Appendix: SGSN D-Node Commands

The commands in this section are for certain operator-specific, SGSN D-node implementations only. These commands are not to be used for any other type of standard, SGSN-related configuration, or to configure any GGSN services.

clear gprs isgsn statistics

To clear the current GPRS intra-Serving GPRS Support Node (iSGSN) statistics, use the **clear gprs isgsn statistics** privileged EXEC command (SGSN D-node only).

clear gprs isgsn statistics

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

Usage Guidelines

Use the **clear gprs isgsn statistics** command to clear the current GPRS iSGSN statistics. This command clears the counters that are displayed by the **show gprs isgsn statistics** command.

Examples

The following example clears the current GPRS iSGSN statistics:

```
router# clear gprs isgsn statistics
```

clear l2relay statistics

To clear the Layer 2 Relay (l2relay) statistics for the SGSN, use the **clear l2relay statistics** privileged EXEC command (SGSN D-node only).

clear l2relay statistics

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

Usage Guidelines

Use the **clear l2relay statistics** command to clear the current l2relay statistics.

Examples

The following example clears the l2relay statistics:

```
router# clear l2relay statistics
```

Related Commands

Command	Description
clear l2relay topology-map	Clears the Layer 2 Relay topology map for the SGSN.

clear l2relay topology-map

To clear the Layer 2 Relay topology map for the SGSN, use the **clear l2relay topology-map** privileged EXEC command (SGSN D-node only).

clear l2relay topology-map

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

Usage Guidelines

The SGSN module maintains a l2relay topology map that the router uses to keep a list of the unit IDs (UIDs) of the SGSN-datacom (SGSN-D) and SGSN-telecom (SGSN-T) units with which it can communicate. UIDs are added to the topology map when the router receives self-ID packets from SGSN-D and SGSN-T units on the network.

For debugging purposes, it may be useful to clear the Layer 2 Relay topology map. Using the **clear l2relay topology-map** command clears all of the data structures in the list of SGSN units so that the list can be rebuilt.

Normally you will not need to use this command. If problems with the SGSN are encountered, Cisco technical support personnel may request that you clear the Layer 2 Relay topology map.

Examples

The following example clears the l2relay topology map for the SGSN:

```
router# clear l2relay topology-map
```

Related Commands

Command	Description
clear l2relay statistics	Clears the l2relay statistics for the SGSN (SGSN D-node only).

l2relay echo-interval

To specify the interval at which the SGSN sends l2relay keepalive messages, use the **l2relay echo-interval** global configuration command. To restore the default value for the echo interval (10 seconds) use the **no** form of the command (SGSN D-node only).

l2relay echo-interval *seconds*

no l2relay echo-interval

Syntax Description

seconds	The length of the echo interval, in seconds. Specify a value between 1 and 360 seconds. The default is 10 seconds.

Defaults

10 seconds

Command Modes

Global configuration

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

Usage Guidelines

Use the **l2relay echo-interval** command to specify the interval at which the SGSN sends Layer 2 Relay keepalive messages.

The SGSN module uses the proprietary l2relay protocol in conjunction with the intra-Serving GPRS Support Node (iSGSN) protocol for communication between the SGSN-datacom (SGSN-D) and SGSN-telecom (SGSN-T) units that comprise the SGSN. Each SGSN-D or SGSN-T unit periodically sends out keepalive messages (echo requests) to the other SGSN units to inform them that it is functioning. You can fine-tune the performance of the nodes that comprise the SGSN by adjusting the echo interval value.

To restore the default value for the echo interval (10 seconds) use the **no** form of the command.

Examples

The following example shows an interval of 15 seconds between Layer 2 Relay keepalive messages:

```
l2relay echo-interval 15
```

l2relay flow-control

To specify quench threshold and resume threshold percentages that determine when the l2relay protocol begins and ends flow control processing, use the **l2relay flow-control** global configuration command. To restore the default values for flow control processing, use the **no** form of the command (SGSN D-node only).

l2relay flow-control {**enable** | *quench-threshold* | *resume-threshold*}

no l2relay flow-control

Syntax Description

enable	Enables flow control.
quench-threshold	The percentage of congestion that triggers flow control processing.
resume-threshold	The percentage of congestion that triggers resumption of normal processing.

Defaults

The default value for the *quench-threshold* argument is 80.

The default value for the *resume-threshold* argument is 20.

Command Modes

Global configuration

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

Usage Guidelines

If you have enabled Layer 2 Relay flow-control processing using the **l2relay flow-control enable** command, you can use the **l2relay flow-control** command to specify congestion percentages that trigger flow control processing or resumption of normal Layer 2 Relay processing.

The *quench-threshold* argument specifies the congestion percentage that must be reached before flow-control processing begins. For example, if you specify 60 for the quench-threshold argument, then the SGSN initiates flow control when Layer 2 Relay processing becomes 60% congested.

The *resume-threshold* argument specifies the congestion percentage that must be reached before normal Layer 2 Relay processing is resumed. For example, if you specify 40 for the resume-threshold argument, then the SGSN resumes normal Layer 2 Relay processing when the congestion percentage decreases to 40%.

Examples

In the following example, 60 is specified for the quench-threshold argument:

```
l2relay flow-control quench-threshold 60
```

l2relay pilot-uid

To specify the unit ID of an SGSN-T node to which packets with unknown destination information are transmitted, use the **l2relay pilot-uid** global configuration command. To delete the pilot UID, use the **no** form of the command (SGSN D-node only).

l2relay pilot-uid *uid*

no l2relay pilot-uid

Syntax Description

uid	Number between 1 and 32 that specifies unit ID for the pilot unit. The default is 0xFF.

Defaults

0xFF (invalid UID)

Command Modes

Global configuration

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

Usage Guidelines

Each router that is running an SGSN module is assigned a unit ID as part of SGSN configuration. In the event that a packet comes in for an unknown SGSN, the receiving SGSN sends the packet to a unit designated as the "pilot" SGSN-T unit. Use the **l2relay pilot-uid** command to specify the SGSN-T unit to which packets with unknown destination information are transmitted.

Examples

```
l2relay uid 5
l2relay pilot-uid 3
```

l2relay use-interface

To specify the physical interfaces used by the l2relay protocol running on the SGSN, use the **l2relay use-interface** global configuration command (SGSN D-node only).

l2relay use-interface *interface_1* [*interface_2*]

Syntax Description

interface_1	Interface that is used by the Layer 2 Relay protocol.
interface_2	A secondary interface that can be used by the Layer 2 Relay protocol.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

Usage Guidelines

Use the **l2relay use-interface** command to specify one or more interfaces that the Layer 2 Relay protocol uses to communicate with the SGSN-T and SGSN-D units that comprise the SGSN.

Examples

The following example shows the configuration for a Fast Ethernet interface (FastEthernet3/0) and the **l2relay use-interface** command that specifies use of that interface.

```
interface FastEthernet3/0
 ip address 5.0.0.55 255.0.0.0
 no ip directed-broadcast
 no ip mroute-cache
 no keepalive
!
l2relay use-interface FastEthernet3/0
```

show gprs isgsn statistics

To display statistics that show the status of the intra-Serving GPRS Support Node running on the router, use the **show gprs isgsn statistics** privileged EXEC command (SGSN D-node only).

show gprs isgsn statistics

Syntax Description

This command has no keywords or arguments.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(2)GB	The Local Rejected PDPs field was added to the output display.
12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

Usage Guidelines

The processing nodes that comprise the SGSN communicate using the proprietary iSGSN Protocol. Each SGSN component running on a Cisco 7200 series router maintains statistical information about the status of the service. Use the **show gprs isgsn statistics** command to display status information about the iSGSN Protocol.

Examples

The following example shows output from the **show gprs isgsn statistics** command:

```
router# show gprs isgsn statistics

        Input Packets:  16    Bytes:               864
        Output Packets: 16    Bytes:               752
        Input Drops:    4     Out Drops:           0
        Out Errors:     0     Local Rejected PDPs: 0
```

Table 10 describes the fields shown in the display.

Table 10 show gprs isgsn statistics Field Descriptions

Field	Description
Input Packets, Bytes	Number of input packets and total bytes.
Output Packets, Bytes	Number of output packets and total bytes.
Input Drops	Number of dropped input packets.
Out Drops	Number of dropped output packets.

Table 10 show gprs isgsn statistics Field Descriptions (continued)

Field	Description
Out Errors	Number of output errors.
Local Rejected PDPs	Number of GTP create PDP contexts rejected by the D-node (supports SMG-28 standards level and later).

Related Commands

Command	Description
show l2relay statistics	Displays statistics that show the status of the Layer 2 Relay Protocol running on the SGSN.

show l2relay statistics

To display statistics that show the status of the Layer 2 Relay Protocol running on the SGSN, use the **show l2relay statistics** privileged EXEC command (SGSN D-node only).

show l2relay statistics

Syntax Description

This command has no keywords or arguments.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

Usage Guidelines

Use the **show l2relay statistics** command to display statistical and other information about the Layer 2 Relay protocol running on the SGSN, including the following information:

- Layer 2 Relay Protocol configuration and performance
- The topology of the SGSN components
- Data throughput on the SGSN components

Examples

The following example shows output from the **show l2relay statistics** command:

```
router# show l2relay statistics

         l2relay uid = 3                 unit-type = D
         l2relay echo-time = 10          flow control enable = 1
         l2relay reset_value = 164       l2rly_pak_drop = 0
         l2relay_inputQ len = 0          l2relay_mgmtQ len = 0
         l2relay_flow_quench at 80 %     resume at 20 %
         l2relay pilot_uid = 1

l2relay topology:
-----------------------------------------------------------------
         FastEthernet3/0
Type UID  mac_address1  Tx/Rx   mac_address2    Tx/Rx   Cngst   OQlen
 D   3   0050.2a53.0854 1/1     0000.0000.0000  0/0     0       0
 T   1   0040.05a2.26cb 1/1     0000.0000.0000  0/0     0       0

l2relay accounting:
-------------------------------------------------------------
Type    UID     Byte_out/Pak_out        Byte_in/Pak_in
 D      3       16936/542               0/0
 T      1       0/0                     0/0
```

Table 11 describes the fields shown in the first part of the display.

Table 11 show l2relay statistics Field Descriptions

Field	Description
l2relay uid	Unit ID of the SGSN component running on the router.
unit-type	Type of SGSN unit running on the router: D indicates an SGSN-D unit; T indicates an SGSN-T unit.
l2relay echo-time	Configured value for the Layer 2 Relay echo interval.
flow control enable	Indicates whether flow control is enabled on the SGSN unit: 0 indicates flow control is enabled; 1 indicates it is disabled.
l2relay reset_value	Number of times that the SGSN D-unit or T-unit has been reset.
l2rly_pak_drop	Number of packets dropped by the Layer 2 Relay Protocol module.
l2relay_inputQ len	Current length of the Layer 2 Relay input queue.
l2relay_mgmtQ len	Current length of the Layer 2 Relay management queue.
l2relay_flow_quench at	Current Layer 2 Relay quench percentage setting.
resume at	Current Layer 2 Relay resume percentage setting.
l2relay pilot_uid	Currently configured Layer 2 Relay pilot unit ID.

The second part of the output from **show l2relay statistics** shows Layer 2 Relay topology information about each SGSN unit that is running.

Table 12 describes the fields shown in the l2relay topology section of the display.

Table 12 show l2relay statistics Field Descriptions

Field	Description
Cngst	UID congestion indicator, with the following values: • 0—No congestion. • 1—Congestion.
Interface name	Name of the interface specified in the **l2relay use-interface** command. In the example, the interface is the FastEthernet3/0 interface.
mac_address1	MAC address of the first interface configured with the **l2relay use-interface** command.
mac_address2	MAC address of the second interface configured with the **l2relay use-interface** command (if one is configured).
OQlen	Current length of the output queue.
Tx/Rx (first field)	Number of packets transmitted and received over this interface.
Tx/Rx (second field)	Path status indicator for the transmit (Tx) and receive (Rx) path, with the following values: • 0—Problem condition detected on the path. • 1—Path is functional.

Table 12 show l2relay statistics Field Descriptions (continued)

Field	Description
Type	Type of SGSN unit, with the following values: • D—SGSN datacom (SGSN-D) unit • T—SGSN telecom (SGSN-T) unit
UID	Unit identifier.

The last part of the output from the **show l2relay statistics** command shows Layer 2 Relay accounting information for each SGSN unit.

Table 13 describes the fields shown in the l2relay accounting section of the display.

Table 13 show l2relay statistics Field Descriptions

Field	Description
Byte_in/Pak_in	Number of bytes/packets received by this unit.
Byte_out/Pak_out	Number of bytes/packets transmitted by this unit.
Type	Type of SGSN unit, with the following values: • D—SGSN datacom (SGSN-D) unit • T—SGSN telecom (SGSN-T) unit
UID	Unit identifier.