# Implementing LPTS

Local Packet Transport Services (LPTS) maintains tables describing all packet flows destined for the secure domain router (SDR), making sure that packets are delivered to their intended destinations.

For a complete description of the LPTS commands listed in this module, refer to the LPTS Commands module of *IP Addresses and Services Command Reference for Cisco CRS Routers*.

### Feature History for Implementing LPTS

| Release | Modification |
|---|---|
| Release 3.6.0 | The LPTS policer configuration feature was introduced. |



# Prerequisites for Implementing LPTS

The following prerequisites are required to implement LPTS:

You must be in a user group associated with a task group that includes the proper task IDs. The command reference guides include the task IDs required for each command. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

# Information About Implementing LPTS

To implement LPTS features mentioned in this document you must understand the following concepts:

## LPTS Overview

LPTS uses two components to accomplish this task: the port arbitrator and flow managers. The port arbitrator and flow managers are processes that maintain the tables that describe packet flows for a logical router, known

as the Internal Forwarding Information Base (IFIB). The IFIB is used to route received packets to the correct Route Processor or line card for processing.

LPTS interfaces internally with all applications that receive packets from outside the router. LPTS functions without any need for customer configuration. However, LPTS **show** commands are provided that allow customers to monitor the activity and performance of LPTS flow managers and the port arbitrator.

# LPTS Policers

In Cisco IOS XR, the control packets, which are destined to the Route Processor (RP), are policed using a set of ingress policers in the incoming line cards. These policers are programmed statically during bootup by LPTS components. The policers are applied based on the flow type of the incoming control traffic. The flow type is determined by looking at the packet headers. The policer rates for these static ingress policers are defined in a configuration file, which are programmed on the line card during bootup.

You can change the policer values based on the flow types of these set of ingress policers. You are able to configure the rate per policer per node (locally) and globally using the command-line interface (CLI); therefore, overwriting the static policer values.

**Note** If two different ACLs with same ACEs are applied to an LPTS Policer, only the first ACL applied takes effect. When the first ACL is removed, the second ACL does not take effect on the LPTS Policer. If you want the second ACL to take effect on the LPTS Policer, reconfigure it on the LPTS Policer.

# Configuring LPTS Policers

This task allows you to configure the LPTS policers.

### SUMMARY STEPS

1. **configure**
2. **lpts pifib hardware police** [**location** *node-id*]
3. **flow** *flow_type* {**rate** *rate*}
4. **commit**
5. **show lpts pifib hardware police** [**location** {**all** | *node_id*}]

### DETAILED STEPS

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **configure** | |
| **Step 2** | **lpts pifib hardware police** [**location** *node-id*]<br>**Example:**<br>`RP/0/RP0/CPU0:router(config)# lpts pifib hardware police location 0/2/CPU0`<br>`RP/0/RP0/CPU0:router(config-pifib-policer-per-node)#` | Configures the ingress policers and enters pifib policer global configuration mode or pifib policer per node configuration mode.<br>The example shows pifib policer per node configuration mode and global. |

| | Command or Action | Purpose |
|---|---|---|
| | `RP/0/RP0/CPU0:router(config)# lpts pifib hardware police`<br>`RP/0/RP0/CPU0:router(config-pifib-policer-global)#` | |
| **Step 3** | **flow** *flow_type* {**rate** *rate*}<br>**Example:**<br>`RP/0/RP0/CPU0:router(config-pifib-policer-per-node)# flow ospf unicast default rate 20000` | Configures the policer for the LPTS flow type. The example shows how to configure the policer for the ospf flow type.<br>• Use the *flow_type* argument to select the applicable flow type. For information about the flow types, see *IP Addresses and Services Command Reference for Cisco CRS Routers*.<br>• Use the **rate** keyword to specify the rate in packets per seconds (PPS). The range is from 0 to 4294967295.<br>**Note** LPTS policy for ntp-default flow type, supports a flow rate of 100 pps on Cisco ASR 9000 Series Router.<br>Starting with Cisco IOS XR Release 6.1.3, LPTS policy for ntp-default flow type, supports a flow rate higher than 100 pps on Cisco ASR 9000 Series Router.<br>Based on the number of NTP client scale requirement, you can increase the flow rate value to allow higher packets per second (PPS). For example,<br>`lpts pifib hardware police location 0/0/CPU0`<br>`flow ntp default rate 1000`<br>`flow ntp known rate 1000` |
| **Step 4** | **commit** | |
| **Step 5** | **show lpts pifib hardware police** [**location** {**all** \| *node_id*}]<br>**Example:**<br>`RP/0/RP0/CPU0:router# show lpts pifib hardware police location 0/2/cpu0` | Displays the policer configuration value set.<br>• (Optional) Use the **location** keyword to display pre-Internal Forwarding Information Base (IFIB) information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.<br>• Use the **all** keyword to specify all locations. |

# Configuration Examples for Implementing LPTS Policers

This section provides the following configuration example:

# Configuring LPTS Policers: Example

The following example shows how to configure LPTS policers:

```
configure
 lpts pifib hardware police
  flow ospf unicast default rate 200
  flow bgp configured rate 200
  flow bgp default rate 100
 !
 lpts pifib hardware police location 0/2/CPU0
  flow ospf unicast default rate 100
  flow bgp configured rate 300
 !
```

The following is the show command and the sample output:

```
show lpts pifib hardware police location 0/2/CPU0

FT - Flow type ID; PPS - Packets per second configured rate

FT Flow type                  Rate (PPS) Accept/Drop
-- -------------------------- ---------- ----------------
0  unconfigured-default       101        0/0
0

unconfigured-default

101
       0/0
1

Fragment

1000       0
/0
2
 OSPF-mc-known

1500

32550
/0
3
 OSPF-mc
-default

250
       0/0
4
 OSPF-uc-known

2000

0
/0
5

OSPF
-uc-default

 101

 1
/0
```

```
6
 ISIS-known
              250   1500        0/0
7

ISIS
-default

250

 0
/0
8
 BGP-known

 2000       17612
/0
9
BGP-default cfg-peer               203

5
/0
10 BGP
-default

500

 4
/0
11
PIM-mcast
                 1500       0/0
12 PIM-ucast
                 1500       0/0
13 IGMP

      1500
      0/0
14
ICMP-local
               1046       0/0
15
ICMP-app
              1000     1046       0/0
16
ICMP-control

1000
      0/0
17 ICMP
-default

1046       0
/0
18
LDP-TCP-known
           1500       9965
/0
19
LDP-TCP-cfg-peer

1500
0/0
20
```

```
LDP-TCP-default

250

 0
/0
21 LDP
-UDP

1000

59759
/0
22 All
-routers
             1500       0/0
23
LMP-TCP-known
           1500       0/0
24
LMP-TCP-cfg-peer

1500
0/0
25
LMP-TCP-default

250
       0/0
26 LMP
-UDP                     1000       0/0
27 RSVP-UDP
                  1000       0/0
28 RSVP
1000       0/0
29 IKE
               1000       0/0
30
IPSEC-known

1000
0/0
31 IPSEC
-default

 250
       0/0
32
MSDP-known
                 1000       0/0
33
MSDP-cfg-peer

 1000
0/0
34 MSDP-default

250
       0/0
35 SNMP

1000
0/0
36 NTP
```

```
500
       0/0
37
SSH-known
              1000       0/0
38 SSH
-default
              1000       0/0
39
HTTP-known
             1000       0/0
40 HTTP
-default
1000       0/0
41
SHTTP-known
            1000       0/0
42 SHTTP
-default
            1000       0/0
43
TELNET-known
           500   1000        0/0
44 TELNET
-default

500
       0/0
45
CSS-known

1000
0/0
46 CSS
-default

500
       0/0
47
RSH-known

1000
0/0
48 RSH
-default

500
       0/0
49
UDP-known

 2000
      0/0
50
UDP-listen
             1500       0/0
51
UDP-cfg-peer

1500

0
/0
```

```
52 UDP
-default

101

 653
/0
53
TCP-known
                2000       0/0
54
TCP-listen
             2000       0/0
55
TCP-cfg-peer

2000

0
/0
56 TCP
-default

101

 6
/0
57
Mcast-known

2000
0/0
58 Mcast
-default

 101
       0/0
59
Raw-listen
                250        0/0
60 Raw
-default

 250
       0/0
61 ip-sla

1000
      0/0
62 EIGRP
                    1500       0/0
63 RIP
                   2398    1500       0/0
64
PCEP                       101        0/0
```

# Additional References

The following sections provide references related to implementing LPTS.

### Related Documents

| Related Topic | Document Title |
|---|---|
| Cisco IOS XR LPTS commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples | *Cisco LPTS Commands* module in the *IP Addresses and Services Command Reference for Cisco CRS Routers* |

### Standards

| Standards | Title |
|---|---|
| No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature. | — |

### MIBs

| MIBs | MIBs Link |
|---|---|
| — | To locate and download MIBs, use the Cisco MIB Locator found at the following URL and choose a platform under the Cisco Access Products menu: https://mibs.cloudapps.cisco.com/ITDIT/MIBS/servlet/index |

### RFCs

| RFCs | Title |
|---|---|
| No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature. | — |

### Technical Assistance

| Description | Link |
|---|---|
| The Cisco Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content. | http://www.cisco.com/techsupport |