LPTS Commands

This chapter describes the Cisco IOS XR software commands used to monitor Local Packet Transport Services (LPTS).

For detailed information about LPTS concepts, configuration tasks, and examples, refer to the *Cisco IOS XR IP Addresses and Services Configuration Guide for the Cisco XR 12000 Series Router*.

clear lpts ifib statistics

To clear the Internal Forwarding Information Base (IFIB) statistics, use the **clear lpts ifib statistics** command in EXEC mode.

clear lpts ifib statistics [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Clears the IFIB statistics for the designated node. The *node-id* argument is entered in standard *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If you do not specify a node with the **location** keyword and *node-id* argument, the **clear lpts ifib statistics** command clears the IFIB statistics for the node on which the command is run.

Task ID

Task ID	Operations
lpts	execute

The following example shows how to clear the IFIB statistics for the RP:

```
RP/0/0/CPU0:router# clear lpts ifib statistics
```

Related Commands

Command	Description
show lpts ifib statistics, on page 27	Displays the LPTS IFIB statistics.

clear lpts pifib hardware statistics

To clear the Pre-Internal Forwarding Information Base (Pre-IFIB) hardware statistics, use the **clear lpts pifib hardware statistics** command in EXEC mode.

clear lpts pifib hardware statistics location *node-id*

Syntax Description

location *node-id*	Clears the Pre-IFIB hardware statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If you do not specify a node with the **location** keyword and *node-id* argument, this command clears the Pre-IFIB hardware statistics for the node on which the command is run.

Task ID

Task ID	Operations
lpts	execute

Related Commands

Command	Description
show lpts pifib hardware police, on page 42	Displays the policer configuration value set.

clear lpts pifib statistics

To clear the Pre-Internal Forwarding Information Base (Pre-IFIB) statistics, use the **clear lpts pifib statistics** command in EXEC mode.

clear lpts pifib statistics [**location** *node-id*]

Syntax Description

location *node-id*	Clears the Pre-IFIB statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If you do not specify a node with the **location** keyword and *node-id* argument, this command clears the Pre-IFIB statistics for the node on which the command is run.

Task ID

Task ID	Operations
lpts	execute

The following example shows how to clear the Pre-IFIB statistics for the RP:

```
RP/0/0/CPU0:router# clear lpts pifib statistics
```

Related Commands

Command	Description
show lpts pifib statistics, on page 46	Displays the LPTS PIFIB statistics.

flow (LPTS)

To configure the policer for the Local Packet Transport Services (LPTS) flow type, use the **flow** command in pifib policer global configuration mode or pifib policer per-node configuration mode. To disable this feature, use the **no** form of this command.

flow *flow-type* **rate** *rate*

no flow *flow-type* **rate** *rate*

Syntax Description

flow-type	List of supported flow types.
rate *rate*	Specifies the rate in packets per seconds (PPS). The range is from 0 to 4294967295.

Command Default

The default behavior is to load the policer values from the static configuration file that is platform dependant.

Command Modes

Pifib policer global configuration

Pifib policer per-node configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The table lists the supported flow types and the parameters that are used to define a policer.

Table 1: List of Supported Flow Types

Flow Type	Description	Default Packet Rate (Recommended)
all-routers	Packets sent to all-routers multicast addresses, which include multicast LDP UDP packet.	10000
bgp-cfg-peer	Packets from a configured BGP peer.	10000

Flow Type	Description	Default Packet Rate (Recommended)
bgp-default	Packets from unconfigured, newly configured, or wildcard BGP peers.	10000
bgp-known	Packets from established BGP peering sessions.	25000
css-default	Packets from a new or newly established CSS session.	1000
css-known	Packets from an established CSS session.	1000
default-flow	Default flow type.	500
eigrp	EIGRP packets for configured interfaces.	20000
fragment	Fragmented packets.	1000
http-default	Packets from a new or newly established HTTP session.	1000
http-known	Packets from an established HTTP session.	1000
icmp-app	ICMP or ICMPv6 packets of interest to applications.	2500
icmp-control	ICPMv6 control packets.	2500
icmp-default	Other ICMP or ICMPv6 packets.	2500
icmp-local	ICMP or ICMPv6 packets with local interest.	2500
igmp	IGMP packets.	3500
ike	IKE packets.	1000
ipsec-default	AH or ESP packets with unknown or newly configured SPIs.	1000
ipsec-known	AH or ESP packets with known SPIs.	3000
isis-default	IS-IS packets for unconfigured (or newly, configured) interfaces.	5000

Flow Type	Description	Default Packet Rate (Recommended)
isis-known	IS-IS packets for configured interfaces.	20000
ldp-tcp-cfg-peer	Packets from a configured LDP TCP peer (SYNs or newly, established sessions).	10000
ldp-tcp-default	Packets from an unconfigured, newly configured, or wildcard LDP TCP peer.	10000
ldp-tcp-known	Packets from an established LDP peering session.	25000
ldp-udp	Unicast LDP UPD packets.	500
lmp-tcp-cfg-peer	Packets from a configured LMP TCP peer (SYNs or newly established sessions).	10000
lmp-tcp-default	Packets from an unconfigured, newly configured, or wild-card LMP TCP peer.	10000
lmp-tcp-known	Packets from an established LMP peering session.	25000
lmp-udp	Unicast LMP UDP packets.	500
msdp-cfg-peer	Packets from a configured MSDP peer.	1000
msdp-default	Packets from an unconfigured, newly configured, or wildcard MSDP peer.	1000
msdp-known	Packets from an established MSDP session.	1000
multicast-default	Packets for unconfigured or newly configured multicast groups.	500
multicast-known	Packets for configured multicast groups.	25000
ntp-known	Packets from an established NTP session.	500

Flow Type	Description	Default Packet Rate (Recommended)
ntp-default	Packets from a new or newly established NTP session.	500
ospf-mc_default	OSPF multicast packets for unconfigured (or newly configured) interfaces.	5000
ospf-mc-known	OSPF multicast packets for configured interfaces.	20000
ospf-uc-default	OSPF unicast packets for unconfigured (or newly configured) interfaces.	1000
ospf-uc-known	OSPF unicast packets for configured interfaces.	5000
pim-multicast	PIM multicast packets.	23000
pim-unicast	PIM unicast packets.	10000
rip	RIP packets.	20000
rsh-default	Packets from a new or newly established RSH session.	1000
rsh-known	Packets from an established RSH session.	1000
rsvp	RSVP packets.	7000
rsvp-udp	RSVP UDP packets.	7000
raw-default	Packets for unconfigured or newly configured IPv4 or IPv6 protocols.	500
raw-listen	Packets for configured IP protocols.	500
shttp-default	Packets from a new or newly established SSHTP session.	1000
shttp-known	Packets from an established SHTTP session.	1000
snmp	SNMP packets.	2000

Flow Type	Description	Default Packet Rate (Recommended)
ssh-default	Packets from a new or newly established SSH session.	1000
ssh-known	Packets from an established SSH session.	1000
tcp-cfg-peer	Packets for configured TCP peers.	25000
tcp-default	Packets for unconfigured or newly configured TCP services.	500
tcp-known	Packets for established TCP sessions.	25000
tcp-listen	Packets for configured TCP services.	25000
telnet-default	Packets from a new or newly established Telnet session.	1000
telnet-known	Packets from an established Telnet session.	1000
udp-cfg-peer	Packets for configured UDP-based protocol sessions.	4000
udp-default	Packets for unconfigured or newly configured UDP services.	500
udp-known	Packets for established UDP sessions.	25000
udp-listen	Packets for configured UDP services.	4000

Task ID

Task ID	Operations
config-services	read, write

The following example shows how to configure the LPTS policer for the bgp-known flow type for all line cards:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# lpts pifib hardware police
```

```
RP/0/0/CPU0:router(config-pifib-policer-global)# flow bgp-known rate 20000
```

The following example shows how to configure LPTS policer for the Intermediate System-to-Intermediate System (IS-IS)-known flow type for a specific line card:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:routerconfig)# lpts pifib hardware police location 0/2/CPU0
RP/0/0/CPU0:router(config-pifib-policer-per-node)# flow isis-known rate 22222
```

lpts pifib hardware police

To configure the ingress policers and to enter pifib policer global configuration mode or pifib policer per-node configuration mode, use the **lpts pifib hardware police** command in global configuration mode. To set the policer to the default value, use the **no** form of this command.

lpts pifib hardware police[**location** *node-id*][**flow** *flow-type* **rate** *rate*]

no lpts pifib hardware police [**location** *node-id*][**flow** *flow-type* **rate** *rate*]

Syntax Description

location *node-id*	(Optional) Designated node. The *node-id* argument is entered in the *rack/slot/module* notation.
flow *flow-type* **rate** *rate*	Lpts flow type and the policer rate in packets per second (PPS).

Command Modes

Global configuration

Command History

Release	Modification
Release 3.6.0	This command was introduced.
Release 4.2.0	New flow types such as dns, radius, tacacs, ntp known, rsvp known and pim multicast known flow types were added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
lpts	read, write

Task ID	Operations
config-services	read, write

This example shows how to configure the **lpts pifib hardware police** command for all line cards:

```
RP/0/0/CPU0:router(config)# lpts pifib hardware police
RP/0/0/CPU0:router(config-pifib-policer-global)#
```

This example shows how to configure the **lpts pifib hardware police** command for a specific line card:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# lpts pifib hardware police location 0/2/CPU0 flow dns rate 10
```

Related Commands

Command	Description
flow (LPTS), on page 5	Configures the policer for the LPTS flow type.
show lpts pifib hardware police, on page 42	Displays the policer configuration value set.

show lpts bindings

To display the binding information in the Port Arbitrator, use the **show lpts bindings** command in EXEC mode.

show lpts bindings [**location** *node-id*] [**client-id** {**clnl**| **ipsec**| **ipv4-io**| **ipv6-io**| **mpa**| **tcp**| **test**| **udp**| **raw**}] **[brief]** [**vrf** *vrf-name*]

Syntax Description

location *node-id*	(Optional) Displays information for the specified node. The *node-id* argument is entered in the *rack/slot/module* notation.

client-id	(Optional) Type of client. It can be one of the following values: • **clnl —**ISO connectionless protocol (used by IS-IS) • **ipsec —**Secure IP • **ipv4-io —**Traffic processed by the IPv4 stack • **ipv6-io —**Traffic processed by the IPv6 stack • **mpa —**Multicast Port Arbitrator (multicast group joins) • **tcp —**Transmission Control Protocol • **test —**Test applications • **udp —**User Datagram Protocol • **raw —**Raw IP
brief	(Optional) Displays summary output.
vrf *vrf-name*	(Optional) Name of assigned VRF.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was supported.
Release 3.6.0	The **vrf** keyword was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show lpts bindings** command displays the Local Packet Transport Services (LPTS) bindings (requests to receive traffic of a particular type). Bindings are aggregated into flows by the LPTS Port Arbitrator; flows are then programmed into the Internal Forwarding Information Base (IFIB) and Pre-IFIB to direct packets to applications.

If you specify the optional **client-id** keyword and type of client, only bindings from that client are shown. If you specify the optional **location** keyword and *node-id* argument, only bindings from clients on that node are displayed.

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts bindings** command, displaying bindings for all client ID types:

```
RP/0/0/CPU0:router# show lpts bindings

@ - Indirect binding; Sc - Scope

------------------------------------------
Location   :0/1/CPU0
Client ID  :IPV4_IO
Cookie     :0x00000001
Clnt Flags :
Layer 3    :IPV4
Layer 4    :ICMP
Local Addr :any
Remote Addr:any
Local Port :any
Remote Port:any
Filters    :Type / Intf or Pkt Type / Source Addr / Location
 INCLUDE_TYPE / type 8
 INCLUDE_TYPE / type 13
 INCLUDE_TYPE / type 17
------------------------------------------
Location   :0/2/CPU0
Client ID  :IPV4_IO
Cookie     :0x00000001
Clnt Flags :
Layer 3    :IPV4
Layer 4    :ICMP
Local Addr :any
Remote Addr:any
Local Port :any
Remote Port:any
Filters    :Type / Intf or Pkt Type / Source Addr / Location
 INCLUDE_TYPE / type 8
 INCLUDE_TYPE / type 13
 INCLUDE_TYPE / type 17
------------------------------------------
Location   :0/RP1/CPU0
Client ID  :TCP
Cookie     :0x4826f1f8
Clnt Flags :REUSEPORT
Layer 3    :IPV4
Layer 4    :TCP
Local Addr :any
Remote Addr:any
Local Port :7
Remote Port:any
------------------------------------------
Location   :0/RP1/CPU0
Client ID  :TCP
Cookie     :0x4826fa0c
Clnt Flags :REUSEPORT
Layer 3    :IPV4
Layer 4    :TCP
Local Addr :any
Remote Addr:any
Local Port :9
Remote Port:any
------------------------------------------
Location   :0/RP1/CPU0
```

```
Client ID  :TCP
Cookie     :0x482700d0
Clnt Flags :REUSEPORT
Layer 3    :IPV4
Layer 4    :TCP
Local Addr :any
Remote Addr:any
Local Port :19
Remote Port:any
-----------------------------------------
Location   :0/RP1/CPU0
Client ID  :IPV4_IO
Cookie     :0x00000001
Clnt Flags :
Layer 3    :IPV4
Layer 4    :ICMP
Local Addr :any
Remote Addr:any
Local Port :any
Remote Port:any
Filters    :Type / Intf or Pkt Type / Source Addr / Location
 INCLUDE_TYPE / type 8
 INCLUDE_TYPE / type 13
 INCLUDE_TYPE / type 17
```

This table describes the significant fields shown in the display.

Table 2: show lpts bindings Command Field Descriptions

Field	Description
Location	Node location, in the format of *rack/slot/module*.
Client ID	LPTS client type.
Cookie	Client's unique tag for the binding.
Clnt Flags	REUSEPORT -- client has set the SO_REUSEPORT or SO_REUSEADDR socket option.
Layer 3	Layer 3 protocol (IPv4, IPv6, CLNL).
Layer 4	Layer 4 protocol (TCP, UDP).
Local Addr	Local (destination) address.
Remote Addr	Remote (source) address.
Local Port	Local (destination) TCP or UDP port, or ICMP/IGMP packet type, or IPsec SPI.
Remote Port	Remote (source) TCP or UDP port.

The following sample output is from the **show lpts bindings brief** command:

```
RP/0/0/CPU0:router# show lpts bindings brief

@ - Indirect binding; Sc - Scope
```

```
Location   Clnt Sc L3   L4    VRF-ID   Local,Remote Address.Port  Interface
---------- ---- -- ---- ----- -------- -------------------------- ------------
0/1/CPU0   IPV4 LO IPV4 ICMP  *        any.ECHO any               any
0/1/CPU0   IPV4 LO IPV4 ICMP  *        any.TSTAMP any             any
0/1/CPU0   IPV4 LO IPV4 ICMP  *        any.MASKREQ any            any
0/1/CPU0   IPV6 LO IPV6 ICMP6 *        any.ECHOREQ any            any
0/3/CPU0   IPV4 LO IPV4 ICMP  *        any.ECHO any               any
0/3/CPU0   IPV4 LO IPV4 ICMP  *        any.TSTAMP any             any
```

This table describes the significant fields shown in the display.

Table 3: show lpts bindings brief Command Field Descriptions

Field	Description
Location	Node location, in the format of *rack/slot/module*.
Clnt ID	LPTS client type.
Sc	Scope (LR = Logical-Router, LO = Local).
Layer 3	Layer 3 protocol.
Layer 4	Layer 4 protocol.
VRF-ID	VPN routing and forwarding (VRF) identification (vrfid) number.
Local,Remote Address.Port	Local (destination) and Remote (source) addresses and ports or packet types.
Interface	Inbound interface.

Related Commands

Command	Description
show lpts clients, on page 15	Displays the client information for the Port Arbitrator.
show lpts flows, on page 17	Displays information about LPTS flows.

show lpts clients

To display the client information for the Port Arbitrator, use the **show lpts clients** command in EXEC mode.

show lpts clients [times]

Syntax Description

times	(Optional) Displays information about binding request rates and service times.

Command Default No default behavior or values

Command Modes EXEC

Command History

Release	Modification
Release 3.2	This command was supported.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show lpts clients** command displays the clients connected to the local packet transport services (LPTS) port arbitrator (PA).

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts clients** command:

```
RP/0/0/CPU0:router# show lpts clients

o_flgs - open flags ; clid - client id
clid            loc             flags   o_flgs
RAW(3)          0/RP1/CPU0      0x1     0x2
TCP(1)          0/RP1/CPU0      0x1     0x2
IPV4_IO(5)      0/1/CPU0        0x3     0x2
IPV4_IO(5)      0/2/CPU0        0x3     0x2
IPV4_IO(5)      0/RP1/CPU0      0x3     0x2
MPA(7)          0/RP1/CPU0      0x3     0x0
```

This table describes the significant fields shown in the display.

Table 4: show lpts clients Command Field Descriptions

Field	Description
Clid	LPTS client ID.
Loc	Node location, in the format *rack/slot/module*.
Flags	Client flags. **Note** The client flags are used only for debugging purposes.

Field	Description
o_flags	Open flags. **Note** The open flags are used only for debugging purposes.

The following sample output is from the **show lpts clients times** command. The output shows samples for the last 30 seconds, 1 minute, 5 minutes, 10 minutes, and a total (if nonzero). The number of transactions, number of updates, and the minimum/average/maximum time in milliseconds to process each transaction is shown.

```
RP/0/0/CPU0:router# show lpts clients times

o_flgs - open flags ; clid - client id
clid            loc      flags   o_flgs
RAW(3)          0/RP1/CPU0       0x1      0x2
   30s:2 tx 2 upd 2/2/3ms/tx
    1m:2 tx 2 upd 2/2/3ms/tx
    5m:2 tx 2 upd 2/2/3ms/tx
   10m:2 tx 2 upd 2/2/3ms/tx
 total:2 tx 2 upd 2/-/3ms/tx
TCP(1)          0/RP1/CPU0       0x1      0x2
 total:3 tx 3 upd 1/-/1ms/tx
IPV4_IO(5)      0/1/CPU0         0x3      0x2
 total:1 tx 1 upd 0/-/0ms/tx
IPV4_IO(5)      0/2/CPU0         0x3      0x2
 total:1 tx 1 upd 1/-/1ms/tx
IPV4_IO(5)      0/RP1/CPU0       0x3      0x2
 total:1 tx 1 upd 3/-/3ms/tx
MPA(7)          0/RP1/CPU0       0x3      0x0
```

Related Commands

Command	Description
show lpts bindings, on page 11	Displays the binding information in the port arbitrator.
show lpts flows, on page 17	Displays information about LPTS flows.

show lpts flows

To display information about Local Packet Transport Services (LPTS) flows, use the **show lpts flows** command in EXEC mode.

show lpts flows [brief]

Syntax Description

brief	(Optional) Displays summary output.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was supported.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show lpts flows** command is used to display LPTS flows, which are aggregations of identical binding requests from multiple clients and are used to program the LPTS Internal Forwarding Information Base (IFIB) and Pre-IFIB.

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts flows** command:

```
RP/0/0/CPU0:router# show lpts flows

-----------------------------------------
L3-proto    : IPV4(2)
L4-proto    : ICMP(1)
VRF-ID      : * (000000000)
Local-IP    : any
Remote-IP   : any
Pkt-Type    : 8
Remote-Port : any
Interface   : any (0x0)
Flow-type   : ICMP-local
Min-TTL     : 0
Slice       : RAWIP4_FM
Flags       : 0x20 (in Pre-IFIB)
Location    : (drop)
Element References
location / count / scope
* / 3 / LOCAL
```

This table describes the significant fields shown in the display.

Table 5: show lpts flows Command Field Descriptions

Field	Description
L3-proto	Layer 3 protocol (IPv4, IPv6, CLNL).
L4-proto	Layer 4 protocol (TCP, UDP, and so on.).

Field	Description
VRF-ID	VPN routing and forwarding (VRF) identification (vrfid) number.
Local-IP	Local (destination) IP address.
Remote-IP	Remote (source) IP address.
Pkt-Type	ICMP or IGMP packet type.
Remote-Port	Remote (source) TCP or UDP port.
Interface	Ingress interface.
Flow-type	Flow classification for hardware packet policing.
Min-TTL	Minimum time-to-live value expected from in the incoming packet. Ant packet received with a lower TTL value will be dropped.
Slice	IFIB slice.
Flags	• Has FGID: delivered to multiple destinations • No IFIB entry: IFIB entry suppressed • Retrying FGID allocation • In Pre-IFIB: entry is in Pre-IFIB as well • Deliver to one: if multiple bindings, will deliver to only one
Location	*rack/slot/module* to deliver to
Element References	• location: *rack/slot/module* of client. • count: number of clients at that location. • scope: binding scope (LR:Logical Router, LOCAL:Local)

The following sample output is from the **show lpts flows brief** command:

```
RP/0/0/CPU0:router# show lpts flows brief

+ - Additional delivery destination; L - Local interest; P - In Pre-IFIB

 L3   L4    VRF-ID   Local, Remote Address.Port      Interface    Location    LP
 ---- ----- -------- ------------------------------- ------------ ----------- --
 IPV4 ICMP  *        any.ECHO any                    any          (drop)      LP
```

```
IPV4 ICMP  *        any.TSTAMP any                 any          (drop)      LP
IPV4 ICMP  *        any.MASKREQ any                any          (drop)      LP
IPV6 ICMP6 *        any.ECHOREQ any                any          (drop)      LP
IPV4 any   default  224.0.0.2 any                  Gi0/1/0/1    0/5/CPU0     P
```

This table describes the significant fields shown in the display.

Table 6: show lpts flows brief Command Field Descriptions

Field	Description
L3	Layer 3 protocol (IPv4, IPv6, CLNL).
L4	Layer 4 protocol.
VRF-ID	VPN routing and forwarding (VRF) identification (vrfid) number.
Local, Remote Address.Port	Local (destination) and remote (source) IP addresses and TCP or UDP ports, or ICMP/IGMP packet types, or IPSec Security Parameters Indices.
Interface	Ingress interface.
Location	Delivery location: • *rack/slot/module*— individual location • [0xNNNNN]— multiple locations (platform-dependent value) • (drop)— do not deliver to any application
LP	Local interest (to be processed by IPv4 or IPv6 stack directly) or entry is resident in Pre-IFIB.

Related Commands

Command	Description
show lpts bindings, on page 11	Displays the binding information in the port arbitrator.
show lpts clients, on page 15	Displays the client information for the port arbitrator.

show lpts ifib

To display the entries in the Internal Forwarding Information Base (IFIB), use the **show lpts ifib** command in EXEC mode.

show lpts ifib [entry] [**type** {**bgp4**| **bgp6**| **isis**| **mcast4**| **mcast6**| **ospf-mc4**| **ospf-mc6**| **ospf4**| **ospf6**| **raw4**| **raw6**| **tcp4**| **tcp6**| **udp4**| **udp6**}| **all**] [**brief [statistics]**] **[slices] [times]** [**location** *node-id*]

Syntax Description

entry	(Optional) Displays the IFIB entries.
type	(Optional) Displays the following protocol types. • **bgp4 —**IPv4 Border Gateway Protocol (BGP) slice • **bgp6 —**IPv6 BGP slice • **isis —**Intermediate System-to-Intermediate System (IS-IS) slice • **mcast4 —**IPv4 multicast slice • **mcast6 —**IPv6 multicast slice • **ospf-mc4 —**IPv4 Open Shortest Path First (OSPF) multicast slice • **ospf-mc6 —**IPv6 OSPF multicast slice • **ospf4 —**IPv4 OSPF slice • **ospf6 —**IPv6 OSPF slice • **raw4 —**IPv4 raw IP • **raw6 —**IPv6 raw IP • **tcp4 —**IPv4 Transmission Control Protocol (TCP) slice • **tcp6 —**IPv6 TCP slice • **udp4 —**IPv4 UDP slice • **udp6 —**IPv6 UDP slice
all	Displays all IFIB types.
brief	(Optional) Displays the IFIB entries in brief format.
statistics	(Optional) Displays the IFIB table with statistics information.
slices	(Optional) Displays IFIB slices.
times	(Optional) Displays the IFIB update transaction times.
location *node-id*	(Optional) Specifies the location of the Flow Manager. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was supported.
Release 3.6.0	The **slices** and **times** keywords were added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use this command to display detailed information about the entries in an IFIB slice. This command is useful for debugging problems with delivering packets to applications.

When the **statistics** keyword is used, detailed statistics are displayed for packet count, number of entries in each slice, and a total entries count.

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts ifib** command:

```
RP/0/0/CPU0:router# show lpts ifib

O - Opcode; A - Accept Counter; D - Drop Counter; F - Flow Type; L - Listener Tag;
I - Local Flag; Y - SYN; T - Min TTL; DV - Deliver; DP - Drop; RE - Reassemble; na - Not
Applicable
-----------------------------------------------------
VRF-ID           : default (0x60000000)
Port/Type        : any
Source Port      : any
Dest IP          : any
Source IP        : any
Layer 4          : 88 (88)
Interface        : any (0x0)
O/A/D/F/L/I/Y/T  : DELIVER/0/0/EIGRP/IPv4_STACK/0/0/0
Deliver List     : 0/5/CPU0
-----------------------------------------------------
```

This table describes the significant fields shown in the display.

Table 7: show lpts ifib entries Command Field Descriptions

Field	Description
VRF-ID	VPN routing and forwarding (VRF) identification (vrfid) number.
Port/Type	Destination (local) TCP or UDP port number, or ICMP/IGMP packet type, or IPSec Security Parameters Index.t2222

Field	Description
Source Port	Source (remote) TCP or UDP port.
Dest IP	Destination (local) IP address.
Source IP	Source (remote) IP address.
Layer 4	Layer 4 protocol number (6 = TCP). **Note** Only the common Layer 4 protocol names are displayed.
Interface	Ingress interface name.
O/S/P/R/L/I/Y	• O: Opcode (DELIVER, DROP, or REASSEMBLE • S: Stats counter • P: Packet forwarding priority (LO, MED, or HIGH) • R: Rate limit (LO, MED, or HIGH) • L: Listener tag (IPv4_STACK, IPv6_STACK, or CLNL_STACK) • I: Local-interest flag (0 or 1) • Y: TCP SYN flag (0 or 1)
Deliver List	• (drop)—Drop packet • *rack/slot/module*—Deliver to single destination • [0xNNNN]—Deliver to multiple destinations (platform-dependent format)

The following sample output is from the **show lpts ifib brief** command:

```
RP/0/0/CPU0:router# show lpts ifib brief

 Slice    Local, Remote Address.Port            L4    Interface    Dlvr
 -------- ------------------------------------ ----- ------------ -----------
 TCP4     any.7 any                            TCP   any          0/RP1/CPU0
 TCP4     any.9 any                            TCP   any          0/RP1/CPU0
```

The following sample output is from the **show lpts ifib brief statistics** command:

```
RP/0/0/CPU0:router# show lpts ifib brief statistics

 Slice    Local, Remote Address.Port            L4    Interface    Accept/Drop
 -------- ------------------------------------ ----- ------------ -----------
 TCP4     any.7 any                            TCP   any          0/0
```

```
 TCP4      any.9 any                                TCP   any          0/0
 TCP4      any.19 any                               TCP   any          0/0

 Slice     Num. Entries Accepts/Drops
 --------- ------------ -------------
TCP4      3            0/0
Total     3            0/0
```

Related Commands

Command	Description
show lpts ifib slices, on page 24	Displays IFIB slice information.

show lpts ifib slices

To display Internal Forwarding Information Base (IFIB) slice information, use the **show lpts ifib slices** command in EXEC mode.

show lpts ifib slices [**type** {**bgp4**| **bgp6**| **isis**| **mcast4**| **mcast6**| **ospf-mc4**| **ospf-mc6**| **ospf4**| **ospf6**| **raw4**| **raw6**| **tcp4**| **tcp6**| **udp4**| **udp6**}] **[all] [statistics] [times]**

Syntax Description

type	(Optional) Enter protocol types. • **bgp4** —IPv4 Border Gateway Protocol (BGP) slice • **bgp6** —IPv6 BGP slice • **isis** —Intermediate System-to-Intermediate System (IS-IS) slice • **mcast4** —IPv4 multicast slice • **mcast6** —IPv6 multicast slice • **ospf-mc4** —IPv4 Open Shortest Path First (OSPF) multicast slice • **ospf-mc6** —IPv6 OSPF multicast slice • **ospf4** —IPv4 OSPF slice • **ospf6** —IPv6 OSPF slice • **raw4** —IPv4 raw IP • **raw6** —IPv6 raw IP • **tcp4** —IPv4 Transmission Control Protocol (TCP) slice • **tcp6** —IPv6 TCP slice • **udp4** —IPv4 UDP slice • **udp6** —IPv6 UDP slice
all	(Optional) Displays all entries.

statistics	(Optional) Displays the statistics for slice lookups.
times	(Optional) Displays the IFIB update transaction times.

Command Default No default behavior or values

Command Modes EXEC

Command History

Release	Modification
Release 3.2	This command was supported.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show lpts ifib slices** command when troubleshooting IFIB entries and slice assignments. This command is especially useful when troubleshooting problems with delivering packets to applications.

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts ifib slices** command:

```
RP/0/0/CPU0:router# show lpts ifib slices

Slice    L3   L4     Port  Location
-------- ---- ------ ----- --------
RAWIP4   IPV4 any    any   0/RP1/CPU0
RAWIP6   IPV6 any    any   0/RP1/CPU0
OSPF4    IPV4 OSPF   any   0/RP1/CPU0
OSPF6    IPV6 OSPF   any   0/RP1/CPU0
OSPF_MC4 IPV4 any    any   0/RP1/CPU0
OSPF_MC6 IPV6 any    any   0/RP1/CPU0
BGP4     IPV4 TCP    179   0/RP1/CPU0
BGP6     IPV6 TCP    179   0/RP1/CPU0

UDP4     IPV4 UDP    any   0/RP1/CPU0
UDP6     IPV6 UDP    any   0/RP1/CPU0
TCP4     IPV4 TCP    any   0/RP1/CPU0
TCP6     IPV6 TCP    any   0/RP1/CPU0
ISIS     CLNS -      any   0/RP1/CPU0
MCAST4   IPV4 any    any   0/RP1/CPU0
MCAST6   IPV6 any    any   0/RP1/CPU0
```

The following sample output is from the **show lpts ifib slices times** command:

```
RP/0/0/CPU0:router# show lpts ifib slices times

Slice    L3   L4     Port  Location
-------- ---- ------ ----- --------
RAWIP4   IPV4 any    any   0/RP1/CPU0
RAWIP6   IPV6 any    any   0/RP1/CPU0
OSPF4    IPV4 OSPF   any   0/RP1/CPU0
OSPF6    IPV6 OSPF   any   0/RP1/CPU0
OSPF_MC4 IPV4 any    any   0/RP1/CPU0
OSPF_MC6 IPV6 any    any   0/RP1/CPU0
BGP4     IPV4 TCP    179   0/RP1/CPU0
BGP6     IPV6 TCP    179   0/RP1/CPU0

UDP4     IPV4 UDP    any   0/RP1/CPU0
UDP6     IPV6 UDP    any   0/RP1/CPU0
TCP4     IPV4 TCP    any   0/RP1/CPU0
TCP6     IPV6 TCP    any   0/RP1/CPU0
ISIS     CLNS -      any   0/RP1/CPU0
MCAST4   IPV4 any    any   0/RP1/CPU0
MCAST6   IPV6 any    any   0/RP1/CPU0
  Flow Manager 0/RP1/CPU0:
   total:5 tx 13 upd 1/-/1ms/tx
```

The following sample output is from the **show lpts ifib slices statistics** command:

```
RP/0/0/CPU0:router# show lpts ifib slices all statistics

Slice    L3   L4     Port  Location   Lookups RmtDlvr Rejects RLDrops NoEntry
-------- ---- ------ ----- ---------- ------- ------- ------- ------- -------
RAWIP4   IPV4 any    any   0/0/CPU0   5       0       0       0       0
RAWIP6   IPV6 any    any   0/0/CPU0   0       0       0       0       0
OSPF4    IPV4 OSPF   any   0/0/CPU0   0       0       0       0       0
OSPF6    IPV6 OSPF   any   0/0/CPU0   0       0       0       0       0
OSPF_MC4 IPV4 any    any   0/0/CPU0   0       0       0       0       0
OSPF_MC6 IPV6 any    any   0/0/CPU0   0       0       0       0       0
BGP4     IPV4 TCP    179   0/0/CPU0   0       0       0       0       0
BGP6     IPV6 TCP    179   0/0/CPU0   0       0       0       0       0

UDP4     IPV4 UDP    any   0/0/CPU0   3704    0       979     0       0
UDP6     IPV6 UDP    any   0/0/CPU0   0       0       0       0       0
TCP4     IPV4 TCP    any   0/0/CPU0   0       0       0       0       0
TCP6     IPV6 TCP    any   0/0/CPU0   0       0       0       0       0
ISIS     CLNS -      any   0/0/CPU0   0       0       0       0       0
MCAST4   IPV4 any    any   0/0/CPU0   0       0       0       0       0
MCAST6   IPV6 any    any   0/0/CPU0   0       0       0       0       0
  Flow Manager 0/0/CPU0:
   Packets in: 3792
   Packets delivered locally without lookups: 83
   Slice lookups: 3709
     Rejects: 979
```

This table describes the significant fields shown in the display.

Table 8: show lpts ifib slices statistics Command Field Descriptions

Field	Description
Slice	Slice number.
L3-proto	Layer 3 protocol (IPv4, IPv6, CLNL).
L4-proto	Layer 4 protocol (TCP, UDP, and others).

Field	Description
Port	Local (destination) TCP or UDP port.
Location	Node location, in the format *rack/slot/module*.

Related Commands

Command	Description
show lpts ifib , on page 20	Displays entries in the IFIB.

show lpts ifib statistics

To display Internal Forwarding Information Base (IFIB) statistics, use the **show lpts ifib statistics** command in EXEC mode.

show lpts ifib statistics [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Displays IFIB statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts ifib statistics** command:

```
RP/0/0/CPU0:router# show lpts ifib statistics

Flow Manager 0/RP1/CPU0:
   Packets in:254
   Packets delivered locally without lookups:0
   Slice lookups:254
     Post-lookup error drops:
      Failed ipv4_netio_input:1
     Rejects:254
    Packets delivered locally:0
    Packets delivered remotely:0
```

This table describes the significant fields shown in the display.

Table 9: show lpts ifib statistics Command Field Descriptions

Field	Description
Packets in	Packets presented to the LPTS decaps node in netio.
Packets delivered locally without lookups	Packets previously resolved on a LC delivered directly to L3.
Slice lookups	Packets requiring slice lookups.
Post-lookup error drops	Packets dropped after a slice lookup.
Rejects	Packets that caused a TCP RST or ICMP Port/Protocol Unreachable.
Packets delivered locally	Packets delivered to local applications after slice lookups.
Packets delivered remotely	Packets delivered to applications on remote RPs.

Note The sample output is an example only and displays only those fields showing a value. No display exists for nonzero values. This command may show other values depending on your router configuration.

Related Commands

Command	Description
show lpts ifib , on page 20	Displays the entries in an IFIB slice.

show lpts ifib times

To display Internal Forwarding Information Base (IFIB) update transaction times, use the **show lpts ifib times** command in EXEC mode.

show lpts ifib times [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Displays IFIB update transaction times for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Modes

EXEC

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts ifib times** command:

```
RP/0/0/CPU0:router# show lpts ifib times

Slice    L3   L4     Port  Location
-------- ---- ------ ----- --------
RAWIP4   IPV4 any    any   0/RP1/CPU0
RAWIP6   IPV6 any    any   0/RP1/CPU0
OSPF4    IPV4 OSPF   any   0/RP1/CPU0
OSPF6    IPV6 OSPF   any   0/RP1/CPU0
OSPF_MC4 IPV4 any    any   0/RP1/CPU0
OSPF_MC6 IPV6 any    any   0/RP1/CPU0
BGP4     IPV4 TCP    179   0/RP1/CPU0
BGP6     IPV6 TCP    179   0/RP1/CPU0
UDP4     IPV4 UDP    any   0/RP1/CPU0
UDP6     IPV6 UDP    any   0/RP1/CPU0
TCP4     IPV4 TCP    any   0/RP1/CPU0
```

```
TCP6     IPV6 TCP    any   0/RP1/CPU0
ISIS     CLNS -      any   0/RP1/CPU0
MCAST4   IPV4 any    any   0/RP1/CPU0
MCAST6   IPV6 any    any   0/RP1/CPU0
Flow Manager 0/RP1/CPU0:
 total:5 tx 13 upd 1/-/1ms/tx
```

This table describes the significant fields shown in the display.

Table 10: show lpts ifib times Command Field Descriptions

Field	Description
Slice	Slice number.
L3 Protocol	Layer 3 protocol (IPv4, IPV6, CLNL).
L4 Protocol	Layer 4 protocol (TCP, UDP, and so on).
Port	Local (destination) TCP or UDP port.
Location	Node location, in the format *rack/slot/module*.

Related Commands

Command	Description
show lpts ifib , on page 20	Displays detailed information about entries in an IFIB slice.

show lpts mpa groups

To display aggregate information about multicast bindings for groups, use the **show lpts mpa groups** command in EXEC mode.

show lpts mpa groups *type interface-path-id*

Syntax Description

type	Interface type. For more information, use the question mark (?) online help function.

interface-path-id	Either a physical interface instance or a virtual interface instance as follows: • Physical interface instance. Naming notation is *rack/slot/module/port* and a slash between values is required as part of the notation. ◦ *rack*: Chassis number of the rack. ◦ *slot*: Physical slot number of the modular services card or line card. ◦ *module*: Module number. A physical layer interface module (PLIM) is always 0. ◦ *port*: Physical port number of the interface. **Note** In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0 or RP1) and the module is CPU0. Example: interface MgmtEth0/ RP1/CPU0/0. • Virtual interface instance. Number range varies depending on interface type. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was supported.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **show lpts mpa groups** command is used to aggregate information about the multicast groups joined on a specified interface. This command also displays the filter mode and source list associated with the groups joined on a specified interface.

Task ID

Task ID	Operations
lpts	read
network	read

The following sample output is from the **show lpts mpa groups** command:

```
RP/0/0/CPU0:router# show lpts mpa groups POS 0/0/0/0

  224.0.0.2 : includes 0, excludes 1, mode EXCLUDE
    <no source filter>
  224.0.0.13 : includes 0, excludes 1, mode EXCLUDE
    <no source filter>
  224.0.0.22 : includes 0, excludes 1, mode EXCLUDE
    <no source filter>
```

This table describes the significant fields shown in the display.

Table 11: show lpts mpa groups Command Field Descriptions

Field	Description
Includes	Displays the number of sockets that have set up an INCLUDE mode filter for that group and if there are any source-specific filters.
Excludes	Displays the number of sockets that have set up an EXCLUDE mode filter for that group and if there are any source-specific filters.

show lpts pifib

To display Pre-Internal Forwarding Information Base (Pre-IFIB) entries, use the **show lpts pifib** command in EXEC mode.

show lpts pifib [entry] [hardware {**entry | police**}**[type {isis | ipv4 | ipv6}**{**frag | ixmp | mcast | tcp | udp | ipsec | raw | all**}[**entry**] **brief [statistics][location** *node-id*]

Syntax Description

entry	(Optional) Pre-IFIB entry.
hardware	(Optional) Displays hardware for Pre-IFIB.
entry	Displays the entries for Pre-IFIB.
police	Displays the policer values that are being use.
type	(Optional) Protocol type.
isis	Intermediate System-to-Intermediate System (IS-IS) sub Pre-IFIB type.
ipv4	IPv4 sub Pre-IFIB type. Possible values include **frag** , **ixmp** , **mcast** , **tcp** , **udp** , **ipsec** , and **raw** .
ipv6	IPv6 sub Pre-IFIB type. Possible values include **frag** , **icmp** , **ixmp** , **mcast** , **tcp** , **udp** , **ipsec, and raw** .

frag	IPv4 or IPv6 fragment.
icmp	IPv4 or IPv6 IXMP and Internet Group Management Protocol (IGMP).
ixmp	IPv4 or IPv6 IXMP (ICMP and Internet Group Management Protocol [IGMP]).
mcast	IPv4 or IPv6 Multicast.
tcp	IPv4 or IPv6 Transmission Control Protocol (TCP).
udp	IPv4 or IPv6 User Datagram Protocol (UDP).
ipsec	Secure IP.
raw	IPv4 orIPv6 raw IP.
all	All sub Pre-IFIBs.
brief	(Optional) Pre-IFIB entries in brief format.
statistics	(Optional) Pre-IFIB table with statistics information.
location *node-id*	(Optional) The *node-id* argument is entered in the *rack/slot/module* notation (for example, 0/7/CPU0).

Command Default

By default, all entries are displayed.

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was supported.
Release 3.6.0	The **hardware** keyword was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **show lpts pifib** command with the **brief** keyword to perform the following functions:

- Display entries of all or part of a Pre-IFIB.
- Display a short description of each entry in the LPTS Pre-IFIB, optionally displaying packet counts for each entry.

Note These statistics are used only for packets that are processed by a line card, route processor, or distributed route processor.

Pre-IFIB statistics for packets processed by line card hardware are counted separately.

By default, all the defaults are displayed.

Task ID

Task ID	Operations
lpts	read

The following is sample output for the **show lpts pifib** command:

```
RP/0/0/CPU0:router# show lpts pifib

O - Opcode; F - Flow Type; L - Listener Tag; I - Local Flag; T - Min TTL;
na - Not Applicable
-----------------------------------------------------
L3 Protocol       : CLNS
L4 Protocol       : -
VRF-ID            : default (0x60000000)
Destination IP    : any
Source IP         : any
Port/Type         : any
Source Port       : any
Is Fragment       : 0
Is SYN            : 0
Interface         : any (0x0)
O/F/L/I/T         : DELIVER/ISIS-default/CLNS_STACK/0/0
Deliver List      : FGID 11935
Accepts/Drops     : 0/0
Is Stale          : 0
```

The following is sample output for the **show lpts pifib type** command using the **ipv4** and **tcp** keywords.

```
RP/0/0/CPU0:router# show lpts pifib type ipv4 tcp

O - Opcode; F - Flow Type; L - Listener Tag; I - Local Flag; T - Min TTL;
na - Not Applicable
-----------------------------------------------------
L3 Protocol       : IPV4
L4 Protocol       : TCP
VRF-ID            : default (0x60000000)
Destination IP    : any
Source IP         : any
Port/Type         : Port:23
Source Port       : any
Is Fragment       : 0
Is SYN            : 0
Interface         : any (0x0)
O/F/L/I/T         : DELIVER/TELNET-default/IPv4_LISTENER/0/0
Deliver List      : 0/

0/CPU0
Accepts/Drops     : 0/0
Is Stale          : 0
-----------------------------------------------------
```

The following is sample output from the **show lpts pifib entry brief** command:

```
RP/0/0/CPU0:router# show lpts pifib entry brief

* - Critical Flow; I - Local Interest;
X - Drop; R - Reassemble;

 Type       VRF-ID   Local, Remote Address.Port L4    Interface    Deliver
 ---------- -------- -------------------------- ----- ------------ -------------

 ISIS       *        - -                        -     any          0/0/CPU0
 IPv4_frag  *        any any                    any   any          R
 IPv4_IXMP  *        any.ECHO any               ICMP  any          XI
 IPv4_IXMP  *        any.TSTAMP any             ICMP  any          XI
 IPv4_IXMP  *        any.MASKREQ any            ICMP  any          XI
 IPv4_IXMP  *        any any                    ICMP  any          0/0/CPU0
 IPv4_IXMP  *        any any                    IGMP  any          0/0/CPU0
 IPv4_mcast *        224.0.0.5 any              any   any          0/0/CPU0
 IPv4_mcast *        224.0.0.6 any              any   any          0/0/CPU0
 IPv4_mcast *        224.0.0.0/4 any            any   any          0/0/CPU0

 IPv4_TCP   *        any.179 any                TCP   any          0/0/CPU0
 IPv4_TCP   *        any any.179                TCP   any          0/0/CPU0
 IPv4_TCP   *        any any                    TCP   any          0/0/CPU0
 IPv4_UDP   *        any any                    UDP   any          0/0/CPU0
 IPv4_IPsec *        any any                    ESP   any          0/0/CPU0
 IPv4_IPsec *        any any                    AH    any          0/0/CPU0
 IPv4_rawIP *        any any                    OSPF  any          0/0/CPU0
 IPv4_rawIP *        any any                    any   any          0/0/CPU0
 IPv6_frag  *        any any                    any   any          R
 IPv6_ICMP  *        any.na any                 ICMP6 any          XI
 IPv6_ICMP  *        any any                    ICMP6 any          0/0/CPU0
 IPv6_mcast *        ff02::5 any                any   any          0/0/CPU0
 IPv6_mcast *        ff02::6 any                any   any          0/0/CPU0
 IPv6_mcast *        ff00::/8 any               any   any          0/0/CPU0
 IPv6_TCP   *        any.179 any                TCP   any          0/0/CPU0
 IPv6_TCP   *        any any.179                TCP   any          0/0/CPU0
 IPv6_TCP   *        any any                    TCP   any          0/0/CPU0
 IPv6_UDP   *        any any                    UDP   any          0/0/CPU0
 IPv6_IPsec *        any any                    ESP   any          0/0/CPU0
 IPv6_IPsec *        any any                    AH    any          0/0/CPU0
 IPv6_rawIP *        any any                    OSPF  any          0/0/CPU0
 IPv6_rawIP *        any any                    any   any          0/0/CPU0
```

The following sample output is from the **show lpts pifib entry brief statistics** command:

```
RP/0/0/CPU0:router# show lpts pifib entry brief statistics

* - Critical Flow; I - Local Interest;
X - Drop; R - Reassemble;

 Type       VRF-ID   Local, Remote Address.Port L4    Interface    Accepts/Drops

 ---------- -------- -------------------------- ----- ------------ -------------

 ISIS       *        - -                        -     any          0/0
 IPv4_frag  *        any any                    any   any          0/0
 IPv4_IXMP  *        any.ECHO any               ICMP  any          0/0
 IPv4_IXMP  *        any.TSTAMP any             ICMP  any          0/0
 IPv4_IXMP  *        any.MASKREQ any            ICMP  any          0/0
 IPv4_IXMP  *        any any                    ICMP  any          5/0
 IPv4_IXMP  *        any any                    IGMP  any          0/0
 IPv4_mcast *        224.0.0.5 any              any   any          0/0
 IPv4_mcast *        224.0.0.6 any              any   any          0/0
 IPv4_mcast *        224.0.0.0/4 any            any   any          0/0
 IPv4_TCP   *        any.179 any                TCP   any          0/0
 IPv4_TCP   *        any any.179                TCP   any          0/0
 IPv4_TCP   *        any any                    TCP   any          0/0
 IPv4_UDP   *        any any                    UDP   any          4152/0
 IPv4_IPsec *        any any                    ESP   any          0/0
 IPv4_IPsec *        any any                    AH    any          0/0
```

```
 IPv4_rawIP *        any any                    OSPF  any          0/0

----------------------


statistics:

Type            Num. Entries         Accepts/Drops

------          ------------         -------------
ISIS            1                    0/0
IPv4_frag       1                    0/0
IPv4_IXMP       5                    5/0
IPv4_mcast      3                    0/0
IPv4_TCP        3                    0/0
IPv4_UDP        1                    4175/0
IPv4_IPsec      2                    0/0
IPv4_rawIP      2                    0/0
IPv6_frag       1                    0/0
IPv6_ICMP       2                    0/0
IPv6_mcast      3                    0/0
IPv6_TCP        3                    0/0
IPv6_UDP        1                    0/0
IPv6_IPsec      2                    0/0
IPv6_rawIP      2                    0/0
Total           32

Packets into Pre-IFIB: 4263
Lookups: 4263
Packets delivered locally: 4263
Packets delivered remotely: 0
```

This table describes the significant fields shown in the display for the **show lpts pifib brief statistics** command.

Table 12: show lpts pifib Command Field Descriptions

Field	Description
Type	Hardware entry type.
VRF ID	VPN routing and forwarding (VRF) identification (vrfid) number.
Local, Remote Address. Port	Indicates local address (in the form of local port and type) and remote address (remote port).
L4	Layer 4 protocol of the entry.
Interface	Interface for this entry.
Accepts/Drops	Number of packets sent to DestAddr/Number of packets dropped due to policing.
Num. Entries	Number of pre-ifib entries of the listed type.
Packets into Pre-IFIB	Packets presented for pre-IFIB lookups.
Lookups	Packets looked up.

Field	Description
Packets delivered locally	Packets delivered to local applications or the local stack (*n* duplicated) packets duplicated for delivery to applications and the local stack.
Packets delivered remotely	Packets delivered to applications or for lookup on other RPs.

show lpts pifib hardware context

To display the context for the Local Packet Transport Services (LPTS) pre-IFIB hardware-related data structures, use the **show lpts pifib hardware context** command in EXEC mode.

show lpts pifib hardware context [**location** {**all**| *node_id* }]

Syntax Description

location *node-id*	(Optional) Displays pre-Internal Forwarding Information Base (IFIB) information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.
all	Specifies all locations.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts pifib hardware context** command with the **location** keyword:

```
RP/0/0/CPU0:router# show lpts pifib hardware context location 0/1/0

Node: 0/1/CPU0:
----------------------------------------
ACL ID for block 0: 3
Batching mode: No batching
TCAM Mgr ready: Yes
Mstats Mgr ready: Yes
Metro Driver ready: Yes
Resource sync: Yes
Sweep invoked: Yes
Initialization phase: Done
Queue for TCAM Batching:
    Size: 0 Head ptr: 0x0
Queue for Entry Processing:
    Size: 0 Head ptr: 0x0
Queue for Resources Releasing:
    Size: 0 Head ptr: 0x0
--------
IPv4 Region:
Block [0]:
    # of TCAM entries: 56 block created: Yes
    first entry in the block: 0x482a055c
Last non mandatory entry: 0x482c1a08
Queue for Mandatory entries not in TCAM:
    Size: 0 Head ptr: 0x0
Queue for Non Mandatory entries not in TCAM:
    Size: 0 Head ptr: 0x0
1st entry to be programmed: 0x0
Max. of entries: 15999
# of entries in shadow list: 54
1st entry in shadow list: 0x482a055c
last entry in shadow list: 0x48303534
--------
IPv6 Region:
Block [0]:
    # of TCAM entries: 20 block created: Yes
    first entry in the block: 0x482c1720
Last non mandatory entry: 0x482c1b00
Queue for Mandatory entries not in TCAM:
    Size: 0 Head ptr: 0x0
Queue for Non Mandatory entries not in TCAM:
    Size: 0 Head ptr: 0x0
1st entry to be programmed: 0x0
Max. of entries: 15999
# of entries in shadow list: 20
1st entry in shadow list: 0x482c1720
last entry in shadow list: 0x482e2344
--------
ISIS Region:
Block [0]:
    # of TCAM entries: 1 block created: Yes
    first entry in the block: 0x482e2cf4
Last non mandatory entry: 0xfd30d088
Queue for Mandatory entries not in TCAM:
    Size: 0 Head ptr: 0x0
Queue for Non Mandatory entries not in TCAM:
    Size: 0 Head ptr: 0x0
1st entry to be programmed: 0x0
Max. of entries: 15999
# of entries in shadow list: 1
1st entry in shadow list: 0x482e2cf4
last entry in shadow list: 0x482e2cf4
# of TCAM Insert: 0
# of TCAM Delete: 0
# of TCAM Update: 0
# of resource leaks: 0
```

show lpts pifib hardware entry

To display entries in the Local Packet Transport Services (LPTS) pre-IFIB hardware table, use the **show lpts pifib hardware entry** command in EXEC mode.

show lpts pifib hardware entry [**type** {**ipv4**| **ipv6**| **isis**}] [**start-index** *number* **num-entries** *number*] [**brief**| **statistics**] [**location** {**all**| *node_id*}]

Syntax Description

type	(Optional) Specifies the hardware entry type. Enter one of the following types: • **ipv4 —**Specifies IPv4 entries. • **ipv6 —**Specifies IPv6 entries. • **isis —**Specifies ISIS entries.
start-index *number*	(Optional) Starting index number.
num-entries *number*	(Optional) Maximum entries permitted.
brief	(Optional) Displays summary hardware entry information.
statistics	(Optional) Displays hardware entry accept or drop statistics for each summary entry.
all	Specifies all locations.

Command Default

Displays hardware entry information in brief.

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.6.0	The **all** keyword was added.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts pifib hardware entry** command with the **location** keyword:

```
RP/0/0/CPU0:router# show lpts pifib hardware entry location 0/1/CPU0

Node: 0/0/CPU0:
----------------------------------------
M - Fabric Multicast;
L - Listener Tag; T - Min TTL;
F - Flow Type;
DestNode - Destination Node;
DestAddr - Destination Fabric queue;
SID - Stream ID;
Po - Policer; Ct - Stats Counter;
Lp - Lookup priority; Sp - Storage Priority;
Ar - Average rate limit; Bu - Burst;
HAr - Hardware Average rate limit; HBu - Hardware Burst;
Cir - Committed Information rate in HAL
Rsp - Relative sorting position;
Rtp - Relative TCAM position;
na - Not Applicable or Not Available
-----------------------------------------------------
VRF ID            : any
Destination IP    : any
Source IP         : any
Is Fragment       : 0
Interface         : any
M/L/T/F           : 0/ISIS_FM/0/ISIS-default
DestNode          : 48
DestAddr          : 48
SID               : 9
L4 Protocol       : -
Source port       : any
Destination Port  : any
Ct                : 0xd84da
Accepted/Dropped  : 0/0
Lp/Sp             : 0/0
# of TCAM entries : 1
HPo/HAr/HBu/Cir   : 1879638/2000pps/2000ms/2000pps
State             : Entry in TCAM
Rsp/Rtp           : 0/2

             Node: 0/1/CPU0:
----------------------------------------
V - Vital; M - Fabric Multicast;
C - Moose Congestion Flag; L - Listener Tag; T - Min TTL;
F - Flow Type;
DestNode - Destination Node;
DestAddr - Destination Fabric Address;
Sq - Ingress Shaping Queue; Dq - Destination Queue;
Po - Policer; Ct - Stats Counter;
Lp - Lookup priority; Sp - Storage Priority;
Ar - Average rate limit; Bu - Burst;
Rsp - Relative sorting position;
-----------------------------------------------------
L4 Protocol       : any
VRF ID            : any
Source IP         : any
Port/Type         : any
Source Port       : any
Is Fragment       : 1
```

```
Is SYN            : any
Interface         : any
V/M/C/L/T/F       : 0/0/0/IPv4_REASS/0/Fragment
DestNode          : Local
DestAddr          : Punt
Sq/Dq/Ct          : 4/na/0x24400
Accepted/Dropped  : 0/0
Lp/Sp             : 0/0
# of TCAM entries : 1
Po/Ar/Bu          : 101/1000pps/100ms
State             : Entry in TCAM
Rsp/Rtp           : 0/0
-------------------------------------------------
```

This table describes the significant fields shown in the display.

Table 13: show lpts pifib hardware entry Command Field Descriptions

Field	Description
L4 Protocol	Layer 4 protocol of the entry.
VRF ID	VPN routing and forwarding (VRF) identification (vrfid) number.
Source IP	Source IP address for this entry.
Port/Type	Port or ICMP1 type for this entry.
Source Port	Source port for this entry.
Is Fragment	Indicates if this entry applies to IP fragments.
Is SYN	Indicates if this entry applies to TCP SYNs.
Interface	Interface for this entry.
V/M/C/L/T/F	• V—vital • M—fabric multicast • C—moose congestion flag • L—listener tag • T—minimum time-to-live • F—flow type
DestNode	Destination node to which to send the packet.
DestAddr	Destination address to which to send the packet.

Field	Description
Sq/Dq/Ct	• Sq—Ingress Shaping Queue • Dq—Destination Queue • Ct—Stats Counter.
Accepted/Dropped	Number of packets sent to DestAddr/Number of packets dropped due to policing.

[1]

show lpts pifib hardware police

To display the policer configuration value set, use the **show lpts pifib hardware police** command in EXEC mode.

show lpts pifib hardware police [**location** {*node_id* }]

Syntax Description

location *node-id*	(Optional) Displays pre-Internal Forwarding Information Base (IFIB) information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

If no policer is configured, the default value is the configured rate.

Command Modes

EXEC

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

[1] 1. Internet Control Message Protocol

Task ID

Task ID	Operations
lpts	read

This sample output is from the **show lpts pifib hardware police** command with the **location** keyword for 0/2/CPU0:

```
RP/0/0/CPU0:router#show lpts pifib hardware police location 0/2/CPU0


-------------------------------------------------------------
                Node 0/2/CPU0:
-------------------------------------------------------------
 Burst = 100ms for all flow types
-------------------------------------------------------------
FlowType               Policer Type    Cur. Rate Def. Rate Accepted   Dropped
---------------------- ------- ------- --------- --------- ---------- ---------
unconfigured-default   100     Static  500       500       0          0
Fragment               106     Static  1000      1000      0          0
OSPF-mc-known          107     Static  20000     20000     0          0
OSPF-mc-default        111     Static  5000      5000      0          0
OSPF-uc-known          161     Static  5000      5000      0          0
OSPF-uc-default        162     Static  1000      1000      0          0
ISIS-known             108     Static  20000     20000     0          0
ISIS-default           112     Static  5000      5000      0          0
BFD-known              170     Static  8500      8500      0          0
BFD-default            171     Static  8500      8500      0          0
BFD-MP-known           177     Static  8400      8400      0          0
BFD-MP-0               178     Static  128       128       0          0
BGP-known              113     Static  25000     25000     0          0
BGP-cfg-peer           114     Static  10000     10000     0          0
BGP-default            115     Static  1500      1500      0          0
PIM-mcast-default      116     Static  23000     23000     0          0
PIM-mcast-known        176     Static  23000     23000     0          0
PIM-ucast              117     Static  10000     10000     0          0
IGMP                   118     Static  3500      3500      0          0
ICMP-local             119     Static  2500      2500      0          0
ICMP-app               120     Static  2500      2500      0          0
ICMP-control           164     Static  2500      2500      0          0
ICMP-default           121     Static  2500      2500      0          0
LDP-TCP-known          122     Static  25000     25000     0          0
LDP-TCP-cfg-peer       152     Static  10000     10000     0          0
LDP-TCP-default        154     Static  10000     10000     0          0
LDP-UDP                158     Static  2500      2500      0          0
All-routers            160     Static  10000     10000     0          0
LMP-TCP-known          123     Static  25000     25000     0          0
LMP-TCP-cfg-peer       153     Static  10000     10000     0          0
LMP-TCP-default        155     Static  10000     10000     0          0
LMP-UDP                159     Static  2500      2500      0          0
RSVP-UDP               124     Static  7000      7000      0          0
RSVP-default           125     Static  500       500       0          0
RSVP-known             126     Static  7000      7000      0          0
IKE                    127     Static  1000      1000      0          0
IPSEC-known            129     Static  3000      3000      0          0
IPSEC-default          128     Static  1000      1000      0          0
MSDP-known             130     Static  1000      1000      0          0
MSDP-cfg-peer          131     Static  1000      1000      0          0
MSDP-default           132     Static  1000      1000      0          0
SNMP                   133     Static  2000      2000      0          0
SSH-known              135     Static  1000      1000      0          0
SSH-default            136     Static  1000      1000      0          0
HTTP-known             137     Static  1000      1000      0          0
HTTP-default           138     Static  1000      1000      0          0
SHTTP-known            139     Static  1000      1000      0          0
IFIB_FT_SHTTP_DEFAULT  140     Static  1000      1000      0          0
```

```
TELNET-known            141     Static  1000      1000      0           0
TELNET-default          142     Static  1000      1000      0           0
CSS-known               143     Static  1000      1000      0           0
CSS-default             144     Static  1000      1000      0           0
RSH-known               145     Static  1000      1000      0           0
RSH-default             146     Static  1000      1000      0           0
UDP-known               147     Static  25000     25000     0           0
UDP-listen              156     Static  4000      4000      0           0
UDP-cfg-peer            157     Static  4000      4000      0           0
UDP-default             101     Static  500       500       0           0
TCP-known               148     Static  25000     25000     0           0
TCP-listen              149     Static  25000     25000     0           0
TCP-cfg-peer            150     Static  25000     25000     0           0
TCP-default             102     Static  500       500       0           0
Mcast-known             151     Static  25000     25000     0           0
Mcast-default           103     Static  500       500       0           0
Raw-listen              104     Static  500       500       0           0
Raw-default             105     Static  500       500       0           0
Ip-Sla                  163     Static  10000     10000     0           0
EIGRP                   109     Static  20000     20000     0           0
RIP                     110     Static  20000     20000     0           0
L2TPv3                  165     Static  25000     25000     0           0
PCEP                    166     Static  100       100       0           0
GRE                     167     Static  1000      1000      0           0
VRRP                    168     Static  1000      1000      0           0
HSRP                    169     Static  400       400       0           0
MPLS-oam                172     Static  100       100       0           0
L2TPv2                  179     Static  25000     25000     0           0
DNS                     173     Static  500       500       0           0
RADIUS                  174     Static  7000      7000      0           0
TACACS                  175     Static  500       500       0           0
NTP-default             134     Static  500       500       0           0
NTP-known               180     Static  500       500       0           0

-------------------------
statistics:
Packets accepted by deleted entries: 0
Packets dropped by deleted entries: 0
Run out of statistics counter errors: 0
```

This table describes the significant fields shown in the display.

Table 14: show lpts pifib hardware police Command Field Descriptions

Field	Description
FlowType	Type of flow that is binding between a tuple and a destination.
Rate (PPS)	Policer rate in packets per second (PPS).
Accept	Number of packets that are accepted by this policer.
Drop	Number of packets that are dropped by this policer.

Related Commands

Command	Description
flow (LPTS), on page 5	Configures the policer for the LPTS flow type.

Command	Description
lpts pifib hardware police, on page 10	Configures the ingress policers and enters pifib policer global configuration mode.

show lpts pifib hardware usage

To display hardware table usage, use the **show lpts pifib hardware usage** command in EXEC mode.

show lpts pifib hardware usage [**type** {**ipv4**| **ipv6**| **isis**}] [**location** {*node-id*| **all**}]

Syntax Description

type	(Optional) Specifies the hardware entry type. Enter one of the following types: • **ipv4 —**Specifies IPv4 entries. • **ipv6 —**Specifies IPv6 entries. • **isis —**Specifies ISIS entries.
location *node-id*	(Optional) Displays pre-Internal Forwarding Information Base (IFIB) information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.
a ll	(Optional) Specifies all locations.

Command Default

Without the optional parameters, the **show lpts pifib hardware usage** command displays a brief summary of hardware entry information.

Command Modes

EXEC

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts pifib hardware usage** command with the **location** keyword:

```
RP/0/0/CPU0:router# show lpts pifib hardware usage location 0/1/cpu0

Type       Size            Used            Used(%)
---------- --------------- --------------- -------
ipv4       6000            21              0.35
ipv6       4000            15              0.38
isis       4000            1               0.03
```

This table describes the significant fields shown in the display.

Table 15: show lpts pifib hardware usage Command Field Descriptions

Field	Description
Type	Type of pre-IFIB entry.
Size	Maximum number of entries (72-bits) allowed for the type.
Used	Number of entries in use.
Used(%)	Percentage of total entries in use.

show lpts pifib statistics

To display Pre-Internal Forwarding Information Base (Pre-IFIB) statistics, use the **show lpts ifib statistics** command in EXEC mode.

show lpts pifib statistics [**location** *node-id*]

Syntax Description

location *node-id*	(Optional) Displays Pre-IFIB statistics for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts pifib statistics** command:

```
RP/0/0/CPU0:router# show lpts pifib statistics

Packets into Pre-IFIB:80
Lookups:80
Packets delivered locally:80
Packets delivered remotely:0
```

This table describes the significant fields shown in the display.

Table 16: show lpts pifib statistics Command Field Descriptions

Field	Description
Packets into Pre-IFIB	Packets presented for pre-IFIB lookups.
Lookups	Packets looked up.
Packets delivered locally	Packets delivered to local applications or the local stack (*n* duplicated) packets duplicated for delivery to applications and the local stack.
Packets delivered remotely	Packets delivered to applications or for lookup on other RPs.

Related Commands

Command	Description
show lpts pifib , on page 32	Displays information about pre-IFIB entries.

show lpts port-arbitrator statistics

To display local packet transport services (LPTS) port arbitrator statistics, use the **show lpts port-arbitrator statistics** command in EXEC mode.

show lpts port-arbitrator statistics

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts port-arbitrator statistics** command:

```
RP/0/0/CPU0:router# show lpts port-arbitrator statistics

LPTS Port Arbitrator statistics:
 PA FGID-DB library statistics:
  0 FGIDs in use, 512 cached, 0 pending retries
  0 free allocation slots, 0 internal errors, 0 retry attempts
  1 FGID-DB notify callback, 0 FGID-DB errors returned
  FGID-DB permit mask: 0x7 (alloc mark rack0)
  PA API calls:
            1 init              1 realloc_done
            8 alloc             8 free
           16 join             16 leave
            8 detach
  FGID-DB API calls:
            1 register          1 clear_old
            1 alloc             0 free
           16 join             16 leave
            0 mark              1 mark_done
```

show lpts vrf

To display the Local Packet Transport Services (LPTS) VPN routing and forwarding (VRF) instance identification numbers and names, use the **show lpts vrf** command in EXEC mode.

show lpts vrf

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes EXEC

Command History

Release	Modification
Release 3.3.0	This command was introduced.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
lpts	read

The following sample output is from the **show lpts vrf** command:

```
RP/0/0/CPU0:router# show lpts vrf

VRF-ID      VRF-NAME
0x00000000  *
0x60000000  default
```

This table describes the significant fields shown in the display.

Table 17: show lpts vrf Command Field Descriptions

Field	Description
VRF-ID	VPN routing and forwarding (VRF) identification (vrfid) number.
VRF-NAME	Name given to the VRF.