CHAPTER 19

Configuring IP Unicast Layer 3 Switching on Supervisor Engine 1

Note The features described in this chapter are supported only on Supervisor Engine 1, the policy feature card (PFC), and the Multilayer Switch Feature Card (MSFC or MSFC2). For information about Supervisor Engine 2, PFC2, and MSFC2, see Chapter 17, "Configuring IP Unicast Layer 3 Switching on Supervisor Engine 2."

Supervisor Engine 1 with PFC and MSFC or MSFC2 provide hardware Layer 3 switching with Multilayer Switching (MLS). This chapter describes how to configure IP unicast Layer 3 switching on the Catalyst 6500 series switches.

Note For complete syntax and usage information for the commands used in this chapter, refer to the *Catalyst 6500 Series Switch Cisco IOS Command Reference* publication.

This chapter consists of these sections:

Note To configure the MSFC to support MLS on a Catalyst 5000 series switch, refer to the *Layer 3 Switching Software Configuration Guide* at this URL: http://www.cisco.com/univercd/cc/td/doc/product/lan/cat5000/rel_5_2/layer3/index.htm.

Understanding How IP MLS Works

These sections provide an overview of IP MLS and describe how IP MLS works:

IP MLS Overview

IP MLS provides high-performance hardware-based Layer 3 switching for Catalyst 6500 series switches. IP MLS switches unicast IP data packet flows between IP subnets using advanced application-specific integrated circuit (ASIC) switching hardware, which offloads the processor-intensive packet routing from network routers.

The packet forwarding function is moved onto Layer 3 switches whenever a complete switched path exists between two hosts. Standard routing protocols, such as Open Shortest Path First (OSPF), Enhanced Interior Gateway Routing Protocol (EIGRP), Routing Information Protocol (RIP), and Intermediate System-to-Intermediate System (IS-IS), are used for route determination.

In addition, IP MLS provides traffic statistics you can use to identify traffic characteristics for administration, planning, and troubleshooting. IP MLS uses NetFlow Data Export (NDE) to export flow statistics.

Note For more information about NDE, see Chapter 33, "Configuring NDE."

IP MLS Flows

Layer 3 protocols, such as IP and Internetwork Packet Exchange (IPX), are connectionless—they deliver every packet independently of every other packet. However, actual network traffic consists of many end-to-end conversations, or flows, between users or applications.

A flow is a unidirectional sequence of packets between a particular source and destination that share the same protocol and transport-layer information. Communication from a client to a server and from the server to the client are separate flows. For example, Telnet traffic transferred from a particular source to a particular destination comprises a separate flow from File Transfer Protocol (FTP) packets between the same source and destination.

Flows are based only on Layer 3 addresses, which allow IP traffic from multiple users or applications to a particular destination to be carried on a single flow if only the destination IP address is used to identify a flow.

Layer 3 MLS Cache

The PFC maintains a Layer 3 switching table (the Layer 3 MLS cache) for Layer 3-switched flows. The cache also includes entries for traffic statistics that are updated in tandem with the switching of packets. After the MLS cache is created, packets identified as belonging to an existing flow can be Layer 3 switched based on the cached information. The MLS cache maintains flow information for all active flows.

An MLS cache entry is created for the initial packet of each flow. Upon receipt of a packet that does not match any flow currently in the MLS cache, a new IP MLS entry is created.

The state and identity of the flow are maintained while packet traffic is active; when traffic for a flow ceases, the entry ages out. You can configure the aging time for MLS entries kept in the MLS cache. If an entry is not used for the specified period of time, the entry ages out and statistics for that flow can be exported to a flow collector application.

The maximum MLS cache size is 128K entries. However, an MLS cache larger than 32K entries increases the probability that a flow will not be switched by the PFC and will get forwarded to the Catalyst 6500 series switch.

Flow Masks

A flow mask is a filter configured by a network administrator that is used by the PFC to determine how MLS entries are created. The more detailed the flow-mask criteria, the deeper into the packet the MLS process must look in order to verify if the packet meets those criteria.

The PFC supports only one flow mask, and when the PFC flow mask changes, the entire MLS cache is purged. When the PFC exports cached entries, flow records are created based on the current flow mask.

Depending on the current flow mask, some fields in the flow record might not have values. Unsupported fields are filled with a zero (0).

There are three types of IP MLS flow-mask modes: destination-ip, source-destination-ip, and full-flow-ip. This section describes how these three flow-mask modes work.

- destination-ip—The least-specific flow mask. The PFC maintains one MLS entry for each destination IP address. All flows to a given destination IP address use this MLS entry. In destination-ip mode, the destination IP address of the switched flows are displayed, along with the packet rewrite information: rewritten destination MAC, rewritten VLAN, and egress interface.
- source-destination-ip—The PFC maintains one MLS entry for each source and destination IP address pair. All flows between a given source and destination use this MLS entry regardless of the protocol-specific Layer 4 port information.
- full-flow-ip—The most-specific flow mask. The PFC creates and maintains a separate MLS cache entry for each IP flow. A full-flow-ip entry includes the source IP address, destination IP address, protocol, and protocol-specific Layer 4 port information.

Note The flow mask mode affects the screen output of the **show mls ip** command.

Interaction Between Software Features and Flow Mask Behavior

This section describes the flow mask used when different software features are configured in a system with a Supervisor Engine 1.

- Security ACLs—Does not affect flow mask.
- Reflexive ACLs—Does not affect flow mask.
- TCP intercept—Does not affect flow mask.
- Policy Based Routing (PBR)—Does not affect flow mask.
- ISLB (IOS Server Load Balancing)—When packets are processed by the ISLB process, a full-flow-ip mask is used.
- WCCP (Web Cache Control Protocol)—When packets are processed by WCCP, a full-flow-ip mask is used.

Note A full-flow-ip mask is used if the if the Web Cache engines are Layer-2 adjacent to the switch. If the Web Cache engines are not Layer-2 adjacent, then GRE encapsulation needs to be configured to send packets to the Web Cache engines and in that the flow mask is not affected because the packets are processed in software.

- CBAC (Context-Based Access Control)—Does not affect flow mask.
- Unicast RPF—When unicast RPF is configured with the **ip verify unicast** command, the flow mask is changed by the Layer 3 manager to source-destination-ip mask.
- Netflow Data export (NDE)—The flow mask used is determined by the **mls flow ip** command.
- QoS Microflow policing—When packets are processed by microflow policing, a full-flow-ip mask is used.

Layer 3-Switched Packet Rewrite

When a packet is Layer 3 switched from a source host to a destination host, the PFC performs a packet rewrite based on information learned from the MSFC and stored in the MLS cache.

If Host A and Host B are on different VLANs and Host A sends a packet to the MSFC to be routed to Host B, the PFC recognizes that the packet was sent to the MAC address of the MSFC. The PFC checks the MLS cache and finds the entry matching the flow in question.

When the PFC receives the packet, it is formatted (conceptually) as follows:

Frame Header		**IP Header**				**Payload**	
Destination	Source	Destination	Source	TTL	Checksum	Data	Checksum
MSFC MAC	*Host A MAC*	*Host B IP*	*Host A IP*	*n*	*calculation1*		

The PFC rewrites the Layer 2 frame header, changing the destination MAC address to the MAC address of Host B and the source MAC address to the MAC address of the MSFC (these MAC addresses are stored in the MLS cache entry for this flow). The Layer 3 IP addresses remain the same, but the IP header Time to Live (TTL) is decremented and the checksum is recomputed. The PFC rewrites the switched Layer 3 packets so that they appear to have been routed by a router.

The PFC forwards the rewritten packet to Host B's VLAN (the destination VLAN is stored in the MLS cache entry) and Host B receives the packet.

After the PFC performs the packet rewrite, the packet is formatted (conceptually) as follows:

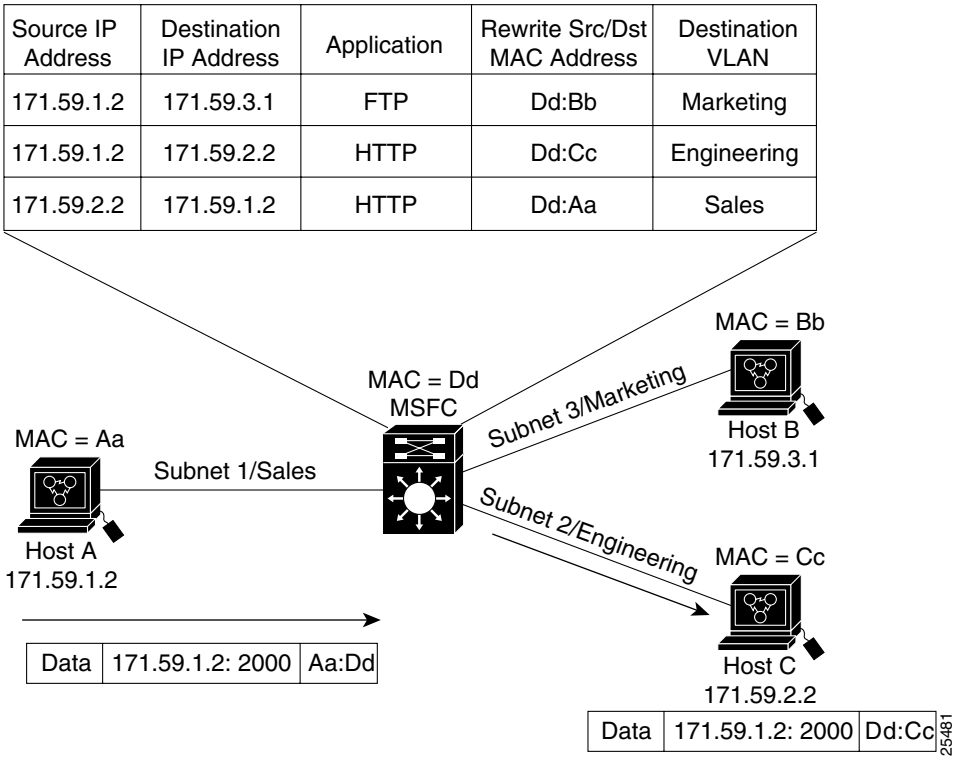
Frame Header		**IP Header**				**Payload**	
Destination	Source	Destination	Source	TTL	Checksum	Data	Checksum
Host B MAC	*MSFC MAC*	*Host B IP*	*Host A IP*	*n-1*	*calculation2*		

IP MLS Operation

Figure 19-1 shows a simple IP MLS network topology. In this example, Host A is on the Sales VLAN (IP subnet 171.59.1.0), Host B is on the Marketing VLAN (IP subnet 171.59.3.0), and Host C is on the Engineering VLAN (IP subnet 171.59.2.0).

When Host A initiates an HTTP file transfer to Host C, an MLS entry for this flow is created (this entry is the second item in the MLS cache shown in Figure 19-1). The PFC stores the MAC addresses of the MSFC and Host C in the MLS entry when the MSFC forwards the first packet from Host A through the switch to Host C. The PFC uses this information to rewrite subsequent packets from Host A to Host C.

Figure 19-1 IP MLS Example Topology



Default IP MLS Configuration

Table 19-1 shows the default IP MLS configuration.

Table 19-1 Default IP MLS Configuration

Feature	Default Value
IP MLS enable state	Enabled
IP MLS aging time	256 seconds
IP MLS fast aging time	32 seconds
IP MLS fast aging-time packet threshold	100 packets
IP MLS long aging time	900 seconds

IP MLS Configuration Guidelines and Restrictions

Follow these guidelines and restrictions when configuring IP MLS:

- The **clear ip route** command clears all IP MLS cache entries.
- The **no ip routing** command purges all IP MLS cache entries and disables IP MLS.
- The **ip security** interface command disables IP MLS on the interface.

Configuring IP MLS

These sections describe how to configure the MSFC for IP MLS:

Note The MSFC can be specified as the MLS route processor (MLS-RP) for Catalyst 5000 family switches using MLS. Refer to the *Layer 3 Switching Configuration Guide—Catalyst 5000 Family, 4000 Family, 2926G Series, 2926 Series, and 2948G* for procedures.

Note With Release 12.1(11b)E and later, when you are in configuration mode you can enter EXEC mode-level commands by entering the **do** keyword before the EXEC mode-level command.

Enabling IP MLS Globally

IP MLS is enabled globally and cannot be disabled.

Disabling and Enabling IP MLS on a Layer 3 Interface

IP MLS is permanently enabled globally but can be disabled and enabled on a specified interface.

To enable IP MLS on a specific interface, perform this task:

	Command	Purpose
Step 1	`Router(config)# interface {{vlan vlan_ID} | {type[1] slot/port} | {port-channel number}}`	Selects an interface to configure.
Step 2	`Router(config-if)# mls ip`	Enables IP MLS on an interface.
	`Router(config-if)# no mls ip`	Disables IP MLS on an interface.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

This example shows how to disable IP MLS for Fast Ethernet port 5/5:

```
Router(config)# interface fastethernet 5/5
Router(config-if)# no mls ip
Router(config-if)#
```

Note IP MLS is enabled by default; you only need to enable it if you have previously disabled it.

Displaying the Interface IP MLS Configuration

To display the IP MLS configuration on a Layer 3 interface, perform this task:

Command	Purpose
`Router# show ip {interface {{vlan vlan_ID} | {type[1] slot/port} | {port-channel number}} | nde}`	Displays IP MLS configuration for an interface.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

This example shows how to display the IP MLS configuration for Fast Ethernet port 5/4:

```
Router# show ip interface fastethernet 5/4
FastEthernet5/4 is up, line protocol is up
  Internet address is 172.20.52.106/29
  Broadcast address is 255.255.255.255
  Address determined by non-volatile memory
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Multicast reserved groups joined: 224.0.0.10
  Outgoing access list is not set
  Inbound  access list is not set
  Proxy ARP is enabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachables are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP fast switching on the same interface is disabled
```

```
  IP Flow switching is disabled
  IP CEF switching is enabled
  IP Fast switching turbo vector
  IP Normal CEF switching turbo vector
  IP multicast fast switching is enabled
  IP multicast distributed fast switching is disabled
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Probe proxy name replies are disabled
  Policy routing is disabled
  Network address translation is disabled
  WCCP Redirect outbound is disabled
  WCCP Redirect exclude is disabled
  BGP Policy Mapping is disabled
  IP multicast multilayer switching is disabled
  IP mls switching is enabled
Router#
```

Configuring the MLS Aging-Time

The MLS aging time applies to all MLS cache entries. See the "Configuring the MLS Aging Time" section on page 33-10.

Setting the Minimum IP MLS Flow Mask

You can set the minimum granularity of the flow mask for the MLS cache on the PFC. The actual flow mask used will be at least of the granularity specified by this command. For information on how the different flow masks work, see the "Flow Masks" section on page 19-3.

For example, if you do not configure access lists on any MSFC, then the IP MLS flow mask on the PFC is destination-ip by default. However, you can force the PFC to use the source-destination-ip flow mask by setting the minimum IP MLS flow mask using the **mls flow destination-source** command.

Caution Changing the flow mask purges all existing shortcuts in the MLS cache and affects the number of active shortcuts on the PFC. Be careful when using this command.

To set the minimum IP MLS flow mask, perform this task:

Command	Purpose
`Router(config)# mls flow [ip {destination | destination-source | full}]`	Sets the minimum IP MLS flow mask for the protocol.
`Router(config)# no mls flow ip`	Reverts to the default IP MLS flow mask.

This example shows how to set the minimum IP MLS flow mask:

```
Router(config)# mls flow ip destination
Router(config)#
```

To display the IP MLS flow mask configuration, perform this task:

Command	Purpose
`Router# show mls netflow flowmask`	With Release 12.1(8a)E and later releases, displays the flow mask configuration.
`Router# show mls flowmask`	With releases earlier than Release 12.1(8a)E, displays the flow mask configuration.

This example shows how to display the MLS flow mask configuration:

```
Router# show mls netflow flowmask
current ip flowmask for unicast: destination address
current ipx flowmask for unicast: destination address
Router#
```

Displaying IP MLS Cache Entries

These sections describe how to display IP MLS cache entries:

- Displaying IP MLS Information, page 19-9
- Displaying IP MLS Cache Entries for a Specific Destination Address, page 19-10
- Displaying Cache Entries for a Specific Source IP Address, page 19-10
- Displaying Entries for a Specific IP Flow, page 19-11

Note For a description of how the flow mask mode affects the screen displays when showing MLS entries, see the "Flow Masks" section on page 19-3.

Displaying IP MLS Information

To display IP MLS information, perform this task:

Command	Purpose
`Router# show mls ip [any | destination ip_address | detail | flow [tcp | udp] | interface {{vlan vlan_ID} | {type[1] slot/port} | {port-channel number}} | macd destination_mac_address | macs source_mac_address | multicast | source ip_address]`	Displays IP MLS information.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

This example shows how to display IP MLS information:

```
Router# show mls ip
DstIP           SrcIP           DstVlan-DstMAC       Pkts         Bytes
-------------------------------------------------------------------------
SrcDstPorts SrcDstEncap Age   LastSeen
-----------------------------------
172.20.52.122   0.0.0.0         5   : 00e0.4fac.b3ff 155          6290
5 /9 ,5 /9  ARPA,ARPA   661   15:09:32

 Number of Entries Found = 1

Router#
```

Displaying IP MLS Cache Entries for a Specific Destination Address

To display MLS entries for a specific destination IP address, perform this task:

Command	Purpose
Router# **show mls ip destination** *ip_address* [**any** | **detail** | **flow** [**tcp** | **udp**] | **interface** {{**vlan** *vlan_ID*} | {*type*[1] *slot/port*} | {**port-channel** *number*}} | **macd** *destination_mac_address* | **macs** *source_mac_address* | **multicast** | **source** *ip_address*]	Displays the IP MLS cache entries for a specific IP destination address.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

This example shows how to display MLS entries for a specific destination IP address:

```
Router# show mls ip destination 127.1.1.1
DstIP/SrcIP     Prot/SrcPt/DstPt   DstMAC/DstVlan    Pkts   Bytes
-----------     ----------------   --------------    ----   -----
127.1.1.1/127.1.1.1 udp/  0040.0bd0.29fc/4095  92 111C
127.1.1.1/0.0.0.0   0040.0bd0.29fc/4095  0 0

 Number of Entries Found = 2

Router#
```

Displaying Cache Entries for a Specific Source IP Address

To display MLS entries for a specific source IP address, perform this task:

Command	Purpose
Router# **show mls ip source** *ip_address* [**any** | **destination** *ip_address* | **detail** | **flow** [**tcp** | **udp**] | **interface** {{**vlan** *vlan_ID*} | {*type*[1] *slot/port*} | {**port-channel** *number*}} | **macd** *destination_mac_address* | **macs** *source_mac_address* | **multicast**]	Displays the IP MLS source cache entries for a specific IP source address.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

This example shows how to display MLS entries for a specific source IP address:

```
Router# show mls ip source 172.20.52.122 any
DstIP           SrcIP           DstVlan-DstMAC       Pkts         Bytes
------------------------------------------------------------------------
SrcDstPorts SrcDstEncap Age   LastSeen
-------------------------------------
172.20.52.122   0.0.0.0         5   : 00e0.4fac.b3ff 157          6370
5 /9 ,5 /9  ARPA,ARPA   901   15:15:30

 Number of Entries Found = 1

Router#
```

Displaying Entries for a Specific IP Flow

To display MLS cache entries for a specific IP flow (when the flow mask mode is IP-flow), perform this task:

Command	Purpose
Router# **show mls ip flow** [**tcp** [**any** | **detail** | **interface** *type slot/port* | **macd** *destination_mac_address* | **macs** *source_mac_address*] | **udp** [**any** | **detail** | **interface** {{**vlan** *vlan_ID*} | {*type*[1] *slot/port*} | {**port-channel** *number*}} | **macd** *destination_mac_address* | **macs** *source_mac_address*]]	Displays the IP MLS cache entries for a specific IP flow.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

This example shows how to display MLS cache entries for a specific IP flow:

```
Router# show mls ip flow tcp detail
IP Destination    IP Source    Vlan Xtag L3-protocol Encapsulation RW-Vlan
--------------+---------------+----+----+-----------+-------------+-------+
 RW-MACSource  RW-MACDestination     Bytes       Packets    Age  Last Seen
--------------+-----------------+------------+------------+-----+---------+
    QoS     Police Count Threshold    Leak     Drop Bucket  Use-Tbl Use-Enable
-----------+------------+---------+-----------+----+-------+-------+----------+

 Number of Entries Found = 0

Router#
```

Clearing IP MLS Cache Entries

The **clear mls ip** command removes specific MLS cache entries. If none of the following parameters are entered, all IP Layer 3 entries in the table are cleared:

- **destination** or **source**—Describes the IP addresses of the origin and termination point being purged.
- **interface** and its arguments—Limits the purge to entries for that interface.
- **macd** (MAC **destination**) or **macs** (MAC **source**)—Specifies the source or destination parameters to use when searching for entries to purge.
- **exclude protocol**—Specifies **all port**, **tcp port**, or **upd port** and interface to allow a entries to remain in the table.

- **slot**—Clears only the entries associated with a specific slot number.

The **flow** keyword specifies the following additional flow information:

- Protocol family (*protocol*)—Specifies **tcp** or **udp**.
- TCP or UDP source and destination port numbers—If the protocol you specify is Transmission Control Protocol (TCP) or User Datagram Protocol (UDP), specify the source and destination TCP or UDP port numbers.

To clear an IP MLS cache entry, perform this task:

Command	Purpose
`Router# clear mls [exclude protocol [all port 1-96 | [tcp port 1-96 | udp port 1-96]] | ip [any | destination ip_address | flow [tcp [any | interface | macd | macs] | udp [any | interface | macd | macs]] | interface {{vlan vlan_ID} | {type[1] slot/port} | {port-channel number}} | macd dest_mac_address | macs source_mac_address | multicast | source]]`	Clears MLS cache entries.

1. *type* = **ethernet**, **fastethernet**, **gigabitethernet**, or **tengigabitethernet**

This example shows how to clear MLS cache entries with destination IP address 172.20.26.22:

```
Router# clear mls ip destination 172.20.26.22
Router#
```

This example shows how to clear MLS cache entries with destination IP address 172.20.26.22, source 172.20.22.113, and flow TCP port 23:

```
Router# clear mls ip destination 172.20.26.22 source 172.20.22.113 flow tcp 23
Router#
```

To display the MLS entries and confirm they have been cleared see the "Displaying IP MLS Cache Entries" section on page 19-9.

Displaying IP MLS Contention Table and Statistics

These sections describe how to display the MLS IP contention table and statistics:

Displaying the IP MLS Contention Table

The **show mls table-contention** command displays the flow contention level. The table contention level (TCL) is indicated with a number ranging from 0 (normal) to 3 (maximum). When reaching levels 1 through 3, accelerated aging starts, and begins to age out entries at a rate suitable to reduce the current contention rate. The detailed option displays the breakdown of contention between different flows.

To show the MLS contention table and VLAN statistics, perform this task:

Command	Purpose
Router# **show mls table-contention** [**detailed** | **summary**]	Displays the MLS contention table.

This example shows how to display the MLS contention table:

```
Router# show mls table-contention detailed
Detailed Table Contention Level Information
===========================================
Layer 3
-------
L3 Contention Level:     0
Page Hits Requiring 1 Lookup    =        10
Page Hits Requiring 2 Lookups   =        0
Page Hits Requiring 3 Lookups   =        0
Page Hits Requiring 4 Lookups   =        0
Page Hits Requiring 5 Lookups   =        0
Page Hits Requiring 6 Lookups   =        0
Page Hits Requiring 7 Lookups   =        0
Page Hits Requiring 8 Lookups   =        0
Page Misses                     =        0

Router#
```

Displaying IP MLS VLAN Statistics

The **show mls vlan-statistics** command displays VLAN-based statistics for MLS cache entries. Specifying a VLAN identifier results in a display with only the shortcuts for that VLAN. If you specify a slot, only the information about that specific slot is shown; otherwise, all entries are displayed.

To display the MLS VLAN statistics, perform this task:

Command	Purpose
Router# **show mls vlan-statistics** *1-1024*	Displays the MLS VLAN statistics.

This example shows how to display the VLAN statistics for VLAN 1 for every slot:

```
Router# show mls vlan-statistics 1
Slot 0
=======
Vlan 1 Statistics Information:
------------------------------
65280 Layer 2 Packets Bridged, 0 Bytes
65280 Layer 3 Packets Input, 0 Bytes
65280 Layer 3 Packets Output, 0 Bytes
Slot 1
=======
Vlan 1 Statistics Information:
------------------------------
65280 Layer 2 Packets Bridged, 0 Bytes
65280 Layer 3 Packets Input, 0 Bytes
65280 Layer 3 Packets Output, 0 Bytes
Slot 2
=======
```

```
Vlan 1 Statistics Information:
------------------------------
65280 Layer 2 Packets Bridged, 0 Bytes
65280 Layer 3 Packets Input, 0 Bytes
65280 Layer 3 Packets Output, 0 Bytes
Slot 3
=======

(Information Deleted)

Router#
```

Troubleshooting IP MLS

Table 19-2 describes IP MLS-related debugging commands that you can use to troubleshoot IP MLS problems.

Table 19-2 IP MLS Debugging Commands

Command	Description
[**no**] **debugging l3-mgr events**	Displays Layer 3 manager-related events.
[**no**] **debugging l3-mgr packets**	Displays Layer 3 manager packets.
[**no**] **debugging l3-mgr global**	Displays bug trace of IP global purge events.
[**no**] **debugging l3-mgr all**	Turns on all Layer 3 manager debugging messages.

To configure the IP MLS-related debugging commands, perform this task:

Command	Purpose
Router# **debugging mls** {**ip** {**all** | **error** | **events** | **messages** | **multicast**} | **rp** {**all** | **error**| **events** | **ip** | **locator** | **packets** | **verbose**}}	Configures IP-MLS debugging.
Router# {**no debugging** | **undebug**} {**all** | {**mls** {**ip** {**all** | **error** | **events** | **messages** | **multicast**} | **rp** {**all** | **error**| **events** | **ip** | **locator** | **packets** | **verbose**}}}	Disables IP-MLS debugging.

This example shows how to configure all IP debugging:

```
Router# debugging mls ip all
mls ip all debugging is on
Router#
```

Note Enter the **show tech-support** command to display system information.