

LPTS Commands

Note All commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 540 Series Router that is introduced from Cisco IOS XR Release 6.3.2. References to earlier releases in Command History tables apply to only the Cisco NCS 5500 Series Router.

Note

- Starting with Cisco IOS XR Release 6.6.25, all commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 560 Series Routers.
- Starting with Cisco IOS XR Release 6.3.2, all commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 540 Series Router.
- References to releases before Cisco IOS XR Release 6.3.2 apply to only the Cisco NCS 5500 Series Router.
- Cisco IOS XR Software Release 7.0.1 specific updates are not applicable for the following variants of Cisco NCS 540 Series Routers:
  - N540-28Z4C-SYS-A
  - N540-28Z4C-SYS-D
  - N540X-16Z4G8Q2C-A
  - N540X-16Z4G8Q2C-D
  - N540X-16Z8Q2C-D
  - N540-12Z20G-SYS-A
  - N540-12Z20G-SYS-D
  - N540X-12Z16G-SYS-A
  - N540X-12Z16G-SYS-D

This chapter describes the Cisco IOS XR software commands used to monitor Local Packet Transport Services on NCS 5000 routers.

For detailed information about LPTS concepts, configuration tasks, and examples, refer to the *IP Addresses and Services Configuration Guide for Cisco NCS 5500 Series RoutersIP Addresses and Services Configuration Guide for Cisco NCS 540 Series RoutersIP Addresses and Services Configuration Guide for Cisco NCS 560 Series Routers*.

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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 XR EXEC mode.

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

Syntax Description

location *node-id*	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

XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
lpts	execute

Examples

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

```
RP/0/RP0/CPU0:router# clear lpts ifib statistics
```

clear lpts pifib statistics

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

XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
lpts	execute

Examples

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

```
RP/0/RP0/CPU0:router# clear lpts pifib statistics location 0/RP0/CPU0
```

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 50000.

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 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)
BGP-default	SRC port 179 and Dest Port 179 with protocol as TCP.	4000
fragment	IPv4/v6 fragmented packets.	1000
ICMP-default	All ICMP type packets.	2500
ISIS default	All ISIS protocol packets.	3500

Flow Type	Description	Default Packet Rate (Recommended)
LDP-UDP	UDP with Destination Port 646.	2000
OSPF-MC-default	OSPFv2 (224.0.0.5 and 224.0.0.6) OSPFv3 (FF02::5 and FF02::6).	3500
OSPF-UC-default	OSPFv2 and OSPFv3 Unicast DBD packets.	3000
RAW-default	RAW default entry in LPTS.	500
RSVP-default	All RSVP protocol packets (RSVP signalling, refresh etc...).	14500
TCP-default	All TCP protocol packets (TCP-known, cfg-peer, listen).	25500
Third party applications	All third party application packets.	10000
UDP-default	All UDP protocol packets (UDP-known, CFG-peer, listen).	25500

Task ID

Task ID	Operations
config-services	read, write

Examples

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

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# lpts pifib hardware police
RP/0/RP0/CPU0:router(config-pifib-policer-global)# flow bgp-default rate 4000
```

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

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:routerconfig)# lpts pifib hardware police location 0/2/CPU0
RP/0/RP0/CPU0:router(config-pifib-policer-per-node)# flow isis-default 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 XR Config 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* { **default** } [**rate** *rate*]
no lpts pifib hardware police [**location** *node-id*] [**flow** *flow-type* { **default** } [**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).
default	Indicates generic flows which are policed with default-rate. For example, BGP (*, 179), any packet with port:179 policed with default rate.

Command Modes

XR Config mode

Command History

Release	Modification
Release 6.0	This command was introduced.

Usage Guidelines

Provided that the apllication and the IP-SLA processing rates support it, you can specify the flow rate for IP-SLA flow entries to up to 1500.

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/RP0/CPU0:router(config)# lpts pifib hardware police
RP/0/RP0/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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# lpts pifib hardware police location 0/2/CPU0 flow fragment
rate 1000
```

lpts pifib hardware domain

To configure LPTS ingress domain, use the **lpts pifib hardware domain** command in the configuration mode.

lpts pifib hardware domain *name*

Syntax Description

domain *name*	Specifies ingress domain name.

Command Default

No ingress domain is configured.

Command Modes

XR Config mode

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

None.

Task ID

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

This example shows how to configure the ingress domain using the **lpts pifib hardware domain** command:

```
RP/0/RP0/CPU0:router(config)# lpts pifib hardware domain ACCESS
RP/0/RP0/CPU0:router(config-lpts-domain-ACCESS)#
```

lpts pifib hardware dynamic-flows

To configure LPTS flow types and define the maximum LPTS entries for each flow type in the TCAM use the **lpts pifib hardware dynamic-flows** in configuration mode.

lpts pifib hardware dynamic-flows location *node-id* **flow** *flow-type* **max** *maximum-flow-entries*

Syntax Description

location*node-id*	Configures Dynamic LPTS per node. The *node-id* argument is entered inthe rack/slot/module notation. For more information, use the question mark (?) online help function
flow *flow-type*	Configures speficied flow type.
max *maximum-flow-entries*	Configures maximum flow entries per node. **Note** The maximum flow entry value of zero denotes that a flow type is not configured. For more information, use the question mark (?) online help function

Command Default

Dynamic LPTS is disabled

Command Modes

Configuration

Command History

Release	Modification
Release 6.2.2	This command was introduced.

Usage Guidelines

The sum of maximum LPTS entries configured for all flow types must not exceed 8000 entries. User can configure only configurable LPTS flow types listed in below table.

Table 2: Configurable Flow Types and Default Maximum Flow Entries

Flow Type	Default Maximum Flow Entries
BGP-known	900
BGP-cfg-peer	900
IP-SLA	50
LDP-TCP-known	300
LDP-TCP-cfg-peer	300
SSH-known	150
Telnet Known	150

Flow Type	Default Maximum Flow Entries
NTP known	150
LDP-UDP	300
OSPF-uc-known	300
OSPF-mc-known	600
RSVP known	300
ISIS known	300
TPA	5
PIM-mcast-known	300
IGMP	1200
SNMP	300
VRRP	150
DNS	40
All-routers	300



Note You can increase the flow entries for IP-SLA to 500 by decreasing the other flow entries in such a way that the total of flow entries add up to 8000.

In this example you will configure the BGP-known and ISIS-known LPTS flow type in the TCAM and define the maximum flow entries as 1800 and 500 for node location 0/1/CPU0.

```
Router#configure
Router(config)#lpts pifib hardware dynamic-flows location 0/1/CPU0
Router(config-pifib-flows-per-node)#flow bgp-known max 1800
Router(config-pifib-flows-per-node)#flow ISIS-known max 500
```

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The sum of maximum LPTS entries configured for all flow types must not exceed 2000 entries.

IPv6 LPTS entries take more TCAM space as compared to IPv4 entries. Thus, a system with many IPv6 LPTS entries cannot achieve a scale ~2000 entries.

Users can configure LPTS flow types listed in below table. This is applicable on the following NCS 540 variants

N540X-6Z18G-SYS-A, N540X-6Z18G-SYS-D, N540X-8Z16G-SYS-A, N540X-8Z16G-SYS-D, N540X-4Z14G2Q-A, N540X-4Z14G2Q-D

Table 3: Configurable Flow Types and Default Maximum Flow Entries

Flow Type	Default Maximum Flow Entries
BGP-known	222
BGP-cfg-peer	222
IP-SLA	15
LDP-TCP-known	74
LDP-TCP-cfg-peer	74
SSH-known	37
Telnet Known	37
NTP known	37
LDP-UDP	74
OSPF-uc-known	74
OSPF-mc-known	148
RSVP known	74
ISIS known	74
TPA	5
PIM-mcast-known	74
IGMP	287
SNMP	74
VRRP	37
DNS	10
All-routers	74

In this example you will configure the ISIS-known LPTS flow type in the TCAM and define the maximum flow entries as 100 for node location 0/RP0/CPU0.

```
Router# configure
Router(config)# lpts pifib hardware dynamic-flows location 0/RP0/CPU0
Router(config-pifib-flows-per-node)# flow isis known max 100
Router(config-pifib-flows-per-node)# commit
```

Task ID

Task ID	Operation
lpts	read, write

Task ID	Operation
config-services	read, write

lpts punt police

To configure the ingress policer for the multicast, and broadcast punted traffic or to configure the ingress policer for the protocol punted traffic, use the **lpts punt police** command in XR Config mode. To set the policer to the default value, use the **no** form of this command.

lpts punt police { **bcast** | **domain** *name* | **interface** *name* | **location** *node-id* | **mcast** | **protocol** { **arp | cdp | lacp | l2pt } } **rate** *rate*

Syntax Description

bcast	Specifies broadcast packets.
domain *name*	Specifies LPTS domain name.
interface *name*	Specifies specific interface location.
location *node-id*	Specifies the designated location. The *node-id* argument is entered in the *rack/slot/module* notation.
mcast	Specifies multicast packets.
protocol	Specifies protocol packets. Following protocols are supported: • ARP • CDP • LACP • L2PT
rate *rate*	LPTS policer rate in packets per second (PPS). **Note** The PPS minimum and maximum range depends on a platform.

Command Default

No rate limit is configured.

Command Modes

XR Config mode

Command History

Release	Modification
Release 6.6.3	This command was introduced.
Release 25.2.1	Added support for L2PT protocol.

Usage Guidelines

After configuring the policer rates, the commit is accepted successfully. However, it is recommended to verify if there's any error message captured in the syslog.

Task ID

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

Examples

This example shows how to configure the rate limit the multicast, broadcast and protocol punted traffic using the **lpts punt police** command at the global level:

```
RP/0/RP0/CPU0:router(config)# lpts punt police
RP/0/RP0/CPU0:router(config-lpts-punt-policer-global)# bcast rate 1000
RP/0/RP0/CPU0:router(config-lpts-punt-policer-global)# mcast rate 1000
RP/0/RP0/CPU0:router(config-lpts-punt-policer-global)# protocol arp rate 700
RP/0/RP0/CPU0:router(config-lpts-punt-policer-global)# protocol lacp rate 700
```

Examples

This example shows how to configure rate limit of 900 pps for the L2PT protocol packets:

```
Router#configure
Router(config)# lpts punt police location 0/0/cpu
Router(config-lpts-punt-policer)# protocol l2pt rate 900
```

lpts punt police location exception ipv4

To modify the default policer rate for the IPv4 packets that require fragmentation or TTL Error packets received on the router, use the **lpts punt police location** *node-id* **exception ipv4** command in XR Config mode. To set the policer rate to the default value, use the **no** form of this command.

lpts punt police location *node-id* **exception ipv4** { **fragment** | **ttl-error** } **rate** *rate*

Syntax Description

fragment	Specifies the IPv4 packets that require fragmentation received on the router.
ttl-error	Specifies the IPv4 TTL error packets received on the router.
rate *rate*	LPTS policer rate in packets per second (PPS). **Note** The PPS minimum and maximum range depends on a platform.

Command Default

The default policer rate for the IPv4 fragment is 4000 PPS.

Command Modes

XR Config mode

Command History

Release	Modification
Release 6.6.3	This command was introduced.

Usage Guidelines

- After configuring the policer rates, the commit is accepted successfully. However, it is recommended to verify if there's any error message captured in the syslog.
- The maximum policer rate limit for IPv4 fragments is 4000 PPS, which is the default value. If you configure a higher value than the default rate, the system automatically defaults to 4000.

Task ID

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

Examples

This example shows how to configure a new policer rate for IPv4 fragments received on the router using the **lpts punt police location** *0/0//CPU0* **exception ipv4 fragment rate** *rate* command at the global level:

```
RP/0/RP0/CPU0:router(config)# lpts punt police location 0/0/CPU0 exception ipv4 fragment
rate 3000
```

This example shows how to configure a new policer rate for IPv4 TTL error packets received on the router using the **lpts punt police location** *0/0//CPU0* **exception ipv4 ttl-error rate** *rate* command at the global level:

```
RP/0/RP0/CPU0:router(config)# lpts punt police location 0/0/CPU0 exception ipv4 ttl-error
rate 1000
```

show lpts bindings

To display the binding information in the Port Arbitrator, use the **show lpts bindings** command in XR 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

XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

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/RP0/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 4: 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/RP0/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 5: 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.

show lpts clients

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

XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

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/RP0/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 6: show lpts clients Command Field Descriptions

Field	Description
Clid	LPTS client ID.
Loc	Node location, in the format *rack/slot/module*.

Field	Description
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/RP0/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
```

show lpts flows

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

show lpts flows [**brief**]

Syntax Description

brief	(Optional) Displays summary output.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

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/RP0/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 7: 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. Any 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/RP0/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 8: 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.

show lpts ifib

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

XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

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/RP0/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/IPv4_STACK/0/0/0
Deliver List     : 0/5/CPU0
-----------------------------------------------------
```

This table describes the significant fields shown in the display.

Table 9: 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.

Field	Description
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/RP0/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/RP0/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
```

show lpts ifib slices

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

XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

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/RP0/CPU0:router# show lpts ifib slices

Slice    L3   L4     Port  Location
-------- ---- ------ ----- --------
RAWIP4   IPV4 any    any   0/RP0/CPU0
RAWIP6   IPV6 any    any   0/RP0/CPU0
OSPF4    IPV4 OSPF   any   0/RP0/CPU0
OSPF6    IPV6 OSPF   any   0/RP0/CPU0
OSPF_MC4 IPV4 any    any   0/RP0/CPU0
OSPF_MC6 IPV6 any    any   0/RP0/CPU0
BGP4     IPV4 TCP    179   0/RP0/CPU0
BGP6     IPV6 TCP    179   0/RP0/CPU0

UDP4     IPV4 UDP    any   0/RP0/CPU0
UDP6     IPV6 UDP    any   0/RP0/CPU0
TCP4     IPV4 TCP    any   0/RP0/CPU0
TCP6     IPV6 TCP    any   0/RP0/CPU0
ISIS     CLNS -      any   0/RP0/CPU0
MCAST4   IPV4 any    any   0/RP0/CPU0
MCAST6   IPV6 any    any   0/RP0/CPU0
```

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

```
RP/0/RP0/CPU0:router# show lpts ifib slices times

Slice    L3   L4     Port  Location
-------- ---- ------ ----- --------
RAWIP4   IPV4 any    any   0/RP0/CPU0
RAWIP6   IPV6 any    any   0/RP0/CPU0
OSPF4    IPV4 OSPF   any   0/RP0/CPU0
OSPF6    IPV6 OSPF   any   0/RP0/CPU0
OSPF_MC4 IPV4 any    any   0/RP0/CPU0
OSPF_MC6 IPV6 any    any   0/RP0/CPU0
BGP4     IPV4 TCP    179   0/RP0/CPU0
BGP6     IPV6 TCP    179   0/RP0/CPU0

UDP4     IPV4 UDP    any   0/RP0/CPU0
UDP6     IPV6 UDP    any   0/RP0/CPU0
TCP4     IPV4 TCP    any   0/RP0/CPU0
TCP6     IPV6 TCP    any   0/RP0/CPU0
ISIS     CLNS -      any   0/RP0/CPU0
MCAST4   IPV4 any    any   0/RP0/CPU0
MCAST6   IPV6 any    any   0/RP0/CPU0
  Flow Manager 0/RP0/CPU0:
   total:5 tx 13 upd 1/-/1ms/tx
```

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

```
RP/0/RP0/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 10: 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 *rack/slot/module*.

show lpts ifib statistics

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

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

Command History

Release	Modification
Release 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 ifib statistics** command:

```
RP/0/# show lpts ifib statistics

Flow Manager 0/RP0/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 11: 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.

Field	Description
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.

show lpts ifib times

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

XR EXEC mode

Command History

Release	Modification
Release 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 ifib times** command:

```
RP/0/RP0/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/RP0/CPU0:
 total:5 tx 13 upd 1/-/1ms/tx
```

This table describes the significant fields shown in the display.

Table 12: 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*.

show lpts pifib

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

show lpts pifib [entry] [hardware {**entry | police**} [**brief**] **[location** *node-id*]

Syntax Description

entry	(Optional) Pre-IFIB entry.
hardware	(Optional) Displays hardware for Pre-IFIB.
entry	(Optional) Displays the entries for Pre-IFIB.
police	(Optional) Displays the policer values that are being use.
brief	(Optional) Pre-IFIB entries in brief format.
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

XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

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 including the statistics for **hardware** are displayed.

Task ID

Task ID	Operations
lpts	read

Examples

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

```
RP/0/RP0/CPU0:router#  show lpts pifib entry brief location 0/3/CPU0

* - Any VRF; I - Local Interest;
X - Drop; R - Reassemble;

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

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

 ISIS       *        -      any          0/RP0/CPU0   - -
 IPv4_frag  *        any    any          R            any any
 IPv4_echo  *        ICMP   any          I            any,ECHO any
 IPv4       *        ICMP   any          0/RP0/CPU0   any,ECHOREPLY any
 IPv4       *        ICMP   any          I            any,TSTAMP any
 IPv4       *        ICMP   any          I           any,MASKREQ any
 IPv4       *        TCP    any          0/RP0/CPU0   any any,179
 IPv4       *        TCP    any          0/RP0/CPU0   any,179 any
 IPv4       *        TCP    any          0/RP0/CPU0   any any
 IPv4       *        UDP    any          0/RP0/CPU0   any,1701 any
 IPv4       *        UDP    any          0/RP0/CPU0   any any
 IPv4       *        OSPF   any          0/RP0/CPU0   224.0.0.5 any
 IPv4       *        OSPF   any          0/RP0/CPU0   224.0.0.6 any
 IPv4       *        OSPF   any          0/RP0/CPU0   any any
 IPv4       *        any    any          0/RP0/CPU0   any any
 IPv6_frag  *        any    any          R            any any
 IPv6_echo  *        ICMP6  any          I           any,ECHOREQ any
```

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

```
RP/0/RP0/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/RP0

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

The following is sample output from the **show lpts pifib** command with the **entry** and **brief** keywords added command:

```
RP/0/RP0/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** command with the **entry, brief,** and **entry brief statistics** keywords added:

```
RP/0/RP0/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** command with the **brief** and **statistics** keywords .

Table 13: 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.

Field	Description
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 (*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 entry

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

show lpts pifib hardware entry [**brief**] [**location** {**all***node_id*}]

Syntax Description

brief	(Optional) Displays summary hardware entry information.
location all	(Optional) Specifies all locations.
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

Displays hardware entry information in brief.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 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 entry** command with the **location** keyword:

```
RP/0/RP0/CPU0:router# show lpts pifib hardware entry brief location 0/3/CPU0

* - Read on clear stats
-----------------------------------------------------

DestIP             L4Proto  port/Type          remotePort    npu    ListenerTag
Flowtype                 DestNode           Accepted* Dropped*  OOS
------------------ -----    ----------------- ------------ ------ ------------------
------------------       ----------------- --------- --------- ---------
0.0.0.0            0        any                0            0      IPv4_REASS
Fragment                 Local LC           0         0
0.0.0.0            1        ICMP_Dflt          0            0      RAWIP4_FM
ICMP-default             Local LC           0         0          *
224.0.0.5          89       any                0            0      IPv4_STACK
OSPF-mc-default          Deliver RP         72        0          *
224.0.0.6          89       any                0            0      IPv4_STACK
OSPF-mc-default          Deliver RP         0         0          *
0.0.0.0            89       any                0            0      OSPF4_FM
```

```
OSPF-uc-default          Deliver RP          30          0          *
0.0.0.0            6         Port:179            0             0       BGP4_FM
BGP-default              Local LC            0           0          *
0.0.0.0            6         Port:any          179           0       BGP4_FM
BGP-default              Local LC           25           0          *
0.0.0.0            6         Port:any            0             0       TCP4_FM
TCP-default              Local LC            0           0          *
0.0.0.0           17         Port:any            0             0       UDP4_FM
UDP-default              Local LC           67           0          *
0.0.0.0           46         any                 0             0       RAWIP4_FM
RSVP-default             Local LC            0           0          *
0.0.0.0            0         any                 0             0       RAWIP4_FM
Raw-default              Local LC            0           0          *
::                 0         any                 0             0       IPv6_REASS
Fragment                 Local LC            0           0          *
::                58         ICMP6_LL            0             0       RAWIP6_FM
ICMP-default             Local LC           10           0          *
::                58         ICMP6_MD            0             0       RAWIP6_FM
ICMP-default             Local LC            3           0          *
::                58         ICMP6_Dflt          0             0       RAWIP6_FM
ICMP-default             Local LC            4           0          *
0:2ff::500:0      89         any                 0             0       IPv6_STACK
OSPF-mc-default          Deliver RP         76           0          *
0:2ff::600:0      89         any                 0             0       IPv6_STACK
OSPF-mc-default          Deliver RP          0           0          *
::                89         any                 0             0       OSPF6_FM
OSPF-uc-default          Deliver RP         44           0          *
::                 6         Port:179            0             0       BGP6_FM
BGP-default              Local LC           16           0          *
::                 6         Port:any          179           0       BGP6_FM
BGP-default              Local LC           16           0          *
::                 6         Port:any            0             0       TCP6_FM
TCP-default              Local LC            0           0          *
::                17         Port:any            0             0       UDP6_FM
UDP-default              Local LC            0           0          *
::                 0         any                 0             0       RAWIP6_FM
Raw-default              Local LC            0           0          *
any                0         ISIS_Dflt           0             0       CLNS_STACK
ISIS-default             Deliver RP         56           0          *
any                0         ISIS_Jumbo          0             0       CLNS_STACK
ISIS-default             Deliver RP          0           0          *
```

This table describes the significant fields shown in the display.

Table 14: show lpts pifib hardware entry Command Field Descriptions

Field	Description
DestIP	IP address of the destination node.
L4 Protocol	Layer 4 protocol of the entry.
Port/Type	Port or type for this entry.
remotePort	Remote port for this entry.
npu	Network Processor Unit.
ListenerTag	Name of the listener node.
Flowtype	Type of the LPTS flow.

Field	Description
DestNode	Destination node to which to send the packet.
Accepted/Dropped	Number of packets sent to DestAddr/Number of packets dropped due to policing.
OOS	* indicates statistics are exhausted

show lpts pifib hardware police

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

show lpts pifib hardware police [**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

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

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.3.2	Monitor LPTS host path drops via `Cisco-IOS-XR-lpts-pre-ifib-oper` YANG data model.
Release 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 0/3/CPU0:

```
RP/0/RP0/CPU0:router#show lpts pifib hardware police location 0/3/CPU0


------------------------------------------------------------
               Node 0/3/CPU0:
------------------------------------------------------------
 Burst = 100ms for all flow types
------------------------------------------------------------
FlowType               Policer Type    Cur. Rate Burst     npu
---------------------- ------- ------- --------- --------- ---------
Fragment               32102   np      1000      100       0
OSPF-mc-default        32104   np      3500      1000      0
OSPF-uc-default        32106   np      3000      1000      0
ISIS-default           32108   np      3500      1000      0
BGP-default            32118   np      4000      1250      0
ICMP-default           32126   np      10000     100       0
LDP-TCP-default        32130   np      4000      2000      0
LDP-UDP                32131   np      2000      1000      0
```

```
RSVP-default            32138   np      14500     700       0
UDP-default             32163   np      25500     100       0
TCP-default             32167   np      25500     100       0
Raw-default             32171   np      500       100       0
TPA                     32196   np      10000     6000      0
```

This table describes the significant fields shown in the display.

Table 15: show lpts pifib hardware police Command Field Descriptions

Fleld	Description
FlowType	Type of flow that is binding between a tuple and a destination.
Policer	Policer Values in PPS.
Type	Type of LPTS entry.
Cur. Rate	Packet rate set for the entry.
Burst	Accepable burst size for the policer.
npu	Network Processor Unit.

show lpts pifib statistics

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

XR EXEC mode

Command History

Release	Modification
Release 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 statistics** command:

```
RP/0/RP0/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.

show lpts port-arbitrator statistics

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

XR EXEC mode

Command History

Release	Modification
Release 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 port-arbitrator statistics** command:

```
RP/0/RP0/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 XR EXEC mode.

show lpts vrf

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 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 vrf** command:

```
RP/0/RP0/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.