Content

Chapter 1 Commands for MPLS

1.1 mpls egress-ttl

Command: mpls egress-ttl <*0-255*>
no mpls egress-ttl
Function: Set the TTL value of IP messages through the egress LSR of LSP;
the no operation will cancel the configured value.
Parameters: <*0-255*>: the TTL value.
Default: None.
Command Mode: Global Mode
Usage Guide: The egress-ttl configuration of the LSR will be the TTL of all IP
messages forwarded through this egress LSR.
Example: Set the egress TTL as 45.
Switch#config terminal
Switch(config)#mpls egress-ttl 45
Related Commands: mpls ingress-ttl

1.2 mpls enable

Command: mpls enable
       no mpls enable
Function: Enable mpls protocol; the no command will disable the protocol.
Parameters: None.
Default: The mpls protocol is disabled by default.
Command Mode: Global Mode.
Usage Guide: Implementing this command will enable the mpls protocol.
Example:
Switch(config)#mpls enable

1.3 mpls ingress-ttl

Command: mpls ingress-ttl <*0-255*>
no mpls ingress-ttl
Function: Set the TTL value of IP messages through the ingress LSR of LSP;
the no operation will cancel the configured value.
Parameters: <*0-255*>: the TTL value.
Default: None.
Command Mode: Global Mode
Usage Guide: The ingress-ttl configuration of the ingress LSR will be the TTL
value in the top label of all MPLS messages entering this LSP through the LSP
ingress router.
Example: Set the ingress TTL as 45.
Switch#config terminal
Switch(config)#mpls ingress-ttl 45
Related Commands: mpls egress-ttl

1.4 show mpls

Command: show mpls
Function: Display all label data.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Implementing this command will display all label data.
Example: Display all label data.
Switch#show mpls
  Minimum label configured: 16
  Maximum label configured: 1048575
  Per label-space information:
  Label-space 0 is using minimum label: 16 and maximum label: 1048575
  Custom ingress TTL configured: none

Custom egress TTL configured: none

Display	Explanation
Minimum label configured	The configured minimum label
Maximum label configured	The configured maximum label
Per label-space information	The space information of each label
Label-space 0 is using minimum label	The minimum label can be used by label-space 0.
Label-space 0 is using maximum label	The maximum label can be used by label-space 0.
Custom ingress TTL configured	The ingress TTL configured by users
Custom egress TTL configured	The egress TTL configured by users

1.5 show mpls enable

Command: show mpls enable
Function: Display whether the mpls is enabled.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Implementing this command will display whether the mpls is
enabled.
Example: Display whether the mpls is enabled.
Switch#show mpls enable
Switch#MPLS enable has been on
Related Commands: mpls enable

1.6 show mpls forwarding-table

Command: show mpls forwarding-table
Function: Display the information of all LSP created by the switch as an
ingress router, and FTN (FEC to Next-Hop-Label-Forwarding-Entry) marked as
selected.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Implementing this command will display the information of all
LSP created by the switch as an ingress router, and FTN marked as selected.
Example: Display the information of all LSP created by the switch as an
ingress router.
Switch#show mpls forwarding-table
Codes: > - selected FTN, B - BGP FTN, C - CR-LDP FTN, K - CLI FTN,
L - LDP FTN, R - RSVP-TE FTN, S - SNMP FTN, U - unknown FTN
Code   FEC   FTN-ID   Pri Nexthop   Out-Label
Out-Intf
L>   200.200.1.2/32   1   Yes 202.200.1.1   640
Vlan3
L>   202.200.1.0/24   2   Yes 0.0.0.0   3
Vlan3
L>   202.200.2.0/24   3   Yes 202.200.1.1   3
Vlan3

Display	Explanation
Code	Type
FEC	The FEC Address
FTN-ID	The FTN ID
Pri	The Primary lsp label
Nexthop	The next-hop address
Out-Label	The Out label
Out-Intf	The Out interface

1.7 show mpls ftn-table brief

Command: show mpls ftn-table brief
Function: Display brief information of public network FTN routers created by MPLS on the switch.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Implementing this command will display brief information of public network FTN routers created by MPLS on the switch.
Example:
Switch#show mpls ftn-table brief

FTN Entry Brief Information

FEC	Out-Label	Out-intf	Next hop	Oper-code	Op-State	Vrf
100.1.1.0/24	3	Vlan10	0.0.0.0	Push	Up	0

1.8 show mpls ftn-table detail

Command: show mpls ftn-table detail
Function: Display detailed information of public network FTN router created by MPLS on the switch.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Implementing this command will display detailed information of public network FTN routers created by MPLS on the switch.
Example:
Switch#show mpls ftn-table detail

```
FTN ID              :     1
VrfIndex            :     0
Fec                 :     100.1.1.0/24
Nexthop addr        :     0.0.0.0
Owner               :     LDP
Primary             :     Yes
Row Status          :     Active
Exp-bits            :     0X0
Incoming DSCP       :     none
Tunnel ID           :     0
Protected LSP id    :     0
QoS Resource id     :     0
In-Label            :     0
In-Interface        :     N/A
Out-Label           :     3
Out-Interface       :     Vlan10
Admin Status        :     Up
Oper Status         :     Up
Oper Code           :     Push
```

Display	Explanation
FTN ID	The FEC ID
VrfIndex	The Vrf Index
Fec	The Fec Address
Nexthop addr	The next-hop address
Owner	The protocol creating the cross-link table
Primary	Whether it is primary or not.

Row Status	The Row status
Exp-bits	The experiment bits
Incoming DSCP	Differentiated Services CodePoint.
Tunnel ID	The Tunnel ID
Protected LSP id	The id of protected LSP
QoS Resource id	The ID of Qos Resource
in label	The in label
In-Interface	The in interface
Out-Label	The out label
Out-Interface	The out interface
Admin Status	The administration status
Oper Status	The operation status
Oper Code	The operation code

1.9 show mpls ilm-table

Command: show mpls ilm-table
Function: Display the information of ILM routers created by MPLS on the switch.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Implementing this command will display the information of ILM routers created by MPLS.
Example:
Switch#show mpls ilm-table

```
In-Label   Out-Label   In-Intf   Out-Intf   Nexthop        FEC
640        3           Vlan1     Vlan2      24.1.1.2       2.2.2.2/32
641        3           Vlan2     Vlan1      14.1.1.1       1.1.1.1/32
```

Display	Explanation
In-Label	The in label
Out-Label	The out label
In-Intf	The in interface
Out-Intf	The our interface
Nexthop	The next-hop address
FEC	The fec address

1.10 show mpls vrf-table

Command: show mpls vrf-table [vrf-name]
Function: Display the detailed information of all configured VRP ingresses.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Implementing this command will display the detailed information of all configured VRP ingresses. If there is a specified VRF in the parameter, only details about this ingress will be displayed.
Example:
Switch#show mpls vrf-table

```
Output for VRF table with id: 1

--------------------------------------------
 FTN ID          :     1
 VrfIndex        :     1
 Fec             :     10.1.1.0/24
 Nexthop addr    :     0.0.0.0
 Owner           :     BGP
```

```
Primary              :      Yes
Row Status           :      Active
Exp-bits             :      0X0
Incoming DSCP        :      none
Tunnel ID            :       0
Protected LSP id     :      0
QoS Resource id      :      0
In-Label             :      0
In-Interface         :      N/A
Out-Label            :      0
Out-Interface        :      Vlan20
Admin Status         :      Up
Oper Status          :      Up
Oper Code            :      Deliver to IP
```

Display	Explanation
FTN ID	The FEC ID
VrfIndex	The Vrf Index
Fec	The Fec address
Nexthop addr	The next-hop address
Owner	The protocol creating the cross-link table
Primary	Whether it is primary or not
Row Status	The row status
Exp-bits	The experiment bits
Incoming DSCP	Differentiated Services CodePoint.
Tunnel ID	The tunnel ID
Protected LSP id	The ID of protected LSP
QoS Resource id	The ID of Qos resource
in label	The in label
In-Interface	The in interface
Out-Label	The out label
Out-Interface	The out interface
Admin Status	The administration status
Oper Status	The operation status
Oper Code	The operation code

Chapter 2 LDP

2.1 advertisement-mode

Command: advertisement-mode {downstream-on-demand | downstream-unsolicited}
no advertisement-mode {downstream-on-demand | downstream-unsolicited}
Function: Configure the advertisement mode of labels; the no operation will cancel the configuration.
Parameters: None.
Default: Downstream-unsolicited mode
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: The LDP label advertisement mode determines how the LDP protocol handles the label advertisement. The protocol supports two modes: the first one is downstream-on-demand, which means, only when the upstream propose a label request, will the switch advertise a label to it; the other one is downstream-unsolicited, which means, the switch will allocate labels for all upstreams no matter they need one or not. It is recommended to use this mode together with the label retention modes and label control modes: the downstream-unsolicited mode corresponds with the liberal retention mode and the liberal mode, while the downstream-on-demand mode with the conservative retention mode and the ordered mode. It is better not to configure other attributes separately. If the interface is in the label advertisement mode, this command will have no effect.
Example: Configure the label advertisement mode as downstream-unsolicited.
Switch(config)#router ldp
Switch(config-router)#advertisement-mode downstream-on-demand
Related Commands: ldp advertisement-mode, label-retention-mode, ldp label-retention-mode

2.2 clear ldp adjacency

Command: clear ldp adjacency {<*ip-addr*>|*}
Function: Cancel the LDP adjacency.
Parameters: <*ip-addr*> is the adjacent IP address, * means to clear all adjacencies.
Default: None.
Command Mode: Admin Mode.
Usage Guide: Implementing this command will clear the adjacency between the switch and its neighbor. With all configurations staying the same, the switch will recreate an adjacency with the neighbor through negotiation.
Example: Clear the adjacency with the neighbor 10.10.10.1.
Switch#clear ldp adjacency 10.10.10.1

2.3 clear ldp session

Command: clear ldp session {<*ip-addr*> | *}
Function: Clear LDP sessions.
Parameters: <*ip-addr*> is the IP address of the neighbor, * means to clear all sessions.
Default: None.
Command Mode: Admin Mode
Usage Guide: Implementing this command will clear session procedures. With all configurations staying the same, the switch will restart the session again. Please pay attention to the relationship between session and adjacency: multiple adjacencies may be created in one session.
Example:
Switch#clear ldp session *

2.4 clear ldp statistics

Command: clear ldp statistics
Function: Clear the LDP statistics.
Parameters: None.
Default: None.
Command Mode: Admin Mode.
Usage Guide: Implementing this command will clear all statistics.
Example:
Switch#clear ldp statistics

2.5 control-mode

Command: control-mode {ordered | independent}
no control-mode
Function: Configure the LSP control mode; the no operation will cancel the
configuration.
Parameters: None.
Default: The default mode is "independent".
Command Mode: LDP Protocol Configuration Mode
Usage Guide: LSP provides two different control modes: independent and
ordered. The independent mode means that, there is no need to acquire a label
map of the FEC from the downstream, which is required in the ordered mode
when a LSR is advertising to the upstream a label map related with the
specified FEC (unless this LSR is the egress router of this FEC). Hop-by-hop
route applications usually work in the independent LSP control mode, and
choose DU mode as the label advertisement mode. The ordered mode should
be used along with the DoD mode.
Example: Configure the LSPcontrol mode to ordered.
Switch(config)#router ldp
Switch(config-router)#control-mode ordered
Related Commands: advertisement-mode, ldp advertisement-mode

2.6 debug ldp all

Command: debug ldp all
no debug ldp all
Function: Display all debug information related with LDP; when it is disabled,
all debug switches will be disabled too.
Parameters: None.
Default: No display of debug information.
Command Mode: Admin Mode.
Example: Enable all debug switches.
Switch#debug ldp all
Switch#

2.7 debug ldp dsm

Command: debug ldp dsm
no debug ldp dsm
Function: Display debug information related with the LDP downstream state
machine; the no operation will disable the debug information.
Parameters: None.
Default: No display of debug information.
Command Mode: Admin Mode.
Usage Guide: Implementing this command will display the debug information
related with the LDP downstream state machine. With it is enabled, debug
information will be displayed when any the LDP protocol change related with
the downstream state machine happens.
Example: Enable the debug switch.
Switch#debug ldp dsm
Switch#

2.8 debug ldp error

Command: debug ldp error
no debug ldp error
Function: Display debug information of LDP errors; the no operation will disable the debug information.
Parameters: None.
Default: No display of debug information.
Command Mode: Admin Mode.
Usage Guide: When there is any LDP error, corresponding debug information will be displayed with this command enabled.
Example: Enable the debug switch.
Switch# debug ldp error
Switch#

2.9 debug ldp events

Command: debug ldp events
no debug ldp events
Function: Display debug information of LDP events; the no operation will disable the debug information.
Parameters: None.
Default: No display of debug information.
Command Mode: Admin Mode.
Usage Guide: With this command enabled, the corresponding debug information of LDP events will be displayed.
Example: Enable the debug switch.
Switch#debug ldp events
Switch#

2.10 debug ldp fsm

Command: debug ldp fsm
no debug ldp fsm
Function: Display debug information related with the LDP session finite state machine; the no operation will disable the debug information.
Parameters: None.
Default: No display of debug information.
Command Mode: Admin Mode.
Usage Guide: Enable (Disable) the debug information related with the LDP session finite state machine.
Example: Enable the debug switch.
Switch#debug ldp fsm
Switch#

2.11 debug ldp hexdump

Command: debug ldp hexdump
no debug ldp hexdump
Function: Display the debug information of LDP messages in hex; the no operation will disable the debug information.
Parameters: None.
Default: No display of debug information.
Command Mode: Admin Mode.
Usage Guide: Enable (Disable) the hex debug information of received and sent LDP message contents.
Example: Enable the debug switch
Switch#debug ldp hexdump
Switch#

2.12 debug ldp nsm

Command: debug ldp nsm
no debug ldp nsm
Function: Enable the debug information switch of the message

communication between NSM and LDP; the no operation will disable the switch.
Parameters: None.
Default: No display of the debug information.
Command Mode: Admin Mode.
Usage Guide: Enable (Disable) the debug information of NSM, mainly including interface changes, route changes, entry distribution and etc.
Example: Enable the debug switch
Switch#debug ldp nsm

2.13 debug ldp packet

Command: debug ldp packet [receive|send|detail]
no debug ldp packet [receive|send|detail]
Function: Display the debug information of LDP messages; the no operation will disable the switch.
Parameters: None.
Default: No display of debug information.
Command Mode: Admin Mode.
Usage Guide: Enable (Disable) the debug information of LDP receiving and sending messages. All information about sending and receiving messages will be displayed with the switch enabled while no such information will be printed. receive|send|detail separately means information of receiving/sending and detailed information.
Example: Enable the debug switch.
Switch#debug ldp packet receive

2.14 debug ldp timer

Command: debug ldp timer
no debug ldp timer
Function: Display the debug information of the LDP timer; the no operation will disable the switch.
Parameters: None.
Default: No display of debug information.
Command Mode: Admin Mode.
Usage Guide: The debug information of the LDP timer will be displayed with this command enabled.
Example: Enable the debug switch.
Switch#debug ldp timer

2.15 debug ldp tsm

Command: debug ldp tsm
no debug ldp tsm
Function: Display the debug information of the LDP state machine.
Parameters: None.
Default: No display of debug information.
Command Mode: Admin Mode.
Usage Guide: Implementing this command will display the debug information of the LDP state machine.
Example: Enable the debug switch.
Switch#debug ldp tsm

2.16 debug ldp usm

Command: debug ldp usm
no debug ldp usm
Function: Display the debug information of the LDP upstream state machine.
Parameters: None.
Default: No display of debug information.
Command Mode: Admin Mode.
Usage Guide: Implementing this command will display the debug information

of the LDP upstream state machine.
Example: Enable the debug switch.
Switch#debug ldp usm

2.17 ldp {enable|disable}

Command: ldp {enable|disable}
Function: Enable the LDP protocol on the interface.
Parameters: None.
Default: The LDP is disabled.
Command Mode: Interface Mode.
Usage Guide: The LDP protocol is a label switching protocol used when switching labels in the public network, which usually works in a BGP VPN environment. "router ldp" is used to globally enable the LDP protocol, however, in interfaces where the protocol is actually working, implementing "ldp enable" in the interface configuration mode is required, so does enabling Label-switching, which, in combination with this command, work as a whole to ensure the normal operation of the protocol.
Example:
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ldp enable
Related Commands: router ldp, label-Switching

2.18 global-merge-capability

Command: global-merge-capability {merge-capable|non-merge-capable }
no global-merge-capability {merge-capable|non-merge-capable }
Function: Enable or disable globally the LDP label merging capability; the no operation will restore the default value.
Parameters: None.
Default: Enable the label merging capability globally.
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: The LSP map multiple in-labels to the same FEC, corresponding with the same out-label and out-interface, in which case, when packets with different labels enter the LSR, the output packets will bear the same label. This procedure is called label merging. If the label-merging capability on the interface changes, the switch will reboot.
Example:
Switch(config)#router ldp
Switch(config-router)#global-merge-capability non-merge-capable

2.19 hello-interval

Command: hello-interval <*hello-interval*>
no hello-interval
Function: Set the global time interval between hello messages; the no operation will restore the default value.
Parameters: <*hello-interval*> is the time interval between hello messages, ranging from 1 to 65535 seconds.
Default: 5s.
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: LDP discovers its neighbors and keeps the communication with them through multicast Hello. Implementing this command will set the time interval of sending hello messages. Please pay attention to the relationship between it and the hold-time. It is better to set a value no greater than 1/3 of the latter. When the interface is configured with Hello-interval, the global configuration will have no effect on it.
Example: Configure the hello-interval as 10:
Switch(config)#router ldp
Switch(config-router)#hello-interval 10
Related Commands: hold-time, ldp hello-interval, ldp hold-time

2.20 hold-time

Command: hold-time <*hold-time*>
no hold-time
Function: Configure the hold-time of LDP multicast peers, whose default value is 15 seconds; the no operation will restore the default value.
Parameters: <hold-time> is the hold-time of multicast peer, ranging from 1 to 65535 seconds
Default: 15s.
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: LDP discovers its neighbors and keeps in communication with them through multicast Hello. Implementing this command will set the time interval of sending hello messages. Please pay attention to the relationship between it and the hello-interval. It is better to set a value at least three times as long as the latter. When the interface is configured with Hold-interval, the global configuration will have no effect on it.
Example: Configure the hold-time as 50:
Switch(config)#router ldp
Switch(config-router)#hold-time 50
Related Commands: hello-interval, ldp hold-time, ldp hello-interval

2.21 import-bgp-routes

Command: import-bgp-routes
no import-bgp-routes
Function: Configure to import BGP routes; the "no" operation will restore the default configuration.
Parameters: None.
Default: LDP doesn't import BGP routes by default.
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: In common cased, LDP finds routes the route table of the system. But there are exceptions where it doesn't import default routes or BGP routes. Importing the default routes may cause disorder, so it is forbidden in any case. If the users can make sure the security, then they can import BGP routes through this command and allocate labels for them.
Example: Import BGP routes and set the import route labels.
Switch(config)#router ldp
Switch(config-router)#import-bgp-routes

2.22 keepalive-interval

Command: keepalive-interval <*interval*>
no keepalive-interval
Function: Configure the interval between LDP keep-alive messages, whose default value is 10 seconds; the no operation will restore the default value.
Parameters: <interval>is the interval between keep-alive messages, ranging from 1 to 65535 seconds.
Default: 10s.
Command Mode: LDP Protocol Configuration Mode
Usage Guide: LDP will send keepalive messages to each other for keeping the communication, if there is no data after the creation of a TCP session. Implementing this command will set the interval of sending keepalive messages. Please make sure the value is big enough to prevent too many keepalive messages. When this value is configured on the interface, the global configuration command will lose effect.
Example: Configure the global keepalive-interval as 50s.
Switch(config)#router ldp
Switch(config-router)#keepalive-interval 50
Related Commands: keepalive-timeout, ldp keepalive-interval

2.23 keepalive-timeout

Command: keepalive-timeout *<time-val>*
no keepalive-timeout
Function: Configure the timeout value of LDP sessions, whose default value is 30 seconds; the no operation will restore the default value.
Parameters: <time-val>is the timeout value of LDP sessions, ranging from 1 to 65535 seconds.
Default: 30s.
Command Mode: LDP Protocol Configuration Mode
Usage Guide: LDP will send keepalive messages to each other for keeping the communication, if there is no data after the creation of a TCP session. Without receiving a keepalive message within the timeout period set by this command, the connection will be treated as disconnected. Usually this value should be at least three times as long as the keepalive interval. When this value is configured on the interface, the global configuration command will lose effect.
Example: Configure the global timeout value.
Switch(config)#router ldp
Switch(config-router)#keepalive-timeout 50
Related Commands: keepalive-interval, ldp keepalive-timeout

2.24 label-retention-mode

Command: label-retention-mode {conservative|liberal}
no label-retention-mode {conservative|liberal}
Function: Set the label retention mode; the no operation will cancel the configuration.
Parameters: None.
Default: Liberal
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: The LDP label retention mode determines how the LDP protocol handles the label information. The protocol provides two modes: the first one is conservative, which means only allows the retention of label information useful for the switch and drops other information. The other one is liberal, which means to allow the retention of all label information. This mode works together with the label advertisement mode, with liberal working with the "downstream unsolicited" advertisement mode, and conservative with the "downstream-on-demand" mode. Please notice that the manually configured liberal mode and the default one are different. When the liberal mode is set manually, the conservative mode of the interface will be the same as the global one if there is no configuration; while in the default liberal mode, it will be adjusted according to the label advertisement mode of the interface. In common cases, it is not recommended to configure this attributes, for it is in accordance with the label advertisement mode, and will be changed automatically when the label advertisement mode changes. Configuring this attribute separately may cause unmatched attributes. If the label retention mode changes when the label retention modes of all sessions on the interface are already configured, the session will be reconnected.
Example: Set the global label retention mode as liberal.
Switch(config)#router ldp
Switch(config-router)#label-retention-mode liberal
Related Commands: advertisement-mode, ldp advertisement-mode

2.25 label-switching

Command: label-switching
no label-switching
Function: Enable the label-switching function; the no operation will disable the function.
Parameters: None.
Command Mode: Interface Configuration Mode
Default: The label-switching function is disabled.

Usage Guide: Implementing this command to enable the label-switching function. This is a necessity to ensure the normal operation of the LDP protocol.
Example: Enable the label-switching function of the interface vlan1:
Switch#config terminal
Switch(config)#interface vlan 1
Switch(Config-if-Vlan1)#label-switching
Related Commands: enable-ldp

2.26 ldp advertisement-mode

Command: ldp advertisement-mode {downstream-on-demand | downstream-unsolicited}
no ldp advertisement-mode {downstream-on-demand | downstream-unsolicited}
Function: Set the interface label advertisement mode; the no operation will cancel the configuration.
Command Mode: Interface Configuration Mode.
Usage Guide: Implementing this command will set the label advertisement mode as downstream-unsolicited or downstream-on-demand. Parameters different with the global configuration can be used when configuring the interface. By default, the value is the global default or the global configuration, unless the interface has its own settings. This mode works together with two other modes, and any change of it will affect the other two at the same time. If the parameter is downstream-unsolicited, the label retention mode will be Liberal and the LSP control mode will be Independent, if it is downstream-on-demand, the label retention mode will be Conservative and the LSP control mode will be Ordered. Parameters different with the global configuration can be used when configuring the interface with this command.
Example: Configure the label advertisement mode as downstream-unsolicited in the interface mode.
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ldp advertisement-mode downstream-unsolicited
Related Commands: label-retention-mode, ldp label-retention-mode, advertisement-mode

2.27 ldp hello-interval

Commands: ldp hello-interval *<hello-interval>*
no ldp hello-interval
Function: Set the hello-interval of the interface; the no operation will cancel the configuration.
Parameters: *<hello-interval>* is the interval between multicast Hello messages, ranging from 1 to 65535 seconds.
Default: Using the global configuration.
Command Mode: Interface Configuration Mode
Usage Guide: Implementing this command will set the interval between multicast Hello messages. Parameters different with the global configuration can be used when configuring the interface with this command.
Example: Set the hello interval of the interface as 25s.
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ldp hello-interval 25
Related Commands: ldp hold-time, hold-time

2.28 ldp hold-time

Command: ldp hold-time *<hold-time>*
no ldp hold-time
Function: Set the neighbor hold-time of the interface; the no operation will restore the default value.
Parameters: <hold-time>is the neighbor hold time, ranging from 1 to 65535 seconds.

Default: Use the global configuration.
Command Mode: Interface Configuration Mode.
Usage Guide: LDP discovers its neighbors and keeps the communication with them through multicast Hello. Implementing this command will set neighbor hold-time when configuring the multicast. Please pay attention to the relationship between it and the hello-time, that is, it is better to set a value at least three times as long as the hello-time. When the interface is configured with Hold-interval, the global configuration will have no effect on it.
Example: Set the neighbor hold-time as 220s:
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ldp hold-time 220
Related Commands: ldp hello-interval, hello-interval

2.29 ldp keepalive-interval

Command: ldp keepalive-interval <*interval-time*>
no ldp keepalive-interval
Function: Configure the interval between keep-alive messages; the no operation will restore the default value.
Parameters: <*interval-time*> is the interval between keep-alive messages, ranging from 1 to 65535 seconds.
Default: Use the global configuration.
Command Mode: Interface Configuration Mode
Usage Guide: LDP will send keepalive messages to each other for keeping the communication, if there is no data after the creation of a TCP session. Implementing this command will set the interval of sending keepalive messages. Please make sure the value is big enough to prevent too many keepalive messages. Parameters different with the global configuration can be used when configuring the interface.
Example: Configure the keepalive-interval of the interface as 33s.
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ldp keepalive-interval 33
Related Commands: ldp keepalive-timeout, keepalive-timeout

2.30 ldp keepalive-timeout

Command: ldp keepalive-timeout <*time-val*>
no ldp keepalive-timeout
Function: Configure the session timeout value of the interface; the no operation will restore the default value.
Parameters: <*time-val*> is the timeout value of sessions, ranging from 1 to 65535 seconds.
Default: 30s.
Command Mode: LDP Protocol Configuration Mode
Usage Guide: LDP will send keepalive messages to each other for keeping the communication, if there is no data after the creation of a TCP session. Without receiving a keepalive message within the timeout period set by this command, the connection will be treated as disconnected. Usually this value should be at least three times as long as the keepalive interval. Parameters different with the label configuration can be used when configuring the interface.
Example: Configure the keepalive-interval of the interface as 200s.
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ldp keepalive-timeout 200
Related Commands: ldp keepalive-interval, keepalive-interval

2.31 ldp label-retention-mode

Command: ldp label-retention-mode {conservative | liberal}
no ldp label-retention-mode {conservative | liberal}
Function: Set the label retention mode; the no operation will restore the default value.
Parameters: None.

Default: Liberal
Command Mode: Interface Configuration Mode.
Usage Guide: Set the label retention mode as conservative or liberal. When the label retention mode is changed, all the sessions on the interface will be created. If the configuration of the interface is different with the global one, the latter will be ignored. Parameters different with the global configuration can be used when configuring the interface with this command.
Example: Set the label retention mode of the interface as conservative.
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ldp label-retention-mode conservative
Related Commands: advertisement-mode, ldp advertisement-mode

2.32 ldp multicast-hellos

Command: ldp multicast-hellos
no ldp multicast-hellos
Function: Configure the interface to discover LDP neighbors with multicast Hello messages; the no operation will cancel the configuration.
Parameters: None.
Default: Use the global configuration.
Command Mode: Interface Configuration Mode
Usage Guide: LDP can discover its neighbors through multicast Hello messages or specify one via the "targeted-peer" command. Implementing this command will enable the multicast hello based neighbor discovery. Implementing the no operation will stop receiving and sending multicast Hello messages, so that the only way to discover neighbors is "targeted-peer". Parameters different with the global configuration can be used when configuring the interface with this command.
Example:
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ldp multicast-hellos
Related Commands: multicast-hellos

2.33 ldp targeted-peer-hello-interval

Command: ldp targeted-peer-hello-interval *<hello-interval>*
no ldp targeted-peer-hello-interval
Function: Set the interval of Hello to the specified target, the no operation will cancel the configuration and restore to the global one.
Parameters: *<hello-interval>* is the interval of Hello to the specified target, ranging from 1 to 65535 seconds.
Default: Use the global configuration
Command Mode: Interface Configuration Mode.
Usage Guide: LDP discovers its neighbors and keeps the communication with them by sending Hello to specified targets. Implementing this command will configure the interval of Hello to the specified target. Please pay attention to the relationship between it and the targeted-peer-hold-time. It is recommended to set a value no greater than 1/3 of the targeted-peer-hold-time. Parameters different with the global configuration can be used when configuring the interface with this command.
Example: Set the interval of Hello to the specified target as 225s.
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ldp targeted-peer-hello-interval 255
Related Commands: ldp targeted-peer-hold-time, targeted-peer-hold-time

2.34 ldp targeted-peer-hold-time

Command: ldp targeted-peer-hold-time *<hold-time>*
no ldp targeted-peer-hold-time
Function: Set the peer-hold-time of specified destination for the interface; the no operation will cancel the configuration can restore to the global one.
Parameters: *<hold-time>* is the peer-hold-time of the specified target, ranging

from 1 to 65535 seconds.
Default: Use the global configuration.
Command Mode: Interface Configuration Mode.
Usage Guide: LDP keeps the communication with neighbors by sending Hello to specified targets. Implementing this command will configure the peer-hold-time of specified destination. Please pay attention to the relationship between it and the targeted-peer-hello-time. It is recommended to set a value at least 3 times as long as the targeted-peer-hello-time. Parameters different with the global configuration can be used when configuring the interface with this command.
Example:
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ldp targeted-peer-hold-time 50
Related Commands: ldp targeted-peer-hello-interval,
targeted-peer-hello-interval

2.35 loop-detection
Command: loop-detection
no loop-detection
Function: Enable the LDP loop detection; the no operation will cancel the configuration.
Parameters: None.
Default: The loop detection is disabled by default.
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: LDP can be configured to enable the loop detection or not. If it is enabled, LDP provides two methods: the first is to check whether the HOP-COUNT exceeds the upper limit; the other is to check whether there is any repeated LSR-ID on the path vector.
Example:
Switch(config)#router ldp
Switch(config-router)#loop-detection

2.36 loop-detection-count
Command: loop-detection-count <*count*>
Function: Set the max number of hops allowed in the LDP loop detection; the no operation will restore to the default value.
Parameters: <*count*> is the allowed hop number, ranging from 1 to 255.
Default: 255.
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: LDP can be configured to enable the loop detection or not. If it is enabled, implementing this command will set the allowed hop number. The configuration will only take effect with loop-detection enabled. The no operation will restore to the default value.
Example: Set the allowed hop number in the LDP loop detection as 200:
Switch(config)#router ldp
Switch(config-router)#loop-detection-count 200
Related Commands: loop-detection

2.37 multicast-hellos
Command: multicast-hellos
no multicast-hellos
Function: Configure the interface to discover LDP neighbors with multicast Hello messages or not; the no operation will stop receiving and sending multicast hellos.
Parameters: None.
Default: Enable the receiving and sending of multicast Hellos on the LDP interface.
Command Mode: LDP Protocol Configuration Mode
Usage Guide: LDP can discover its neighbors through multicast Hello

messages or specify one via the "targeted-peer" command. Implementing this command will enable the multicast hello based neighbor discovery. Implementing the no operation will stop sending multicast Hello messages, so that the only way to discover neighbors is "targeted-peer". Configure to sending and receiving multicast hello messages globally, and enumerate all interfaces. If this attribute is already configured on the interface, the global configuration will be ignored, otherwise, the global one will take effect.
Example:
Switch(config)#router ldp
Switch(config-router)#multicast-hellos

2.38 propagate-release

Command: propagate-release
no propagate-release
Function: Configure to propagate the label release to neighbors; the no operation will do the opposite.
Parameters: None.
Default: Disabled.
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: If the label is expired, the switch won't send it to the upstream, unless this command is enabled.
Example:
Switch(config)#router ldp
Switch(config-router)#propagate-release

2.39 request-retry

Command: request-retry
no request-retry
Function: Set LDP to retry 5 times after the request for a label is rejected; the no operation will cancel the configuration.
Parameters: None.
Default Settings: Don't retry.
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: When LDP send a label request to the downstream, if the latter rejects it for some reasons, LDP will retry for 5 times with this attribute is configured, at an interval of request-retry-timeout.
Example:
Switch(config)#router ldp
Switch(config-router)#request-retry
Related Commands: request-retry-timeout

2.40 request-retry-timeout

Command: request-retry-timeout <*time-val*>
no request-retry-timeout
Function: Set the retry timeout interval after LDP's request for a label is rejected; the no operation will restore the default value.
Parameters: <*time-val*> is the timeout interval, ranging from 1 to 65535 seconds.
Default: 5s.
Command Mode: LDP Protocol Configuration Mode
Usage Guide: When LDP send a label request to the downstream, if the latter rejects it for some reasons, LDP will retry for 5 times with this attribute is configured, at an interval of request-retry-timeout.
Example: Set the retry timeout interval as 10 seconds.
Switch(config)#router ldp
Switch(config-router)#request-retry-timeout 10
Related Commands: request-retry

2.41 router ldp

Command: router ldp
no router ldp
Function: Enable the LDP protocol; the no operation will disable it.
Parameters: None.
Default: LDP is disabled.
Command Mode: Global Mode.
Usage Guide: The LDP protocol is a label advertising protocol used when switching labels in the public network, which usually works in a BGP VPN environment. Implementing this command will globally enable the LDP protocol, however, in interfaces where the protocol is actually working, implementing "enable-ldp" in the interface configuration mode is required, so does enabling Label-switching, which, in combination with this command, work as a whole to ensure the normal operation of the protocol.
Example:
Switch(config)#router ldp
Switch(config-router)#

2.42 router-id

Command: router-id *<ip-addr>*
no router-id
Function: Set the router ID used by LDP; the no operation will cancel the configuration.
Parameters: *<ip-addr>* is the router ID, in dotted decimal format.
Default: The ID will be automatically obtained.
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: The router ID exclusively identifies a LDP device in the network. Router-id is the value of router-id in Hello messages.
Example:
Switch(config)#router ldp
Switch(config-router)#router-id 10.10.10.10

2.43 show ldp

Command: show ldp
Function: Display some basic LDP attributes of this LSR.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Implementing this command will display the current configuration information of LDP.
Example:
Switch#show ldp
Router ID : 10.10.0.11
LDP Version : 1
Global Merge Capability : N/A
Label Advertisement Mode : Downstream Unsolicited
Label Retention Mode : Liberal
Label Control Mode : Independent
Loop Detection : Off
Loop Detection Count : 0
Request Retry : Off
Propagate Release : Disabled
Hello Interval : 5
Targeted Hello Interval : 15
Hold time : 15
Targeted Hold time : 45
Keepalive Interval : 10
Keepalive Timeout : 30
Request retry Timeout : 5

Multicast Hello : Enabled
Targeted Hello Accept : Disabled
Transport Interface : N/A
Import BGP routes : No

Display	Explanation
Router ID : 10.10.0.11	Router id is 10.10.0.11
LDP Version : 1	The LDP version is 1
Global Merge Capability : N/A	The global label merging capability is disabled
Label Advertisement Mode : Downstream Unsolicited	The label advertisement mode is downstream unsolicited
Label Retention Mode : Liberal	The label retention mode is Liberal
Label Control Mode : Independent	The label control mode is Independent
Loop Detection : Off	The loop detection is disabled
Loop Detection Count : 0	The loop detection count is 0
Request Retry : Off	The switch won't retry after a rejected label request.
Propagate Release : Disabled	The switch won't propagate the label release messages
Hello Interval : 5	The interval between Hello messages is 5s
Targeted Hello Interval : 15	The interval between Hello messages to a specified target is 15s
Hold time : 15	The hold time of adjacency is 15s
Targeted Hold time : 45	The hold time of adjacency with specified targets is 45s
Keepalive Interval : 10	The intervals between keepalive messages sent by the interface is 10s
Keepalive Timeout : 30	The keepalive timeout period is 30s
Request retry Timeout : 5	The retry timeout after the label request being rejected is 5s.
Multicast Hello : Enabled	Discover neighbors via multicast Hello messages
Targeted Hello Accept : Disabled	The switch won't accept Hello from specified targets.
Transport Interface : N/A	No transport interface
Import BGP routes : No	The switch won't import BGP routes

2.44 show ldp adjacency

Command: show ldp adjacency
Function: Display all adjacency information of this LSR.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Implementing this command will display LDP adjacency information, for diagnosing and troubleshooting.
Example:
Switch#show ldp adjacency
IP Address   Interface Name   Holdtime   LDP ID
192.168.3.5   vlan1   15   10.10.0.18:0
192.168.4.5   vlan2   15   10.10.0.18:0

Display	Explanation
IP Address	The IP address of the neighbor
Interface Name	The interface name of the connection with the neighbor

Holdtime	The holdtime of the adjacency
LDP ID	（LSR-ID : Label Space）The LDP ID

2.45 show ldp downstream

Command: show ldp downstream
Function: Display all downstream information of this LSR.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode
Usage Guide: Implementing this command will display the information of downstreams maintained by the current protocol.
Example:
Switch#show ldp downstream
Session peer 192.168.11.50:
Downstream state: Established Label: impl-null RequestID: 0 Peer: 192.168.11.50 Attr:
Downstream state: Established Label: impl-null RequestID: 0 Peer: 192.168.11.50 Attr:
Downstream state: Established Label: impl-null RequestID: 0 Peer: 192.168.11.50 Attr:
Downstream state: Established Label: 20 RequestID: 0 Peer: 192.168.11.50 Attr:

2.46 show ldp fec

Command: show ldp fec
Function: Display information about all FECs (Forwarding Equivalence Class) of this LSR.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Display information about all FECs (Forwarding Equivalence Class) of this LSR.
Example:
Switch#show ldp fec
LSR codes   : E/N - LSR is egress/non-egress for this FEC,
              L - LSR received a label for this FEC,
              > - LSR will use this route for the FEC

Code	FEC	Session	Out Label	Nexthop Addr
E >	3.3.3.1/32	Non-Existent	None	Connected
E >	4.4.4.1/32	Non-Existent	None	80.80.90.2
E >	80.80.90.0/24	Non-Existent	None	Connected
E >	80.90.70.0/24	Non-Existent	None	80.80.90.2
E >	80.90.70.10/32	Non-Existent	None	Connected
E >	80.90.70.78/32	Non-Existent	None	Connected

2.47 show ldp interface

Command: show ldp interface [vlan *1-4094* | IFNAME]
Function: Display LDP information about all or specified interfaces of this LSR.
Parameters: *1-4094* VLAN ID;
              IFNAME: the interface name.
Default: None.

Command Mode: Admin and Config mode.
Usage Guide: Display the LDP information of the interface; user-provided parameters can specify some particular interfaces; no parameter means to display information of all interfaces.
Examples:
Switch#show ldp interface
Interface LDP Identifier Label-switching Merge Capability
vlan0   10.10.0.11:0   Disabled   N/A
vlan1   10.10.0.11:0   Enabled   Merge capable
vlan2   10.10.0.11:0   Enabled   Merge capable

2.48 show ldp lsp

Command: show ldp lsp
Function: Display the label switching path of this LSR.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Display the label switching path of the switch.
Example:
Switch#show ldp lsp
FEC IPV4:10.1.1.0/24 -> 0.0.0.0
   Downstream state: Established Label: none RequestID: 0 Peer: EGRESS
Attr: None
       Upstream state: Established Label: impl-null RequestID: 0 Peer: 15.1.1.70
Attr: None
       Upstream state: Established Label: impl-null RequestID: 0 Peer: 20.1.1.1
Attr: None
   Downstream state: Established Label: impl-null RequestID: 0 Peer: 15.1.1.70
Attr: None
FEC IPV4:11.1.1.0/24 -> 0.0.0.0
   Downstream state: Established Label: impl-null RequestID: 0 Peer: 15.1.1.70
Attr: None
   Downstream state: Established Label: none RequestID: 0 Peer: EGRESS
Attr: None
       Upstream state: Established Label: impl-null RequestID: 0 Peer: 15.1.1.70
Attr: None
   Downstream state: Established Label: impl-null RequestID: 0 Peer: 20.1.1.1
Attr: Hop Count: 1

2.49 show ldp session

Command: show ldp session [*<ip-addr>*]
Function: Display information about specified or all LDP sessions of this LSR.
Parameters: *<ip-addr>*: the IP address of the neighbor to display, in dotted decimal format.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Display information about current LDP sessions of this switch.
Example:
Switch#show ldp session
Peer IP Address IF Name   My Role   State   KeepAlive
192.168.11.50   vlan1   Passive   OPERATIONAL 30
192.168.13.60   vlan2   Passive   OPERATIONAL 30

2.50 show ldp statistics

Command: show ldp statistics
Function: Display the LDP statistics of this LSR.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.

Usage Guide: Display the current LDP statistics of this switch.
Example:
Switch#show ldp statistics

PacketType	Sent	Received
Notification	18	22
Hello	102589	103935
Initialization	37	37
Keepalive	45216	45224
Address	44	40
Address Withdraw	3	1
Label Mapping	97	152
Label Request	0	0
Label Withdraw	3	38
Label Release	42	3
Request About	0	0

Display		Explanation
PacketType		The packet types will be listed as below:
Total	Sent	The total number of this type of packets that have been sent.
	Received	The total number of this type of packets that have been received.

2.51 show ldp targeted-peers

Command: show ldp targeted-peers
Function: Display the information of LDP targeted peers in the configuration of this LSR.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Display the currently configured LDP neighbor information.
Example:
Switch#show ldp targeted-peers
IP Address   Interface
10.1.1.66   Vlan2

2.52 show ldp upstream

Command: show ldp upstream
Function: Display information of all upstreams of this LSR.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Display information of all LDP upstreams maintained by the switch.
Example:
Switch#show ldp upstream
Session peer 192.168.11.50:
Upstream state: Established Label: impl-null RequestID: 0 Peer: 192.168.11.50
Attr:
Upstream state: Established Label: impl-null RequestID: 0 Peer: 192.168.11.50
Attr:

2.53 show mpls ldp discovery

Command: show mpls ldp discovery interface [vlan <1-4094> | IFNAME]
Function: Display all interfaces and label-switching information of this LSR.
Parameters: <1-4094>: VLAN ID.
              IFNAME: The interface name
Default: None.
Command Mode: Admin and Config mode.

Usage Guide: Display all or specified interfaces and label-switching
information.
Example:
Switch#show mpls ldp discovery
Interface	LDP Identifier	Label-switching	Merge Capability
Vlan1	10.10.0.11:0	Enabled	Merge capable
Vlan2	10.10.0.11:0	Enabled	Merge capable
Loopback1	0.0.0.0:0	Disabled	N/A

2.54 show mpls ldp fec

Command: show mpls ldp fec
Function: Display information about all FECs of this LSR.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Display information about currently maintained FECs.
Example:
Switch#show mpls ldp fec
LSR codes   : E/N - LSR is egress/non-egress for this FEC,
                L - LSR received a label for this FEC,
                > - LSR will use this route for the FEC

Code	FEC	Session	Out Label	Nexthop Addr
E >	10.1.1.0/24	non-existent	none	15.1.1.68
NL	10.1.1.0/24	10.1.1.66	impl-null	15.1.1.68
E >	11.1.1.0/24	non-existent	none	15.1.1.68
E >	15.1.1.0/24	non-existent	none	connected
NL>	15.1.1.0/24	10.1.1.66	impl-null	connected
E >	20.1.1.0/24	non-existent	none	15.1.1.68
NL	30.1.1.0/24	10.1.1.66	impl-null	invalid
E >	100.1.1.0/24	non-existent	none	connected
NL	100.1.1.0/24	10.1.1.66	impl-null	connected

2.55 show mpls ldp neighbor

Command: show mpls ldp neighbor
Function: Display information about all neighbors of this LSR.
Parameters: None.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Display information of LDP neighbors, which is useful for
troubleshooting.
Example:
Switch#show mpls ldp neighbor
IP Address	Interface Name	Holdtime	LDP ID
192.168.3.5	vlan1	15	10.10.0.18:0
192.168.4.5	vlan2	15	10.10.0.18:0

2.56 show mpls ldp parameter

Command: show mpls ldp parameter
Function: Display basic LDP attributes of this LSR.
Parameters: None.

Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Display information of current LDP configurations.
Example:
Switch#show mpls ldp parameter
Router ID : 10.10.0.11
LDP Version : 1
Global Merge Capability : N/A
Label Advertisement Mode : Downstream Unsolicited
Label Retention Mode : Liberal
Label Control Mode : Independent
Loop Detection : Off
Loop Detection Count : 0
Request Retry : Off
Propagate Release : Disabled
Hello Interval : 5
Targeted Hello Interval : 15
Hold time : 15
Targeted Hold time : 45
Keepalive Interval : 10
Keepalive Timeout : 30
Request retry Timeout : 5
Targeted Hello Receipt : Disabled
Transport Address : N/A
Transport Interface : N/A
Import BGP routes : No

Display	Explanation
Router ID : 10.10.0.11	Router id 为 10.10.0.11 Router ID is 10.10.0.11
LDP Version : 1	The LDP version is 1
Global Merge Capability : N/A	The global label merging capability is disabled
Label Advertisement Mode : Downstream Unsolicited	The label advertisement mode is Downstream Unsolicited
Label Retention Mode : Liberal	The label retention mode is Liberal
Label Control Mode : Independent	The label control mode is Independent
Loop Detection : Off	The loop detection is disabled
Loop Detection Count : 0	The loop detection count is 0.
Request Retry : Off	Don't retry when the request is rejected
Propagate Release : Disabled	Don't propagate the label release message
Hello Interval : 5	The interval between Hello messages is 5s
Targeted Hello Interval : 15	The interval between Hello messages to the specified target is 15s
Hold time : 15	The adjacency hold time is 15s
Targeted Hold time : 45	The hold time of adjacency with the specified target is 45s
Keepalive Interval : 10	The interval between keepalive messages is 10s
Keepalive Timeout : 30	The keepalive timeout of is 30s
Request retry Timeout : 5	The retry timeout after the request is rejected is 5s.
Targeted Hello Receipt : Disabled	Forbidden the receipt of Hello messages from the specified target.
Transport Address : N/A	No configuration of the Transport address

Transport Interface : N/A	No configuration of the Transport Interface
Import BGP routes : No	Don't import BGP routes.

2.57 show mpls ldp session

Command: show mpls ldp session [<*ip-addr*>]
Function: Display all or specified LDP sessions of this LSR.
Parameters: <ip-addr> is the IP address of the neighbors to be displayed, in dotted decimal format.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Display information about current LDP sessions of this switch.
Example:
Switch#show mpls ldp session
Peer IP Address IF Name   My Role   State   KeepAlive
192.168.11.50   vlan1   Passive   OPERATIONAL 30
192.168.13.60   vlan2   Passive   OPERATIONAL 30

2.58 targeted-hello-accept

Command: targeted-hello-accept [filter <*1-99*>]
no targeted-hello-accept
Function: Configure the LDP to receive Hello messages from the specified target, applied in the extended mode.
Parameters: <*1-99*>: the access list ID that will be used.
Default: Don't accept target-Hello messages.
Command Mode: LDP Protocol Configuration Mode
Usage Guide: By implementing this command, users can specify targets, from which the LDP will accept Hello messages, via access list commands.
Example:
Switch(config)#router ldp
Switch(config-router)#targeted-hello-accept filter 1

2.59 targeted-peer

Command: targeted-peer <*ip-addr*>
no targeted-peer <*ip-addr*>
Function: Configure the LDP neighbor of the specified target; the no operation will delete the configuration.
Parameters: <ip-adddr> is the IP address of the neighbor, in dotted decimal format.
Default: No targeted-peer.
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: LDP can discover a neighbor via multicast Hello messages or manual configurations. This command enables the latter method by adding a targeted-peer and establishing the adjacency with it. The no operation will delete the configuration. Configuring a targeted-peer neighbor means to establish an extended session.
Example: Configure the LDP neighbor of the specified target is 10.10.10.10
Switch(config)#router ldp
Switch(config-router)#targeted-peer 10.10.10.10

2.60 targeted-peer-hello-interval

Command: targeted-peer-hello-interval <*hello-interva*>
no targeted-peer-hello-interval
Function: Configure the global interval between Hello messages to the specified target; the no operation will restore the default value.
Parameters: <*hello-interval*> is the interval between Hello messages to the specified target, ranging from 1 to 65535 seconds.
Default: 15s.
Command Mode: LDP Protocol Configuration Mode
Usage Guide: LDP discovers a neighbor and stays in communication with it

via sending Hello messages to the specified target. Implementing this command will configure the interval between those Hello messages. Please pay attention to the relationship between it and the targeted-peer-hold-time. It is recommended to configure a value no greater than 1/3 of the latter. When a specified interface has its own configuration, this command will lose effect on it.
Example: Configure the Hello interval as 50s.
Switch(config)#router ldp
Switch(config-router)#targeted-peer-hello-interval 50
Related Commands: targeted-peer-hold-time, ldp targeted-peer-hold-time, ldp targeted-peer-hello-Interval

2.61 targeted-peer-hold-time

Command: targeted-peer-hold-time <*hold-time*>
no targeted-peer-hold-time
Function: Configure the global hold-time of the specified target; the no operation will restore the default value.
Parameters: <*hold-time*> is the hold-time of the specified target, ranging from 1 to 65535 seconds.
Default: 45s.
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: LDP discovers a neighbor and stays in communication with it via sending Hello messages to the specified target. Implementing this command will configure the hold-time of neighbors discovered by the specified target. Please pay attention to the relationship between it and the targeted-peer-hello-interval. It is recommended to configure a value at least three times as long as the latter. When a specified interface has its own configuration, this command will lose effect on it.
Example: Configure the neighbor hold-time as 50s.
Switch(config)#router ldp
Switch(config-router)#targeted-peer-hold-time 50
Related Commands: targeted-peer-hello-interval, ldp targeted-peer-hold-time, ldp targeted-peer-hello-interval

2.62 transport-address

Command: transport-address <*ip-addr*>
no transport-address
Function: Configure the IP address used by LDP to establish TCP connections; the no operation will cancel the configuration.
Parameters: <*ip-addr*> is the IP address, in dotted decimal format. This address should be one of a loopback interface.
Default: The address is automatically obtained.
Command Mode: LDP Protocol Configuration Mode.
Usage Guide: After the discovery of a neighbor via multicast or targeted Hello messages, LDP doesn't use the interface address sending the messages as the source address when establishing TCP connections, instead it uses the transport-address in the Hello messages to guarantee the uniqueness of the connection. Usually, LDP chooses an interface address as transport-address. Implementing this command will configure this address. The no operation will cancel the configuration, and regain an interface address as transport-address automatically.
Example: Configure 10.10.10.10 as the source address of TCP connections.
Switch(config)#router ldp
Switch(config-router)#transport-address 10.10.10.10

Chapter 3 MPLS VPN

3.1 address-family ipv4

Command: address-family ipv4 [unicast | vrf <vrf-name>| multicast]
no address-family ipv4 vrf <vrf-name>
Function: Configure the BGP VPN address family; the no operation will cancel
the configuration. Before entering the BGP-VPN view, this VRF should be
created and configured with rd.
Parameters: unicast: unicast address family factor
             <vrf-name> : the VPN route/forwarding instance name
Default: No BGP VPN address family.
Command Mode: BGP Route Configuration Mode.
Example:
Switch(config)#router bgp 100
Switch(config-router)#address-family ipv4 vrf VRF-A
Switch(config-router-af)#

3.2 address-family vpnv4

Command: address-family vpnv4 [unicast]
Function: Configure the BGP VPNv4 address family in non-default mode.
Parameters: unicast: the unicast address family factor.
Default: No BGP VPNv4 address family.
Command Mode: BGP Route Configuration Mode.
Example:
Switch(config)#router bgp 100
Switch(config-router)#address-family vpnv4 unicast
Switch(config-router-af)#

3.3 aggregate-address

Command: aggregate-address <ip-address/M> [summary-only] [as-set]
no aggregate-address <ip-address/M> [summary-only] [as-set]
Function: By aggregating addresses, users can decrease the route message
propagation; the no operation will cancel the configuration.
Parameters: <ip-address/M>: IP address, MASK length
             [summary-only]: Only send the summary and ignore the route.
             [as-set]: Display each AS of the path once in the list form.
Default: No aggregate configuration.
Command Mode: BGP Route Configuration Mode, VRF Address Family
Configuration Mode.
Usage Guide: By aggregating addresses, users can decrease the route
message propagation. The summary-only option means only to send the
summary and ignore the route, and the as-set option will display the AS of
every route covered by the aggregate for once without repetition.
Example:
Switch(config-router)#aggregate-address 100.1.0.0/16 summary-only
Switch(config-router)#aggregate-address 100.2.0.0/16 summary-only as-set
Switch(config-router)#aggregate-address 100.3.0.0/16 as-set
Related Commands: bgp aggregate-nexthop-check, no bgp
aggregate-nexthop-check

3.4 clear ip bgp

Command: clear ip bgp * [vrf <vrf-name>] [in | out | soft [in | out]]
Function: Reboot the corresponding bgp process of vrf-name, and the
connections between all peers of the process.
Parameters: <vrf-name>: the configured VPN instance name, whose length
ranges from 1 to 64 characters.
             in: soft reboot and configure the inbound update;
             out: soft reboot and configure the outbound update;

soft: soft reboot
Default: No configuration.
Command Mode: Admin Mode
Usage Guide: Implementing the "clear ip bgp *" command will restart the BGP process; configuring the "in" parameter will send route request message to neighbors; configuring the "out" parameter will send its route to neighbors; configuring the "soft" parameter won't restart the BGP process.
Example:
Switch#clear ip bgp * vrf VRF-A
Switch#

3.5 debug bgp mpls

Command: debug bgp mpls
no debug bgp mpls
Function: Display the information about processing VRF FTN, the global FTN, and global ILM entries while the bgp vpn is running; the no operation will disable the display.
Parameters: None.
Default: No display of debug information.
Command Mode: Admin Mode.
Usage Guide: Enable the debug information to check the information about processing VRF FTN, the global FTN, and global ILM entries while the bgp vpn is running.
Example:
Switch#debug bgp mpls
Switch#

3.6 debug bgp update

Command: debug bgp update
no debug bgp update
Function: Display the route update information received by bgp vpn while it is running; the no command will disable the information.
Parameters: None.
Default: No display of debug information.
Command Mode: Admin Mode.
Example:
Switch#debug bgp update
Switch#

3.7 description

Command: description <*text*>
no description
Function: Configure the description of VRF to record information like the relationship between the VNP instance and a VPN; the no operation will disable the description.
Parameters: <*text*>: the descriptive text, whose length ranges from 1 to 256 characters.
Default: No configuration.
Command Mode: VRF Configuration Mode.
Usage Guide: Following "description" is user's description of VRF, which will be displayed below the corresponding VRF to provide instructions.
Example: Configure the VRF description as "associate with VRF-B VRF-C**".**
Switch(config)#ip vrf VRF-A
Switch(config-vrf)#description associate with VRF-B VRF-C

3.8 import map

Command: import map <*route-map-name*>
no import map
Function: Apply import-route-map policy to the specified VPN instance.

Parameters: <*route-map-name*>: the route-map policy name.
Default: No configuration.
Command Mode: VRF Configuration Mode.
Usage Guide: When a more accurate method of importing VPN instance routes than the extended-community attribute is required, the import-route policy is an option. By default, the imported routes will be filtered according to their VPN-target extended-community attribute. The import-route policy may decline the routes chosen from the communities in the import list.
Example: Apply the map-a route-map to the VRF instance VRF-A.
Switch(config)#ip vrf VRF-A
Switch(config-vrf)#import map map-a
Switch(config-vrf)#

3.9 ip route

This command is not supported by switch.

3.10 ip route vrf

Command: ip route vrf <*vrf-name*>{<*ip-prefix*>
<*mask*>|<*ip-prefix/prefix-length*>}
{<*gateway-address*>|null0} [<*1-255*>]
no ip route vrf <*vrf-name*>{<*ip-prefix*> <*mask*>|<*ip-prefix/prefix-length*>}
{<*gateway-address*>|null0} [<*1-255*>]
Function: Specify static routes for the specified VRF. Before doing this, a successful VPN forwarding instance is required. The no operation will delete the configured static routes.
Parameters: <*vrf-name*>: The specified VRF name
<*ip-prefix*>: the destination IP address
<*mask*>: mask, in dotted decimal format
<*prefix-length*>: the length of the prefix
<*gateway-address*>: the next-hop address
null0: the black hole route;
<*1-255*>: Administrative distance.
Example:
Switch(config)#ip route vrf VRF-A 10.1.1.10 255.255.255.0 10.1.1.1
Switch(config)#

3.11 ip vrf

Command: ip vrf <*vrf-name*>
no ip vrf <*vrf-name*>
Function: Configure a VPN instance with the specified name; the no operation will cancel the instance.
Parameters: <*vrf-name*> the configured VPN instance name, whose length is 1 to 64.
Default: No configuration.
Command Mode: Global Mode.
Usage Guide: Configure a VPN instance with the specified name. There is no default VPN instance on PE, which allows multiple VPN instances. The VPN instance name is case sensitive. Please notice that only after configuring RD will the VPN instance take effect.
Example:
Switch(config)#ip vrf VRF-A
Switch(config-vrf)#

3.12 ip vrf forwarding vrfName

Command: ip vrf forwarding <vrfName>
no ip vrf forwarding <*vrfName*>
Function: Bind interfaces to the specified VRF.
Parameters: <vrfName> is the VRF name, a string shorter than 32 characters.
Command Mode: Interface Configuration Mode.

Usage Guide: Implementing the command if the interface needs to access the Internet. Each interface can only be bound to one VRF, while the latter can be bounded with multiple interfaces. The IGP supporting VPN will record the binding relationship between interfaces and VRF by adding a route received from the bound interface to the route table of the bound VRF. By default, the interface is bound to no VRF, and is a public network interface.
Example:
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ip vrf forwarding vpn1

3.13 mpls proxy loopback-group

Command: mpls proxy loopback-group <1-max_agg_num>
no mpls proxy loopback-group
Function: Make the boardcard to implement MPLS function through MPLS proxy.
Parameter: <1-max_agg_num> is loopback group ID, ranging from 1 to 128.
Default: Do not enable MPLS proxy.
Command Mode: Interface Mode
Usage Guide: When the port of VLAN on the boardcard which does not support MPLS, the interface bind VRF or configure the label exchange, to implement MPLS function, it must configure a loopback group, at least one port (Note: the added port must be not used by vlan1) of the boardcard which support MPLS is added to loopback group, configure MPLS proxy on the interface.
Example 1: Configure mpls proxy on the interface which bind VRF.
Switch(config)#loopback-group 10
Switch(config)#interface e 1/0/1
Switch(config-if-ethernet1/0/1)#loopback 10
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ip vrf forwarding vpn1
Switch(Config-if-Vlan9)#mpls proxy loopback-group 10
Example 2: Configure mpls proxy on the interface which enable the label exchange.
Switch(config)#loopback-group 10
Switch(config)#interface e 1/0/1
Switch(config-if-ethernet1/0/1)#loopback 10
Switch(config)#int vlan 9
Switch(Config-if-Vlan9)#ldp enable
Switch(Config-if-Vlan9)#label-switching
Switch(Config-if-Vlan9)#mpls proxy loopback-group 10

3.14 neighbor remote-as

Command: neighbor <ip-address> remote-as <as-num>
no neighbor <ip-address> remote-as <as-num>
Function: Add a new BGP neighbor; the no operation will delete it.
Parameters: <ip-address>: specify the BGP neighbor address. BGP neighbor address should be Loopback port IP for neighbor switch.
       <as-num>: specify the AS number of the BGP neighbor.
Default: No BGP neighbor.
Command Mode: VRF Address Family Configuration Mode.
Usage Guide: Implementing this command will add a new neighbor for the switch.
Example:
Switch(config)#router bgp 100
Switch(config-router)#address-family ipv4 vrf VRF-A
Switch(config-router-af)#neighbor 3.0.0.1 remote-as 65001
Switch(config-router-af)#

3.15 neighbor as-override

Command: neighbor {*<ip-address>* | *<TAG>*} as-override
no neighbor {*<ip-address>* | *<TAG>*} as-override
Function: Override the AS path (the previous AS number). Before
implementing this command, users should create a neighbor first. The no
operation will delete the configuration.
Parameters: *<ip-address>*: specify the BGP neighbor address;
            ***<TAG>*:** Specify the BGP neighbor group number.
Default: Not configured.
Command Mode: VRF Address Family Configuration Mode.
Usage Guide: After this command being implemented, the route from the
neighbor will override the existing AS number.
Example:
Switch(config)#router bgp 100
Switch(config-router)#address-family ipv4 vrf VRF-A
Switch(config-router-af)#neighbor 3.0.0.1 remote-as 65001
Switch(config-router-af)#neighbor 3.0.0.1 as-override
Switch(config-router-af)#

3.16 neighbor soo

Command: neighbor *<ip-addr>* soo *<soo-val>*
no neighbor *<ip-addr>* soo *<soo-val>*
Function: Configure the site-of-origin from the neighbor route; the no operation
will delete the configuration.
Parameters: *<ip-addr>* the neighbor's ip address, in dotted-decimal format.
          <soo-val> is the site-of-origin, in the same form as RD.
Default: Not configured.
Command Mode: VRF Address Family Configuration Mode.
Usage Guide: If the customer AS is connected with multiple ISP devices,
configuring this attribute can prevent the customer route from returning to the
customer after passing the P area. This configuration will propagate once set.
The route with the SOO attribute won't propagate to the neighbor already
configured with this attribute.
Example:
Switch(config)#router bgp 100
Switch(config-router)#address-family ipv4 vrf test
Switch(config-router-af)#neighbor 11.1.1.64 remote 200
Switch(config-router-af)#neighbor 11.1.1.64 soo 100:10
After configuring this attribute, the switch won't propagate the remote route with
the 100:10 rt attribute to 11.1.1.64. (To be clear, the soo attribute will be
checked together with other rt attributes, that is to say, the neighbor will be
treated as the original neighbor no matter it is or not, once the rt is configured
with the same attributes. In fact, soo is usually configured separately with a
value different with rt/rd, and is unique in the reachable area to describe the
origin accurately).

3.17 rd

Command: rd *<ASN:nn_or_IP-address:nn>*
Function: Configure the RD (Route Distinguish) of VRF.
Parameters: ASN:nn_or_IP-address:nn：The IP address format of the switch
ID. ASN is AS ID, ranging from 1 to 4294967295, it can be shown in decimal
notation (such as 6553700) or delimiter method (such as 100.100); IP-address
is IP address that the length is 4 bytes; nn is arbitrary number that the length is
2 bytes.
Default: Not configured.
Command Mode: VRF Configuration Mode.
Usage Guide: RD can uniquely identify the VPN route. VPN instances realize
address space independence via RD, and thus realize the address overlap
between different VPNs. Usually the configuration includes the AS number and

an arbitrary number. RD can't be deleted directly.
Example:
Switch(config)#ip vrf VRF-A
Switch(config-vrf)#rd 300:3
Switch(config-vrf)#

3.18 route-target

Command: route-target {import | export | both} <*rt-value*>
no route-target {import | export | both} <*rt-value*>
Function: Configure the Route-Target of the specified VRF 的 Route-Target;
The no operation will delete the configuration.
Parameters: import: Means to filter the import route, which means to judge
whether the VPN route can be added into the VRF;
export: Means to use the route of this VRF as the Route-Target that will be
added to when the VPNv4 route sends out messages, in order to filter the
interface import;
both: Means the import and the export use the same Route-Target;
<*rt-value*>: Is the the route target value, the format is
ASN:nn_or_IP-address:nn. ASN is AS ID, ranging from 1 to 4294967295, it can
be shown in decimal notation (such as 6553700) or delimiter method (such as
100.100); IP-address is IP address that the length is 4 bytes; nn is arbitrary
number that the length is 2 bytes.
Default: Not configured.
Command Mode: VRF Configuration Mode.
Usage Guide: A RT is a BGP extended community, for filtering the VPN routes
and controlling the VNP membership of directly connected site and route
policies. For the configured import rule, enumerate all routes received by the
bgp process and add routes matching the condition (the export route-target
overlaps with the import route-target of this VRF) to the bgp process of this
VRF and advertise the route update messages to the bgp private network
neighbors of this VRF. For the configured export rule, enumerate all bgp routes
stored in the bgp process related with this VRF, add an export-target to these
routes and advertise the route update messages to the bgp public network
neighbors. If there is an import route-target of some other VRF matches the
export route- target, copy the routes to the matching VRF and advertise the
route update messages to the bgp private network neighbors of it.
Example:
Switch(config)#ip vrf VRF-A
Switch(config-vrf)#route-target both 100:1
Switch(config-vrf)#

3.19 show ip bgp vpnv4

Command: show ip bgp vpnv4 {all|rd <*rd-val*>|vrf <*vrf-name*>}
Function: Implementing this command will display all VRF of this switch or
route information of the specified VRF.
Parameters: all: all VPNv4 peers.
          rd-val: the route distinguisher, usually in a format of numbers (AS
number of IP address), such as 100:10.
          <*vrf-name*> the configured VPN instance name, whose length is 1
to 64.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Display information of a specified RD or VRF.
Example:
Switch#show ip bgp vpn4 all
Network Next Hop Metric LocPrf Weight Path
Route Distinguisher: 100:10 (Default for VRF test)
*> 11.1.1.0/24 11.1.1.64 0 0 200 ?

*> 20.1.1.0/24 11.1.1.64 0 0 200 ?

3.20 show ip route vrf

Command: show ip route vrf <*vrf-name*> [bgp|datebase]
Function: Display information of the specified route protocol.
Parameters: <*vrf-name*>: the VRF name created with the "if vrf<vrf-name>"
command.

        bgp: the route imported via bgp;
          database: the IP route table database.
Default: None.
Command Mode: Admin and Config mode.
Usage Guide: Display information of the specified route protocol.
Example:
Switch#show ip route vrf vrf-a bgp
Network Next Hop Metric LocPrf Weight Path
Route Distinguisher: 100:10 (Default for VRF test)
*> 11.1.1.0/24 11.1.1.64 0 0 200 ?
*> 20.1.1.0/24 11.1.1.64 0 0 200 ?

3.21 show ip vrf

Command: show ip vrf [<*vrf-name*>]
Function: Implementing this command will display the RIP instance
information related with this VPN route/forwarding instance.
Parameters: <*vrf-name*> specifies the name of the VPN route/forwarding
instance.
Default: No display by default.
Command Mode: Admin and Config mode.
Usage Guide: This command also exists in other route protocols.
Implementing this command will also display the information of other related
route protocol processes.
Example: Display the information of the RIP instances related with the IPI vrf
route/forwarding instance.
Switch#show ip vrf IPI
VRF IPI, FIB ID 1
Router ID: 11.1.1.1 (automatic)
Interfaces:
Vlan1
!
VRF IPI; (id=1); RIP enabled Interfaces:
Ethernet1/8

Name	Interfaces	
IPI	Vlan1	

Name	Default RD	Interfaces
IPI		Vlan1