VPN) ID on a VFI context.

remote link failure notification

To enable Any Transport over MPLS (AToM) remote link failure notification and shutdown, use the **remote link failure notification** command. To disable remote link failure notification, use the **no** form of this command.

remote link failure notification

no remote link failure notification

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable AToM remote link failure notification and shutdown:

```
switch# configure terminal
switch(config)# l2vpn xconnect context XCON1
switch(config-xconnect)# remote link failure notification
```

This example shows how to disable the AToM remote link failure notification and shutdown:

```
switch(config-xconnect)# no remote link failure notification
switch(config-xconnect)#
```

Related Commands	Command	Description
	l2vpn xconnect context	Enters Xconnect configuration mode and establishes a Layer 2 VPN (L2VPN) context for identifying the two members in a VPWS, multi-segment pseudowire, or local connect service.

reoptimize events link-up

To reoptimize tunnels on link-up events, use the **reoptimize events link-up** command. To return to the default setting, use the **no** form of this command.

reoptimize events link-up

no reoptimize events link-up

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes TE configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to reoptimize tunnels on link-up events:

```
switch# configure t
switch(config)# mpls traffic-eng configuration
switch(config-te)# reoptimize events link-up
switch(config-te)#
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

reoptimize timers

To configure Multiprotocol Label Switching (MPLS) traffic engineering reoptimize timers, use the **reoptimize timers** command. To return to the default setting, use the **no** form of this command.

```
reoptimize timers {delay cleanup sec | installation sec | frequency sec}
```

```
no reoptimize timers {delay cleanup | installation | frequency}
```

Syntax Description

delay	Specifies the delay reoptimization action.
cleanup	Specifies to delay the cleanup of the reoptimized LSP.
<i>sec</i>	Time in seconds to delay the cleanup of the replaced tunnel LSP. The range is from 0 to 60.
installation	Specifies to delay the replacement of the current LSP by the reoptimized LSP.
<i>sec</i>	Time in seconds to delay the replacement of the tunnel LSP. The range is from 0 to 3600.
frequency	Specifies the interval between reoptimization scans.
<i>sec</i>	Time in seconds between reoptimizations. The range is from 0 to 604800.

Defaults

The default are as follows:

- Delay cleanups— The default is 10.
- Installation— The default is 3.
- frequency— The default is 3600.

Command Modes

TE configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to delay the replacement of the current LSP by the reoptimized LSP:

```
switch# configure t
switch(config)# mpls traffic-eng configuration
switch(config-te)# reoptimize timers delay installation 3000
```



```
switch(config-te)#
```

Related Commands

Command	Description
mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

restart

To gracefully restart the Resource Reservation Protocol (RSVP) process, use the **restart** command. To return to the default settings, use the **no** form of the command.

restart rsvp

no restart rsvp

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC.

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to rate limit the number of messages that are sent to a neighboring router:

```
switch# restart rsvp
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

rewrite ingress tag push dot1q symmetric

To add one VLAN tag to the incoming dot1q frame and symmetrically apply the operation to the ingress and egress frames, use the **rewrite ingress tag push dot1q symmetric** command.

rewrite ingress tag push dot1q *vlan-id* symmetric

Syntax Description	<i>vlan-id</i>	VLAN ID. The range is from 2 to 967.
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Defaults	None
-----------------	------

Command Modes	config-if-srv mode
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Supported User Roles	network-admin vdc-admin
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Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines The VLAN ID must match the domain ID of the bridge domain to which this Ethernet Flow Point (EFP) is to be associated.

This command is supported only on an EFP that you configured with the **encapsulation default** command.

This command requires the MPLS Services license.

Examples This example shows how to add one VLAN tag to the incoming dot1q frame and symmetrically apply the operation to the ingress and egress frames:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no ip address 10.1.1.1 255.255.255.0
switch(config-if)# service instance 1 ethernet
switch(config-if-srv)# description EFP1forTest
switch(config-if-srv)# encapsulation dot1q 10
switch(config-if-srv)# rewrite ingress tag push dot1q 30 symmetric
switch(config-if-srv)#
```

Related Commands	Command	Description
	<code>rewrite ingress tag translate 1-to-1 dot1q symmetric</code>	To rewrite one VLAN tag in the incoming dot1q frame and symmetrically apply the operation to the ingress and egress frames.
	<code>service instance</code>	Enters interface services configuration mode and configures an EFP on the interface.

rewrite ingress tag translate 1-to-1 dot1q symmetric

To rewrite one VLAN tag in the incoming dot1q frame and symmetrically apply the operation to the ingress and egress frames, use the **rewrite ingress tag translate 1-to-1 dot1q symmetric** command.

rewrite ingress tag translate 1-to-1 dot1q *vlan-id* symmetric

Syntax Description	<i>vlan-id</i>	VLAN ID. The range is from 2 to 967.
---------------------------	----------------	--------------------------------------

Defaults	None
-----------------	------

Command Modes	config-if-srv mode
----------------------	--------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines The VLAN ID must match the domain ID of the bridge domain to which this Ethernet Flow Point (EFP) is to be associated.

This command is supported only on an EFP that you configured with the **encapsulation default** command.

This command requires the MPLS Services license.

Examples This example shows how to rewrite one VLAN tag in the incoming dot1q frame and symmetrically apply the operation to the ingress and egress frames:

```
switch# configure terminal
switch(config)# interface ethernet 2/1
switch(config-if)# no ip address 10.1.1.1 255.255.255.0
switch(config-if)# service instance 1 ethernet
switch(config-if-srv)# description EFP1forTest
switch(config-if-srv)# encapsulation dot1q 10
switch(config-if-srv)# rewrite ingress tag push dot1q 30 symmetric
switch(config-if-srv)# rewrite ingress tag translate 1-to-1 dot1q 20 symmetric
```

Related Commands

Command	Description
rewrite ingress tag push dot1q symmetric	Adds one VLAN tag to the incoming dot1q frame and symmetrically applies the operation to the ingress and egress frames.
service instance	Enters interface services configuration mode and configures an EFP on the interface.

route-target

To create a route-target extended community for a virtual routing and forwarding (VRF) instance, use the **route target** command. To return to the default setting, use the **no** form of this command.

```
route-target {import | export} route-target-ext-community
```

```
no route-target {import | export} route-target-ext-community
```

Syntax Description	import	Exports routing information from the target virtual private network (VPN) extended community.
	export	Exports routing information to the target virtual private network (VPN) extended community.
<i>route-target-ext-community</i>		Route-target-extended community attributes that you can use to specify the VRF's list of import or export route-target extended communities. You can enter the route-target-ext-community argument as follows: <ul style="list-style-type: none"> • 16-bit or 32-bit AS number: your 32-bit number, for example, 1.2:3 • 32-bit IP address: your 16-bit number, for example, 192.0.2.1:1

Defaults None

Command Modes Address family configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command does not require the MPLS Services license.

Examples This example shows how to create a route-target extended community for a VRF:

```
switch# configure t
switch(config)# vrf context vpn1
switch(config-vrf)# address-family ipv4 unicast
switch(config-vrf-af)# route-target import 1:101
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

router bgp

To configure a Border Gateway Protocol (BGP) process for an interface, use the **router bgp** command. To return to the default setting, use the **no** form of this command.

router bgp *as-number*

no router bgp *as-number*

Syntax Description	<i>as-number</i>	Number of an autonomous system that identifies the router to other BGP routers and tags that the routing information passed along. The AS number can be a 16-bit integer or a 32-bit integer in the form of a higher 16-bit decimal number and a lower 16-bit decimal number in xx.xx format.
---------------------------	------------------	---

Defaults	None
-----------------	------

Command Modes	Global configuration mode
----------------------	---------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to configure a BGP process for an interface:

```
switch(config)# router bgp 1.1
switch(config-router)#
```

Related Commands	Command	Description
	tunnel-te interface	Configures the traffic engineering (TE) interface.

router isis

To configure an Intermediate System-to-Intermediate System (IS-IS) routing process, use the **router isis** command. To return to the default setting, use the **no** form of this command.

router isis *routing-process-tag*

no router isis *routing-process-tag*

Syntax Description	<i>routing-process-tag</i>	Routing process tag. The maximum size is 20 alphanumeric characters.
--------------------	----------------------------	--

Defaults	None
----------	------

Command Modes	Router configuration mode
---------------	---------------------------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples	This example shows how to configure an IS-IS routing process:
----------	---

```
switch# configure terminal
switch(config)# router isis p1
switch(config-router)#
```

Related Commands	Command	Description
	tunnel-te interface	Configures the traffic engineering (TE) interface.

router ospf

To enable an Open Shortest Path First (OSPF) routing process, use the **router ospf** command. To return to the default setting, use the **no** form of this command.

```
router ospf router-process-tag
```

```
no router ospf router-process-tag
```

Syntax Description	<i>router-process-tag</i> Process name. The maximum size is 20 alphanumeric characters.
---------------------------	---

Syntax Description	This command has no arguments or keywords.
---------------------------	--

Defaults	None
-----------------	------

Command Modes	Router configuration mode
----------------------	---------------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples	This example shows how to enable an OSPF routing process:
-----------------	---

```
switch# configure terminal
switch(config)# router ospf p1
switch(config-router)#
```

Related Commands	Command	Description
	tunnel-te interface	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

router rip

To enable the Routing Information Protocol (RIP), use the **router rip** command. To return to the default setting, use the **no** form of this command.

router rip *instance-tag*

no router rip *instance-tag*

Syntax Description	<i>instance-tag</i>	Instance tag that can be any case-sensitive, alphanumeric string up to 20 characters.
---------------------------	---------------------	---

Defaults	None
-----------------	------

Command Modes	Global configuration mode
----------------------	---------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to enable RIP:

```
switch# configure terminal
switch(config)#
switch(config)# feature rip
switch(config)# router rip Test1
switch(config-router)#
```

Related Commands	Command	Description
	tunnel-te interface	Configures the traffic engineering (TE) interface.

router-id

To configure the preferred interface for determining the Label Distribution Protocol (LDP) router ID, use the **router-id** command. To return to the default setting, use the **no** form of this command.

router-id loopback *interface number* [**force**]

no router-id loopback *interface number* [**force**]

Syntax Description	loopback	Specifies the loopback interface. The interface could be Ethernet or any others.
	<i>interface number</i>	Virtual interface number. The range is from 0 to 1023.
	force	(Optional) Specifies to forcibly change the LDP router ID.

Defaults None

Command Modes LDP configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

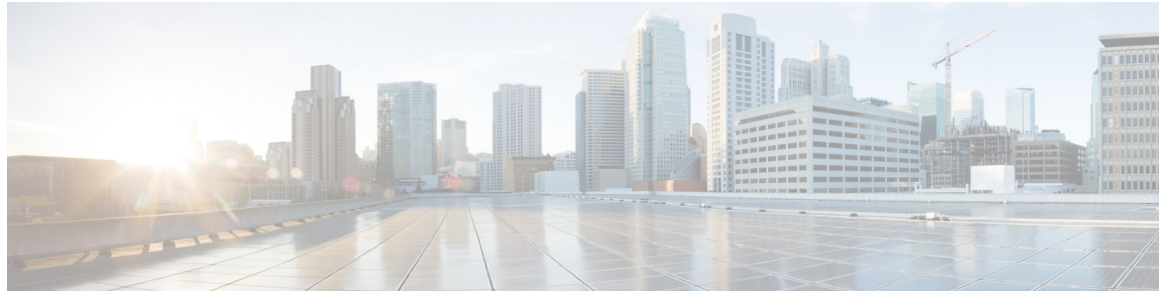
Examples This example shows how to specify the preferred interface for determining the LDP router ID:

```
switch(config)# mpls ldp
switch(config-ldp)# router-id loopback 2
switch(config-ldp)#
```

This example shows how to assign Ethernet 2/2 interface as the LDP router ID:

```
switch# configure terminal
switch(config)# mpls ldp
switch(config-ldp)# router-id loopback 0 force
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).



S Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with S.

sanity

To enable sanity checks for Layer 2 VPN, use the **sanity** command. To disable this feature, use the **no** form of this command.

sanity

no sanity

Syntax Description This command does not have any arguments or keywords.

Defaults None

Command Modes Layer 2 VPN configuration (config-l2vpn)

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	7.2(0)D1(1)	This command was introduced.

Usage Guidelines This command does not require a license.

Examples The following example enables sanity checks for Layer 2 VPN:

```
switch# configure terminal
switch (config)# l2vpn
switch (config-l2vpn)# sanity
```

The following example disables this feature:

```
switch (config-l2vpn)# no sanity
```


send-community extended

To specify that a community's attribute should be sent to a Border Gateway Protocol (BGP) neighbor, use the **send-community extended** command.

send-community extended

Syntax Description This command does not have any arguments or keywords.

Defaults None

Command Modes config-router-neighbor-af mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command does not require a license.

Examples

This example shows how to specify that a community's attributes should be sent to a BGP neighbor::

```
switch# configure terminal
switch (config)# feature mpls l3vpn
switch(config)# feature bgp
switch(config)# route-map costMap permit 10
switch(config-route-map)# set extcommunity cost 1 100
switch(config)# router bgp 1.1
switch(config-router)# router-id 192.0.2.255
switch(config-router)# neighbor 192.0.2.1 remote-as 100
switch(config-router-neighbor)# address-family vpnv4 unicast
switch(config-router-neighbor-af)# send-community extended
switch(config-router-neighbor-af)#
```

Related Commandss	Command	Description
	address-family	Enters address family configuration mode for configuring IP VPN sessions.
	neighbor	Configures a neighbor and enters address family neighbor configuration mode. The IP address is an IPv4 or IPv6 address.

send-lifetime

To configure the send lifetime of a key, use the **send-lifetime** command. To return to the default setting, use the **no** form of this command.

send-lifetime {*start-time* | **local** *start-time*} {**duration** *seconds* | *end-time* | **infinite**}

no send-lifetime {*start-time* | **local** *start-time*} {**duration** *seconds* | *end-time* | **infinite**}

Syntax Description

<i>start-time</i>	Time to start. hh:mm:ss is the time format. The range is from 0 to 23: 0 and from 59: 0 to 59. The maximum size is 8 alphanumeric characters.
local <i>start-time</i>	Specifies the time in the local time zone. hh:mm:ss is the time format.
duration	Sets the send lifetime duration as follows: <ul style="list-style-type: none"> • Enter the number of days from 1 to 31. • Enter the name of the month. • Enter the year from 1993 to 2035.
<i>seconds</i>	Seconds. The range is from 1 to 2147483646 seconds.
<i>end-time</i>	Time to stop.
infinite	Allows the send lifetime period to never expire.

Defaults

None

Command Modes

Keychain key configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

If the no accept-lifetime value is defined, the associated receive password is valid for authenticating incoming TCP segments.

This command requires the MPLS Services license.

Examples

This example shows how to configure the send lifetime of a key:

```
switch# configure terminal
switch(config)# key chain keychain1
switch(config-keychain)# key 10
switch(config-keychain-key)# send-lifetime 10:00:00 Jan 13 2010 10:00:00 Jun 13 2010
```

```
switch(config-keychain-key) #
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

session protection

To enable Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) session protection, use the **session protection** command. To return to the default setting, use the **no** form of this command.

```
session protection [for prefix-list] [duration {seconds | infinite}]
```

```
no session protection [for prefix-list] [duration {seconds | infinite}]
```

Syntax Description	Parameter	Description
	for	(Optional) Specifies the prefix list that should be protected.
	<i>prefix-list</i>	(Optional) Prefix list for label switched path (LDP) peers.
	duration	(Optional) Specifies the period to sustain the session protection after the loss has been discovered by the link discovery process.
	<i>seconds</i>	(Optional) Holdup time in seconds. The range is from 30 to 2147483.
	infinite	(Optional) Specifies to protect the session forever after the loss has been discovered by the link discovery process.

Defaults None

Command Modes LDP configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable MPLS LDP session protection:

```
switch# configure terminal
switch(config)# mpls ldp configuration
switch(config-ldp)# session protection for prefix1 duration 100
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

set

To define a mapping of values between two quality of services (QoS) types, use the **set** command. To return to the default setting, use the **no** form of this command.

```
set to-field from field table table-map-name
```

```
no set to-field from field table table-map-name
```

Syntax Description	
<i>to-field</i>	EXP field on the outer (topmost) label (mpls-exp-topmost).
<i>from-field</i>	EXP field to be applied on all imposed labels (mpls-exp-imposition).
table	Specifies the table that defines the mapping from the input to the output.
<i>table-map-name</i>	Name of a system-defined table map or an existing table map.

Defaults None

Command Modes Class-map configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples The following example shows how to define a mapping of values between two QoS:

```
switch# configure terminal
switch(config)# policy-map Policy1
switch(config-pmap-qos)# class Class2
switch(config-pmap-c-qos)# set cos mpls-exp-topmost table dscp-cos-mapset
switch(config-pmap-c-qos)# end
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

set mpls experimental imposition

To set the value of the Multiprotocol Label Switching (MPLS) experimental field on all imposed label entries, use the **set mpls experimental imposition** command. To return to the default setting, use the **no** form of this command.

set mpls experimental imposition *mpls-exp-value*

no set mpls experimental imposition *mpls-exp-value*

Syntax Description	<i>mpls-exp-value</i>	Policy map to set the EXP value on all imposed labels of an MPLS header.
Defaults	None	
Command Modes	Address family configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	<p>This example shows how to create a policy map to set the EXP field to a value of 3 on all imposed labels of an MPLS header:</p> <pre>switch# configure terminal switch(config)# policy-map Policy1 switch(config-pmap-qos)# class Class2 switch(config-pmap-c-qos)# set mpls experimental imposition 3 switch(config-pmap-c-qos)# end</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

shutdown (LDP configuration mode)

To shut down all Label Distribution Protocol (LDP) sessions, withdraw all outgoing labels from the forwarding plane, and free all local labels that have been allocated, use the **shutdown** command. To reactivate the LDP service, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes LDP configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to shut down all LDP sessions, withdraw all outgoing labels from the forwarding plane, and free all local labels that have been allocated:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-ldp)# shutdown
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

shutdown (TE configuration mode)

To shut down the Multiprotocol Label Switching (MPLS) traffic engineering (TE) sessions, use the **shutdown** command. To return to the default settings, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes TE configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples The following example shows how to shutdown the Multiprotocol Label Switching (MPLS) traffic engineering (TE) sessions:

```
switch# configure terminal
switch(config)# mpls ldp configuration
switch(config-ldp)# shutdown
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

signalling advertise explicit-null

To advertise the explicit null label in signalling messages, use the **signalling advertise explicit-null** command. To return to the default settings, use the **no** form of this command.

signalling advertise explicit-null

no signalling advertise explicit-null

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes TE configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to advertise the explicit null label in signalling messages:

```
switch(config)# mpls traffic-eng configuration
switch(config-te)# signalling advertise explicit-null
switch(config-te)#
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering Protocol (MPLS-TE).

signalling client batch-time

To configure the client batch timer, use the **signalling client batch-time** command. To return to the default settings, use the **no** form of this command.

signalling client batch-time *msec*

no signalling client batch-time *msec*

Syntax Description	<i>msec</i>	Milli seconds. The range is from 100 ms to 2000 msec.
Defaults	None	
Command Modes	RSVP configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to configure the client batch timer: <pre>switch(config)# ip rsvp switch(config-ip-rsvp)# signalling refresh reduction switch(config-ip-rsvp)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling hello graceful-restart

To enable node-based hellos for a graceful restart at the global level, use the **signalling hello graceful-restart** command. To disable the sending of hellos for a graceful restart, use the **no** form of this command.

signalling hello graceful-restart

no signalling hello graceful-restart

Syntax Description This command has no arguments or keywords.

Defaults ON

Command Modes RSVP configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable node-based hellos for a graceful restart at the global level:

```
switch(config)# ip rsvp
switch(config-ip-rsvp)# signalling hello graceful-restart
switch(config-ip-rsvp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling hello graceful-restart refresh interval

To configure the interval at which Resource Reservation Protocol (RSVP) graceful-restart hello messages are sent to each neighbor, use the **signalling hello graceful-restart refresh** command. To return to the default settings, use the **no** form of this command.

signalling hello graceful-restart refresh interval *time*

no signalling hello graceful-restart refresh interval *time*

Syntax Description	<i>time</i>	Hello interval in seconds. The range is from 2000 to 300000.
Defaults	100000 seconds	
Command Modes	RSVP configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	<p>This example shows how to configure the interval at which RSVP graceful-restart hello messages are sent to each neighbor:</p> <pre>switch(config)# ip rsvp switch(config-ip-rsvp)# signalling hello graceful-restart interval 2200 switch(config-ip-rsvp)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling hello graceful-restart refresh misses

To configure the number of consecutive missed hello messages before a neighbor is declared down or unreachable, use the **signalling hello graceful-restart refresh misses** command. To return to the default settings, use the **no** form of this command.

signalling hello graceful-restart refresh misses *refresh-misses*

no signalling hello graceful-restart refresh misses *refresh-misses*

Syntax Description	<i>refresh-misses</i>	Number of missed hello messages. The range is from 4 to 10.
--------------------	-----------------------	---

Defaults	4
----------	---

Command Modes	RSVP configuration mode
---------------	-------------------------

SupportedUserRoles	network-admin vdc-admin
--------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples	This example shows how to configure the number of consecutive missed hello messages before a neighbor is declared down or unreachable:
----------	--

```
switch(config)# ip rsvp
switch(config-ip-rsvp)# signalling hello graceful-restart refresh misses 5
switch(config-ip-rsvp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling hello graceful-restart send recovery-time

To configure the recovery time that is advertised in the restart-capability object in hello messages, use the **signalling hello graceful-restart send recovery-time** command. To return to the default settings, use the **no** form of this command.

signalling hello graceful-restart send recovery-time *time*

no signalling hello graceful-restart send recovery-time *time*

Syntax Description	<i>time</i>	Hello interval in seconds.The range is from 2000 to 300000.
Defaults	120 seconds	
Command Modes	RSVP configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to configure the recovery time that is advertised in the hello messages: <pre>switch(config)# ip rsvp switch(config-ip-rsvp)# signalling hello graceful-restart send recovery-time 130 switch(config-ip-rsvp)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling hello graceful-restart send restart-time

To configure the restart time that is advertised in the restart-capability object in hello messages, use the **signalling hello graceful-restart send restart-time** command. To return to the default settings, use the **no** form of this command.

signalling hello graceful-restart send restart-time *time*

no signalling hello graceful-restart send restart-time *time*

Syntax Description	<i>time</i>	Hello interval in seconds. The range is from 2000 to 300000.
--------------------	-------------	--

Defaults	30 seconds
----------	------------

Command Modes	RSVP configuration mode
---------------	-------------------------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples	This example shows how to configure the restart time that is advertised in the hello messages:
----------	--

```
switch(config)# ip rsvp
switch(config-ip-rsvp)# signalling hello graceful-restart send restart-time 130
switch(config-ip-rsvp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling hello reroute

To reroute the use of hello messages, use the **signalling hello reroute** command. To disable the sending of reroute hellos, use the **no** form of this command.

signalling hello reroute

no signalling hello reroute

Syntax Description This commands has no arguments or keywords.

Defaults OFF

Command Modes RSVP configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure the reroute hello messages:

```
switch(config)# ip rsvp
switch(config-ip-rsvp)# signalling hello reroute
switch(config-ip-rsvp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling initial-retransmit-delay

To configure the minimum amount of time that Resource Reservation Protocol (RSVP) waits for an acknowledgment before retransmitting the same message, use the **signalling initial-retransmit-delay** command. To return to the default settings, use the **no** form of this command.

signalling initial-retransmit-delay *time*

no signalling initial-retransmit-delay *time*

Syntax Description	<i>time</i>	Hello interval in seconds. The range is from 2000 to 300000.
---------------------------	-------------	--

Defaults	1 second
-----------------	----------

Command Modes	RSVP configuration mode
----------------------	-------------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples	This example shows how to configure the minimum amount time that RSVP waits for an acknowledgment before retransmitting the same message:
-----------------	---

```
switch(config)# ip rsvp
switch(config-ip-rsvp)# signalling initial-retransmit-delay 4
switch(config-ip-rsvp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling patherr state-removal

To delete a path state automatically when forwarding a PATH-ERROR message, use the **signalling patherr state-removal** command. To return to the default settings, use the **no** form of this command.

signalling patherr state-removal

no signalling patherr state-removal

Syntax Description This command has no arguments or keywords.

Defaults Disabled

Command Modes RSVP configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to delete a path state automatically when forwarding a PATH-ERROR message:

```
switch(config)# ip rsvp
switch(config-ip-rsvp)# signalling patherr state-removal
switch(config-ip-rsvp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signaling protocol none

To disable the signaling protocol and to use manually configured pseudowires, use the **signaling protocol none** command.

signaling protocol none

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Global configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to disable the signaling protocol and to use manually configured pseudowires:

```
switch# configure terminal
switch(config)# mpls label range 17 199 static 200 500
switch(config)# interface pseudowire pw 123
switch(config-if-pseudowire)# signaling protocol none
switch(config-if-pseudowire)#
```

Related Commands	Command	Description
	interface pseudowire	Enters interface pseudowire configuration mode and configures a static pseudowire logical interface.

signalling rate-limit

To rate limit the number of messages being sent to a neighboring router, use the **signalling rate-limit** command. To return to the default settings, use the **no** form of the command.

signalling rate-limit {[*interval msec*] [*limit messages*]}

no signalling rate-limit {[*interval msec*] [*limit messages*]}

Syntax Description

interval	(Optional) Specifies the scheduling interval.
<i>msec</i>	Interval in milliseconds. The range is from 250 to 2000.
limit	(Optional) Specifies the message limit per scheduling interval.
<i>messages</i>	Message limit value. The range is from 1 to 500.

Defaults

The default are as follows:

- Interval— The default is 1000.
- Limit— The default is 100.

Command Modes

RSVP configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to rate limit the number of messages that are being sent to a neighboring router:

```
switch(config)# ip rsvp
switch(config-ip-rsvp)# signalling rate-limit interval 300
switch(config-ip-rsvp)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling refresh interval

To configure how often the Resource Reservation Protocol (RSVP) state is refreshed, use the **signalling refresh interval** command. To return to the default settings, use the **no** form of this command.

signalling refresh interval *time*

no signalling refresh interval *time*

Syntax Description	<i>time</i>	Hello interval in seconds.The range is from 2000 to 300000.
Defaults	30 seconds	
Command Modes	RSVP configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to configure how often the RSVP state is refreshed: <pre>switch(config)# ip rsvp switch(config-ip-rsvp)# signalling refresh interval 35 switch(config-ip-rsvp)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling refresh misses

To configure the number of refresh messages that can be missed before the Resource Reservation Protocol (RSVP) determines that a state is to expire, use the **signalling refresh misses** command. To return to the default settings, use the **no** form of this command.

signalling refresh misses *refresh-missed*

no signalling refresh misses *refresh-missed*

Syntax Description	<i>time</i>	Hello interval in seconds. The range is from 2000 to 300000.
---------------------------	-------------	--

Defaults	4 seconds.
-----------------	------------

Command Modes	RSVP configuration mode
----------------------	-------------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples	This example shows how to configure the number of refresh messages that can be missed before RSVP determines that a state is to expire:
-----------------	---

```
switch(config)# ip rsvp
switch(config-ip-rsvp)# signalling refresh misses 5
switch(config-ip-rsvp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling refresh reduction

To enable the Resource Reservation Protocol (RSVP) refresh reduction, use the **signalling refresh reduction** command. To disable RSVP refresh reduction, use the **no** form of the command.

signalling refresh reduction

no signalling refresh reduction

Syntax Description This command has no arguments or keywords.

Defaults Enabled

Command Modes RSVP configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to enable RSVP refresh reduction:

```
switch(config)# ip rsvp
switch(config-ip-rsvp)# signalling refresh reduction
switch(config-ip-rsvp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling refresh reduction ack-delay

To configure the maximum amount of time the Resource Reservation Protocol (RSVP) holds on to an acknowledgement before sending it, use the **signalling refresh reduction ack-delay** command. To return to the default settings, use the **no** form of the command.

signalling refresh reduction ack-delay *time*

no signalling refresh reduction ack-delay *time*

Syntax Description	<i>time</i>	Hello interval in seconds.The range is from 2000 to 300000.
---------------------------	-------------	---

Defaults	0.25 second.
-----------------	--------------

Command Modes	RSVP configuration mode
----------------------	-------------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples	This example shows how to configure the maximum amount of time RSVP holds on to an acknowledgment before sending it:
-----------------	--

```
switch(config)# ip rsvp
switch(config-ip-rsvp)# signalling refresh reduction ack-delay
switch(config-ip-rsvp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

signalling refresh reduction bundle-max-size

To configure the bundle maximum send message size, use the **signalling refresh reduction bundle-max-size** command. To return to the default settings, use the **no** form of the command.

signalling refresh reduction bundle-max-size *value*

no signalling refresh reduction bundle-max-size *value*

Syntax Description	<i>value</i>	Bundle size in bytes. The range is from 0 to 65000.
Defaults	4096 bytes	
Command Modes	RSVP configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to configure the bundle maximum send message size: <pre>switch(config)# ip rsvp switch(config-ip-rsvp)# signalling refresh reduction bundle-max-size 30 switch(config-ip-rsvp)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

SOO

To configure the Site of Origin (SOO) Border Gateway Protocol (BGP) extended community value, use the **soo** command.

soo *value*

Syntax Description	<i>value</i>	The value is in one of the following format: <ul style="list-style-type: none"> autonomous system number (ASN) IP address <p>The number ranges is from 0 to 65535 for a 2-byte ASN or 0 to 4294967295 for a 4-byte ASN.</p>
---------------------------	--------------	---

Defaults	None
-----------------	------

Command Modes	config-router--vrf-neighbor-af mode
----------------------	-------------------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples	<p>This example shows how to configure the SOO BGP extended community value:</p> <pre>switch# configure terminal switch(config)# feature bgp switch(config)# router bgp 1.1 switch(config-router)# vrf vpn1 switch(config-router-vrf)# neighbor 209.165.201.1 remote-as 1.2 config-router-vrf-neighbor)# address-family ipv4 unicast switch(config-router-neighbor-af)# neighbor 33.0.1.63 remote-as 100 switch(config-router-vrf-neighbor)# address-family ipv4 unicast switch(config-router-vrf-neighbor-af)# allowas-in 3 switch(config-router-vrf-af)# soo 1:1 switch(config-router-vrf-af)#</pre>
-----------------	--

Related Commands	Command	Description
	address-family ipv4 unicast	Enters address family configuration mode for configuring routing sessions that use standard IPv4 address prefixes.
	allowas-in	Allows duplicate autonomous system number (ASN) in the AS path. Configure this parameter in the VPN address family configuration mode at the PE spokes and at the neighbor mode at the PE hub.
	neighbor	Adds an entry to the BGP or multiprotocol BGP neighbor table for this VRF.

state enabled

To enable a port profile, use the **state enabled** command.

state enabled

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes config-if-prof mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to configure a VPN ID on a VFI context:

```
switch# configure terminal
switch(config)# port-profile type pseudowire Test1
switch(config-if-prof)# encapsulation mpls
switch(config-if-prof)# state enabled
switch(config-if-prof)#
```

Related Commands	Command	Description
	encapsulation mpls	Specifies MPLS encapsulation for this profile.
	interface pseudowire	Enters interface pseudowire configuration mode and configures a static pseudowire logical interface.
	port-profile type pseudowire	Enters interface port-profile configuration mode and configures a port profile.

system bridge-domain

To identify the IDs that are available for bridge-domain configurations, use the **system bridge-domain** command.

```
system-bridge domain id [-id \-id,..., id-id]
```

Syntax Description	<i>id</i>	System bridge domain ID. The range is from 2 to 967.
	<i>-id</i>	Last ID in a range of contiguous IDs. The hyphen (-) is required.

Defaults None

Command Modes Global configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines The optional list of ID ranges are separated by commas (.). Do not type the ellipses (...). This command requires the MPLS Services license.

Examples This example shows how to identify the IDs that are available for bridge-domain configurations:

```
switch# configure terminal
switch(config)# system bridge-domain 10-50,100-500
switch(config)#
```

Related Commands	Command	Description
	bridge-domain	Enters bridge-domain configuration mode and configures a bridge domain.

switchport allowed vlan

To allow a flow from the specified VLAN to pass through the trunk, use the **switchport allowed vlan** command.

switchport allowed vlan *vlan-id*

Syntax Description	<i>vlan-id</i>	VLAN ID. The range is from 1 to 4094.
--------------------	----------------	---------------------------------------

Defaults	None
----------	------

Command Modes	Interface configuration mode
---------------	------------------------------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	The VLAN ID must match the ID of the VLAN to which this virtual forwarding interface (VFI) is to be associated.
------------------	---

This command requires the MPLS Services license.

Examples	This example shows how to allow flow from the specified VLAN to pass through the trunk:
----------	---

```
switch# configure terminal
switch(config)# vlan 100
switch(config-vlan)# member vfi foo
switch(config-vlan)# exit
switch(config)# interface ethernet 2/1
switch(config-if)# switchport mode trunk
switch(config-if)# switchport allowed vlan 100
switch(config-if)#
```

Related Commands	Command	Description
	member vfi	

update-source loopback

To specify the source address of the Border Gateway Protocol (BGP) session, use the **autonomous-system** command.

update-source loopback {1|0}

Syntax Description	<i>as-number</i>	AS number. The ASN can be a 16-bit integer or a 32-bit integer in the form of a higher 16-bit decimal number and a lower 16-bit decimal number in the xx.xx format.
---------------------------	------------------	---

Defaults	None
-----------------	------

Command Modes	config-router-vrf mode
----------------------	------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to specify the source address of the BGP session:

```
switch# configure terminal
switch(config)# feature bgp
switch(config)# router bgp 1.1
switch(config-router)# router-id 192.0.2.255
switch(config-router)# router-id 192.0.2.255
switch(config-router-vrf-af)# neighbor 209.165.201.1 remote-as
switch(config-router-vrf-af)# update-source loopback 0
```

Related Commands	Command	Description
	address-family ipv4 unicast	Enters address family configuration mode for configuring routing sessions that use standard IPv4 address prefixes.
	send-community extended	Specifies that a community's attribute should be sent to a BGP neighbor.



Show Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with Show.

show bgp unicast neighbors vrf

To display information about Border Gateway Protocol (BGP) neighbors, use the **show bgp unicast neighbors vrf** command.

```
show bgp {ipv4 | ipv6} unicast neighbors vrf vrf-name
```

Syntax Description		
	<i>vrf-name</i>	VRF name that is any case-sensitive, alphanumeric string up to 32 characters.
	ipv4	Specifies the IPv4 MPLS network.
	ipv6	Specifies the IPv6 MPLS network.

Defaults	None
----------	------

Command Modes	EXEC mode
---------------	-----------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples	This example shows how to display information about BGP neighbors: <pre>switch(config-router-vrf-neighbor-af)# show bgp ipv4 unicast neighbors vrf vpn1 switch(config-router-vrf-neighbor-af)#</pre>
----------	---

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show bridge-domain

To display information about bridge domains that are configured on the device, use the **show bridge-domain** command.

show bridge-domain BD-LIST

Syntax Description	BD-LIST	Displays the bridge-domain range.
Defaults	None	
Command Modes	Any command mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	6.2.2	This command was introduced.
Usage Guidelines	This command does not require a license.	
Examples	This example shows how to display information about bridge domains that are configured on the device: switch# show bridge-domain	
Related Commands	Command	Description
	bridge-domain	Enters bridge-domain configuration mode and configures a bridge domain.
	system bridge-domain	Identifies the IDs that are available for bridge-domain configurations.

show ethernet service instance

To display information about service instances that are configured on the device, use the **show ethernet service instance** command.

show ethernet service instance [detail]

Syntax Description	detail	Displays detailed information about the service instances.
---------------------------	---------------	--

Defaults	None
-----------------	------

Command Modes	Any command mode
----------------------	------------------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	This command does not require a license.
-------------------------	--

Examples	This example shows how to display information about service instances that are configured on the device:
-----------------	--

```
switch# show ethernet service instance detail
switch#
```

Related Commandss	Command	Description
	show ethernet service instance interface ethernet	Displays information about service instances that are configured on an interface.

show ethernet service instance interface ethernet

To display information about service instances that are configured on an interface, use the **show ethernet service instance interface ethernet** command.

show ethernet service instance interface ethernet *slot/port* [**detail**]

Syntax Description	<i>slot/port</i>	Slot and port.
	detail	(Optional) Displays detailed information about the service instances that are configured on an interface.
Defaults	None	
Command Modes	Any command mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	6.2.2	This command was introduced.
Usage Guidelines	This command does not require a license.	
Examples	This example shows how to display detailed information about the service instances that are configured on an interface:	
	<pre>switch# show ethernet service instance interface ethernet 5/1 detail switch#</pre>	
Related Commandss	Command	Description
	show ethernet service instance	Displays information about service instances that are configured on the device.

show ethernet service instance id interface ethernet

To display information about a specific service instance that is configured on an interface, use the **show ethernet service instance id interface ethernet** command.

show ethernet service instance id *service-instance-id* **interface ethernet** *slot/port* [**detail**]

Syntax Description		
	<i>service-instance-id</i>	Bridge-domain ID.
	<i>slot/port</i>	Slot and port.
	detail	(Optional) Displays detailed information about a specific service instance.

Defaults None

Command Modes Any command mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to display detailed information about about a specific service instance configured on an interface:

```
switch# show ethernet service instance id 10 interface ethernet 5/3 detail
switch#
```

Related Commandss	Command	Description
	show ethernet service instance	Displays information about service instances that are configured on the device.
	show ethernet service instance interface ethernet	Displays information about service instances that are configured on an interface.

show forwarding

To display the contents of the IP Forwarding Information Base (FIB), use the **show forwarding** command.

show forwarding [route | mpls | adjacency mpls stats]

Syntax Description	route	(Optional) Display the IP routing table.
	mpls	(Optional) Displays MPLS forwarding.
	adjacency mpls stats	(Optional) Displays MPLS adjacency statistics.

Defaults None

Command Modes Any command mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to display the contents of the IP FIB:

```
switch# show forwarding adjacency mpls stats
slot 4
=====

slot 6
=====

next-hop          rewrite info    tx packets    tx bytes    Label info
-----

slot 7
=====

next-hop          rewrite info    tx packets    tx bytes    Label info
-----
```

■ show forwarding

```
slot 8
=====

next-hop          rewrite info  tx packets  tx bytes    Label info
-----

switch#
```

Related Commandss

Command	Description
show mpls switching	Displays the contents of the MPLS LFIB.

show ip ospf

To display information about Open Shortest Path First (OSPF), use the **show ip ospf** command.

```
show ip ospf instance-tag vrf vrf-name
```

Syntax Description	Instance tag	Description
	<i>instance-tag</i>	Instance tag that is a case-sensitive, alphanumeric string up to 20 characters.
	vrf	Displays the virtual routing and forwarding (VRF) instance.
	<i>vrf-name</i>	VRF name that is any case-sensitive, alphanumeric string up to 32 characters.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display information about OSPF:

```
switch(config)# show ip ospf test1 vrf vpn1

Routing Process test1 with ID 0.0.0.0 VRF vpn1
Stateful High Availability enabled
Graceful-restart is configured
  Grace period: 60 state: Inactive
  Last graceful restart exit status: None
Supports only single TOS(TOS0) routes
Supports opaque LSA
Administrative distance 110
Reference Bandwidth is 40000 Mbps
SPF throttling delay time of 200.000 msec,
  SPF throttling hold time of 1000.000 msec,
  SPF throttling maximum wait time of 5000.000 msec
LSA throttling start time of 0.000 msec,
  LSA throttling hold interval of 5000.000 msec,
  LSA throttling maximum wait time of 5000.000 msec
Minimum LSA arrival 1000.000 msec
LSA group pacing timer 10 secs
Maximum paths to destination 8
```

■ show ip ospf

```
Number of external LSAs 0, checksum sum 0
Number of opaque AS LSAs 0, checksum sum 0
Number of areas is 0, 0 normal, 0 stub, 0 nssa
Number of active areas is 0, 0 normal, 0 stub, 0 nssa
switch(config)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip ospf mpls ldp interface

To display the configuration status of the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) Interior Gateway Protocol (IGP) synchronization on the Open Shortest Path First (OSPF) interfaces, use the **show ip ospf mpls ldp interface** command.

```
show ip ospf mpls ldp interface [ethernet slot/port]
```

Syntax Description	ethernet (Optional) Specifies an Ethernet interface.				
	slot/port (Optional) Slot or chassis number. The range is from 1 to 253 characters.				
Defaults	None				
Command Modes	Interface configuration mode				
Supported User Roles	network-admin vdc-admin				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>5.2(1)</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	5.2(1)	This command was introduced.
Release	Modification				
5.2(1)	This command was introduced.				
Usage Guidelines	This command requires the MPLS Services license.				
Examples	<p>This example shows how to display the configuration status of the MPLS LDP and IGP synchronization on the OSPF interfaces:</p> <pre>switch# config t Enter configuration commands, one per line. End with CNTL/Z. switch(config)# interface ethernet 7/1 switch(config-if)# show ip ospf mpls ldp interface ethernet 7/1 switch(config-if)#</pre>				
Related Commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>mpls ldp configuration</td> <td>Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).</td> </tr> </tbody> </table>	Command	Description	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).
Command	Description				
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).				

show ip pim mdt

To display the Protocol Independent Multicast (PIM) data multicast distribution tree (MDT) information, use the **show ip pim mdt** command.

```
show ip pim mdt [vrf {vrf-name | all}]
```

Syntax Description		
vrf	(Optional)	Displays the virtual routing and forwarding VRF instance.
<i>vrf-name</i>	(Optional)	VRF name. The maximum size is 32 alphanumeric characters.
all	(Optional)	Displays information for all VRFs.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the MDT information for VRF instances:

```
switch(config-vrf)# show ip pim mdt vrf vpn4
MVPN Status Information for VRF "vpn4" : MTI(mti6) Up
  Default MDT group 235.1.1.1 (Mode - ASM Shared)
    MTU: 1476
    Configured tunnel source interface:
    Default BGP tunnel source interface: loopback1
    PIM Hello Interval: 30000 milliseconds
    PIM JP Interval: 60 seconds
    Data MDT Join Interval: 60 seconds
    Data MDT Switchover Interval: 3 seconds
    Data MDT Holddown Interval: 60 seconds
    Data MDT Timeout Interval: 180 seconds
    MDT Source address: 22.22.0.1 (iod loopback1)
    BGP RD: 400:4 (set)
    Data MDT: 232.8.8.0/24 threshold: 10
switch#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip pim mdt receive

To display the Protocol Independent Multicast (PIM) data multicast data tree (MDT) information, use the **show ip pim mdt receive** command.

```
show ip pim mdt receive [detail] [vrf vrf name]
```

Syntax Description	Parameter	Description
	detail	(Optional) Displays the detailed information.
	vrf	(Optional) Displays the virtual routing and forwarding (VRF) instance.
	<i>vrf-name</i>	(Optional) VRF name. The maximum size is 32 alphanumeric characters.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the data MDT advertisements that this specified router has received:

```
switch# show ip pim mdt receive vrf all
MDT Data Groups Received List for vrf: vpn1
C-Source      C-Group      MDT Source    MDT Group     Uptime
10.0.0.1      232.1.1.1    11.0.0.1      225.1.1.1     2d17h
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip pim mdt send

To display the Protocol Independent Multicast (PIM) data multicast distribution tree (MDT) join send information, use the **show ip pim mdt send** command.

```
show ip pim mdt send [detail] [vrf {vrf-name | all}]
```

Syntax Description	Parameter	Description
	detail	(Optional) Displays the detailed information.
	vrf	(Optional) Displays the virtual routing and forwarding (VRF) instance.
	<i>vrf-name</i>	(Optional) VRF name. The maximum size is 32 alphanumeric characters.
	all	(Optional) Displays the information for all VRFs.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the data multicast distribution tree (MDT) join send information:

```
switch# show ip pim mdt send vrf all
MDT Data Groups Send List for vrf: vpn1
C-Source      C-Group      MDT Source    MDT Group     Uptime
 10.0.0.1     232.1.1.1    11.0.0.1     225.1.1.1     2d17h
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip prefix-list

To display the contents of all current IP prefix lists or of a specified prefix list, use the **show ip prefix-list** command.

```
show ip prefix-list [prefix-list]
```

Syntax Description	prefix-list	(Optional) Prefix list. The maximum length is 63 alphanumeric characters.
---------------------------	-------------	---

Defaults	None
-----------------	------

Command Modes	Interface configuration mode
----------------------	------------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	It is important that you enter this command to see how the prefix list is defined; otherwise, you cannot verify MPLS label filtering.
-------------------------	---

This command requires the MPLS Services license.

Examples	This example shows how to display the contents of all current IP prefix lists:
-----------------	--

```
switch(config)# mpls ldp configuration
switch(config-ldp)# show ip prefix-list p1
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rip vrf

To display information about the Routing Information Protocol (RIP), use the **show ip rip vrf** command.

```
show ip rip vrf vrf-name
```

Syntax Description	<i>vrf-name</i>	VRF name that is any case-sensitive, alphanumeric string up to 32 characters.
--------------------	-----------------	---

Defaults	None
----------	------

Command Modes	Global configuration mode
---------------	---------------------------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples This example shows how to display information about RIP:

```
switch(config)# show ip rip vrf vpn1
Process Name "rip-test1" VRF "vpn1"
RIP port 520, multicast-group 224.0.0.9
Admin-distance: 120
Updates every 30 sec, expire in 180 sec
Collect garbage in 120 sec
Default-metric: 1
Max-paths: 8
Process is up and running
  Interfaces supported by ipv4 RIP :
    Redistributing :
      bgp-65536      policy bagpipe
switch(config)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp

To display the global Resource Reservation Protocol (RSVP) information, use the **show ip rsvp** command.

show ip rsvp

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the global RSVP information:

```
switch# show ip rsvp
RSVP Process
  Supervisor State: Active
  Start Type: configuration [stateless]
  High Availability: Enabled [ok]
  Graceful Restart: enabled
  Hello State Timeout: disabled
  Router id: 0.0.0.0
  Patherr State Removal: Disabled
  Local Epoch: 0x74b530

Registered RSVP Clients
  MPLS-TE [Service-Access-Point 288, ID 1, Batch-Time 50 msec]

Message Bundling
  Disabled [Transmit-delay 50 msec, Max-Size 4096 bytes]

Refresh Parameters
  Interval 45 sec, Miss-Limit 4

Refresh-Reduction
  Disabled [Initial-Retransmit-Delay 5000 msec]
  [Rapid-Retransmit Enabled, Ack-Delay 400 msec]
```

Rate-Limit
--More-

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp authentication

To display the authentication for the Resource Reservation Protocol (RSVP), use the **show ip rsvp authentication** command.

show ip rsvp authentication [*interface name*] [*neighbor ip-address*] [detail]

Syntax	Description
interface	(Optional) Specifies the authentication interface information.
<i>name</i>	(Optional) Authentication name.
neighbor	(Optional) Specifies the authentication neighbor information.
<i>ip-address</i>	IP address.
detail	(Optional) Specifies the detailed authentication information.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the RSVP authentication information:

```
switch# config t
switch(config)# ip rsvp
switch(config-ip-rsvp)# show ip rsvp authentication
```

Codes: S - static, D - dynamic, C - chain,
G - global, N - neighbor, I - interface,

From	To	Neighbor	I/F	Mode	Key-Src	Key-ID	Code
4.5.4.5	10.10.10.14	4.5.4.4	Eth2/3	SEND	key1	4660	SGC
5.5.1.5	10.10.10.10	5.5.1.1	Eth2/6	SEND	key1	4660	SGC

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp counters

To display the Resource Reservation Protocol (RSVP) packet counters, use the **show ip rsvp counters** command.

show ip rsvp counters [*interface name* | **teardown** | **all**]

Syntax Description	Parameter	Description
	interface	(Optional) Specifies the interface RSVP packet counters.
	<i>name</i>	(Optional) Name of the counters.
	teardown	(Optional) Specifies the RSVP teardown counters.
	all	(Optional) Specifies all counters.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display all the RSVP counters:

```
switch# show ip rsvp counters all
Teardown Reason          Path      Resv
UNSPECIFIED              0         0
PATH_TIMEOUT              0         0
RESV_TIMEOUT              0         0
SIGNALLED                 0         0
MGMT                      0         0
POLICY                    0         0
PROXY                     0         0
NO_RESOURCES              0         0
PREEMPTED                 0         0
MSG_ERROR                  0         0
INTERNAL                   0         0
TRAFFIC_CONTROL           0         0
POLICY_SYNC                0         0
GR_TIMEOUT                 0         0
LINK_NBOR_DOWN            0         0
LOCAL-SEND_PERR_PSR       0         0
```

■ show ip rsvp counters

```

NETWORK_PERR_PSR          0          0
HST_TIMEOUT               0          0
PLR_BACKUP_DELETE        0          0
CLI-CLEAR                 0          0
RESTART-COMMAND          0          0
INTERFACE-DELETE         0          0
Sent :
--More--

```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp fast-reroute

To display the Resource Reservation Protocol (RSVP) Fast Reroute (FRR) information, use the **show ip rsvp fast-reroute** command.

show ip rsvp fast-reroute [detail]

Syntax Description	detail	(Optional) Specifies the detailed fast reroute information.
--------------------	--------	---

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display RSVP fast reroute information:

```
switch# config t
switch(config)# interface ethernet 6/1
switch(config-if)# show ip rsvp fast-reroute
      A - Active      R - Ready      U - Unassigned
Destination      TunID Source      Backup      Protected-I/f      Hop      State
10.10.10.10      20    10.10.10.15    tunnel-te200    tunnel-te200      NNhop    A

Fast-Reroute Summary:
  Total Reroutable Paths: 2
  Active: 2, Ready: 0, Unassigned: 0
dc3rtg-x5(config-if)# show ip rsvp fast-reroute detail
Session type: LSP4
Primary Tunnel: Dest 10.10.10.10, ID 20, Source 10.10.10.15
Backup Tunnel: tunnel-te200 [ifid 0x221000c8]
Merge-Point: 10.10.10.10
Merge-Point in ERO: 2.4.1.1
Hop-Protection: NNhop
FRR-State: Active
Protected Interface: tunnel-te200
Bandwidth-Protect: Enabled
FRR-Bandwidth/Protect-Level: 100/2
Desired-Bit: 0x0
BSelect Priority: 7
```

■ show ip rsvp fast-reroute

```
Backup Source/Tail Address: 10.10.10.15/10.10.10.10  
Backup Physical Interface: Ethernet2/6 [Addr 5.5.1.5, mtu 1500]
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp hello client lsp

To display the Resource Reservation Protocol (RSVP) hello client label switched path (LSP) database, use the `show ip rsvp hello client lsp` command.

`show ip rsvp hello client lsp [detail]`

Syntax Description	detail (Optional) Specifies the detailed LSP information.
---------------------------	--

Defaults	None
-----------------	------

Command Modes	EXEC mode
----------------------	-----------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to display the RSVP hello client LSP database:

```
switch(config-if)# show ip rsvp hello client lsp
```

Local	Remote	tun_id	lsp_id	subgrp_orig	subgrp_id	FLAGS
10.10.10.15	10.10.10.10	20	2074	0.0.0.0	0	48
10.10.10.15	10.10.10.10	200	16	0.0.0.0	0	48
10.10.10.15	10.10.10.14	10	2059	0.0.0.0	0	48
10.10.10.15	10.10.10.14	100	10	0.0.0.0	0	48

Related Commands	Command	Description
	<code>mpls ldp configuration</code>	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp hello client neighbor

To display the Resource Reservation Protocol (RSVP) hello neighbor information, use the **show ip rsvp hello client neighbor** command.

show ip rsvp hello client neighbor [detail]

Syntax Description	detail (Optional) Specifies the detailed hello neighbor information.
---------------------------	---

Defaults	None
-----------------	------

Command Modes	EXEC mode
----------------------	-----------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to display RSVP hello neighbor information:

```
switch(config-if)# show ip rsvp hello client neighbor

Remote      Type      NBR_STATE  HI_STATE   LSPs
10.10.10.10  GR        Normal     Up         1
10.10.10.14  GR        Normal     Up         3
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp hello instance

To display the Resource Reservation Protocol (RSVP) hello instance information, use the **show ip rsvp hello instance** command.

show ip rsvp hello instance [detail]

Syntax Description	detail (Optional) Specifies the detailed hello instance information.
---------------------------	---

Defaults	None
-----------------	------

Command Modes	EXEC mode
----------------------	-----------

SupportedUserRoles	network-admin vdc-admin
---------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to display RSVP hello instance information:

```
switch(config-if)# show ip rsvp hello instance
```

```
Active Instances:
  Client Neighbor I/F State LostCnt LSPs Interval
  GR 10.10.10.10 Any Up 0 1 10000
  GR 10.10.10.14 Any Up 0 3 10000
Passive Instances:
  - None -
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp interface

To display Resource Reservation Protocol (RSVP) interface information, use the **show ip rsvp interface** command.

```
show ip rsvp interface [name] [detail | backup-tunnel]
```

Syntax Description

name	(Optional) Interface name for the specified interface.
detail	(Optional) Specifies the detailed interface information.
backup-tunnel	(Optional) Specifies the backup tunnel information known to RSVP.

Defaults

None

Command Modes

EXEC mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to verify the RSVP interface:

```
switch(config-ip-rsvp)# show ip rsvp interface
Interface          Ifindex   IOD     MPLS    Config  State
Ethernet2/2       0x1a081000 37      enabled None     Up
switch(config-ip-rsvp)# show ip rsvp interface detail
Ethernet2/2 (IOD 37, IfIndex 0x1a081000, Address 1.5.4.4/24):
  MPLS: enabled, Configuration:
    Dynamic Owner: No, Keepalive flag: Not Set
    State: Up [Flags 271458], MTU 1500
    Dynamic Cleanup timer: stopped
    Signalling DSCP: 48, Hello DSCP: 48
  Databases:
    Traffic Control State Count: 1
    Neighbor Count: 0, Incoming States Count 0
  Refresh:
    Refresh Reduction Disabled (Srefresh size config 0, max 1500)
    Refresh Timer stopped, Srefresh timer stopped (Interval 45000ms)
    Expiry Timer stopped (Interval 30000ms, Refresh Misses 4)
  Message Bundling:
    Disabled (Max size 1500)
  Reliable Messaging:
```

```

Disabled (Ack Timer stopped, Initial Retransmit 5000ms, Delay 400ms)
Ack Config Size 0, Max Size 1500
Reliable Srefresh: Disabled
Pacing:
  Disabled (Pace Timer stopped, Interval 1000msec, Limit 100)
  Pace List Count 0, Total Deferred 0
Authentication : Disabled
Hello State Timeout : Disabled
  Interval 2000, Acks Miss Limit 4
    
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp internal

To display internal counters, event history buffers, memory statistics or persistent store Resource Reservation Protocol (RSVP) information, use the **show ip rsvp internal** command.

show ip rsvp internal [**counters** | **event-history** | **mem-stat** | **pss**]

Syntax Description

counters	(Optional) Specifies the RSVP statistics.
event-history	(Optional) Specifies the event history buffer content.
mem-stat	(Optional) Specifies the RSVP memory statistics.
pss	(Optional) Specifies persistent store information.

Defaults

None

Command Modes

EXEC mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to display the RSVP internal information:

```
switch# show ip rsvp internal counters
Signaling RX Error          Path      Resv
Confirm                     0         0
Admit-Error-Delay-Bound    0         0
Admit-Error-BW-Unavail     0         0
Admit-Error-MTU            0         0
Admit-Error-Unknown        0         0
Admin-Error-Info           0         0
Admin-Error-Warn           0         0
Admin-Error-Unknown        0         0
Admin-Error-Reject         0         0
Admin-Error-Exceed         0         0
Admin-Error-Preempt        0         0
Admin-Error-Expired        0         0
Admin-Error-Replaced       0         0
Admin-Error-Merge          0         0
Admin-Error-Pop            0         0
Admin-Error-Server         0         0
```

```
Admin-Error-PD-Syntax          0          0
Admin-Error-PD-Intgr           0          0
Admin-Error-PE-Bad             0          0
Admin-Error-PD-Miss            0          0
Admin-Error-No-Rsc             0          0
Admin-Error-RSVP               0          0
Admin-Error-Service            0          0
--More--
switch#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp neighbor

To display Resource Reservation Protocol (RSVP) neighbor information, use the **show ip rsvp neighbor** command.

show ip rsvp neighbor [*ip-address*] [**detail**]

Syntax Description	
<i>ip-address</i>	(Optional) IP address.
detail	(Optional) Specifies the detailed neighbor information.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display RSVP neighbor information:

```
switch# show ip rsvp neighbor
Address      Interface      RouterID      State  Expiry      LastSend
3.0.206.6    Ethernet1/7    1.1.1.6      UP,RR  14 minutes  4 sec
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp reservation

To display detailed Resource Reservation Protocol (RSVP) reservations, use the **show ip rsvp reservation** command.

```
show ip rsvp reservation [destination ip-address] [sender ip-address] [dst-port port] [src-port port] [detail]
```

Syntax Description	Parameter	Description
	destination	(Optional) Specifies the destination IP address information.
	<i>ip-address</i>	IP address.
	sender	(Optional) Specifies the source IP address information.
	dst-port	(Optional) Specifies the destination port information.
	<i>port</i>	(Optional) Destination port value. The range is from 0 to 2147483647.
	src-port	(Optional) Specifies the source port information.
	detail	(Optional) Specifies the detailed RSVP status.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the detailed RSVP reservation status:

```
switch# show ip rsvp reservation detail
Reservation:
Tun Dest: 10.1.1.1 Tun ID: 1 Ext Tun ID: 172.16.1.1
Tun Sender: 172.16.1.1 LSP ID: 104
Next Hop: 172.17.1.2 on Eth1/0
Label: 18 (outgoing)
Reservation Style is Shared-Explicit, QoS Service is Controlled-Load
Average Bitrate is 0 bits/sec, Maximum Burst is 1K bytes
Min Policed Unit: 0 bytes, Max Pkt Size: 0 bytes
RRO:
172.18.1.1/32, Flags:0x1 (Local Prot Avail/to NHOP)
Label subobject: Flags 0x1, C-Type 1, Label 18
```

■ show ip rsvp reservation

```
172.19.1.1/32, Flags:0x0 (Local Prot Avail/In Use/Has BW/to NHOP)
Label subobject: Flags 0x1, C-Type 1, Label 16
172.19.1.2/32, Flags:0x0 (No Local Protection)
Label subobject: Flags 0x1, C-Type 1, Label 0
Resv ID handle: CD000404.
Policy: Accepted. Policy source(s): MPLS/TE
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp sender

To display the Resource Reservation Protocol (RSVP) path status, use the **show ip rsvp sender** command.

```
show ip rsvp sender [destination ip-address] [sender ip-address] [dst-port port] [src-port port]
[detail]
```

Syntax Description	Parameter	Description
	destination	(Optional) Specifies the path based on a destination IP address.
	<i>ip-address</i>	Destination IP address.
	sender	(Optional) Specifies the path based on a source IP address.
	<i>ip-address</i>	Source IP address.
	dst-port	(Optional) Specifies the path based on a destination port.
	<i>port</i>	Destination port value. The range is from 0 to 2147483647.
	src-port	(Optional) Specifies the path based on a source port.
	<i>port</i>	Source port value. The range is from 0 to 2147483647.
	detail	(Optional) Specifies the detailed RSVP status.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the detailed RSVP path status:

```
switch# show ip rsvp sender detail
PATH:
Tun Dest: 10.10.0.6 Tun ID: 100 Ext Tun ID: 10.10.0.1
Tun Sender: 10.10.0.1 LSP ID: 31
Path refreshes:
arriving: from PHOP 10.10.7.1 on Et0/0 every 30000 msecs
Session Attr:
Setup Prio: 7, Holding Prio: 7
Flags: (0x7) Local Prot desired, Label Recording, SE Style
```

show ip rsvp sender

```

session Name: R1_t100
ERO: (incoming)
10.10.7.2 (Strict IPv4 Prefix, 8 bytes, /32)
10.10.0.6 (Strict IPv4 Prefix, 8 bytes, /32)
RRO:
10.10.7.1/32, Flags:0x0 (No Local Protection)
10.10.4.1/32, Flags:0x9 (Local Prot Avail/to NNHOP) !Available to NNHOP
10.10.1.1/32, Flags:0x0 (No Local Protection)
Traffic params - Rate: 10K bits/sec, Max. burst: 1K bytes
Min Policed Unit: 0 bytes, Max Pkt Size 4294967295 bytes
Fast-Reroute Backup info:
Inbound FRR: Not active
Outbound FRR: No backup tunnel selected
Path ID handle: 50000416.
Incoming policy: Accepted. Policy source(s): MPLS/TE
Status: Proxy-terminated

```

This example shows how to display the path-based destination port value:

```

switch# show ip rsvp sender dst-port 2
Total Sender States: 0
To          From          Pro DPort Sport Prev Hop          I/F
switch#

```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp session

To display the Resource Reservation Protocol (RSVP) session information, use the **show ip rsvp session** command.

```
show ip rsvp session [destination ip-address]
```

Syntax Description	destination	(Optional) Specifies the session based on a destination IP address.
	<i>ip-address</i>	Destination IP address.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the RSVP session information:

```
switch# config t
switch(config)# interface ethernet 6/1
switch(config-if)# show ip rsvp session
Total Sessions: 4
Type Destination      DPort  Proto/ExtTunID  PSBs  RSBs  Reqs  PXSBs  RXSBs
LSP4 10.10.10.10      20     10.10.10.15    1     1     0     1     0
LSP4 10.10.10.10      200    10.10.10.15    1     1     0     1     0
LSP4 10.10.10.14      10     10.10.10.15    1     1     0     1     0
LSP4 10.10.10.14      100    10.10.10.15    1     1     0     1     0
Total Sessions: 0
Type Destination      DPort  Proto/ExtTunID  PSBs  RSBs  Reqs  PXSBs  RXSBs
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp signalling rate-limit

To display the Resource Reservation Protocol (RSVP) globally configured signalling rate limit information, use the **show ip rsvp signalling rate-limit** command.

show ip rsvp signalling rate-limit

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the RSVP signalling rate limit parameters:

```
switch# show ip rsvp signalling rate-limit
Rate-Limiting: Disabled
  Limit: 100
  Interval (msec): 1000
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ip rsvp signalling refresh

To display the Resource Reservation Protocol (RSVP) signalling refresh information, use the **show ip rsvp signalling refresh** command.

```
show ip rsvp signalling refresh {interval | misses | reduction}
```

Syntax Description	Parameter	Description
	interval	Specifies the interval for refresh messages.
	misses	Specifies the misses required to trigger a state timeout.
	reduction	Specifies the refresh reduction parameters.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the RSVP globally configured refresh interval information:

```
switch# show ip rsvp signalling refresh interval
Refresh interval (sec): 45
switch#
```

This example shows how to display the RSVP globally configured refresh misses information:

```
switch# show ip rsvp signalling refresh misses
Refresh misses: 4
switch#
```

This example shows how to display the RSVP globally configured refresh reduction information:

```
switch# show ip rsvp signalling refresh reduction
Refresh Reduction: Disabled
  ACK delay (msec): 400
  Initial retransmit delay (msec): 5000
  Local epoch: 0x74b530
  Message IDs: in use 0, total allocated 0, freed 0
switch#
```

■ show ip rsvp signalling refresh

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show ipv6 route static vrf

To display information about a static virtual routing and forwarding (VRF) route, use the **show ipv6 route static vrf** command.

```
show ipv6 route static vrf vrf-name
```

Syntax Description	<i>vrf-name</i>	VRF name that is any case-sensitive, alphanumeric string up to 32 characters.
Defaults	None	
Command Modes	EXEC mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	<p>This example shows how to display information about a static VRF route:</p> <pre>switch# show ipv6 route statistics vrf vrf1 IPv6 Routing Table for VRF "vrf1" '*' denotes best ucast next-hop '**' denotes best mcast next-hop '[x/y]' denotes [preference/metric] Could not resolve "statistics"</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show l2vpn atom vc detail

To display detailed information about Any Transport over MPLS (AToM) virtual circuits (VCs) and static pseudowires that have been enabled to route Layer 2 packets on a device, use the **show l2vpn atom vc detail** command.

show l2vpn atom vc detail

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Any command mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to display detailed information about Any Transport over MPLS (AToM) virtual circuits (VCs) and static pseudowires that have been enabled to route Layer 2 packets on a device:

```
switch# show l2vpn atom vc detail

pseudowire100002 is down, VC status is down
  Create time: 4w6d, last status change time: 5w5d
  Last label FSM state change time: 4w6d
  Destination address: 10.0.0.4 VC ID: 80
  Output interface: none, imposed label stack {}
  Preferred path: not configured
  Default path: no route
  No adjacency
  Member of vfi service vpls-80
  Service id: 0xc3000001
  Signaling protocol: LDP, peer unknown
  Targeted Hello: 0.0.0.0(LDP Id) -> 10.0.0.4, LDP is DOWN, no binding
  Graceful restart: not configured and not enabled
  Non stop routing: not configured and not enabled
  PWid FEC (128), VC ID: 80
  Status TLV support (local/remote)           : enabled/None (no remote binding)
  LDP route watch                             : enabled
  Label/status state machine                  : provisioned, LndRnd
  Local dataplane status received             : No fault
```

```

BFD dataplane status received      : Not sent
BFD peer monitor status received   : No fault
Status received from access circuit : DOWN(hard-down, not-ready)
Status sent to access circuit      : Not sent
Status received from pseudowire i/f : No fault
Status sent to network peer        : No status
Status received from network peer  : None (no remote binding)
Adjacency status of remote peer    : None (no remote binding)
Sequencing: receive disabled, send disabled
Bindings
Parameter      Local                               Remote
-----
Label          unassigned                          unassigned
Group ID       unknown
Interface      unknown
MTU            unknown
Control word   off (configured: autosense)         unknown
PW type        unknown
VCCV CV type   unknown
VCCV CC type   unknown
Status TLV     enabled                             None (no remote binding)
Rx Counters
  0 input transit packets, 0 bytes
  0 drops, 0 seq err
Tx Counters
  0 output transit packets, 0 bytes
  0 drops
    
```

Related Commands

Command	Description
show l2vpn atom	Displays the Any Transport over MPLS (AtoM) information.

show l2vpn atom

To display the Any Transport over MPLS (AtoM) information, use the **show l2vpn atom** command.

```
show l2vpn atom {binding | fsm | summary | vc}
```

Syntax Description	binding	Displays the AToM label binding information.
	fsm	Displays the finite state machine counter.
	summary	Displays the summary of Layer 2 transport.
	vc	Displays AToM virtual circuit information.

Defaults None

Command Modes Any command mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to display the AToM VC information:

```
switch# show l2vpn atom vc
```

```

          Service
Interface Dest Address   VC ID   Type   Name           Status
-----
pw100002  10.0.0.4   80     vfi    vpls-80        DOWN
switch #
```

Related Commands	Command	Description
	show l2vpn atom vc detail	Displays detailed information about Any Transport over MPLS (AtoM) virtual circuits (VCs) and static pseudowires that have been enabled to route Layer 2 packets on a device.

show l2vpn service vfi

To display Layer 2 VPN (L2VPN) virtual forwarding interface (VFI) service information, use the **show l2vpn service vfi** command.

```
show l2vpn service vfi {all | interface | name | peer}
```

Syntax Description	all	(Optional) Displays all VPLS service entries.
	interface	(Optional) Displays all services by the member interface.
	name	(Optional) Displays a specific service by its name.
	peer	(Optional) Displays all services by the peer IP address.

Defaults None

Command Modes Any command mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to display all the L2VPN VFI service entries:

```
switch# show l2vpn service vfi all
```

```
Legend: St=State      XC St=State in the L2VPN Service      Prio=Priority
         UP=Up         DN=Down                          AD=Admin Down      IA=Inactive
         SB=Standby   HS=Hot Standby      RV=Recovering      NH=No Hardware
         m=manually selected
```

```

Interface          Group          Encapsulation          Prio  St  XC  St
-----          -
VPLS name: vpls-80, State: DN
  vfi100001          vpls-80 (VFI)          0      DN  DN
switch#
```

Related Commandss	Command	Description
	show l2vpn vfi	Displays L2VPN VFI information.

show l2vpn vfi

To display Layer 2 VPN (L2VPN) virtual forwarding interface (VFI) information, use the **show l2vpn vfi** command.

```
show l2vpn service vfi { name | vpc }
```

Syntax Description	name	Description
	name	Displays a specific VFI by name.
	vpc	Displays virtual port channel (vPC) VPLS Redundancy information.

Defaults	None
	None

Command Modes	Any command mode
	Any command mode

Supported User Roles	network-admin vdc-admin
	network-admin vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines	This command does not require a license.
	This command does not require a license.

Examples	This example shows how to display L2VPN VFI information:
	This example shows how to display L2VPN VFI information:

```
switch# show l2vpn vfi vpc
VFI name: vpls-80
  Mode: primary
  State: VFI Primary
  BD Id: 0

switch#
```

Related Commandss	Command	Description
	show l2vpn service vfi	Displays L2VPN VFI service information.

show l2vpn service xconnect all

To display the status information about the specified XConnect service, use the **show l2vpn service xconnect all** command.

```
show l2vpn service xconnect {all | interface | name | peer}
```

Syntax Description		
	all	Displays all VPLS service entries.
	interface	Displays all services by the member interface.
	name	Displays a specific service by its name.
	peer	Displays all services by the peer IP address.

Defaults None

Command Modes Any command mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to display the status information about the specified XConnect service:

```
switch# show l2vpn service xconnect all
switch#
```

show mpls forwarding statistics

To display the Multiprotocol Label Switching Label Distribution Protocol (LDP) traffic forwarding statistics, use the **show mpls forwarding statistics** command.

show mpls forwarding statistics

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes LDP configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the MPLS LDP traffic forwarding statistics:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# mpls ldp configuration
switch(config-ldp)# show mpls forwarding statistics
MPLS software forwarding stats summary:
  Packets/Bytes sent           : 0/0
  Packets/Bytes received      : 0/0
  Packets/Bytes forwarded     : 0/0
  Packets/Bytes originated    : 0/0
  Packets/Bytes consumed      : 0/0
  Packets/Bytes input dropped  : 0/0
  Packets/Bytes output dropped: 0/0
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls ldp neighbor graceful-restart

To display the graceful-restart information for the Label Distribution Protocol (LDP) sessions, use the **show mpls ldp neighbor graceful-restart** command.

show mpls ldp neighbor graceful-restart

Syntax Description This command does not have any arguments or keywords.

Defaults None

Command Modes Any command mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to display the graceful-restart information for the LDP sessions:

```
switch# show mpls ldp neighbor graceful-restart
switch#
```

Related Commandss	Command	Description
	show mpls ldp graceful-restart	Displays graceful- restart sessions and session parameters.
	show run mpls ldp all	Displays information about all of the running LDP sessions.

show mpls interface detail

To display details about the configuration status of the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) on the interface, use the **show mpls interface detail** command.

show mpls interface detail

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how display details about the configuration status of MPLS LDP on the interface:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# show mpls interface detail
Interface Ethernet2/2:
    ldp enabled
    MPLS operational
    Label space id 0x10000001
    MPLS sub-layer Ethernet2/2-mpls layer(0x26000002)
Interface tunnel-te1:
    mpls te vif enabled
    MPLS is not operational
    Label space id 0x10000001
    MPLS sub-layer tunnel-te1-mpls layer(0x26000001)
switch(config)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls interfaces

To display the Multiprotocol Label Switching (MPLS) interfaces, use the **show mpls interfaces** command.

```
show mpls interfaces { detail | ethernet slot/port subinterface statistics | internal | loopback
virtual interface number statistics | port-channel port channel number sub interface statistics
| tunnel-te TE interface number statistics }
```

Syntax Description		
detail		Displays detailed information about the interface.
ethernet		Displays the Ethernet interface.
<i>slot/port</i>		Slot or port number. The range is from 1 to 253.
<i>subinterface</i>		Sub interface separator.
statistics		Displays the statistics information.
internal		Displays the internal information.
loopback		Displays the loopback interfaces.
<i>virtual interface number</i>		Virtual interface number. The range is from 0 to 1023.
port-channel		Port channel interface.
<i>port channel number</i>		Port channel number. The range is from 1 to 4096.
tunnel-te		Displays the traffic engineering interface.
<i>TE interface number</i>		Traffic engineering interface number. The range is from 0 to 65503.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the traffic engineering statistics interface information:

```
switch# show mpls interfaces tunnel-te 1 statistics
tunnel-te1
    MPLS disabled
switch#
```

■ show mpls interfaces

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls ip bindings

To display the Multiprotocol Label Switching (MPLS) IP Label Information Base, use the **show mpls ldp bindings** command.

```
show mpls ip bindings destination-prefix [advertisement-prefix-list | detail | local | local-label
[number] | neighbor addr | remote-label [number] | summary]
```

Syntax Description	
<i>destination-prefix</i>	Destination prefix.
advertisement-prefix-list	(Optional) Displays the advertisement prefix list.
detail	(Optional) Displays the detailed information.
local	(Optional) Displays only locally assigned label values.
local-label	(Optional) Displays the locally assigned label values.
<i>number</i>	(Optional) Displays the label value. The range is from 1 to 2147483647.
neighbor	Displays the label from LDP neighbor.
<i>addr</i>	Neighbor IP address.
remote-label	(Optional) Displays remotely assigned label values.
summary	(Optional) Displays the summary information.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the LDP summary information:

```
switch# show mpls ip bindings summary
Total number of prefixes: 2
Total tib route info allocated: 1
switch#
```

show mpls ip bindings**Related Commands**

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls label range

To display the range of local labels available for use on packet interfaces, use the `show mpls label range` command.

`show mpls label range`

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the range of local labels available for use on packet interfaces:

```
switch# show mpls label range
Downstream Generic label region: Min/Max label: 16/471804
switch#
```

Related Commands	Command	Description
	<code>mpls ldp configuration</code>	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls ldp backoff

To display information about the configured session setup backoff parameters and any potential Label Distribution Protocol (LDP) peers with which session setup attempts are being throttled, use the **show mpls ldp backoff** command.

show mpls ldp backoff

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the LDP session setup backoff table:

```
switch# mpls ldp
switch# show mpls ldp backoff
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls ldp capabilities

To display Label Distribution Protocol (LDP) capabilities information, use the **show mpls ldp capabilities** command.

show mpls ldp capabilities

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the LDP capabilities information:

```
switch# show mpls ldp capabilities
DP Capabilities - [<description> (<type>)]
-----
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls ldp checkpoint

To display Label Distribution Protocol (LDP) checkpoint information, use the **show mpls ldp checkpoint** command.

show mpls ldp checkpoint

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the LDP checkpoint information:

```
switch# show mpls ldp checkpoint
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls ldp discovery

To display the status of the Label Distribution Protocol (LDP) discovery process including the transport address, use the **show mpls ldp discovery detail** command.

show mpls ldp discovery [detail]

Syntax Description	detail	(Optional) Displays the detailed LDP discovery information.
Defaults	None	
Command Modes	EXEC mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	<p>This example shows how to display the status of the LDP discovery process including the transport address:</p> <pre>switch# show mpls ldp discovery Local LDP Identifier: 10.0.0.30:0 Discovery Sources: Interfaces: Ethernet2/2 (ldp): xmit Enabled: Interface config Hello interval: 333 ms; Transport IP addr: 10.0.0.30 Clients: IPv4 switch(config-if)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls ldp graceful-restart

To display the graceful-restart parameters for a router's sessions with its Label Distribution Protocol (LDP) neighbors, use the **show mpls ldp graceful-restart** command.

show mpls ldp graceful-restart

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the graceful-restart parameters for a router's sessions with its LDP neighbors:

```
switch# show mpls ldp graceful-restart
LDP Graceful Restart is enabled
Neighbor Liveness Timer: 120 seconds
Max Recovery Time: 120 seconds
Forwarding State Holding Time: 600 seconds
Down Neighbor Database (0 records):
Graceful Restart-enabled Sessions:
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls ldp igp sync

To display the configuration status of the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) Interior Gateway Protocol (IGP) synchronization on the specified interface, use the **show mpls ldp igp sync** command.

```
show mpls ldp igp sync [interface ethernet slot/chassis number]
```

Syntax Description	interface ethernet (Optional) Specifies an Ethernet interface.				
	slot/chassis number (Optional) Slot or chassis number. The range is from 1 to 253 characters.				
Defaults	None				
Command Modes	EXEC mode				
Supported User Roles	network-admin vdc-admin				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>5.2(1)</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	5.2(1)	This command was introduced.
Release	Modification				
5.2(1)	This command was introduced.				
Usage Guidelines	This command requires the MPLS Services license.				
Examples	<p>This example shows how to display the delay time configuration for the MPLS LDP and IGP synchronization on the specified interface:</p> <pre>switch# show mpls ldp igp sync interface ethernet 6/1 switch#</pre>				
Related Commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>mpls ldp configuration</td> <td>Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).</td> </tr> </tbody> </table>	Command	Description	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).
Command	Description				
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).				

show mpls ldp neighbor

To display Label Distribution Protocol (LDP) neighbors, use the **show mpls ldp neighbor** command.

show mpls ldp neighbor [**capabilities** | **detail** | **graceful-restart** | **password**]

Syntax Description		
	capabilities	(Optional) Displays the neighbor capability information.
	detail	(Optional) Displays the detailed neighbor information.
	graceful-restart	(Optional) Displays graceful restart neighbor information.
	password	(Optional) Displays neighbor password information.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the neighbor capability information:

```
switch# show mpls ldp neighbor capabilities
switch#
```

This example shows how to display graceful restart neighbor information:

```
switch# show mpls ldp neighbor graceful-restart
switch#
```

This example shows how to display detailed neighbor information:

```
switch# show mpls ldp neighbor detail
switch#
```

This example shows how to display neighbor password information:

```
switch# show mpls ldp neighbor password
Peer LDP Ident: 10.0.0.22:0; Local LDP Ident 10.0.0.13:0
TCP connection: 10.0.0.22.20954 - 10.0.0.13.646
Password: not required, neighbor, stale
```

```
Adj pwd Rx/Tx: [nil]/[nil]  
TCP pwd Rx/Tx: [nil]/[nil]  
State: Oper; Msgs sent/rcvd: 36/39
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls ldp parameter

To display the current Label Distribution Protocol (LDP) configuration parameters, including the session hold time, use the **show mpls ldp parameter** command.

show mpls ldp parameter

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the LDP configuration parameter:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# mpls ldp configuration
switch(config-ldp)# show mpls ldp parameter
LDP Feature Set Manager: State Initialized
LDP features:
  Basic
  IP-over-MPLS
  TDP
  IGP-Sync
  Auto-Configuration
  TCP-MD5-Rollover
  LLAF
Protocol version: 1
Session hold time: 180 sec; keep alive interval: 60 sec
Discovery hello: holdtime: 1 sec; interval: 5 sec
Discovery targeted hello: holdtime: 1 sec; interval: 1 sec
Accepting targeted hellos; peer acl: a
Downstream on Demand max hop count: 255
LDP for targeted sessions
LDP initial/maximum backoff: 15/120 sec
LDP loop detection: off
switch(config-ldp)#
```


Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls oam

To display the MPLS operations and management (OAM) information, use the **show mpls oam** command.

show mpls oam {echo statistics summary | internal mem-stats detail no libs}

Syntax Description

echo	Specifies the echo request information.
statistics	Specifies the detailed echo packet statistics.
summary	Specifies the echo packet statistics summary.
internal	Specifies OAM internal information.
mem-stats	Specifies memory allocation statistics.
detail	Specifies the detailed information.
no libs	Specifies to exclude libraries.

Defaults

None

Command Modes

EXEC

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to display the detailed echo packet statistics:

```
switch# show mpls oam echo statistics

Cisco TLV version: RFC 4379 Compliant
Echo Reply return code distribution:
  x - No return code (0)           - 0
  M - Malformed Echo request (1)  - 0
  m - Unsupported TLVs (2)        - 0
  ! - Success (3)                 - 0
  F - No FEC mapping (4)          - 0
  D - DS Map mismatch (5)         - 0
  I - Unknown Upstream Interface index (6) - 0
  U - Reserved (7)                - 0
  L - Labeled output interface (8) - 0
  B - Unlabeled output interface (9) - 0
```

```

f - FEC mismatch (10) - 0
N - No label entry (11) - 0
P - No receive interface label protocol (12) - 0
p - Premature termination of LSP (13) - 0
X - Undefined return code - 0
Echo Requests: sent (0)/received (0)/timedout (0)/unsent (0)
Echo Replies: sent (0)/received (0)/unsent (0)
switch#

```

This example shows how to display the echo packet statistics summary:

```

switch# show mpls oam echo statistics summary

Cisco TLV version: RFC 4379 Compliant
Echo Requests: sent (0)/received (0)/timedout (0)/unsent (0)
Echo Replies: sent (0)/received (0)/unsent (0)
switch#

```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls static binding ipv4

To display the Multiprotocol Label Switching (MPLS) configured static IPv4 labels, use the **show mpls static binding ipv4** command.

show mpls static binding ipv4

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Interface configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the MPLS static IPv4 labels:

```
switch# config t
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# mpls ldp configuration
switch(config-ldp)# show mpls static binding ipv4
switch(config-ldp)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls static binding ipv4 vrf

To display the configured Multiprotocol Label Switching (MPLS) static virtual routing and forwarding (VRF) binding for IPv4, use the **show mpls static binding ipv4 vrf** command.

```
show mpls static binding ipv4 vrf vrf-name
```

Syntax Description	<i>vrf-name</i>	VRF name. The maximum size is 32 alphanumeric characters.
---------------------------	-----------------	---

Defaults	None
-----------------	------

Command Modes	Interface configuration mode
----------------------	------------------------------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	You must configure the MPLS VPN and VRFs before creating VRF-aware static labels. This command requires the MPLS Services license.
-------------------------	---

Examples	This example shows how to display the MPLS VRF static bindings for IPv4: <pre>switch# conf t Enter configuration commands, one per line. End with CNTL/Z. switch(config-ldp)# show mpls static binding ipv4 vrf vrf100----need to get the output</pre>
-----------------	---

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching

To display the contents of the Multiprotocol Label Switching (MPLS) Unified Label Information Base (ULIB), use the **show mpls switching** command.

```
show mpls switching {ip prefix | ipv6 prefix}
```

Syntax Description		
	<i>ipv4-prefix</i>	Specifies the IPv4 prefix or mask.
	<i>ipv6-prefix</i>	Specifies the IPv6 prefix or mask.

Defaults None

Command Modes EXEC

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(5) and higher including 6.1(1)	Changed the command output.
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the MPLS label switching database:

```
switch(config)# show mpls switching
Legend:
(P)=Protected, (F)=FRR active, (*)=more labels in stack.
In-Label Out-Label FEC name Out-Interface Next-Hop
VRF default
106 3 10.1.1.2/32 Eth2/19 19.20.0.2
106 None 10.1.1.2/32 Eth2/9 9.10.0.2
VRF vpn1
101 None 92.168.1.0/24 Eth2/26.1 110.0.1.2
VRF vpn2
100 None 92.168.2.0/24 Eth2/26.2 110.0.2.2
VRF vpn3
102 None 92.168.3.0/24 Eth2/26.3 110.0.3.2
VRF vpn4
103 None 92.168.4.0/24 Eth2/26.4 110.0.4.2
VRF vpn5
104 None 92.168.5.0/24 Eth2/26.5 110.0.5.2
VRF vpn6
105 None 92.168.6.0/24 Eth2/26.6 110.0.6.2
```

```
In-Label VRF
492287 vpn
492288 vpn4
492289 vpn5
492290 vpn6
Tunnel-Headend Out-Label Out-Interface Next-Hop
tunnel-te101 0 0.0.0.0
tunnel-te201 3 Eth2/19 19.20.0.2
switch(config)#
```

This example shows how to display the IP prefix :

```
switch(config)# show mpls switching 10.1.1.2/32
```

Legend:

(P)=Protected, (F)=FRR active, (*)=more labels in stack.

```
In-Label  Out-Label  FEC name          Out-Interface  Next-Hop
VRF default

106        Pop Label 10.1.1.2/32  Eth2/19        19.20.0.2
106        No Label 10.1.1.2/32  Eth2/9         9.10.0.2
switch(config)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching aggregate

To display the aggregate-related information, use the **show mpls switching aggregate** command.

show mpls switching aggregate

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the aggregate related information:

```
switch# show mpls switching aggregate
Legend:
(P)=Protected, (F)=FRR active, (*)=more labels in stack.
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching aggregate detail

To display the detailed aggregate-related information, use the **show mpls switching aggregate detail** command.

```
show mpls switching aggregate detail {vrf vrf name}
```

Syntax Description	vrf	Displays the virtual routing and forwarding (VRF) instance.
	<i>vrf name</i>	VRF name. The maximum size is alphanumeric 32 characters.

Defaults None

Command Modes EXEC

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the detailed aggregate-related information for a VRF instance:

```
switch# show mpls switching aggregate detail vrf vrf1  
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching aggregate ipv4

To display the IPv4 aggregate-related information, use the **show mpls switching aggregate ipv4** command.

```
show mpls switching aggregate ipv4{detail vrf vrf name | vrf vrf name}
```

Syntax Description	Parameter	Description
	detail	Displays the detailed information.
	vrf	Displays the virtual routing and forwarding (VRF) instance.
	<i>vrf name</i>	VRF name. The maximum size is 32 alphanumeric characters.

Defaults None

Command Modes EXEC

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the IPv4 aggregate-related information for a VRF instance:

```
switch# show mpls switching aggregate ipv4 detail vrf vrf1
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching aggregate ipv6

To display the IPv6 aggregate-related information, use the **show mpls switching aggregate ipv6** command.

```
show mpls switching aggregate ipv6 {detail vrf vrf name | vrf vrf name }
```

Syntax Description	Parameter	Description
	detail	Displays the detailed information.
	vrf	Displays the virtual routing and forwarding (VRF) instance.
	<i>vrf name</i>	VRF name. The maximum size is 32 alphanumeric characters.

Defaults None

Command Modes EXEC

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the IPv6 aggregate-related information for a VRF instance:

```
switch# show mpls switching aggregate ipv6 detail vrf vrf1
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching aggregate vrf

To display the per virtual routing and forwarding (VRF) aggregate-related information, use the **show mpls switching aggregate vrf** command.

```
show mpls switching aggregate ipv6 {vrf vrf name}
```

Syntax Description	Parameter	Description
	vrf	Displays the virtual routing and forwarding (VRF) instance.
	<i>vrf name</i>	VRF name. The maximum size is 32 alphanumeric characters.

Defaults None

Command Modes EXEC

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the per-VRF aggregate-related information:

```
switch# show mpls switching aggregate vrf vrf1
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching clients

To display the Unified Label Information Base (ULIB) client components, use the **show mpls switching clients** command.

show mpls switching clients

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the ULIB client components:

```
switch# show mpls switching clients
CLIENT: mpls te lif Index: 1
  UUID: 120, SAP: 288, Stale time: 180000
  Flags: 0x00000000
  Messages received:
    Register: 1, Convergence: 0
    FEC Messages: 0
      FEC Additions: 0, ILE Additions: 0
      FEC Deletions: 0, ILE Deletions: 0
    Last XID: 0
  Messages sent:
    FEC Ack Messages: 0

CLIENT: LDP-Dynamic Index: 2
  UUID: 123, SAP: 285, Stale time: 600
  Flags: 0x00000000
  Messages received:
    Register: 1, Convergence: 0
    FEC Messages: 0
      FEC Additions: 0, ILE Additions: 0
      FEC Deletions: 0, ILE Deletions: 0
    Last XID: 0
  Messages sent:
```

■ show mpls switching clients

```
FEC Ack Messages: 0
```

```
--More--  
switch#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching detail

To display the detailed information, use the **show mpls switching detail** command.

```
show mpls switching detail vrf vrf name
```

Syntax Description	vrf	Displays the virtual routing and forwarding (VRF) instance.
	<i>vrf name</i>	VRF name. The maximum size is 32 alphanumeric characters.
Defaults	None	
Command Modes	EXEC	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to display the detailed information for a VRF instance: switch# show mpls switching detail vrf vrf1 switch#	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching interface

To display the information for the specified outgoing interface, use the **show mpls switching interface** command.

show mpls switching interface { **ethernet** *slot/port* **detail** **vrf** *vrf name* **vrf** *vrf name* }

Syntax Description		
	<i>slot/port</i>	Slot or port number. The slot range is from 1 to 253 and the port range is from 1 to 128.
	detail	Displays the detailed information.
	vrf	Displays the virtual routing and forwarding (VRF) instance.
	<i>vrf name</i>	VRF name. The maximum size is 32 alphanumeric characters.

Defaults None

Command Modes EXEC

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the information for the specified outgoing interface:

```
switch# show mpls switching interface ethernet 6/1 vrf vrf1
Legend:
(P)=Protected, (F)=FRR active, (*)=more labels in stack.
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching labels

To display label-related information, use the **show mpls switching label** command.

```
show mpls switching labels [label 1 label 2] detail vrf vrf name vrf vrf name }
```

Syntax Description		
<i>label 1</i>		Low label value. The range is from 0 to 524286.
<i>label 2</i>		High label value. The range is from 0 to 524286.
detail		Specifies the detailed information.
vrf		Displays the virtual routing and forwarding (VRF) instance.
<i>vrf name</i>		VRF name. The maximum size is 32 alphanumeric characters.

Defaults	
	None

Command Modes	
	EXEC

Supported User Roles	
	network-admin vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	
	This command requires the MPLS Services license.

Examples	
	This example shows how to display the label-related information for the VRF instance:

```
switch# show mpls switching labels vrf vrf1
Legend:
(P)=Protected, (F)=FRR active, (*)=more labels in stack.
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching traffic-eng lsp ipv4

To display the traffic engineering label switched path (LSP) IPv4-related entries, use the **show mpls switching traffic-eng lsp ipv4** command.

```
show mpls switching traffic-eng lsp ipv4 {TE ingress address | detail vrf vrf name | vrf vrf name }
```

Syntax Description		
	<i>TE ingress address</i>	Traffic engineering (TE) ingress address.
	detail	Displays the detailed information.
	vrf	Displays the virtual routing and forwarding (VRF) instance.
	<i>vrf name</i>	VRF name. The maximum size is 32 alphanumeric characters.

Defaults None

Command Modes EXEC

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the traffic engineering LSP IPv4 per VRF related entries:

```
switch# show mpls switching traffic-eng lsp ipv4 vrf vrf1
Legend:
(P)=Protected, (F)=FRR active, (*)=more labels in stack.
switch#
```

This example shows how to display the traffic engineering LSP IPv4 ingress address:

```
switch# show mpls switching traffic-eng lsp ipv4 10.1.1.1 101
```

```
Legend:
(P)=Protected, (F)=FRR active, (*)=more labels in stack.
```

In-Label	Out-Label	Tunnel Midpoint	Out Interface	Next-Hop	
18	18	10.1.1.1/10.1.1.4/-101	Eth2/27	27.28.0.2	P

```
switch#
```

This example shows how to display the traffic engineering LSP IPV4 detailed information:

```
switch# show mpls switching traffic-eng lsp ipv4 detail
IPv4 TE LSP
  In-Label                : 18
  Out-Label stack         : 18
  Source address          : 10.1.1.1
  Destination address     : 10.1.1.4
  Tunnel ID               : 101
  Extended tunnel id      : 10.1.1.1
  Tunnel Instance        : 27
  Out interface           : Eth2/27
  Next hop                : 27.28.0.2
  FRR status              : Protected
  Input traffic statistics : 0 packets, 0 bytes
  Output statistics per label : label 18, 0 bytes, 0 packets
switch#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching traffic-eng tunnels

To display the traffic engineering head end information, use the **show mpls switching traffic-eng** command.

show mpls switching traffic-eng tunnels

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the traffic engineering head end information:

```
switch# show mpls switching traffic-eng tunnels
```

Legend:

(P)=Protected, (F)=FRR active, (*)=more labels in stack.

```
Tunnel-Headend      Out-Label  Out-Interface  Next-Hop
tunnel-te105        3          Eth2/1         1.7.0.2
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls switching vrf

To display the Multiprotocol Label Switching (MPLS) virtual routing and forwarding (VRF) instance, use the **show mpls switching vrf** command.

show mpls switching vrf *vrf name*

Syntax Description	<i>vrf name</i>	VRF name. The maximum size is 32 alphanumeric characters.
--------------------	-----------------	---

Defaults	None
----------	------

Command Modes	EXEC
---------------	------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples This example shows how to display the per VRF information:

```
switch(config)# show mpls switching vrf vpn4
```

Legend:

(P)=Protected, (F)=FRR active, (*)=more labels in stack.

In-Label	Out-Label	FEC name	Out-Interface	Next-Hop
VRF vpn4				
103	None	92.168.4.0/24	Eth2/26.4	110.0.4.2

```
In-Label VRF
492288 vpn4
switch(config)#
switch(config)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls traffic-eng autoroute

To display the autorouted tunnel destination information, use the **show mpls traffic-eng autoroute** command.

```
show mpls traffic-eng autoroute [ipaddr]
```

Syntax Description	<i>ipaddr</i>	(Optional) Destination IP address for the autorouted tunnels.
Defaults	None	
Command Modes	EXEC mode	
SupportedUserRoles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to display the autorouted tunnel destination information: <pre>switch# show mpls traffic-eng autoroute 10.1.1.2 MPLS TE autorouting enabled destination 0001.0001.0002.00, area isis-p1 level-2, has 1 tunnels tunnel-te3000 (nexthop 10.1.1.2) (flags: Announce)</pre>	
Related Commands	Command	Description
	show mpls traffic-eng forwarding-adjacency	Displays the forwarding adjacency tunnel destination information.

show mpls traffic-eng exp

To display the Multiprotocol Label Switching (MPLS) traffic engineering (TE) tunnel expression information, use the **show mpls traffic-eng exp** command.

```
show mpls traffic-eng exp [ipaddr]
```

Syntax Description	<i>ipaddr</i> (Optional) Destination IP address for the master tunnels.				
Defaults	None				
Command Modes	EXEC mode				
Supported User Roles	network-admin vdc-admin				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>5.2(1)</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	5.2(1)	This command was introduced.
Release	Modification				
5.2(1)	This command was introduced.				
Usage Guidelines	This command requires the MPLS Services license.				
Examples	<p>This example shows how to display the Multiprotocol Label Switching (MPLS) traffic engineering (TE) tunnel expression information:</p> <pre>switch# show mpls traffic-eng exp 10.1.1.1 Destination: 10.1.1.1 Master: tunnel-te1 Status: up Members Status Conf Exp Actual Exp tunnel-te2 up (Active) Default Default tunnel-te3 up (Active) 3 3 switch#</pre>				
Related Commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>show mpls traffic-eng autoroute</td> <td>Displays the autorouted tunnel destination information.</td> </tr> </tbody> </table>	Command	Description	show mpls traffic-eng autoroute	Displays the autorouted tunnel destination information.
Command	Description				
show mpls traffic-eng autoroute	Displays the autorouted tunnel destination information.				

show mpls traffic-eng forwarding-adjacency

To display the forwarding adjacency tunnel destination information, use the **show mpls traffic-eng forwarding-adjacency** command.

```
show mpls traffic-eng forwarding-adjacency [ipaddr]
```

Syntax Description	<i>ipaddr</i>	(Optional) Destination IP address for forwarding adjacency tunnels.
Defaults	None	
Command Modes	EXEC mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to display the forwarding adjacency tunnel destination information:	
	<pre>switch# show mpls traffic-eng forwarding-adjacency 10.1.1.2 destination 0001.0001.0002.00, area isis-p1 level-2, has 1 tunnels tunnel-te3000 (nexthop 10.1.1.2) (flags: Announce Forward-Adjacency, holdtime 0) switch#</pre>	
Related Commands	Command	Description
	show mpls traffic-eng autoroute	Displays the autorouted tunnel destination information.

show mpls traffic-eng high-availability

To display the Multiprotocol Label Switching (MPLS) traffic engineering (TE) high availability information, use the **show mpls traffic-eng high-availability** command.

```
show mpls traffic-eng high-availability { database | shared-database }
```

Syntax Description	database	Displays the MPLS TE checkpoint database.
	shared-database	Displays the MPLS TE shared database.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the MPLS TE shared database:

```
switch# show mpls traffic-eng high-availability shared-database
Local Link Ethernet2/2
  I/F IOD 0x1a081000, Area 2, Protocol IS-IS, Node Type Router
  Flags 0xbaeeb:
    Rtr_Id, Area, Proto, Handle, Addr, Nbr_ID, Adm_Wt,
    Max_BW, Max_Res, Max_ResSub, TX_BW_Un, Affin, Sub_T, IGP_Wt,
  System Id 0001.0001.0001.00, TE Router Id 10.1.1.1
  IP Address 12.12.1.2
  Neighbor: Protocol IS-IS, Node Type Network
    System Id 0001.0001.0002.00, IP Address 0.0.0.0
  TE Metric 4294967295, IGP Metric 400
  Link Max: BW 1262402592, Reserved 0, Reserved Subpool 0
  Affinity 0, Subnet Type Broadcast
  Pri Pool 0 BW (kbps)
  ---
    0          0
    1          0
    2          0
    3          0
    4          0
    5          0
```

■ show mpls traffic-eng high-availability

```

        6                0
        7                0
Is not Deleted
Tunnel tunnel-te3000
  I/F handle 0x32, Area 2, Protocol IS-IS, Node Type Router
  Flags 0x3: Announce
           Is Autoroute, Is Forwarding Adjacency
  System Id 0001.0001.0002.00, Dest 10.1.1.2
  IGP Metric 0, Metric Mode 0
switch#

```

Related Commands

Command	Description
show mpls traffic-eng link-management advertisements	Displays the link management advertisements information.

show mpls traffic-eng link-management

To display the link management information, use the **show mpls traffic-eng link management** command.

```
show mpls traffic-eng link-management {admission-control [intfc] | advertisement |
bandwidth-allocation [summary] [intfc] | igp-neighbors [igp-id isis nsapaddr | ospf ipaddr]
| [ip ipaddr] | [intfc] | interfaces [intfc] | statistics [intfc] | summary [intfc]}
```

Syntax Description

admission-control	Displays the link management admission control.
<i>intfc</i>	(Optional) Interface number.
advertisement	Displays the link management advertisements.
bandwidth-allocation	Specifies the link management bandwidth allocation.
summary	(Optional) Displays the link management summary.
igp-neighbors	Displays the link management IP neighbors.
igp-id	(Optional) Displays the link management Interior Gateway Protocol (IGP) neighbors by the IGP ID.
<i>isis</i>	Intermediate System-to-System (IS-IS) node ID.
<i>nsapaddr</i>	(Optional) Neighbors IP address.
ospf	(Optional) Displays the neighbors with the matching Open Shortest Path First (OSPF) node ID.
<i>ipaddr</i>	(Optional) Neighbor's IP address.
ip	(Optional) Displays the neighbor's IP address.
interfaces	Displays the link management traffic engineering interfaces.
statistics	Displays the link management traffic engineering statistics.
summary	Displays the link management summary.

Defaults

None

Command Modes

EXEC mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to display the link management advertisements:

```
switch# show mpls traffic-eng link-management advertisements
Flooding Status:      ready
Configured Areas:    1
IGP Area[1] ID::    isis-p1 level-2
System Information::
  Flooding Protocol:  ISIS
Header Information::
  IGP System ID:     0001.0001.0001.00
  MPLS TE Router ID: 10.1.1.1
  Flooded Links:     4
Link ID:: 0 (Ethernet2/2)
Link Subnet Type:    Broadcast
Link IP Address:     12.12.1.2
Designated Router:   0001.0001.0002.00
TE metric:           4294967295
IGP metric:          400
Physical Bandwidth:  100000 kbits/sec
Res. Global BW:      0 kbits/sec
Downstream::
                                Global Pool
                                -----
Reservable Bandwidth[0]:        0 kbits/sec
Reservable Bandwidth[1]:        0 kbits/sec
Reservable Bandwidth[2]:        0 kbits/sec
Reservable Bandwidth[3]:        0 kbits/sec
Reservable Bandwidth[4]:        0 kbits/sec
Reservable Bandwidth[5]:        0 kbits/sec
Reservable Bandwidth[6]:        0 kbits/sec
Reservable Bandwidth[7]:        0 kbits/sec
Attribute Flags:                0x0
switch#
```

Related Commands

Command	Description
show mpls traffic-eng topology	Displays the Multiprotocol Label Switching (MPLS) traffic engineering (TE) topology information.

show mpls traffic-eng lsp attributes

To display information about configured label switched path (LSP) attribute lists, use the **show mpls traffic-eng lsp attributes** command.

```
show mpls traffic-eng lsp attributes [name] [string]
```

Syntax Description	
<i>name</i>	(Optional) Attribute list name.
<i>string</i>	(Optional) Specifies the attribute list name. The range is from 1 to 63 alphanumeric characters.

Defaults	None
----------	------

Command Modes	EXEC mode
---------------	-----------

Supported User Roles	network-admin vdc-admin
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Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	Use the show mpls traffic-eng lsp attributes command to view the LSP attribute lists configured on the switch.
------------------	---

This command requires the MPLS Services license.

Examples	This example shows how to display information about configured LSP attribute lists:
----------	---

```
switch# show mpls traffic-eng lsp attributes name test
LIST test
  bandwidth 100
  protection fast-reroute
  record-route
switch#
```

Related Commands	Command	Description
	lsp attribute	Configures the label switched path (LSP) attribute information.

show mpls traffic-eng topology

To display the traffic engineering (TE) topology, use the **show mpls traffic-eng topology** command.

```
show mpls traffic-eng topology [ipaddr | [area area | level-1 | level-2] igp-id isis nsap-address |
  ospf ip-address ] [brief]
```

Syntax Description		
<i>ipaddr</i>		Interface IP address.
area		Displays the restricted output to an OSPF area.
<i>area</i>		Open Shortest Path First (OSPF) area ID as a decimal value. The range is from 0 to 4294967295.
level-1		Displays the restricted output to an Intermediate System-to-System (IS-IS) level 1.
level-2		Displays the restricted output to an Intermediate System-to-System (IS-IS) level 2.
igp-id		Displays the topology based on the Interior Gateway Protocol (IGP) ID.
isis		Displays the topology based on the IS-IS IGP ID.
<i>nsap-address</i>		IP address.
ospf		Displays the traffic engineering topology based on the OSPF IGP ID.
<i>ip-address</i>		IP address.
brief		Displays the brief format.

Defaults	None
-----------------	------

Command Modes	EXEC mode
----------------------	-----------

Supported User Roles	network-admin vdc-admin
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Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
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Examples	<p>This example shows how to display the topology based on the IGP ID:</p> <pre>switch# sho mpls traffic-eng topology 10.1.1.1 brief My_System_id: 0001.0001.0001.00 (isis-p1 level-2) Signalling error holddown: 10 sec Global Link Generation 8402 IGP Id: 0001.0001.0001.00, MPLS TE Id:10.1.1.1 Router Node (isis-p1 level-2)</pre>
-----------------	--

```
link[0]: Broadcast, DR: 0001.0001.0001.04, nbr_node_id:4, gen:8395
frag_id: 0, Intf Address: 12.12.1.2
TE metric: MaxLinkMetric, IGP metric: 400, attribute flags: 0x0

link[1]: Broadcast, DR: 0001.0001.0001.03, nbr_node_id:2, gen:8395
frag_id: 0, Intf Address: 13.13.1.3
TE metric: 400, IGP metric: 400, attribute flags: 0x0

link[2]: Broadcast, DR: 0001.0001.0001.02, nbr_node_id:9, gen:8395
frag_id: 0, Intf Address: 14.14.1.4
TE metric: 10, IGP metric: 40, attribute flags: 0x0

link[3]: Broadcast, DR: 0001.0001.0001.01, nbr_node_id:7, gen:8395
frag_id: 0, Intf Address: 14.2.1.4
TE metric: 10, IGP metric: 40, attribute flags: 0x0
switch#
```

Related Commands

Command	Description
show mpls traffic-eng link-management advertisements	Displays the Multiprotocol Label Switching (MPLS) traffic engineering (TE) link management advertisements information.

show mpls traffic-eng tunnels backup

To display if fast reroute backup protection is provided by the tunnels, use the **show mpls traffic-eng tunnels backup** command.

show mpls traffic-eng tunnels backup

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines The command allows you to verify the following:

- The backup tunnel exists—Verify that there is a backup tunnel that terminates at this label switched path (LSP) next-hop (NHOP) or next-next-hop (NNHOP). Look for the LSP's next-hop NHOP or NNHOP in the Dest field.
- The backup tunnel is up—Verify that the backup tunnel is up by looking for Up in the State field.
- The backup tunnel is associated with the LSP's interface—Verify that the interface for the LSP is allowed to use this backup tunnel. Look for the LSP's output interface in the protects field list.
- The backup tunnel has sufficient bandwidth—If you restrict the amount of bandwidth that a backup tunnel can hold, verify that the backup tunnel has sufficient bandwidth to hold the LSPs that would use this backup tunnel if there is a failure. The bandwidth of an LSP is defined by the line bandwidth at the headend of the LSP. To determine the available bandwidth on a backup tunnel, look at the cfg and inuse fields. If there is insufficient backup bandwidth to accommodate the LSPs that would use this backup tunnel if a failure occurs, create an additional backup tunnel or increase the backup bandwidth of the existing tunnel by using the **bandwidth** command.

This command requires the MPLS Services license.



Note

To make a backup tunnel to be operational, the LSP must be reroutable. At the headend of the LSP, enter the **show run int tunnel tunnel-number** command. The output should include the **fast-reroute** command.

Examples

This example shows how to display that fast reroute backup protection is provided by tunnels:

```
show# show mpls traffic-eng tunnels backup
LSP Head, tunnel-te2001, Admin: up, Oper: up
  Src 10.1.1.1, Dest 10.1.1.2, Instance 61
  Fast Reroute Backup Provided:
    Protected i/fs: Eth2/2
    Protected lsps: 4999 Active lsps: 0
    Backup BW: any pool unlimited; inuse: 0 kbps
switch#
```

Related Commands

Command	Description
interface tunnel-te	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mpls traffic-eng tunnels fast-reroute

To display the Multiprotocol Label Switching (MPLS) label switched paths (LSPs) that are protected by Fast Reroute (FRR), use the **show mpls traffic-eng tunnels fast-reroute** command.

show mpls traffic-eng tunnels fast-reroute [summary]

Syntax	Description
summary	(Optional) Displays fast reroute information.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display MPLS traffic engineering (TE) fast reroute information:

```
switch# show mpls traffic-eng tunnels fast-reroute summary
Fast Reroute Summary:
  Protected interfaces      : 1
  Protected LSPs/Sub-LSPs : 4999
  Backup tunnels           : 1
  Active interfaces        : 0
```

This example shows how to display the LSPs that are protected by FRR:

```
switch# show mpls traffic-eng tunnels fast-reroute
P2P Head LSPs
src tun_id [lspid]   Protect   Bandwidth   Backup
-----
10.1.1.4 1000 [258]   I/F        (kbps)      Tunnel
-----
P2P Mid LSPs
src tun_id [lspid]   Protect   Bandwidth   Backup
-----
10.1.1.4 1000 [258]   Eth2/2     0 tunnel-te2001 Ready any-unlim nhop
10.1.1.4 1001 [258]   Eth2/2     0 tunnel-te2001 Ready any-unlim nhop
10.1.1.4 1002 [258]   Eth2/2     0 tunnel-te2001 Ready any-unlim nhop
10.1.1.4 1003 [258]   Eth2/2     0 tunnel-te2001 Ready any-unlim nhop
10.1.1.4 1004 [258]   Eth2/2     0 tunnel-te2001 Ready any-unlim nhop
10.1.1.4 1005 [258]   Eth2/2     0 tunnel-te2001 Ready any-unlim nhop
```

```
10.1.1.4 1006 [257] Eth2/2 0 tunnel-te2001 Ready any-unlim nhop
```

Related Commands

Command	Description
interface tunnel-te	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mvpn bgp mdt-safi

To display multicast virtual private network (MVPN) multicast distribution tree (MDT) Subaddress Family Identifier SAFI information, use the **show mvpn bgp mdt-safi** command.

show mvpn bgp mdt-safi

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the MPLS MVPN MDT SAFI information:

```
[switch]# show mvpn bgp mdt-safi
BGP RDPE AddressMDT Default-Local
100:1 21.21.0.1 232.1.1.1
200:2 21.21.0.1 224.1.1.1
300:3 21.21.0.1 239.1.1.1
400:4 21.21.0.1 235.1.1.1
100:1 22.22.0.1 232.1.1.1 *
200:2 22.22.0.1 224.1.1.1 *
300:3 22.22.0.1 239.1.1.1 *
400:4 22.22.0.1 235.1.1.1 *)
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mvpn mdt encap vrf

To display the Multiprotocol Label Switching (MPLS) multicast virtual private network (MVPN) multicast distribution tree (MDT) encapsulation information, use the **show mvpn mdt encap vrf** command.

```
show mvpn mdt encap vrf vrf-name
```

Syntax Description	<i>vrf-name</i>	VRF name that is any case-sensitive, alphanumeric string up to 32 characters.
---------------------------	-----------------	---

Defaults	None
-----------------	------

Command Modes	EXEC
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Supported User Roles	network-admin vdc-admin
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Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to display the MPLS MVPN MDT encapsulation information:

```
switch# show mvpn mdt encap vrf vpn1
MVPN MDT Encap Information for VRF "vpn1"
Encap Index MDT Group MDT Source MDT Source Intf
1232.1.1.1 22.22.0.1 loopback1
MVPN MDT Encap Information for VRF "vpn2"
Encap Index MDT Group MDT Source MDT Source Intf
1 224.1.1.1 22.22.0.1 loopback1
MVPN MDT Encap Information for VRF "vpn3"
Encap Index MDT Group MDT Source MDT Source Intf
1 239.1.1.1 22.22.0.1 loopback1
MVPN MDT Encap Information for VRF "vpn4"
Encap Index MDT Group MDT Source MDT Source Intf
1235.1.1.1 22.22.0.1 loopback1
switch#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show mvpn mdt route

To display the Multiprotocol Label Switching (MPLS) multicast virtual private networks (MVPN) multicast distribution tree (MDT) route information, use the **show mvpn mdt route** command.

show mvpn mdt route

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the MPLS MVPN MDT route information:

```
switch(config-router-vrf-af)# show mvpn mdt route
MVPN MDT(Global) Route information for VRF "vpn1":
(21.21.0.1, 232.1.1.1) [Refcount: 0]
(22.22.0.1, 232.1.1.1) [Refcount: 0]
(22.22.0.1, 232.2.2.0) [Refcount: 1]
MVPN MDT(Global) Route information for VRF "vpn2":
(21.21.0.1, 224.1.1.1) [Refcount: 0]
(22.22.0.1, 224.1.1.1) [Refcount: 0]
MVPN MDT(Global) Route information for VRF "vpn3":
(*, 239.1.1.1) [Refcount: 0]
MVPN MDT(Global) Route information for VRF "vpn4":
(*, 235.1.1.1) [Refcount: 0]
(21.21.0.1, 235.1.1.1) [Refcount: 0]switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show route static vrf

To display information about a static virtual routing and forwarding (VRF) route, use the **show route static vrf** command.

```
show {ipv4 | ipv6} route static vrf vrf-name
```

Syntax Description	<i>vrf-name</i>	VRF name that is any case-sensitive, alphanumeric string up to 32 characters.
---------------------------	-----------------	---

Defaults	None
-----------------	------

Command Modes	EXEC mode
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Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
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Examples This example shows how to display information about a static VRF route:

```
switch# show ipv6 route static vrf vpn1
IPv6 Routing Table for VRF "vrf1"
'*' denotes best ucast next-hop
 '**' denotes best mcast next-hop
 '[x/y]' denotes [preference/metric]
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show routing

To display the routing information used for various multicast distribution trees (MDTs) in the Multicast Routing Information Base (MRIB), use the **show routing** command.

show routing [ip] multicast mdt encapsulation

Syntax Description	ip	(Optional) Displays the IP information.
	multicast	Displays the multicast information.
	mdt	Displays the multicast distribution tree.
	encapsulation	Displays the encapsulation information.

Defaults None

Command Modes EXEC

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the encapsulation table in the MRIB:

```
switch(config)# vrf context vrf1
switch(config-vrf)# show routing multicast mdt encapsulation vrf vpn4
MDT Encapsulation Information for vrf "vpn4" [Entry Count 3]
  Index  MDT Group      MDT Source      Mroute-Count
   1    235.1.1.1      22.22.0.1        3
   2    235.4.4.0      22.22.0.1        0
   3    232.8.8.0      22.22.0.1        1
switch(config-vrf)#
```

Related Commands	Command	Description
	show ip route detail	Displays the details of the unicast routing tables.

show running-config interface

To display the running configuration for the tunnel interface, use the **show running-config interface** command.

show running-config interface [**tunnel** *number* | **tunnel-te** *number*]

Syntax Description	Parameter	Description
	tunnel	(Optional) Displays the tunnel interface.
	<i>number</i>	Tunnel interface number. The range is from 0 to 4095.
	tunnel-te	(Optional) Displays the traffic engineering interface (TE).
	<i>number</i>	Traffic engineering interface number. The range is from 0 to 65503.

Defaults None

Command Modes EXEC

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the running configuration for the tunnel interface:

```
switch# show running-config interface tunnel-te 1
!Command: show running-config interface tunnel-te1
!Time: Wed Nov 24 04:58:56 2010
version 5.0(1)
interface tunnel-te1
  ip unnumbered loopback0
  mpls ip
  no shutdown
switch(config)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show running-config isis

To display information about the Intermediate System-to-Intermediate System (IS-IS) configuration, use the **show running-config isis** command.

show running-config isis

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Router configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display information about the IS-IS configuration:

```
switch(config)# router isis
switch(config-router)# show running-config isis
!Command: show running-config isis
!Time: Sat Jul  2 05:38:15 2011

version 5.2(1)
feature isis

router isis 1
router isis 2
router isis 20
router isis pl
switch(config-router)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show running-config l3vm

To display the running configuration for the Layer 3 virtual machine (L3VM), use the **show running-config l3vm** command.

show running-config l3vm

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the running configuration for the Layer 3 virtual machine (L3VM):

```
switch# show running-config l3vm
switch# show running-config l3vm

!Command: show running-config l3vm
!Time: Sat May 28 23:58:35 2011

version 5.2(1)
vrf context vrf1
vrf context management

interface Ethernet8/1
  vrf member vrf1

switch#
```

Related Commands	Command	Description
	show mpls forwarding statistics	Displays the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) traffic forwarding statistics.

show running-config mpls ldp

To display the configuration status of the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) on the device, use the **show running-config mpls ldp** command.

show running-config mpls ldp

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the running configuration status of MPLS LDP on the device:

```
switch# show running-config mpls ldp

!Command: show running-config mpls ldp
!Time: Mon Mar 14 01:49:48 2011

version 5.2(1)
feature mpls ldp

interface Ethernet8/1
 mpls ip
 mpls ldp configuration
  discovery hello interval 2
  discovery hello holdtime 10
```

Related Commands	Command	Description
	show mpls forwarding statistics	Displays the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) traffic forwarding statistics.

show running-config mpls traffic-eng

To display the configuration status of the Multiprotocol Label Switching (MPLS) traffic engineering (TE) on the device, use the **show running-config mpls traffic-eng** command.

show running-config mpls traffic-eng

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the running configuration status of MPLS TE on the device:

```
switch# show running-config mpls traffic-eng

!Command: show running-config mpls traffic-eng
!Time: Wed Apr 13 11:37:30 2011

version 5.2(1)
feature mpls traffic-eng

mpls traffic-eng configuration
  explicit-path name backup
    next-address 13.13.1.3
    next-address 23.23.3.2
  explicit-path name foo
    next-address 12.12.1.2
    next-address 12.12.2.1
    next-address 10.1.1.2

interface tunnel-te112
  destination 10.1.1.2
  path-option 10 dynamic

interface tunnel-te212
```

```
destination 10.1.1.2
path-option 10 explicit name foo

interface tunnel-te2001
destination 10.1.1.2
path-option 10 explicit name backup

interface Ethernet2/2
mpls traffic-eng tunnels
mpls traffic-eng administrative-weight 10
mpls traffic-eng backup-path tunnel-te2001

interface Ethernet2/3
mpls traffic-eng tunnels

interface Ethernet2/4
mpls traffic-eng tunnels
mpls traffic-eng administrative-weight 10

interface Ethernet2/6
mpls traffic-eng tunnels
mpls traffic-eng administrative-weight 10
```

Related Commands

Command	Description
show mpls forwarding statistics	Displays the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) traffic forwarding statistics.

show run mpls ldp all

To display information about all of the running Label Distribution Protocol (LDP) sessions, use the **show run mpls ldp all** command.

show run mpls ldp all

Syntax Description This command does not have any arguments or keywords.

Defaults None

Command Modes Any command mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	6.2.2	This command was introduced.

Usage Guidelines This command does not require a license.

Examples This example shows how to display information about all of the running LDP sessions:

```
switch# show run mpls ldp all
switch #
```

Related Commandss	Command	Description
	show mpls ldp graceful-restart	Displays graceful-restart sessions and session parameters.

show running-config ospf

To display information about the Open Shortest Path First (OSPF) configuration, use the **show running-config ospf** command.

show running-config ospf

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes Router configuration mode

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display information about the OSPF configuration:

```
switch(config)# router isis
switch(config-router)# show running-config ospf
!Command: show running-config ospf
!Time: Sat Jul 2 06:16:08 2011

version 5.2(1)
feature ospf

1
foo
p1
process-name
switch(config-router)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show running-config vrf

To display virtual routing and forwarding (VRF) information, use the **show running-config vrf** command.

show running-config vrf *vrf-name*

Syntax Description	<i>vrf-name</i>	VRF name.
--------------------	-----------------	-----------

Defaults	None
----------	------

Command Modes	EXEC
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SupportedUserRoles	network-admin vdc-admin
--------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples	This example shows how to display VRF information:
----------	--

```
switch# show running-config vrf vrf1

!Command: show running-config vrf vrf1
!Time: Tue Mar 15 01:53:18 2011

version 5.2(1)
address-family ipv4 unicast
    maximum routes 2
switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show startup-config mpls traffic-eng

To display startup configuration for traffic engineering (TE), use the **show startup-config mpls traffic-eng** command.

show startup-config mpls traffic-eng [all]

Syntax Description	all	Displays the startup configuration with defaults.
--------------------	-----	---

Defaults None

Command Modes EXEC

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display the startup configuration for TE:

```
switch# show startup-config mpls traffic-eng
list port-channels: Communication could not be established with the process

!Command: show startup-config mpls traffic-eng
!Time: Tue Apr 19 06:52:45 2011
!Startup config saved at: Mon Apr 18 20:15:25 2011

version 5.2(1)
feature mpls traffic-eng

mpls traffic-eng configuration
  fast-reroute timers promotion 4
  link-management timers bandwidth-hold 200
  logging lsp setups
  path-selection overload allow head
  reoptimize timers delay installation 3000
  topology holddown sigerr 200
  shutdown
  lsp attributes 1
--More--
switch#
```

■ `show startup-config mpls traffic-eng`

Related Commands

Command	Description
<code>show running-config mpls traffic-eng</code>	Displays the configuration status of the Multiprotocol Label Switching (MPLS) traffic engineering (TE) on the device.

show startup-config vrf

To display virtual routing and forwarding (VRF) startup system information, use the **show startup-config vrf** command.

```
show startup-config vrf vrf-name
```

Syntax Description	<i>vrf-name</i>	VRF name.
--------------------	-----------------	-----------

Defaults	None
----------	------

Command Modes	EXEC
---------------	------

Supported User Roles	network-admin vdc-admin
----------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
------------------	--

Examples This example shows how to display VRF startup system information:

```
switch# show startup-config vrf1

!Command: show startup-config vrf vrf1
!Time: Tue Mar 15 01:58:31 2011

version 5.2(1)
vrf context vrf1
  address-family ipv4 unicast
    maximum routes 2

switch#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show tech-support mpls manager

To display troubleshooting information for the MultiProtocol Label Switching (MPLS) manager, use the **show tech-support mpls manager** command.

show tech-support mpls manager

Syntax Description This command has no arguments or keywords.

Defaults None

Command Modes EXEC

SupportedUserRoles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to display troubleshooting information for the MPLS manager:

```
switch# show tech-support mpls manager
`show mpls interface`
`show mpls interface detail`
`show system internal mpls manager sdb`
-----
SDB entries by Label space id:
Label space ID      LS type                data count            data
-----
0x10000001          0x1                    0x1                   0x00000001
-----
SDB entries by client pib index:
pib_index  Client name           Client UUID  Client MTS SAP  Stale time
-----
1          mpls-static           0            0                0
2          mpls fwd              545          275              60
3          mpls te lif           288          288              180000
4          ldp                   291          285              60
5          mpls te vif           288          288              60
-----
SDB entries by Interface:
if_index      Label space ID        MPLS sublayer         Client pib index
-----
SDB entries by TTL:
```

```
TTL subtype      Flags      exp count
0x1              0x0       0x0
--More--
switch#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show vrf

To display information about a virtual routing and forwarding (VRF) instance, use the **show vrf** command.

```
show vrf vrf-name
```

Syntax Description	<i>vrf-name</i>	VRF name that is any case-sensitive, alphanumeric string up to 32 characters.
---------------------------	-----------------	---

Defaults	None
-----------------	------

Command Modes	EXEC mode
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Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
-------------------------	--

Examples This example shows how to display the information about a VRF instance:

```
switch# show vrf vrf1
VRF-Name                VRF-ID State  Reason
switch#                  3 Up         --
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

show vrf interface

To display information about interfaces associated with a virtual routing and forwarding (VRF) instance, use the **show vrf interface** command.

show vrf *vrf-name* interface

Syntax Description	<i>vrf-name</i>	VRF name that is any case-sensitive, alphanumeric string up to 32 characters.
---------------------------	-----------------	---

Defaults	None
-----------------	------

Command Modes	EXEC mode
----------------------	-----------

Supported User Roles	network-admin vdc-admin
-----------------------------	----------------------------

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
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Examples	This example shows how to display information about interfaces that are associated with a VRF:
	<pre>switch# show vrf vrf1 interface Interface VRF-Name VRF-ID Site-of-Origin switch#</pre>

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

■ show vrf interface



T Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with T.

table-map

To configure a table map, use the **table-map** command. To return to the default setting, use the **no** form of this command.

table-map *table-map-name*

no table-map *table-map-name*

Syntax Description	<i>table-map-name</i>	Table map name. The maximum size is 40 alphanumeric characters.
Defaults	None	
Command Modes	Table map configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to configure a table map: <pre>switch# configure terminal switch(config)# table-map TableMap1 switch(config-tmap)</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

timers lsa-arrival

To configure the link-state advertisement (LSA) arrival time, use the **timer lsa-arrival** command. To return to the default setting, use the **no** form of this command.

timers lsa-arrival *arrive-time*

no timers lsa-arrival *arrive-time*

Syntax Description	<i>arrive-time</i>	Arrival time. The range is from 10 to 600000 milliseconds.
Defaults	1000	
Command Modes	Router configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to set the LSA arrival time: <pre>switch# configure terminal switch(config)# feature ospf switch(config)# test1 bgp(config-router)# timers lsa-arrival 1200 bgp(config-router)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

timers throttle lsa

To set rate limiting for link-state advertisement (LSA) generation, use the **timers throttle lsa** command. To return to the default setting, use the **no** form of this command.

timers throttle lsa *start-interval hold-interval max-interval*

no timers throttle lsa *start-interval hold-interval max-interval*

Syntax Description

<i>start-interval</i>	Start interval. The range is from 0 to 5000 milliseconds.
<i>hold-interval</i>	Hold interval. The range is from 50 to 30000 milliseconds.
<i>max-interval</i>	Max interval. The range is from 50 to 30000 milliseconds.

Defaults

The defaults are as follows:

- start-interval— The default is 0.
- hold-interval— The default is 5000.
- max-interval— The default is 5000.

Command Modes

Router configuration mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
5.2(1)	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to set rate limiting for LSA generation:

```
switch# configure terminal
switch(config)# feature ospf
switch(config)# test1
switch(config-router)# timers throttle lsa 1 500 600
switch(config-router)#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

topology

To configure the Multiprotocol Label Switching (MPLS) topology database, use the **topology** command.

topology holddown sigerr *sec*

Syntax Description	holddown	Specifies the topology database hold down timers.
	sigerr	Specifies the link hold down time for signalling errors.
	<i>sec</i>	Holddown time in seconds. The range is from 0 to 300.

Defaults None

Command Modes TE configuration mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify the link hold down time for signalling errors:

```
switch# configure terminal
switch(config)# mpls traffic-eng configuration
switch(config-te)# topology holddown sigerr 200
switch(config-te)#
```

Related Commands	Command	Description
	mpls traffic-eng configuration	Configures the Multiprotocol Label Switching (MPLS) Traffic Engineering protocol (MPLS-TE).

tracert mpls

To test the default path of the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP) from source to destination, use the **tracert mpls** command.

```
tracert mpls {ipv4 target address | multipath ipv4 target address | traffic-eng tunnel-te
interface number}
```

Syntax	Description
ipv4	Specifies the target IPv4 address.
<i>target address</i>	Target address.
multipath ipv4	Specifies the label switched path (LSP) multipath traceroute.
traffic-eng	Specifies the target traffic engineering (TE) tunnel interface.
tunnel-te	Specifies the TE interface.
<i>interface number</i>	TE interface number. The range is from 0 to 65503.

Defaults None

Command Modes EXEC mode

Supported User Roles network-admin
vdc-admin

Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines This command requires the MPLS Services license.

Examples This example shows how to specify the target TE tunnel interface:

```
switch# tracert mpls traffic-eng tunnel-te 1

Tracing MPLS TE Label Switched Path on , timeout is 2 seconds

Codes: '!' - success, 'Q' - request not sent, '.' - timeout,
       'L' - labeled output interface, 'B' - unlabeled output interface,
       'D' - DS Map mismatch, 'F' - no FEC mapping, 'f' - FEC mismatch,
       'M' - malformed request, 'm' - unsupported tlvs, 'N' - no label entry,
       'P' - no rx intf label prot, 'p' - premature termination of LSP,
       'R' - transit router, 'I' - unknown upstream index,
       'X' - unknown return code, 'x' - return code 0

Type Ctrl-C to abort.
0 0.0.0.0 MRU 0 [No Label]
```



```
Q 1 *  
switch#
```

Related Commands

Command	Description
mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).



V Commands

This chapter describes the Cisco NX-OS Multiprotocol Label Switching commands that begin with V.

vpn

To configure a virtual private network (VPN) ID on a Virtual Forwarding Interface (VFI) context, use the **vpn** command.

```
vpn vpn-id
```

Syntax Description

<i>vpn-id</i>	VPN ID. The range is from 1 to 4294967295.
---------------	--

Defaults

None

Command Modes

config-l2vpn-vfi mode

Supported User Roles

network-admin
vdc-admin

Command History

Release	Modification
6.2.2	This command was introduced.

Usage Guidelines

This command requires the MPLS Services license.

Examples

This example shows how to configure a VPN ID on a VFI context:

```
switch# configure terminal
switch# configure terminal
switch(config)# l2vpn vfi context vpls80
switch(config-l2vpn-vfi)# description VFIforDualHome
switch(config-l2vpn-vfi)# vpn 10
switch(config-l2vpn-vfi)#
```

Related Commands

Command	Description
bridge domain	Enters bridge-domain configuration mode and configures a bridge domain.
l2vpn vfi context	Establishes a Layer 2 VPN (L2VPN) virtual forwarding interface (VFI) between two or more separate networks.

vrf

To display information for a virtual routing and forwarding (VRF) instance, use the **vrf** command. To return to the default setting, use the **no** form of this command.

vrf *vrf-name*

no vrf *vrf-name*

Syntax Description	<i>vrf-name</i>	VRF name that is any case-sensitive alphanumeric string up to 32 characters.
Defaults	None	
Command Modes	Router VRF configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to display information about each VRF instance:	
	<pre>switch# configure t switch(config)# feature ospf switch(config)# Test1 switch(config-router)# timers throttle lsa 0 5000 5000 switch(config-router)# timers lsa-arrival 30 switch(config-router)# vrf vpn1 switch(config-router-vrf)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

vrf context

To create a new virtual routing and forwarding (VRF) instance, use the **vrf context** command. To return to the default setting, use the **no** form of this command.

vrf context *vrf-name*

no vrf context *vrf-name*

Syntax Description	<i>vrf-name</i>	VRF name that can be any case-sensitive, alphanumeric string up to 20 characters.
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Defaults	None
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Command Modes	Global configuration mode
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Supported User Roles	network-admin vdc-admin
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Command History	Release	Modification
	5.2(1)	This command was introduced.

Usage Guidelines	This command requires the MPLS Services license.
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Examples This example shows how to create a new VRF instance:

```
switch# configure terminal
switch(config)# vrf context blue
switch(config-vrf)#
```

Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

vrf member

To set virtual routing and forwarding (VRF) membership on an interface, use the **vrf member** command. To return to the default setting, use the **no** form of this command.

vrf member *vrf-name*

no vrf member *vrf-name*

Syntax Description	<i>vrf-name</i>	VRF name. The maximum size is 32 alphanumeric characters.
Defaults	None	
Command Modes	Interface configuration mode	
Supported User Roles	network-admin vdc-admin	
Command History	Release	Modification
	5.2(1)	This command was introduced.
Usage Guidelines	This command requires the MPLS Services license.	
Examples	This example shows how to set VRF membership for an interface: <pre>switch# configure terminal switch(config)# interface ethernet 5/0 switch(config-if)# vrf member vpn1 switch(config-if)#</pre>	
Related Commands	Command	Description
	mpls ldp configuration	Configures the Multiprotocol Label Switching (MPLS) Label Distribution Protocol (LDP).

