



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 NCS 6000 Series Routers*.

Feature History for Implementing LPTS

Release	Modification
Release 5.0.0	LPTS was introduced.

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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). Pre-IFIB (PIFIB), which is an abbreviated copy of IFIB, is maintained by port arbitrator on route processor. The line card also downloads the PIFIB for fast lookup. While IFIB is only present on RP, PIFIB is present on both RP and LCs. The entries in PIFIB are used for a single lookup with an exact match. The IFIB, along with PIFIB are 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.

Configuring LPTS Policer with IP TOS Precedence

This task allows you to configure the LPTS policers with IP table of service (TOS) precedence:

SUMMARY STEPS

1. **configure**
2. **lpts pifib hardware police** [*location node-id*]
3. **flow** *flow_type* {**default** | **known**}
4. **precedence** {*number* | *name*}
5. **commit**
6. **show lpts pifib hardware policer** [*location* {**all** | *node_id*}]

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure	

	Command or Action	Purpose
Step 2	<p>lpts pifib hardware police [<i>location node-id</i>]</p> <p>Example:</p> <pre>RP/0/RP0/CPU0:router(config)# lpts pifib hardware police location 0/2/CPU0</pre> <p>or</p> <pre>RP/0/RP0/CPU0:router(config)# lpts pifib hardware police</pre>	<p>Configures the ingress policers. You can configure per node or all locations.</p> <p>The example shows configuration of pifib policer on an individual node and globally for all nodes respectively.</p>
Step 3	<p>flow <i>flow_type</i> {default known}</p> <p>Example:</p> <pre>RP/0/RP0/CPU0:router(config-pifib-policer-per-node)# flow telnet default</pre> <p>or</p> <pre>RP/0/RP0/CPU0:router(config-pifib-policer-global)# flow telnet default</pre>	<p>Configures the policer for the LPTS flow type. The example shows how to configure the policer for the telnet flow type per node or global mode (all locations).</p> <ul style="list-style-type: none"> Use the <i>flow_type</i> argument to select the applicable flow type. For information about the flow types, see <i>IP Addresses and Services Command Reference for Cisco NCS 6000 Series Routers</i>.
Step 4	<p>precedence {<i>number</i> <i>name</i>}</p> <p>Example:</p> <pre>RP/0/RP0/CPU0:router(config-pifib-policer-per-node)# precedence 5 6 7</pre> <p>or</p> <pre>RP/0/RP0/CPU0:router(config-pifib-policer-global)# precedence 5 6 7</pre>	<p>Configures IP TOS precedence against a flow type. You can specify either a precedence number or name. For more information about precedence, use the question mark (?) online help function.</p> <p>The example shows how to configure IP TOS precedence 5, 6, and 7 per node or global mode.</p>
Step 5	commit	
Step 6	<p>show lpts pifib hardware policer [<i>location {all node_id}</i>]</p> <p>Example:</p> <pre>RP/0/RP0/CPU0:router# show lpts pifib hardware policer location 0/2/cpu0</pre>	<p>Displays the policer configuration value set.</p> <ul style="list-style-type: none"> (Optional) Use the location keyword to display policer value for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation. Use the all keyword to specify all locations.

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* {default | known} {rate *rate*}
4. **commit**
5. **show lpts pifib hardware policer** [location {all | *node_id*}]

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure	
Step 2	lpts pifib hardware police [location <i>node-id</i>] Example: RP/0/RP0/CPU0:router(config)# lpts pifib hardware police location 0/2/CPU0 RP/0/RP0/CPU0:router(config-pifib-policer-per-node)# RP/0/RP0/CPU0:router(config)# lpts pifib hardware police RP/0/RP0/CPU0:router(config-pifib-policer-global)#	Configures the ingress policers and enters pifib policer global configuration mode or pifib policer per node configuration mode. The example shows pifib policer per node configuration mode and global.
Step 3	flow <i>flow_type</i> {default known} {rate <i>rate</i> }	Configures the policer for the LPTS flow type. The example shows how to configure the policer for the ospf flow type. <ul style="list-style-type: none"> • Use the <i>flow_type</i> argument to select the applicable flow type. For information about the flow types, see <i>IP Addresses and Services Command Reference for Cisco NCS 6000 Series Routers</i>. • Use the rate keyword to specify the rate in packets per seconds (PPS). The range is from 0 to 4294967295. <p>Note LPTS policy for ntp-default flow type, supports a flow rate of 100 pps on Cisco ASR 9000 Series Router.</p>
Step 4	commit	
Step 5	show lpts pifib hardware policer [location {all <i>node_id</i> }] Example: RP/0/RP0/CPU0:router# show lpts pifib hardware policer location 0/2/cpu0	Displays the policer configuration value set. <ul style="list-style-type: none"> • (Optional) Use the location keyword to display 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. • 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
 !

show lpts pifib hardware policer location 0/2/CPU0

```

```

Node: 0/2/CPU0:
-----
flow_type          priority sw_police_id hw_policer_addr avgrate burst static_avgrate
avgrate_type
-----
unconfigured-default low      0             580096          500      100      500             2
UDP-default         low      1             580608          500      100      500             2
TCP-default         low      2             581120          500      100      500             2
Mcast-default       low      3             581632          500      100      500             2
Raw-listen          low      4             582144          500      100      500             2
Raw-default         low      5             582656          500      100      500             2
Fragment            low      6             583168          1000     100      1000            2
OSPF-mc-known       high     7             583680          2000     1000     2000            2
ISIS-known          high     8             584192          2000     1000     2000            2
EIGRP               high     9             584704          1500     750      1500            2
RIP                 high    10            585216          1500     750      1500            2
OSPF-mc-default     low     11            585728          1500     1000     1500            2
ISIS-default        low     12            586240          1500     1000     1500            2
BGP-known           high    13            586752          2500     1200     2500            2
BGP-cfg-peer        mdeium  14            587264          100      1000     2000            0
BGP-default         low     15            587776          100      750      1500            1
PIM-mcast-default   mdeium  16            588288          23000    100      23000           2
PIM-ucast           low     17            588800          10000    100      10000           2
IGMP                mdeium  18            589312          3500     100      3500            2
ICMP-local          mdeium  19            589824          2500     100      2500            2
ICMP-app            low     20            590336          2500     100      2500            2
ICMP-default        low     21            590848          2500     100      2500            2
LDP-TCP-known       mdeium  22            591360          2500     1250     2500            2
LMP-TCP-known       mdeium  23            591872          2500     1250     2500            2
RSVP-UDP            mdeium  24            592384          7000     600      7000            2
RSVP-default        mdeium  25            592896          500      100      500             2
RSVP-known          mdeium  26            593408          7000     600      7000            2
IKE                 mdeium  27            593920          1000     100      1000            2
IPSEC-default       low     28            594432          1000     100      1000            2
IPSEC-known         mdeium  29            594944          3000     100      3000            2
MSDP-known          mdeium  30            595456          1000     100      1000            2
MSDP-cfg-peer       mdeium  31            595968          1000     100      1000            2
MSDP-default        low     32            596480          1000     100      1000            2
SNMP                low     33            596992          2000     100      2000            2

```

NTP-default	high	34	597504	500	100	500	2
SSH-known	mdeium	35	598016	1000	100	1000	2
SSH-default	low	36	598528	1000	100	1000	2
HTTP-known	mdeium	37	599040	1000	100	1000	2
HTTP-default	low	38	599552	1000	100	1000	2
SHTTP-known	mdeium	39	600064	1000	100	1000	2
SHTTP-default	low	40	600576	1000	100	1000	2
TELNET-known	mdeium	41	601088	1000	100	1000	2
TELNET-default	low	42	601600	1000	100	1000	2
CSS-known	mdeium	43	602112	1000	100	1000	2
CSS-default	low	44	602624	1000	100	1000	2
RSH-known	mdeium	45	603136	1000	100	1000	2
RSH-default	low	46	603648	1000	100	1000	2
UDP-known	mdeium	47	604160	25000	100	25000	2
TCP-known	mdeium	48	604672	25000	100	25000	2
TCP-listen	low	49	605184	25000	100	25000	2
TCP-cfg-peer	mdeium	50	605696	25000	100	25000	2
Mcast-known	mdeium	51	606208	25000	100	25000	2
LDP-TCP-cfg-peer	mdeium	52	606720	2000	1000	2000	2
LMP-TCP-cfg-peer	mdeium	53	607232	2000	1000	2000	2
LDP-TCP-default	low	54	607744	1500	750	1500	2
LMP-TCP-default	low	55	608256	1500	750	1500	2
UDP-listen	low	56	608768	4000	100	4000	2
UDP-cfg-peer	mdeium	57	609280	4000	100	4000	2
LDP-UDP	mdeium	58	609792	2000	1000	2000	2
LMP-UDP	mdeium	59	610304	2000	1000	2000	2
All-routers	high	60	610816	1000	500	1000	2
OSPF-uc-known	high	61	611328	2000	1000	2000	2
OSPF-uc-default	low	62	611840	100	100	1000	0
ip-sla	high	63	612352	10000	100	10000	2
ICMP-control	high	64	612864	2500	100	2500	2
L2TPv3	mdeium	65	613376	25000	100	25000	2
PCEP	mdeium	66	613888	100	200	100	2
GRE	high	67	614400	1000	1000	1000	2
VRRP	mdeium	68	614912	1000	1000	1000	2
HSRP	mdeium	69	615424	400	400	400	2
BFD-known	critical	70	615936	8500	300	8500	2
BFD-default	critical	71	616448	8500	100	8500	2
MPLS-oam	mdeium	72	616960	100	100	100	2
DNS	mdeium	73	617472	500	100	500	2
RADIUS	mdeium	74	617984	7000	600	7000	2
TACACS	mdeium	75	618496	500	100	500	2
PIM-mcast-known	mdeium	76	619008	23000	100	23000	2
BFD-MP-known	mdeium	77	619520	8400	1024	8400	2
BFD-MP-0	mdeium	78	620032	128	100	128	2
L2TPv2-default	mdeium	79	620544	700	100	700	2
NTP-known	high	80	621056	500	100	500	2
L2TPv2-known	mdeium	81	621568	2000	100	2000	2

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	<i>Cisco LPTS Commands</i> module in the <i>IP Addresses and Services Command Reference for Cisco NCS 6000 Series Routers</i>

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: http://cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

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

