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Basic MPLS commands

display mpls forwarding ilm

Use `display mpls forwarding ilm` to display Incoming Label Map (ILM) entries.

Syntax

In standalone mode:

```
display mpls forwarding ilm [ label ] [ slot slot-number ]
```

In IRF mode:

```
display mpls forwarding ilm [ label ] [ chassis chassis-number slot slot-number ]
```

Views

Any view

Predefined user roles

network-admin

network-operator

mdc-admin

mdc-operator

Parameters

label: Displays the ILM entry with the specified incoming label. The value range for this argument is 16 to 1048575. If you do not specify an incoming label, this command displays ILM entry information for all incoming labels.

slot *slot-number*: Specifies a card by its slot number. If you do not specify a card, this command displays ILM entries for the active MPU. (In standalone mode.)

chassis *chassis-number* **slot** *slot-number*: Specifies a card on an IRF member device. The *chassis-number* argument represents the member ID of the IRF member device. The *slot-number* argument represents the slot number of the card. If you do not specify a card, this command displays ILM entries for the global active MPU. (In IRF mode.)

Usage guidelines

An ILM entry records the label operation type, outgoing label, and other forwarding information.

After an LSR receives a labeled packet, it performs the following operations:

1. Identifies the ILM entry that matches the top label of the packet.
2. Performs the specified label operation.
3. Forwards the packet.

Examples

```
# Display all ILM entries.
```

```
<Sysname> display mpls forwarding ilm
```

```
Total ILM entries: 3
```

```
Flags: T - Forwarded through a tunnel
```

```
      N - Forwarded through the outgoing interface to the nexthop IP address
```

```
      B - Backup forwarding information
```

A - Active forwarding information
M - P2MP forwarding information

InLabel	Oper	VRF	Flag	SwapLabel	Forwarding Info	
30	SWAP	0	T	1000	1024	
1279	POP	0	-	-	-	
1407	SWAP	0	NA	1271	Vlan10	50.2.0.2
			NB	1270	Tun0	0.0.0.0

Table 1 Command output

Field	Description
Total ILM entries	Total number of ILM entries.
InLabel	Incoming label.
Oper	Operation type: <ul style="list-style-type: none"> POP—Pops the label. POPGO—Pops the label and forwards the packet to another tunnel. SWAP—Swaps the label.
VRF	Index of a VPN instance.
Flag	Forwarding flag: <ul style="list-style-type: none"> T—Forwarded through a tunnel. N—Forwarded through the outgoing interface to the next hop IP address. B—Backup forwarding information. A—Active forwarding information. M—P2MP forwarding information. This flag is not supported in the current software version.
SwapLabel	Outgoing label value.
Forwarding Info	Forwarding information: <ul style="list-style-type: none"> When the forwarding flag is N, the forwarding information records the outgoing interface and the next hop. When the forwarding flag is T, the forwarding information records the NID.

display mpls forwarding nhlfe

Use `display mpls forwarding nhlfe` to display Next Hop Label Forwarding Entry (NHLFE) entries.

Syntax

In standalone mode:

```
display mpls forwarding nhlfe [ nid ] [ slot slot-number ]
```

In IRF mode:

```
display mpls forwarding nhlfe [ nid ] [ chassis chassis-number slot slot-number ]
```

Views

Any view

Predefined user roles

network-admin
network-operator
mdc-admin
mdc-operator

Parameters

nid: Displays the NHLFE entry with the specified NID. The NID value range is 0 to 4294967294. If you do not specify an NID, this command displays NHLFE entry information for all NIDs.

slot slot-number: Specifies a card by its slot number. If you do not specify a card, this command displays NHLFE entries for the active MPU. (In standalone mode.)

chassis chassis-number slot slot-number: Specifies a card on an IRF member device. The *chassis-number* argument represents the member ID of the IRF member device. The *slot-number* argument represents the slot number of the card. If you do not specify a card, this command displays NHLFE entries for the global active MPU. (In IRF mode.)

Usage guidelines

An NHLFE entry records label forwarding information, such as the outgoing label and outgoing interface. NHLFE entries are mainly used to add multiple labels to packets.

To add multiple labels to a packet, an LSR performs the following operations:

1. Obtains the bottom label and NID in the matching FIB or ILM entry.
2. Obtains the outer label in the NHLFE entry identified by the NID.

Examples

Display the NHLFE entry with NID 2048.

```
<Sysname> display mpls forwarding nhlfe 2048
```

```
Flags: T - Forwarded through a tunnel  
       N - Forwarded through the outgoing interface to the nexthop IP address  
       B - Backup forwarding information  
       A - Active forwarding information  
       M - P2MP forwarding information
```

```
NID          Tnl-Type Flag OutLabel Forwarding Info  
-----  
2048         LSP      NA   2025      Vlan10                10.11.112.26
```

Display all NHLFE entries.

```
<Sysname> display mpls forwarding nhlfe
```

```
Total NHLFE entries: 5
```

```
Flags: T - Forwarded through a tunnel  
       N - Forwarded through the outgoing interface to the nexthop IP address  
       B - Backup forwarding information  
       A - Active forwarding information  
       M - P2MP forwarding information
```

```
NID          Tnl-Type Flag OutLabel Forwarding Info  
-----  
10           -        TA   -        2049
```

20	-	TA	-	2050	
2048	LSP	NA	2025	Vlan10	10.11.112.26
2049	LSP	NA	3024	Vlan20	10.11.112.26
		TB	3026	20	
2050	LSP	NA	3025	Vlan30	10.11.113.26

Table 2 Command output

Field	Description
Total NHLFE entries	Total number of NHLFE entries.
NID	NHLFE entry index.
Tnl-Type	Tunnel type: <ul style="list-style-type: none"> • LOCAL—Direct LSP tunnel. • LSP—Static LSP tunnel, or LSP tunnel signaled using LDP or BGP. • TE—TE tunnel. • GRE—GRE tunnel. • CRLSP—Static CRLSP/SRLSP tunnel or CRLSP tunnel signaled using RSVP. • - (a hyphen)—The tunnel type is invalid.
Flag	Forwarding flag: <ul style="list-style-type: none"> • T—Forwarded through a tunnel. • N—Forwarded through the outgoing interface to the next hop IP address. • B—Backup forwarding information. • A—Active forwarding information. • M—P2MP forwarding information. This flag is not supported in the current software version.
OutLabel	Outgoing label.
Forwarding Info	Forwarding information: <ul style="list-style-type: none"> • When the forwarding flag is N, the forwarding information records the outgoing interface and the next hop. • When the forwarding flag is T, the forwarding information records the NID.

display mpls interface

Use **display mpls interface** to display MPLS interface information, including the interface name, interface status, and interface MPLS MTU.

Syntax

```
display mpls interface [ interface-type interface-number ]
```

Views

Any view

Predefined user roles

network-admin
network-operator
mdc-admin
mdc-operator

Parameters

interface-type interface-number: Specifies an interface by the interface type and number. If you do not specify an interface, this command displays MPLS information for all MPLS-enabled interfaces.

Examples

```
# Display all MPLS interfaces.
```

```
<Sysname> display mpls interface
Interface          Status      MPLS MTU
Vlan10             Up          1500
Vlan20             Up          1500
```

The MPLS MTU of an interface is in bytes.

Related commands

```
mpls enable
```

```
mpls mtu
```

display mpls label

Use `display mpls label` to display MPLS label usage information.

Syntax

```
display mpls label { label-value1 [ to label-value2 ] | all }
```

Views

Any view

Predefined user roles

network-admin

network-operator

mdc-admin

mdc-operator

Parameters

label-value1: Specifies a label value. The value range is 16 to 1048575. If used with the *label-value2* argument, the *label-value1* argument represents the start label of a label range.

to *label-value2*: Specifies the end label of the label range. The value range for the end label is 16 to 1048575. If you specify a label range by using the *label-value1* argument and the **to** *label-value2* option, this command displays usage information for the specified range of labels.

all: Specifies all labels.

Examples

```
# Display usage information for labels 1025 through 1027.
```

```
<Sysname> display mpls label 1025 to 1027
Label      Owner      State
1025      LDP        Alloc
1026      LDP        Alloc
1027      LDP        Inuse
```

Table 3 Command output

Field	Description
Label	Label value.
Owner	Protocol that is using the label: <ul style="list-style-type: none"> • Static—Static LSP. • LDP. • BGP. • StaticCR—Static CRLSP or static SRLSP. • RSVP. • L2VPN. • ISIS. This field displays a hyphen (-) when the label state is Idle .
State	Usage state of the label: <ul style="list-style-type: none"> • Idle—The label is idle. • Alloc—The label has been allocated. • Pending—The label has been released but is still used by an LSP entry. • Inuse—The label has been allocated and used by an LSP entry.

display mpls lsp

Use `display mpls lsp` to display LSP information.

Syntax

```
display mpls lsp [ egress | in-label label-value | ingress |
outgoing-interface interface-type interface-number | protocol { bgp |
isis | ldp | local | rsvp-te [ p2mp ] | static | static-cr } | transit ]
[ vpn-instance vpn-instance-name ] [ ipv4-address mask-length | ipv6
[ ipv6-address prefix-length ] ] [ verbose ]
```

Views

Any view

Predefined user roles

network-admin
network-operator
mdc-admin
mdc-operator

Parameters

egress: Displays the LSPs taking the current LSR as egress.

in-label label-value: Displays the LSPs using the specified label as the incoming label, in the range of 0 to 1048575.

ingress: Displays the LSPs taking the current LSR as ingress.

outgoing-interface interface-type interface-number: Displays the LSPs using the specified interface as the outgoing interface. The `interface-type interface-number` argument specifies an interface by its type and number.

protocol: Displays the LSPs established by a protocol.

bgp: Displays BGP LSPs.

isis: Displays IS-IS SRLSPs.

ldp: Displays LDP LSPs.

local: Displays the LSPs to the direct next hops, the LSPs that use the local MPLS TE tunnel interfaces or tunnel bundle interfaces as the LSP heads, .

rsvp-te: Displays CRLSPs established by RSVP-TE.

p2mp: Displays P2MP CRLSPs established by RSVP-TE. If you do not specify this keyword, the command displays information about P2P CRLSPs and P2MP CRLSPs established by RSVP-TE.

static: Displays static LSPs.

static-cr: Displays static CRLSPs and static SRLSPs.

transit: Displays the LSPs taking the current LSR as a transit LSR.

vpn-instance *vpn-instance-name*: Displays LSPs for the specified MPLS L3VPN instance. The *vpn-instance-name* is a case-sensitive string of 1 to 31 characters. If you do not specify this option, the command displays LSPs for the public network.

ipv4-address mask-length: Displays the IPv4 LSP for an FEC specified by an IPv4 address and a mask length. The value range for the mask length is 0 to 32.

ipv6: Displays IPv6 LSP information. If you do not specify this keyword, the command displays IPv4 LSP information.

ipv6-address prefix-length: Displays the IPv6 LSP for an FEC specified by an IPv6 address and a prefix length. The value range for the prefix length is 0 to 128.

verbose: Displays detailed LSP information. If you do not specify this keyword, the command displays brief LSP information.

Usage guidelines

If you do not specify any parameters, this command displays brief information about all LSPs. If you specify only the **verbose** keyword, this command displays detailed information about all LSPs.

Examples

```
# Display brief information about all IPv4 LSPs.
```

```
<Sysname> display mpls lsp
```

FEC	Proto	In/Out Label	Interface/Out NHLFE
100.100.100.100/24	LDP	-/1049	Vlan20
Backup		-/1050	Vlan21
100.100.100.10/24	LDP	-/1051	Vlan22
Backup		-/1050	Vlan21
100.100.100.10/24	LDP	-/1049	Vlan30
101.100.100.10/24	LDP	1026/1049	Vlan20
102.100.100.10/24	LDP	1027/-	-
103.100.100.10/24	LDP	1028/1049	Tunnel10
110.100.100.20/24	BGP	-/1049	Vlan20
111.100.100.10/24	BGP	2028/1049	Vlan20
112.100.100.10/24	BGP	2029/-	Vlan20
113.100.100.10/24	BGP	2030/1049	NHLFE1500
114.100.100.10/24	BGP	2031/1050	Tunnel100
100.100.100.100	Local	-/-	Vlan20


```

101.101.101.101/32      Static  -/100      Vlan20
-                      Static  100/200     Vlan20
-                      Static  101/-      Vlan20
150.140.150.100/64001/0 StaticCR -/1000     Vlan10
-                      StaticCR 50/1001  Vlan10
-                      StaticCR 51/-      -

```

Table 4 Command output

Field	Description
FEC	Forwarding equivalence class: <ul style="list-style-type: none"> • IP address/mask—Classifies FECs by destination address. • IP address—Classifies FECs by next hop. • IP address/Out Label—Classifies FECs by next hop and outgoing label. • Ingress LSR ID/Tunnel ID/LSP ID—RSVP TE FEC. • - (a hyphen)—The LSP is a static transit LSP, static egress LSP, adjacency path for static SRLSPs, static transit CRLSP, or static egress CRLSP. • Backup—The LSP is a backup LSP of the previous LSP.
Proto	Label distribution protocol: <ul style="list-style-type: none"> • LDP. • BGP. • IS-IS. • RSVP. • Static. • StaticCR—Static CRLSP or static SRLSP. • Local—LSP to a direct next hop, or LSP that uses a local MPLS TE tunnel interface as the LSP head.
In/Out Label	Incoming label/outgoing label.
Interface/Out NHLFE	Outgoing interface name or NHLFE entry index. NHLFE <i>number</i> specifies the outer LSP that carries the current LSP. The outer LSP is that matches the NHLFE entry with an NID of <i>number</i> .

Display IPv6 LSP information.

```

<Sysname> display mpls lsp ipv6
FEC      : 100:100:100:100:100:100:100/128
Protocol : BGP      In-Label   : 1200
Out-Label: 1300    Out-Interface: Vlan10
BkLabel  : 1400    BkInterface  : Vlan20

```

Table 5 Command output

Field	Description
FEC	Forwarding equivalence class: <ul style="list-style-type: none"> • IP address/mask—Classifies FECs by destination address. • IP address—Classifies FECs by next hop. • IP address/Out Label—Classifies FECs by next hop and outgoing label. • Ingress LSR ID/Tunnel ID/LSP ID—RSVP TE FEC. • - (a hyphen)—The LSP is a static transit LSP, static egress LSP, static transit CRLSP, or static egress CRLSP.

Field	Description
Protocol	Label distribution protocol: <ul style="list-style-type: none"> • LDP. • BGP. • RSVP. • Static. • StaticCR—Static CRLSP or static SRLSP. • Local—LSP to a direct next hop, or LSP that uses a local MPLS TE tunnel interface as the LSP head.
BkLabel	Outgoing label of the backup LSP.
BkInterface	Outgoing interface of the backup LSP.

Display detailed information about all LSPs.

```
<Sysname> display mpls lsp verbose
```

```
Destination : 56.10.10.2
FEC         : 56.10.10.2/32
Protocol    : LDP
LSR Type    : Egress
Service     : Statistics
In-Label    : 1024
State       : Active
Inbound Statistics:
  Octets    : 13000
  Packets   : 100
  Errors    : 0
  Discards  : 0
```

```
Destination : 56.10.10.4
FEC         : 56.10.10.2/32
Protocol    : LDP
LSR Type    : Transit
Service     : Statistics
In-Label    : 1026
Inbound Statistics:
  Octets    : 10600
  Packets   : 100
  Errors    : 0
  Discards  : 0
```

```
Path ID     : 0x40000000.1
State       : Active
Out-Label   : 1800
Nexthop     : 10.1.1.2
Out-Interface: Vlan10
BkLabel     : 1900
BkNexthop   : 20.1.1.2
BkInterface : Vlan20
Outbound Statistics:
  Octets    : 12600
```

Packets : 100
 Errors : 0
 Discards : 0

Destination : 56.10.10.4
 FEC : 56.10.10.2/32
 Protocol : LDP
 LSR Type : Ingress
 Service : -
 NHLFE ID : 2000
 State : Active
 Out-Label : 1800
 Nexthop : 10.1.1.2
 Out-Interface: Vlan10

Table 6 Command output

Field	Description
Destination	LSP destination address.
FEC	Forwarding equivalence class: <ul style="list-style-type: none"> • IP address/mask—Classifies FECs by destination address. • IP address—Classifies FECs by next hop. • IP address/Out Label—Classifies FECs by next hop and outgoing label. • Ingress LSR ID/Tunnel ID/LSP ID—RSVP TE or static SRLSP FEC. • - (a hyphen)—The LSP is a static transit LSP, static egress LSP, adjacency path for static SRLSPs, static transit CRLSP, or static egress CRLSP.
Protocol	Label distribution protocol: <ul style="list-style-type: none"> • LDP. • BGP (<i>instance-name</i>)—The <i>instance-name</i> specifies a BGP instance name. The value of default represents the default BGP instance. • RSVP. • Static. • StaticCR—Static CRLSP or static SRLSP. • Local—LSP to a direct next hop, or LSP that uses a local MPLS TE tunnel interface as the LSP head.
LSR Type	LSR type: <ul style="list-style-type: none"> • Ingress—The current LSR is the ingress node of the LSP. • Transit—The current LSR is a transit node of the LSP. • Egress—The current LSR is the egress node of the LSP.
Service	Service deployed on the LSP. The service can only be Statistics , which indicates the MPLS forwarding statistics feature.
Path ID	Forwarding path. The value is in the format of 0xnn.m. The nn represents the NHLFE group ID of the outer LSPs that carry the current LSP, and m represents the sequence number of the equivalence path.
NHLFE ID	NHLFE entry index.

Field	Description
State	LSP state: <ul style="list-style-type: none"> • Active—The LSP is in use. • Inactive—The LSP is idle.
Inbound Statistics	MPLS forwarding statistics in inbound direction: <ul style="list-style-type: none"> • Octets—Number of received octets. • Packets—Number of received packets. • Errors—Number of received error packets. • Discards—Number of discarded packets.
BkLabel	Outgoing label of the backup LSP.
BkNexthop	Next hop address of the backup LSP.
BkInterface	Outgoing interface of the backup LSP.
Outbound Statistics	MPLS forwarding statistics in outbound direction: <ul style="list-style-type: none"> • Octets—Number of sent octets. • Packets—Number of sent packets. • Errors—Number of error packets. • Discards—Number of discarded packets.

Related commands

`display mpls lsp statistics`

display mpls lsp statistics

Use `display mpls lsp statistics` to display LSP statistics.

Syntax

`display mpls lsp statistics [ipv6]`

Views

Any view

Predefined user roles

network-admin
network-operator
mdc-admin
mdc-operator

Parameters

ipv6: Displays IPv6 LSP statistics. If you do not specify this keyword, the command displays IPv4 LSP statistics.

Examples

```
# Display IPv4 LSP statistics.
<Sysname> display mpls lsp statistics
LSP Type      Ingress/Transit/Egress  Active
Static LSP    0/0/0                   0/0/0
Static CRLSP  0/0/0                   0/0/0
LDP LSP      2/2/1                   2/2/1
RSVP CRLSP    0/0/0                   0/0/0
```

```

BGP LSP          0/0/0          0/0/0
Local LSP        2/0/0          2/0/0
ISIS LSP         0/0/0          0/0/0

```

```

-----
Total            4/2/1          4/2/1

```

Display IPv6 LSP statistics.

```

<Sysname> display mpls lsp statistics ipv6
LSP Type      Ingress/Transit/Egress  Active
Static LSP    0/0/0                  0/0/0
Static CRLSP  0/0/0                  0/0/0
LDP LSP       6/6/2                  6/6/2
RSVP CRLSP    0/0/0                  0/0/0
BGP LSP       0/0/0                  0/0/0
Local LSP     2/0/0                  2/0/0
ISIS LSP      0/0/0                  0/0/0

```

```

-----
Total            8/6/2          8/6/2

```

Table 7 Command output

Field	Description
LSP Type	LSP types: <ul style="list-style-type: none"> • Static LSP. • Static CRLSP—Static CRLSP or static SRLSP. • LDP LSP. • Local LSP—LSP to a direct next hop, or LSP that uses a local MPLS TE tunnel interface as the LSP head. • RSVP CRLSP. • BGP LSP. • IS-IS—IS-IS SRLSPs.
Total	Total number of LSPs.
Ingress	Number of LSPs that take the local device as the ingress node.
Transit	Number of LSPs that take the local device as a transit node.
Egress	Number of LSPs that take the local device as the egress node.
Active	Number of active LSPs of a type.

display mpls nib

Use `display mpls nib` to display MPLS Nexthop Information Base (NIB) information.

Syntax

```
display mpls nib [ nib-id ]
```

Views

Any view

Predefined user roles

```

network-admin
network-operator

```

mdc-admin
mdc-operator

Parameters

nib-id: Specifies a next hop ID in the range of 1 to FFFFFFFF. If you do not specify a next hop, this command displays information about all MPLS next hops.

Examples

Display information about all MPLS next hops.

```
<Sysname> display mpls nib  
NIB ID: 0x40000000  
  Users: 1  
  Status: Active  
  ECMP number: 1  
    Outgoing NHLFE ID: 1024  
    Backup outgoing NHLFE ID: 1027
```

Table 8 Command output

Field	Description
NIB ID	ID of the next hop.
Users	Number of ILM entries that use this next hop.
Status	Next hop status: <ul style="list-style-type: none">• Active—The next hop is active.• Dummy—The next hop is inactive.
ECMP number	Number of equal-cost NHLFE entries.
Outgoing NHLFE ID	ID of the NHLFE entry to which the next hop corresponds.
Backup outgoing NHLFE ID	ID of the backup NHLFE entry.

display mpls nid

Use `display mpls nid` to display usage information for NIDs.

Syntax

```
display mpls nid [ nid-value1 [ to nid-value2 ] ]
```

Views

Any view

Predefined user roles

network-admin
network-operator
mdc-admin
mdc-operator

Parameters

nid-value1: Specifies an NID. The value range is 0 to 65535. If used with the *nid-value2* argument, the *nid-value1* argument represents the start NID of an NID range.


```

65536-73727      8192
131072-139263   8192
Protocols:
Type             State
LDP              Normal
Static           Normal

```

Table 9 Command output

Field	Description
Egress Label Type	Label type that the egress node assigns to the penultimate hop: <ul style="list-style-type: none"> • Implicit-null. • Explicit-null. • Non-null.
Labels	Label information.
Range	Label range.
Idle	Number of idle labels in the label range.
Protocols	Label distribution protocols that generated LSPs and their running states.
Type	Protocol type: <ul style="list-style-type: none"> • LDP. • BGP (<i>instance-name</i>). The <i>instance-name</i> specifies a BGP instance name. The value of default represents the default BGP instance. • RSVP. • Static—Static LSP. • StaticCR—Static CRLSP. • TE. • CCC. • ISIS.
State	Label distribution protocol running state: <ul style="list-style-type: none"> • Normal—The protocol is in normal state. • Recover—The protocol is in the GR process.

mpls enable

Use **mpls enable** to enable MPLS on an interface.

Use **undo mpls enable** to disable MPLS on an interface.

Syntax

```
mpls enable
```

```
undo mpls enable
```

Default

MPLS is disabled on an interface.

Views

Interface view

Predefined user roles

network-admin

mdc-admin

Examples

```
# Enable MPLS on VLAN-interface 2.
<Sysname> System-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] mpls enable
```

Related commands

display mpls interface

mpls label advertise

Use **mpls label advertise** to specify the type of label the egress node will advertise to the penultimate hop.

Use **undo mpls label advertise** to restore the default.

Syntax

```
mpls label advertise { explicit-null | implicit-null | non-null }
undo mpls label advertise
```

Default

As egress, the device advertises an implicit null label to the penultimate hop.

Views

System view

Predefined user roles

network-admin
mdc-admin

Parameters

explicit-null: Specifies the egress node to advertise an explicit null label of 0 to the penultimate hop.

implicit-null: Specifies the egress node to advertise an implicit null label of 3 to the penultimate hop.

non-null: Specifies the egress node to advertise a non-null label to the penultimate hop.

Usage guidelines

As a best practice, configure the egress node to advertise an implicit null label to the penultimate hop if the penultimate hop supports PHP.

If you want to simplify packet forwarding on egress but keep labels to determine QoS policies, configure the egress node to advertise an explicit null label to the penultimate hop.

Use non-null labels only in particular scenarios. For example, when OAM is configured on the egress node, the egress node can get the OAM function entity status only through non-null labels.

As a penultimate hop, the device accepts the implicit null label, explicit null label, or non-null label advertised by the egress node.

For LDP LSPs, the **mpls label advertise** command triggers LDP to delete the LSPs established before the command is executed and re-establishes new LSPs.

For BGP LSPs, the **mpls label advertise** command takes effect only on the BGP LSPs established after the command is executed. To apply the new setting to BGP LSPs established

before the command is executed, delete the routes corresponding to the BGP LSPs, and then redistribute the routes.

Examples

```
# Configure the egress node to advertise an implicit null label to the penultimate hop.
<Sysname> system-view
[Sysname] mpls label advertise implicit-null
```

Related commands

```
reset mpls ldp
```

mpls lsr-id

Use `mpls lsr-id` to configure an LSR ID for the local LSR.

Use `undo mpls lsr-id` to restore the default.

Syntax

```
mpls lsr-id lsr-id
undo mpls lsr-id
```

Default

An LSR has no LSR ID.

Views

System view

Predefined user roles

```
network-admin
mdc-admin
```

Parameters

lsr-id: Specifies an ID for identifying the LSR, in dotted decimal notation.

Usage guidelines

As a best practice, use the address of a loopback interface on the LSR as the LSR ID.

Examples

```
# Configure the LSR ID as 3.3.3.3 for the local node.
<Sysname> system-view
[Sysname] mpls lsr-id 3.3.3.3
```

Related commands

```
lsr-id
```

mpls mtu

Use `mpls mtu` to set the MPLS MTU for an interface.

Use `undo mpls mtu` to restore the default.

Syntax

```
mpls mtu size
undo mpls mtu
```

Default

The MPLS MTU of an interface is not configured. Fragmentation for MPLS packets is based on the IP MTU. If IP MTU is not configured, fragmentation for MPLS packets is based on the MTU of the interface. The length of a fragment does not include that of the MPLS label. Thus, after an MPLS label is added into a fragment, the length of the MPLS fragment might exceed the interface MTU.

Views

Interface view

Predefined user roles

network-admin

mdc-admin

Parameters

size: Specifies the MPLS MTU of the interface, in the range of 46 to 65535 bytes.

Usage guidelines

This command is effective only when MPLS is enabled on the interface.

If the MPLS MTU is larger than the interface MTU, data forwarding might fail.

MPLS TE tunnel interfaces do not support this command.

Examples

Set the MPLS MTU of VLAN-interface 2 to 1000 bytes.

```
<Sysname> system-view
[Sysname] interface vlan-interface 2
[Sysname-Vlan-interface2] mpls enable
[Sysname-Vlan-interface2] mpls mtu 1000
```

Related commands

```
display mpls interface
```

mpls statistics

Use **mpls statistics** to enable MPLS label forwarding statistics for LSPs.

Use **undo mpls statistics** to disable MPLS label forwarding statistics for LSPs.

Syntax

```
mpls statistics { all | [ vpn-instance vpn-instance-name ] { ipv4 ipv4-address mask-length | ipv6 ipv6-address prefix-length } | static | te ingress-lsr-id tunnel-id }
```

```
undo mpls statistics { all | [ vpn-instance vpn-instance-name ] { ipv4 ipv4-address mask-length | ipv6 ipv6-address prefix-length } | static | te ingress-lsr-id tunnel-id }
```

Default

MPLS label forwarding statistics are disabled for all LSPs.

Views

System view

Predefined user roles

network-admin

mdc-admin

Parameters

a11: Specifies all LSPs.

vpn-instance *vpn-instance-name*: Specifies an MPLS L3VPN instance by its name, a case-sensitive string of 1 to 31 characters. If you do not specify a VPN instance, this command enables MPLS forwarding statistics for public LSPs.

ipv4 *ipv4-address mask-length*: Specifies the IPv4 LSP for an FEC specified by an IPv4 address and a mask length. The mask length is in the range of 0 to 32.

ipv6 *ipv6-address prefix-length*: Specifies the BGP-IPv6 LSP for an FEC specified by an IPv6 address and a prefix length. The prefix length is in the range of 0 to 128.

static: Specifies static LSPs and static CRLSPs.

te *ingress-lsr-id tunnel-id*: Specifies an RSVP-TE tunnel. The *ingress-lsr-id* represents the LSR ID of the ingress node of the tunnel. The *tunnel-id* argument represents the ID of the tunnel. The value range for the *tunnel-id* argument is 1 to 4095.

Usage guidelines

MPLS label forwarding forwards a labeled packet based on its incoming label. MPLS label forwarding statistics is enabled by this command.

To display MPLS label forwarding statistics for the specified LSPs by using the **display mpls lsp verbose** command, you must perform the following tasks:

- Use the **mpls statistics** command to enable the MPLS label forwarding statistics feature for the LSPs.
- Use the **mpls statistics interval** command to set the MPLS label forwarding statistics collection interval.

The execution of the **mpls statistics enable** command on a PE enables MPLS label forwarding statistics for a VPN instance and for all LSPs in the VPN instance. For more information about enabling MPLS label forwarding statistics for a VPN instance, see *MPLS Configuration Guide*.

Examples

```
# Enable MPLS label forwarding statistics for the LSP destined for 2.2.2.2/32.
<Sysname> system-view
[Sysname] mpls statistics ipv4 2.2.2.2 32
```

Related commands

```
display mpls lsp verbose
mpls statistics interval
reset mpls statistics
```

mpls statistics interval

Use **mpls statistics interval** to set the MPLS label forwarding statistics collection interval.

Use **undo mpls statistics interval** to delete the MPLS label forwarding statistics collection interval.

Syntax

```
mpls statistics interval interval
undo mpls statistics interval
```

Default

The MPLS forwarding statistics collection interval is not set.

Views

System view

Predefined user roles

network-admin

mdc-admin

Parameters

interval: Specifies the MPLS label forwarding statistics collection interval in the range of 30 to 65535 seconds.

Usage guidelines

To display MPLS label forwarding statistics for the specified LSPs or VPN instance, you must perform the following tasks:

- Use the **mpls statistics** command to enable the MPLS label forwarding statistics feature for the LSPs or VPN instance.
- Use the **mpls statistics interval** command to set the MPLS label forwarding statistics collection interval.

Examples

```
# Set the MPLS label forwarding statistics collection interval to 30 seconds.
```

```
<Sysname> system-view
```

```
[Sysname] mpls statistics interval 30
```

Related commands

```
display ip vpn-instance mpls statistics
```

```
display mpls lsp verbose
```

```
mpls statistics
```

```
mpls statistics enable
```

```
reset ip vpn-instance mpls statistics
```

```
reset mpls statistics
```

mpls ttl expiration enable

Use **mpls ttl expiration enable** to enable sending MPLS TTL-expired messages.

Use **undo mpls ttl expiration enable** to disable sending MPLS TTL-expired messages.

Syntax

```
mpls ttl expiration enable
```

```
undo mpls ttl expiration enable
```

Default

The MPLS TTL-expired messages sending feature is enabled.

Views

System view

Predefined user roles

network-admin
mdc-admin

Usage guidelines

This command enables an LSR to generate an ICMP TTL-expired message upon receiving an MPLS packet with TTL being 1.

- If the MPLS packet has only one label, the LSR sends the ICMP TTL-expired message back to the source through IP routing.
- If the MPLS packet has multiple labels, the LSR forwards the ICMP TTL-expired message along the LSP of the MPLS packet to the egress node. Then, the egress node sends the message back to the source.

Examples

```
# Disable sending MPLS TTL-expired messages.  
<Sysname> system-view  
[Sysname] undo mpls ttl expiration enable
```

mpls ttl propagate

Use `mpls ttl propagate` to enable TTL propagation.

Use `undo mpls ttl propagate` to disable TTL propagation.

Syntax

```
mpls ttl propagate { public | vpn }  
undo mpls ttl propagate { public | vpn }
```

Default

TTL propagation is enabled for public network packets and is disabled for VPN packets.

Views

System view

Predefined user roles

network-admin
mdc-admin

Parameters

public: Specifies public network packets.

vpn: Specifies VPN packets.

Usage guidelines

When TTL propagation is enabled, MPLS performs the following operations:

- Copies the IP TTL to the label TTL for packets entering the MPLS network.
- Copies the label TTL to the IP TTL for packets leaving the MPLS network.

If you enable TTL propagation on both ingress and egress, the IP tracer facility can show the real path in the MPLS network.

When TTL propagation is disabled, MPLS performs the following operations:

- Sets the label TTL to 255 for packets entering the MPLS network.

- Pops the label for packets leaving the MPLS network, without copying the label TTL value to the IP TTL.

The IP traceroute facility cannot show the real path in the MPLS network.

Within an MPLS network, TTL is always copied between the labels of an MPLS packet. The `mpls ttl propagate` command affects only the propagation between IP TTL and label TTL.

As a best practice, set the same TTL processing mode on all LSRs of an LSP.

To enable TTL propagation for a VPN, you must enable it on all PE devices in the VPN. This allows you to obtain the same traceroute result (hop count) from those PEs.

Examples

```
# Enable TTL propagation for VPN packets.
```

```
<Sysname> system-view
```

```
[Sysname] mpls ttl propagate vpn
```

reset mpls statistics

Use `reset mpls statistics` to clear MPLS forwarding statistics for the specified LSPs.

Syntax

```
reset mpls statistics { all | [ vpn-instance vpn-instance-name ] { ipv4 ipv4-address mask-length | ipv6 ipv6-address prefix-length } | static | te ingress-lsr-id tunnel-id }
```

Views

User view

Predefined user roles

network-admin

mdc-admin

Parameters

all: Specifies all LSPs.

vpn-instance *vpn-instance-name*: Specifies an MPLS L3VPN instance by its name, a case-sensitive string of 1 to 31 characters. If you do not specify a VPN instance, this command clears MPLS forwarding statistics for public LSPs.

ipv4 *ipv4-address mask-length*: Specifies the IPv4 LSP for an FEC specified by an IPv4 address and a mask length. The mask length is in the range of 0 to 32.

ipv6 *ipv6-address prefix-length*: Specifies the BGP-IPv6 LSP for an FEC specified by an IPv6 address and a prefix length. The prefix length is in the range of 0 to 128.

static: Specifies static LSPs and static CRLSPs.

te *ingress-lsr-id tunnel-id*: Specifies an RSVP-TE tunnel. The *ingress-lsr-id* argument represents the LSR ID of the ingress node of the tunnel. The *tunnel-id* argument represents the ID of the tunnel. The value range for the *tunnel-id* argument is 1 to 4095.

Examples

```
# Clear MPLS forwarding statistics for the LSP destined for 2.2.2.2/32.
```

```
<Sysname> reset mpls statistics ipv4 2.2.2.2 32
```

Related commands

```
display mpls lsp verbose
```

```
mpls statistics
mpls statistics interval
```

snmp-agent trap enable mpls

Use `snmp-agent trap enable mpls` to enable SNMP notifications for MPLS.

Use `undo snmp-agent trap enable mpls` to disable SNMP notifications for MPLS.

Syntax

```
snmp-agent trap enable mpls
undo snmp-agent trap enable mpls
```

Default

SNMP notifications for MPLS are disabled.

Views

System view

Predefined user roles

```
network-admin
mdc-admin
```

Usage guidelines

To report critical MPLS events to an NMS, enable SNMP notifications for MPLS. For MPLS event notifications to be sent correctly, you must also configure SNMP on the device. For more information about SNMP configuration, see the network management and monitoring configuration guide for the device.

Examples

```
# Enable SNMP notifications for MPLS.
<Sysname> system-view
[Sysname] snmp-agent trap enable mpls
```