



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*.

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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 <i>node-id</i>	(Optional) Clears the IFIB statistics for the designated node. The <i>node-id</i> argument is entered in standard <i>rack/slot/module</i> notation.
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Command Default

No default behavior or values

Command Modes

EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

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

Examples

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 31	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 <i>node-id</i>	Clears the Pre-IFIB hardware statistics for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
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Command Default

No default behavior or values

Command Modes

EXEC mode

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

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

Examples

Related Commands

Command	Description
show lpts pifib hardware police , on page 48	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 <i>node-id</i>	Clears the Pre-IFIB statistics for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
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Command Default

No default behavior or values

Command Modes

EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

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

Examples

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 53	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 <i>rate</i>	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

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
bgp-default	Packets from unconfigured, newly configured, or wildcard BGP peers.	10000

Flow Type	Description	Default Packet Rate (Recommended)
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
isis-known	IS-IS packets for configured interfaces.	20000

Flow Type	Description	Default Packet Rate (Recommended)
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
ntp-default	Packets from a new or newly established NTP session.	500

Flow Type	Description	Default Packet Rate (Recommended)
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 SHTTP session.	1000
shttp-known	Packets from an established SHTTP session.	1000
snmp	SNMP packets.	2000
ssh-default	Packets from a new or newly established SSH session.	1000

Flow Type	Description	Default Packet Rate (Recommended)
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

Examples

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 2222
```

Ipts 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.

To map the LPTS policer with an ACL, use the **lpts pifib hardware police acl** command in Global Configuration mode.

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

Command Modes

Global Configuration mode

Command History

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

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
lpts	read, write
config-services	read, write

Examples

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
```

This example shows how to configure the TOS precedence for the 0/2/CPU0 location using the **lpts pifib hardware police** command:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# lpts pifib hardware police location 0/2/CPU0 flow telnet default
precedence 5 3 6
```

Related Commands

Command	Description
flow (LPTS), on page 5	Configures the policer for the LPTS flow type.
show lpts pifib hardware police, on page 48	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 {cnl| ipsec| ipv4-io| ipv6-io| mpa| tcp| test| udp| raw}]
[brief] [vrf vrf-name]
```

Syntax Description

location <i>node-id</i>	(Optional) Displays information for the specified node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
client-id	(Optional) Type of client. It can be one of the following values: <ul style="list-style-type: none"> • cnl —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 <i>vrf-name</i>	(Optional) Name of assigned VRF.

Command Default

No default behavior or values

Command Modes

EXEC mode

Command History

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

Usage Guidelines

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

Examples

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 <i>rack/slot/module</i> .
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.

Field	Description
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 <i>rack/slot/module</i> .
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 18	Displays the client information for the Port Arbitrator.
show lpts flows , on page 20	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

Command History

Release	Modification
Release 3.2	This command was supported.

Usage Guidelines

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

Examples

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

```
RP/0/0/CPU0:router# show lpts clients
o_flg - open flags ; clid - client id
clid      loc      flags  o_flg
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.

Field	Description
Loc	Node location, in the format <i>rack/slot/module</i> .
Flags	Client flags. Note The client flags are used only for debugging purposes.
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_flg - open flags ; clid - client id
clid      loc      flags  o_flg
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 13	Displays the binding information in the port arbitrator.
show lpts flows, on page 20	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.
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Command Default

No default behavior or values

Command Modes

EXEC mode

Command History

Release	Modification
Release 3.2	This command was supported.

Usage Guidelines

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

Examples

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.).
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	<ul style="list-style-type: none"> • 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	<i>rack/slot/module</i> to deliver to

Field	Description
Element References	<ul style="list-style-type: none"> • location: <i>rack/slot/module</i> 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: <ul style="list-style-type: none"> • <i>rack/slot/module</i>— 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 13	Displays the binding information in the port arbitrator.
show lpts clients, on page 18	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. <ul style="list-style-type: none"> • 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 <i>node-id</i>	(Optional) Specifies the location of the Flow Manager. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Command Default No default behavior or values

Command Modes EXEC mode

Command History

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

Usage Guidelines

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

Examples

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
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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • (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 28	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. <ul style="list-style-type: none"> • 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 mode

Command History

Release	Modification
Release 3.2	This command was supported.

Usage Guidelines

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

Examples

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

```

show lpts ifib slices

```

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).
Port	Local (destination) TCP or UDP port.
Location	Node location, in the format <i>rack/slot/module</i> .

Related Commands

Command	Description
show lpts ifib , on page 24	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 <i>node-id</i>	(Optional) Displays IFIB statistics for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
---------------------------	--------------------------------	--

Command Default No default behavior or values

Command Modes EXEC mode

Command History	Release	Modification
	Release 3.2	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID	Task ID	Operations
	lpts	read

Examples 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 24	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 <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
-------------------------	--

Command Modes

EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
lpts	read

Examples

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/-/lms/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 <i>rack/slot/module</i> .

Related Commands

Command	Description
show lpts ifib , on page 24	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 mode

Command History

Release	Modification
Release 3.2	This command was supported.

Usage Guidelines

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

Examples

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 or IPv6 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 mode

Command History

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

Usage Guidelines

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

Examples

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

```

show lpts pifib

```

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.
Packets delivered locally	Packets delivered to local applications or the local stack (<i>n</i> 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 <i>node-id</i>	(Optional) Displays pre-Internal Forwarding Information Base (IFIB) information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
all	Specifies all locations.

Command Default

No default behavior or values

Command Modes

EXEC mode

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
lpts	read

Examples

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: <ul style="list-style-type: none"> • ipv4 —Specifies IPv4 entries. • ipv6 —Specifies IPv6 entries. • isis —Specifies ISIS entries.
start-index <i>number</i>	(Optional) Starting index number.
num-entries <i>number</i>	(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 mode

Command History

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

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID	Task ID	Operations
	lpts	read

Examples

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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none">• 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](#)

¹ 1. Internet Control Message Protocol

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

Command Default

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

Command Modes

EXEC mode

Command History

Release	Modification
Release 3.6.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
lpts	read

Examples

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

show lpts pifib hardware police

```

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.
lpts pifib hardware police, on page 11	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: <ul style="list-style-type: none"> • 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 <i>node-id</i> argument is entered in the <i>rack/slot/module</i> 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 mode

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
lpts	read

Examples

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

Command Default

No default behavior or values

Command Modes

EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
lpts	read

Examples

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.

Field	Description
Lookups	Packets looked up.
Packets delivered locally	Packets delivered to local applications or the local stack (<i>n</i> 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 37	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 mode

Command History	Release	Modification
	Release 3.3.0	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID	Task ID	Operations
	lpts	read

Examples 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 mode

Command History	Release	Modification
	Release 3.3.0	This command was introduced.

Usage Guidelines No specific guidelines impact the use of this command.

Task ID	Task ID	Operations
	lpts	read

Examples 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.