

Chapter 6

Monitoring Layer 2 Services over MPLS

This chapter describes the commands you can use to monitor and troubleshoot layer 2 services over MPLS on E-series routers.

This chapter contains the following sections:

- Setting Baselines for Layer 2 Services over MPLS Statistics on page 520
- Monitoring ATM Martini Cell Packing Timers for Layer 2 Services over MPLS on page 520
- Monitoring ATM Subinterfaces for Layer 2 Services over MPLS on page 521
- Monitoring ATM Cross-connects for Layer 2 Services over MPLS on page 522
- Monitoring MPLS Forwarding for Layer 2 Services over MPLS on page 523
- Monitoring MPLS Layer 2 Interfaces for Layer 2 Services over MPLS on page 524

To monitor layer 2 services over MPLS, use the **show** commands described in this chapter.



NOTE: The E120 router and E320 router output for **monitor** and **show** commands is identical to output from other E-series routers, except that the E120 and E320 router output also includes information about the adapter identifier in the interface specifier (*slot/adapter/port*).

Setting Baselines for Layer 2 Services over MPLS Statistics

You can use the **baseline mpls interface** command to set statistics baselines for all MPLS major interface statistics on the specified interface. The router implements the baseline by reading and storing the statistics at the time the baseline is set and then subtracting this baseline when you retrieve baseline-relative statistics.

Use the **delta** keyword with the **show mpls** commands to display baselined statistics. The following statistics are maintained for each MPLS shim interface:

- receive packets and octets
- transmit packets and octets
- receive discarded packets
- transmit discarded packets
- receive error packets
- transmit error packets

Purpose Set baselines for statistics related to layer 2 services over MPLS.

Action To set a statistics baseline for layer 2 services over MPLS:

```
host1#baseline mpls interface
```

Related Topics

- [baseline mpls interface command](#)

Monitoring ATM Martini Cell Packing Timers for Layer 2 Services over MPLS

Purpose Display the current systemwide values configured on the router for the three ATM Martini cell packing timers.

The ATM Martini cell packing timers define the time threshold that the router uses to collect and concatenate ATM cells in a single VCC cell relay-encapsulated packet.

Action To display ATM Martini cell packing timers:

```
host1(config)#show atm mcpt-timers
ATM Martini cell aggregation timers:
Timer1: 1500microseconds
Timer2: 2500microseconds
Timer3: 3500microseconds
```

Meaning Table 39 lists the **show atm mcpt-timers** command output fields

Table 39: show atm mcpt-timers Output Fields

Field Name	Field Description
Timer1	Value in microseconds for the first ATM Martini cell packing timer
Timer2	Value in microseconds for the second ATM Martini cell packing timer
Timer3	Value in microseconds for the third ATM Martini cell packing timer

Related Topics

- [show atm mcpt-timers command](#)

Monitoring ATM Subinterfaces for Layer 2 Services over MPLS

Purpose Display the current state of all specified ATM subinterfaces.

Action To display the current state of all ATM subinterfaces:

```
host1#show atm subinterface
Interface  ATM-Prot VCD VPI VCI Type Encap MTU Status Address
-----
ATM 2/0.100 ATM/MPLS 100 0 100 PVC AAL0 9180 up --
ATM 2/0.101 ATM/MPLS 101 0 101 PVC AAL5 9180 up --
ATM 2/0.200 RFC-1483 200 0 200 PVC SNAP 9180 up --
ATM 2/0.201 RFC-1483 201 0 201 PVC SNAP 9180 up --
4 interface(s) found
```

To display the current state of a specific ATM subinterface:

```
host1#show atm subinterface atm 2/0.100
                                Circuit
Interface  ATM-Prot VCD VPI VCI Type Encap MTU Status Interface
-----
ATM 2/0.100 ATM/MPLS 100 0 100 PVC AAL0 9180 LowerLayerDown Static

Maximum number of cells per packet: 100
Cell aggregation timeout timer: 2

SNMP trap link-status: disabled

InPackets: 0
InBytes: 0
OutPackets: 0
OutBytes: 0
InErrors: 0
OutErrors: 0
InPacketDiscards: 0
InPacketsUnknownProtocol: 0
OutDiscards: 0
1 interface(s) found
```

Meaning Table 40 lists the **show atm subinterface** command output fields; for a description of the other fields in this display, see **show atm vc** in *JUNOS Link Layer Configuration Guide, Chapter 1, Configuring ATM*.

Table 40: show atm subinterface Output Fields

Field Name	Field Description
Encap	Encapsulation type: <ul style="list-style-type: none"> ■ AAL0—VCC cell relay-encapsulated circuits that receive raw ATM cells ■ AAL5—ATM cross-connect interfaces
Maximum number of cells per packet	Maximum number of ATM cells that the router can concatenate in a single packet; if this value is not configured, “Martini cell aggregation: disabled” appears instead of this field. Displayed for an individual ATM over MPLS interface with AAL0 encapsulation

Table 40: show atm subinterface Output Fields (continued)

Field Name	Field Description
Cell aggregation timeout timer	Identifier (1, 2, or 3) of the ATM Martini cell packing timer that detects timeout of the cell collection threshold; if this value is not configured, "Martini cell aggregation: disabled" appears instead of this field. Displayed for an individual ATM over MPLS interface with AAL0 encapsulation



NOTE: For ATM over MPLS interfaces, the ATM-Prot field displays ATM/MPLS.

Related Topics

- **show atm subinterface** command

Monitoring ATM Cross-connects for Layer 2 Services over MPLS

Purpose Display all ATM cross-connects (passthrough connections between local subinterfaces).

Action To display ATM cross-connects:

```

host1#show mpls cross-connects atm
      Cate Peak
VC-ID  Encap gory Rate Interface  VPI VCI Status
-----
600001 AAL5  UBR    0 ATM6/0.101  0 101 Up
        ATM6/2.101  0 101 Up
600002 AAL5  UBR    0 ATM6/0.102  0 102 Up
        ATM6/2.102  0 102 Up
2 local connection(s) found

```

Meaning Table 41 lists the **show mpls cross-connects atm** command output fields

Table 41: show mpls cross-connects atm Output Fields

Field Name	Field Description
VC-ID	VC ID number of the connection
Encap	Administered encapsulation method based on what was configured with the atm pvc command
Category	Configured service category
Peak Rate	Send and receive peak rate, in Kbps
Interface	Specifier and status of the first subinterface that makes up the local cross-connect
VPI	Virtual path identifier of the first subinterface
VCI	Virtual channel identifier of the first subinterface
Status	Current state of the connection

Related Topics

- `show mpls cross-connects atm` command

Monitoring MPLS Forwarding for Layer 2 Services over MPLS

Purpose Display configuration and statistics for all label-switched paths (LSPs) or for specific LSPs configured on the label-switching router (LSR). The **brief** keyword displays only the the action taken for each in label

Action To display LSP configuration and statistics from the MPLS forwarding table:

```
host1:two#show mpls forwarding
serial4/1:1/1/1/1.1 to 222.9.1.3
In label 20
  0 pkts, 0 hcPkts, 0 octets
  0 hcOctets, 0 errors, 0 discardPkts
Out label 45 on tun mpls:1 nbr 222.9.1.3
  0 pkts, 0 hcPkts, 0 octets
  0 hcOctets, 0 errors, 0 discardPkts
```

To display summary information from the MPLS forwarding table:

```
host:two#show mpls forwarding brief
Platform label space
```

In Label	Owner	Action
16	ldp	lookup on inner header/label
17	ldp	swap to 29 on ATM5/0.1, nbr 10.10.11.5
18	ldp	swap to 30 on ATM5/0.1, nbr 10.10.11.5
19	ldp	swap to 32 on ATM5/0.1, nbr 10.10.11.5
20	ldp	swap to 34 on ATM5/0.1, nbr 10.10.11.5
21	ldp	lookup on inner header/label
22	ldp	swap to 38 on ATM5/0.1, nbr 10.10.11.5
23	ldp	swap to 40 on ATM5/0.1, nbr 10.10.11.5
24	ldp	swap to 42 on ATM5/0.1, nbr 10.10.11.5
25	ldp	lookup on inner header/label
26	ldp	swap to 46 on ATM5/0.1, nbr 10.10.11.5
27	ldp	swap to 48 on ATM5/0.1, nbr 10.10.11.5
52	ldp	l2transport to FastEthernet2/0.2
53	ldp	l2transport to FastEthernet2/0.1

L2transport

Interface	Owner	Action
FastEthernet2/0.1	ldp	swap to 55, push 42 on ATM5/0.1, nbr 10.10.11.5
FastEthernet2/0.2	ldp	swap to 54, push 42 on ATM5/0.1, nbr 10.10.11.5

The “swap to” labels 55 and 54 under the L2transport heading in the summary example are VC labels received from the other router. The label that is pushed in this case, 42, is for the base tunnel.

Meaning Table 42 lists the **show mpls forwarding** command output fields

Table 42: show mpls forwarding Output Fields

Field Name	Field Description
name/id	Interface specifier
destination	Destination ip address
In label	Label sent to upstream neighbor for route
Out label	Label received from downstream neighbor for route
pkts	Number of packets sent across tunnel
hcPkts	Number of high-capacity (64-bit) packets sent across tunnel
octets	Number of octets sent across tunnel
hcOctets	Number of high-capacity (64-bit) octets sent across tunnel
errors	Number of packets dropped for some reason before being sent
discardPkts	Number of packets discarded due to lack of buffer space before being sent

Related Topics

- **show mpls forwarding** command

Monitoring MPLS Layer 2 Interfaces for Layer 2 Services over MPLS

Purpose Display status and configuration information about MPLS layer 2 major, minor, and shim interfaces. Both the **show mpls interface shim** command and the **show mpls l2transport interface** command provide the same output. The **shim** keyword displays all shim interfaces. The **brief** keyword displays only limited interface information.

Action To display information about MPLS layer 2 interfaces:

```
host1#show mpls interface shim
MPLS shim interface FastEthernet2/0
  Remote PE address is 10.9.1.3
  Virtual circuit ID is 1
  Group ID is 0 by default
  Control word is not preferred by default
  Don't send sequence numbers by default
  Relay format is ethernet by default
  Administrative state is enabled
  Operational state is down (shim interface does not have a next-hop)
  Operational MTU is 1500
Received:
  0 packets
  0 bytes
  1 error
  0 discards
Sent:
  0 packets
  0 bytes
  0 errors
  0 discards
```

```

received mtu 0

queue 0: traffic class best-effort, bound to ethernet FastEthernet2/0
  Queue length 0 bytes
  Forwarded packets 0, bytes 0
  Dropped committed packets 0, bytes 0
  Dropped conformed packets 0, bytes 0
  Dropped exceeded packets 0, bytes 0

MPLS policy input shimR1
  classifier-group *
    0 packets, 0 bytes
    rate-limit-profile shimR1
      committed: 0 packets, 0 bytes
      conformed: 0 packets, 0 bytes
      exceeded: 0 packets, 0 bytes
MPLS policy output shimR1
  classifier-group *
    0 packets, 0 bytes
    rate-limit-profile shimR1
      committed: 0 packets, 0 bytes
      conformed: 0 packets, 0 bytes
      exceeded: 0 packets, 0 bytes

```

This excerpt from the command output shows the label information displayed when a circuit is up

```

host1#show mpls l2transport interface
...
Out Label 49 on  tun mpls:lsp-de090100-24-37
  0 pkts, 0 hcPkts, 0 octets
  0 hcOctets, 0 errors, 0 discardPkts
  queue 0: traffic class best-effort, bound to atm-vc ATM1/0.1
    Queue length 0 bytes
    Forwarded packets 0, bytes 0
    Dropped committed packets 0, bytes 0
    Dropped conformed packets 0, bytes 0
    Dropped exceeded packets 0, bytes 0
...

```

To display summary information about MPLS shim interfaces:

```

host1#show mpls interface shim brief

```

Interface	Remote-PE or LSP-name	Virtual Circuit ID	Load Balancing Group	Admin state	Oper state
FastEthernet2/0.1	222.9.1.3	200001	-	enabled	up
FastEthernet2/0.2	222.9.1.3	200002	-	enabled	up

Meaning Table 43 lists the **show mpls interface** and **show mpls l2transport interface** command output fields

Table 43: show mpls interface and show mpls l2transport interface Output Fields

Field Name	Field Description
MPLS shim interface	Interface specifier
Remote PE address	Address of the remote PE router for the layer 2 circuit
Virtual circuit ID	VC ID number for the interface
Group ID	Group ID number for the interface
Control word	Configuration of the control word
Sequence number	Statement regarding configuration of sequence number
Relay format	Configuration of relay format
Administrative state	Administrative state, enabled or disabled
Operational state	Statement regarding operational state of interface
Operational MTU	Maximum transmission unit for the interface
Received, Sent	Statistics for MPLS traffic received or sent on the interface
packets	Number of packets received or sent
bytes	Number of bytes received or sent
error	Number of packets that are dropped for some reason at receipt or before being sent
discards	Number of packets that are discarded because of lack of buffer space at receipt or before being sent
received mtu	MTU specified in received packets
queue, traffic class, bound to	Queue and traffic class bound to the specified interface
Queue length	Number of bytes in the queue
Forwarded packets, bytes	Total number of packets and bytes forwarded by this interface
Dropped committed packets, bytes	Total number of committed packets and bytes dropped by this interface
Dropped conformed packets, bytes	Total number of conformed packets and bytes dropped by this interface
Dropped exceeded packets, bytes	Total number of exceeded packets and bytes dropped by this interface
MPLS policy	Type (input, output) and name of policy
classifier-group entry	Entry index
packets, bytes	Number of packets and bytes on the interface
rate-limit-profile	Name of profile
Committed	Number of packets and bytes that conform to the committed access rate
Conformed	Number of packets and bytes that exceed the committed access rate but conform to the peak access rate
Exceeded	Number of packets and bytes that exceed the peak access rate
In label	VC label sent by this router to upstream neighbor for route

Table 43: show mpls interface and show mpls l2transport interface Output Fields

Field Name	Field Description
Out label	VC label received by this router from downstream neighbor for route
MPLS statistics	MPLS statistics for traffic received or sent
pkts	Number of packets received or sent
hcPkts	Number of high-capacity (64-bit) packets received or sent
octets	Number of octets received or sent
hcOctets	Number of high-capacity (64-bit) octets received or sent
errors	Number of packets that are dropped for some reason at receipt or before being sent
discardPkts	Number of packets that are discarded because of lack of buffer space at receipt or before being sent
Interface	Interface specifier
Remote-PE or LSP-name	IP address of the remote PE router or name of the tunnel
Virtual Circuit ID	VC ID number for the interface
Load Balancing Group	Load-balancing group associated with the layer 2 Martini transport circuit
Admin state	Administrative state of the interface, enabled or disabled
Oper state	Operational state of the interface, up or down

Related Topics

- **show mpls interface** command
- **show mpls l2transport interface** command

