show aaa servers sg

To display counters (information about the number of packets sent to and received from authentication, authorization, and accounting [AAA] servers) for all the servers that are members of a specific server group, use the **show aaa servers sg** command in privileged EXEC mode.

> **show aaa servers sg** *sg-name*

Syntax Description

sg-name	Name of the server group for which you want to display counters for each server in the group.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(9)XG	This command was introduced.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show aaa servers sg** command to display counters for all the servers in a specified server group.

The command displays information about packets sent and received for all AAA transaction types.

Examples   The following example displays information about each RADIUS servers that are a member of the "group1" server group:

```
router# show aaa servers sg group1

RADIUS: id 3, priority 0, host 1.1.1.1, auth-port 1645, acct-port 1646
    State: current UP, duration 159574s, previous duration 0s
    Dead: total time 0s, count 0
    Authen: request 0, timeouts 0
            Response: unexpected 0, server error 0, incorrect 0, time 0ms
            Transaction: success 0, failure 0
    Author: request 0, timeouts 0
```

```
                Response: unexpected 0, server error 0, incorrect 0, time 0ms
                Transaction: success 0, failure 0
        Account: request 0, timeouts 0
                Response: unexpected 0, server error 0, incorrect 0, time 0ms
                Transaction: success 0, failure 0
        Elapsed time since counters last cleared: 1d20h19m

RADIUS: id 4, priority 0, host 2.2.2.2, auth-port 1645, acct-port 1646
        State: current UP, duration 159574s, previous duration 0s
        Dead: total time 0s, count 0
        Authen: request 0, timeouts 0
                Response: unexpected 0, server error 0, incorrect 0, time 0ms
                Transaction: success 0, failure 0
        Author: request 0, timeouts 0
                Response: unexpected 0, server error 0, incorrect 0, time 0ms
                Transaction: success 0, failure 0
        Account: request 0, timeouts 0
                Response: unexpected 0, server error 0, incorrect 0, time 0ms
                Transaction: success 0, failure 0
        Elapsed time since counters last cleared: 1d20h19m

RADIUS: id 5, priority 0, host 3.3.3.3, auth-port 1645, acct-port 1646
        State: current UP, duration 159575s, previous duration 0s
        Dead: total time 0s, count 0
        Authen: request 0, timeouts 0
                Response: unexpected 0, server error 0, incorrect 0, time 0ms
                Transaction: success 0, failure 0
        Author: request 0, timeouts 0
                Response: unexpected 0, server error 0, incorrect 0, time 0ms
                Transaction: success 0, failure 0
        Account: request 0, timeouts 0
                Response: unexpected 0, server error 0, incorrect 0, time 0ms
                Transaction: success 0, failure 0
        Elapsed time since counters last cleared: 1d20h19m
```

Table 4 describes the fields shown in the display.

Table 4 show aaa servers sg Field Descriptions

Field	Description
id	An identifier that uniquely identifies the server on the router.
priority	The priority by which the server will be tried within the server group.
host	The IP address of the AAA server.
auth-port	The port on the AAA server that is used for authentication and authorization requests.
acct-port	The port on the AAA server that is used for accounting requests.

Table 4   *show aaa servers sg Field Descriptions*

Field	Description
State	Indicates the assumed state of the AAA server. The following states are possible: • UP—Indicates that the server is currently considered alive and attempts will be made to communicate with it. • DEAD—Indicates that the server is currently presumed dead and, in the case of switchovers, this server will be skipped unless it is the last server in the group. • duration—Is the amount of time the server is assumed to be in the current state, either UP or DEAD. • previous duration—Is the amount of time the server was considered to be in the previous state.
Dead	Indicates the number of times that this server is marked dead, and the cumulative amount of time, in seconds, that it spent in that state.

Table 4   show aaa servers sg Field Descriptions

Field	Description
Authen	Provides information about authentication packets that were sent to and received from a server, and authentication transactions that were successful or that failed. The following information may be reported in this field:
	• request—Number of authentication requests that were sent to the AAA server.
	• timeouts—Number of timeouts (no responses) that were observed, when a transmission was sent to this server.
	• Response—Provides statistics about responses that were observed from the server and includes the following reports:
	– unexpected—Number of unexpected responses. A response is considered unexpected when it is received after the timeout period for the packet has expired. This may happen if the link to the server is severely congested, for example. An unexpected response can also be produced when a server generates a response for no apparent reason.
	– server error—Number of server errors. This category is a catchall for error packets that do not any of the previous categories.
	– incorrect—Number of incorrect responses. A response is considered incorrect if it is of the wrong format expected by the protocol. This frequently happens when an incorrect server key is configured on the router.
	• Transaction—These fields provide information about AAA transactions related to the server. A transaction is defined as a request for authentication, authorization, or accounting information that is sent by the AAA module, or by an AAA client (such as PPP) to an AAA protocol (RADIUS or TACACS+), which may involve multiple packet transmissions and retransmissions. Transactions may require packet retransmissions to one or more servers in a single server group, to verify success or failure. Success or failure is reported to AAA by the RADIUS and TACACS+ protocols, as follows
	– success—Incremented when a transaction is successful.
	– failure—Incremented when a transaction fails (for example, packet retransmissions to another server in the server group failed due to switchover or did not succeed. (A negative response to an Access Request, such as Access Reject, is considered to be a successful transaction).
Author	The fields in this category are similar to those in the Authen fields. An important difference, however, is that because authorization information is carried in authentication packets for the RADIUS protocol, these fields are not incremented when using RADIUS.

Table 4 **show aaa servers sg Field Descriptions**

Field	Description
Account	The fields in this category are similar to those in the Authen fields, but provide accounting transaction and packet statistics.
Elapsed time since counters last cleared	Displays the amount of time in days, hours, and minutes, that has passed since the counters were last cleared.

Related Commands

Command	Description
clear aaa counters server sg	Clears and resets the counters to zero for all servers in a specific server group.

show debugging condition

To display the current state of debugging conditions, use the **show debugging condition** command in privileged EXEC mode:

show debugging condition [*condition-id* | **all** | **next-call** {**gprs** {**pdp** | **summary**}}

Syntax Description

condition-id	Number of the condition for which you want to display its current state.
all	Displays the current state for all conditions.
next-call gprs {**pdp**	**summary**}	Displays existing debug next-call conditions or PDPs with next-call debug conditions, where:
	• **pdp**—Displays the information of all the PDPs under the next call debug condition.
	• **summary**—Displays existing debug next call conditions.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show debugging condition** command to display the current debug next-call conditions or PDPs with next-call conditions.

Examples   **Example 1**

The following is sample output from the **show debugging condition next-call gprs summary** command:

```
Router#show debugging condition next-call gprs summary
GPRS: Debug condition nextcall gprs is set
```

Related Commands .

Command	Description
clear ggsn quota-server statistics	Clears debugs set for existing PDPs.

show ggsn csg

To display the parameters configured for a Content Services Group (CSG) group or the number of path and quota management messages sent and received by a quota server, use the **show ggsn csg** command in privileged EXEC mode.

show ggsn csg [[parameters | statistics [*csg-group-name*]] | **mapping]**

Syntax Description		
parameters	Displays the parameters configured for a CSG group.
statistics	Displays the number of path and quota management messages sent and received by a quota server.
csg-group-name	Name of the group for which you want to display parameters or statistics. If you do not specify the name of a CSG group, output for all configured CSG groups displays.
mapping	Displays the CSG subnet mappings (static and dynamic) for all access-points.

Defaults No default behavior or values.

Command Modes Privileged EXEC

Command History

Release	Modification
12.3(14)YQ	This command was introduced.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Release	Modification
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2 and the following service control messages statistics fields were added to the **statistics** version of the command: • Service Control Req • Enhanced Radius Interim SCR • Enhanced Radius Stop SCR • Service Control Req Ack • Service Control Req Nack • Service Control Usage • Sync Service Control Usage • Async Service Control Usage • Service Control Usage • Service Control Usage Ack • Service Control Usage Nack • SCR fail to send • Enhanced Radius Interim SCR fail to send • Enhanced Radius Stop SCR fail to send
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE and the *csg-group-name* variable and the **mapping** keyword option were added. Additionally, the following fields were added to the **parameters** version of the command: • Acct AAA-Group • PDPs's • APN
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Examples   Example 1 displays the parameters used by the CSG group. Example 2 displays the number of path and management messages sent and received by the quota server. Example 3 displays the path and management statistics sent and received by the enhanced quota server interface. Example 4 displays CSG mappings for all APNs.

Example 1

```
ggsn1#show ggsn csg parameters
GGSN CSG parameters:
  Group name:         csg1
  Virtual/alias address:5.5.5.1
  Port on CSG:        3386
  Path state:         UP
  real addresses:     5.5.5.1 22.22.22.1
```

```
                Acct AAA-Group        CSG1-GROUP
                PDP's                 4
                APN                   1 3 5
                Group name            csg2
                Virtual/alias address:5.5.5.2
                Port on CSG:          3386
                Path state:           UP
                real addresses:       5.5.5.2 22.22.22.2
                Acct AAA-Group        CSG1-GROUP
                PDP's                 1
                APN                   2 3
        ggsn1#

        ggsn1#show ggsn csg parameters
        GGSN CSG parameters:
          Group name:           csg1
          Virtual/alias address:5.5.5.1
          Port on CSG:          3386
          Path state:           UP
          real addresses:       5.5.5.1 22.22.22.1
          Acct AAA-Group        CSG1-GROUP
          PDP's                 4
          APN                   1 3 5
        ggsn1#
```

Example 2

```
        ggsn1#show ggsn csg statistics
        Group Name:               csg1
        GGSN CSG path statistics:
          Outbound msg count:     224
          Outbound byte count:    1344
          Inbound msg count:      222
          Inbound byte count:     1554
        GGSN CSG path msg statistics:
          Service Auth Req:       0
          Service Auth Resp:      0
          Service Reauth Req:     0
          Quota Return:           0
          Quota Return Req:       0
          Quota Push Accept:      0
          Service Stop:           0
          Service Stop Req:       0
          Quota Push:             0
          Quota Push resp:        0
          GTP' Acks:0

        Group Name:               csg2
        GGSN CSG path statistics:
          Outbound msg count:     30
          Outbound byte count:    180
          Inbound msg count:      31
          Inbound byte count:     190
        GGSN CSG path msg statistics:
          Service Auth Req:       0
          Service Auth Resp:      0
          Service Reauth Req:     0
          Quota Return:           0
          Quota Return Req:       0
          Quota Push Accept:      0
          Service Stop:           0
          Service Stop Req:       0
          Quota Push:             0
          Quota Push resp:        0
```

```
  GTP' Acks:0
ggsn1#
```

Example 3

```
ggsn1#show ggsn csg statistics
Service Control Message Statistics:"
  Service Control Req: 0
  Enhanced Radius Interim SCR:0
  Enhanced Radius Stop SCR:     0
  Service Control Req Ack:0
  Service Control Req Nack:0
  Service Control Usage:0
  Sync Service Control Usage:0
  Async Service Control Usage:0
  Service Control Usage:0
  Service Control Usage Ack: 0
  Service Control Usage Nack: 0
  SCR fail to send: 0
  Enhanced Radius Interim SCR fail to send:0
  Enhanced Radius Stop SCR fail to send:  0
ggsn1#
```

Example 4

```
ggsn1#show ggsn csg mapping
APN         MS Address      Netmask           CSG           Type
1           172.24.24.0     255.255.255.252   CSG1          STATIC
1           172.24.24.9     255.255.255.255   CSG1          DYNAMIC
1           172.24.24.11    255.255.255.255   CSG3          DYNAMIC
2           172.22.22.0     255.255.255.252   CSG2          STATIC
2           172.22.22.4     255.255.255.252   CSG2          DYNAMIC
```

Related Commands	Command	Description
	ggsn csg-group	Configures a CSG group or groups on the GGSN for quota server-to-CSG communication.
	port	Configures the port number on which the CSG listens for quota server traffic.
	real-address	Configures the IP address of a real CSG for source checking on inbound messages from a CSG.
	virtual-address	Configures a virtual IP address to which the quota server will send all requests.

show ggsn quota-server

To display quota server parameters or quota server-related statistics, use the **show ggsn quota-server** command in privileged EXEC mode.

show ggsn quota-server [parameters | statistics]

Syntax Description		
parameters	Displays the quota server configuration.	
statistics	Displays quota server-related message and error counts.	

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.3(14)YQ	This command was introduced.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Release	Modification
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2 and the Service msg field was added to the display of the **parameters** version of the command. The following service control messages statistics fields were added to the **statistics** version of the command:

- Service Control Req
- Enhanced Radius Interim SCR
- Enhanced Radius Stop SCR
- Service Control Req Ack
- Service Control Req Nack
- Service Control Usage
- Sync Service Control Usage
- Async Service Control Usage
- Service Control Usage
- Service Control Usage Ack
- Service Control Usage Nack
- SCR fail to send
- Enhanced Radius Interim SCR fail to send
- Enhanced Radius Stop SCR fail to send

Usage Guidelines   Use the **show ggsn quota-server** command to display the quota server configuration or quota server-related statistics on messages and error counts.

Quota server-related statistics can be cleared using the **clear ggsn quota-server statistics** command.

Examples   Example 1 displays the quota server configuration on a GGSN. Example 2 displays quota server interface-related statistics. Example 3 displays enhanced quota server interface-related statistics.

Example 1

```
ggsn1#show ggsn quota-server parameters
GGSN Quota Server parameters:
  Server name: qs
  Interface:   Loopback1
  IP address:  10.1.1.1
  Service msg  Disabled
  Table ID:    0
  Port on QS:  3386
  Echo interval:60 secs
  N3 number:   5
  T3 time:     1 secs
  CSG group:   csg1
```

Example 2

```
ggsn1#show ggsn quota-server statistics
```

```
GGSN Quota Server statistics
Quota management statistics:
  Requests rcvd:  35
  Responses rcvd: 16
  Requests sent:  16
  Responses sent: 27
Overall path management statistics:
  Requests rcvd:  5717
  Responses rcvd: 5818
  Requests sent:  5825
  Responses sent: 5717
Error statistics:
  Negative responses rcvd:0
  Requests unreplied:     0
  Seqnum failures:        0
  Dropped msgs:           10
  Unknown msgs:           0
  Unknown responses:      0
  Msgs with IE error:     0
  Bad source address msgs:0
  Version not supported:  0
  Mandatory TLV missing:  0
  Mandatory TLV incorrect:2
  Invalid Msg format:     0
  No response:            1
```

Example 3

```
ggsn1#show ggsn csg statistics
Service Control Message Statistics:"
  Service Control Req: 0
  Enhanced Radius Interim SCR:0
  Enhanced Radius Stop SCR:     0
  Service Control Req Ack:0
  Service Control Req Nack:0
  Service Control Usage:0
  Sync Service Control Usage:0
  Async Service Control Usage:0
  Service Control Usage:0
  Service Control Usage Ack: 0
  Service Control Usage Nack: 0
  SCR fail to send: 0
  Enhanced Radius Interim SCR fail to send:0
  Enhanced Radius Stop SCR fail to send:  0
ggsn1#
```

	Command	Description
Related Commands .	**clear ggsn quota-server statistics**	Clears the quota server-related statistics displayed using the **show ggsn quota-server statistics** command.
	csg-group	Associates the quota server to a CSG group to use for quota server-to-CSG communication.
	echo-interval	Specifies the number of seconds that the quota server waits before sending an echo-request message to the CSG.
	ggsn quota-server	Configures the quota server process that interfaces with the CSG for enhanced service-aware billing.
	interface	Specifies the logical interface, by name, that the quota server will use to communicate with the CSG.
	n3-requests	Specifies the maximum number of times that the quota server attempts to send a signaling request to the CSG.
	t3-response	Specifies the initial time that the quota server waits before resending a signaling request message when a response to a request has not been received.

show gprs

To display statistics for a gateway GPRS support node (GGSN), use the **show gprs** command in privileged EXEC mode.

show gprs

Syntax Description

access-point-index	Index number of an access point. Statistics for that access point are shown.
all	Statistics for all access points on the GGSN are shown.

Defaults
No default behavior or values.

Command Modes
Privileged EXEC

Command History

Release	Modification
12.4(15)XQ	This command was introduced.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines
Use the **show gprs** command to display statistics collected for the GGSN during the interval defined using the **gprs interval** global configuration command.

Examples   The following example displays statistics for the GGSN:

```
Router#show gprs
 Collection interval - 3 min, Last collected at - 1 min back
   upstream data volume in octets: 0
   downstream data volume in octets: 0
   upstream packet count: 0
   downstream packet count: 0
 Collection interval - 4 min, Last collected at - 2 min back
   upstream data volume in octets: 0
   downstream data volume in octets: 0
   upstream packet count: 0
   downstream packet count: 0
Router#
```

Related Commands

Command	Description
gprs interval	Configures the interval at which the GGSN collects data for APNs.

show gprs access-point

To display information about access points on the gateway GPRS support node (GGSN), use the **show gprs access-point** command in privileged EXEC mode.

show gprs access-point {*access-point-index* [**address-allocation** | **csg-mapping** | **all**]}

Syntax Description

access-point-index	Integer (from 1 to 65535) that identifies a GGSN access point for which you want to display information.
address-allocation	Displays Tunnel ID (TID) and dynamically allocated mobile station (MS) addresses (by either a DHCP or RADIUS server) for packet data protocol (PDP) contexts on the specified access point.
csg-mapping	Displays the subnet-to-CSG mapping established for the specified access point.
all	Displays information about all access points on the GGSN.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Release	Modification
12.2(4)MX	This command was integrated into Cisco IOS Release 12.2(4)MX. • The following output fields were added to the display: – accounting – aggregate – apn_accounting_server_group – apn_authentication_server_group – apn-type – apn_username – apn_password – Block Roamer Mode – GPRS vaccess interface – VPN – wait_accounting • The following output fields were removed from the display: – apn_charging_gw – apn_backup_charging_gw – apn_radius_server • Several output field results were changed from binary 0 and 1 to Yes and No. • The following output fields were added to the **all** version of this command: – Access-type – ppp-regeneration (max-session, setup time) – VRF Name
12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD and the Block Roamer Mode output field was changed to Block Foreign-MS Mode output field.
12.2(8)YW	This command was integrated into Cisco IOS Release 12.2(8)YW. • The following output fields were added to the display: – input ACL – output ACL – backup – RADIUS attribute suppress MSISDN – RADIUS attribute suppress IMSI – RADIUS attribute suppress SGSN Address – RADIUS attribute suppress QoS • The format of the apn_username: , apn_password: display fields was changed to apn_username: apn_password:.

Release	Modification
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(2)XU.
	The following fields were added to the display:
	• cac policy
	• idle timeout
	• input bandwidth pool
	• input service-policy
	• output bandwidth pool
	• Service Mode
	• session timeout
12.3(8)XU2	This command was integrated into Cisco IOS Release 12.3(2)XU2 and the **single pdp-session** field was the display.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU and the following field was added to the display:
	• apn_type: Virtual pre-authenticate
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB and the following field was added to the display:
	• P-CSCF group name
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG and the following fields were added to the **show gprs access-point** *access-point-index* display:
	• IPV6 enable
	• IPV6 base template
	• IPV6 uplink access list
	• IPV6 downline access list
	• IPV6 dynamic_address_pool
	• IPV6 local prefix pool
	• IPV6 primary dns
	• IPV6secondary dns
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ and the following field was added to the display:
	• Delete PDP upon update failure
	• Interim periodic accounting
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE and the following fields were added to the display:
	• Policy Control and Charging
	• Charging Group for APN

Release	Modification
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2 and the Charging Record type field was added to the display.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE and the **csg-mapping** keyword option was added as well as the following fields were added to the display: • CSG Groups • Group • path_state
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines

Use the access-point-index argument to specify a particular access point number for which you want to obtain information.

Use the **address-allocation** keyword to obtain information about dynamically allocated MS addresses and lease terms per access point.

Use the **all** keyword to obtain information about all access points in an abbreviated format.

Examples

Example 1

The following is sample output from the **show gprs access-point** command for access point 1, which is a real access point:

```
Router# show gprs access-point 1

    apn_index 1          apn_name = gprs.corporate.com
    apn_mode: transparent
    apn-type: Real
    accounting: Disable
    interim newinfo accounting: Disable
    interim periodic accounting: Disable
    wait_accounting: Disable
    input ACL: None, output ACL: None
    dynamic_address_pool: dhcp-proxy-client
    apn_dhcp_server: 10.99.100.5     backup: 10.99.100.4
    apn_dhcp_gateway_addr: 10.27.1.1
    apn_authentication_server_group: abc
    apn_accounting_server_group: abc1
    apn_username:  apn_password:
    subscribe_required: No
    deactivate_pdp_context_on violation: Yes
    network_activation_allowed: No
    Policy Control and Charging: Enable
    Block Foreign-MS Mode: Disable
    VPN: Disable  (VRF Name : None)
    GPRS vaccess interface: Virtual-Access2
    RADIUS attribute suppress MSISDN: Disabled
    RADIUS attribute suppress IMSI: Disabled
```

```
            RADIUS attribute suppress SGSN Address: Disabled
            RADIUS attribute suppress QoS: Disabled
            number of ip_address_allocated 0
            session timeout: 0
            idle timeout: 0
            Security features
             Verify IPv4 mobile source address: disable
             Verify IPv4 mobile destination address: disable
             Verify IPv6 mobile source address: disable
             Verify IPv6 mobile destination address: disable

            Traffic redirection:
             Mobile-to-mobile: destination 1.1.1.1

            Total number of PDP in this APN :0

            aggregate:
            In APN:     Disable

            In Global: Disable

    CSG Groups:
            Group:csg1, path_state = UP
            Group:csg2, path-state = UP
            primary dns: 0.0.0.0
            secondary dns: 0.0.0.0
            primary nbns: 0.0.0.0
            secondary nbns: 0.0.0.0
            Charging Group for APN: Global Default
            Charging Record Type:
            Service Mode: Operational
            cac policy: p1
            input bandwidth pool: pool1
            output bandwidth pool: pool2
            input service-policy: pdp-class-pdp
            output bandwidth pool: Disabled
            single pdp-session: Mandatory
            P-CSCF Group Name: GroupA
             IPV6 enable
            Delete PDP upon update failure
            IPV6 base vtemplate : 10
            IPv6 uplink access list: NONE
            IPV6 downlink access list : NONE
            IPV6 dynamic_address_pool : local
            IPV6 local prefix pool : localv6
            IPV6 primary dns : 2001:1:2:3::123
            IPV6 secondary dns: 3001:1:2:3::123
            DHCP address release sent by GGSN     0
```

Table 5 describes the fields show in the example.

Table 5   show gprs access-point Field Descriptions

Field	Description
accounting	Current status of accounting services at the APN: • Enable—Accounting services are enabled at the APN. This is the default for non-transparent access APNs. • Disable—Accounting services are disabled at the APN. This is the default for transparent access APNs. You can configure an APN for accounting services by using the **aaa-accounting** command in access point configuration mode.
aggregate	Route aggregation configuration information on the GGSN. The output display includes the "In APN" field for configuration information for the access point, and the "In global" field for global configuration on the GGSN. The output field may contain the following information: • IP network address and mask for which PDP requests on the access point will be collectively routed over the virtual template interface on the GGSN. IP address and mask information appears if an aggregate range is configured on the GGSN. • auto—Indicates that the GGSN uses the allocated IP mask from the DHCP (IPv4 PDPs) or RADIUS server to perform route aggregation on the APN. The keyword auto appears when the APN is configured with the **aggregate auto** command in access point configuration mode. This value applies only to the APN. • Disable—Indicates that route aggregation is not configured at either the APN or global level.
apn_accounting_server_group	Name of the AAA server group that is providing accounting services.
apn_authentication_server_group	Name of the AAA server group that is providing authentication services.
apn_dhcp_gateway_addr	IP address of the DHCP gateway, if an address is configured.
apn_dhcp_server	IP address of the DHCP server, if configured.
apn_index	Number assigned to the access point.
apn_mode	Current setting for the **access-mode** command: • Transparent—Users are allowed access without authorization or authentication. • Non-transparent—Users must be authenticated by the GGSN acting as a proxy for the authentication.
apn_name	Access point name.

Table 5   show gprs access-point Field Descriptions (continued)

Field	Description
apn_password	Password specified in the **anonymous user** command. If the **anonymous user** command is not configured, this field will be blank.
apn-type	Current setting for the **access-type** command: • Real—APN type that corresponds to a physical interface to an external network on the GGSN. • Virtual—APN type that is not associated with any specific physical target network. • Virtual pre-authenticate—Pre-authentication-based APN type that uses AAA-based user profiles to return the target APN to which the Create PDP Context request is next routed.
apn_username	Username specified in the **anonymous user** command. If the **anonymous user** command is not configured, this field will be blank.
backup	IP address of the backup DHCP server, if configured.
Block Foreign-MS Mode	Current setting for the **block-foreign-ms** command: • Enable—Blocking for foreign MSs is configured. • Disable—Blocking for foreign MSs is not configured.
cac policy	Name of the CAC maximum QoS policy applied to the APN, if any.
Charging Group for APN	Charging group applied to the APN. Possible values are Global Default or the name of a configured charging group.
Charging Record Type	Indicates the type of charging record configured under the APN: • None—No records are generated. • G-CDR—G-CDRs are generated. • eG-CDR—enhanced G-CDRs are generated. The charging record configuration is set by using the **charging record type** command.
charging service mode	Indicates whether the charging functions of a GGSN are in operational or maintenance mode.
CSG Groups: Group	Name of the CSG2 group under the APN.
CSG Groups: path_state	Current state of the path to the CSG2. Possible values are UP and DOWN.

Table 5 **show gprs access-point Field Descriptions (continued)**

Field	Description
Current iSCSI Use State in Group	Current state of the iSCSI connection in the charging group: • ACTIVE—Connection is established and the iSCSI device is being used for writing CDRs. • STANDBY—Connection is established, but there is an active charging gateway present in the group. The iSCSI target is ready to backup the charging gateways if all charging gateways go down. • UNDEFINED—Connection is down, or an iSCSI target has not been configured for the charging group.
deactivate_pdp_context_on violation	Current setting for the **access-violation** command: • No—User packets are discarded. • Yes—Mobile sessions are terminated when there is an access violation.
Delete PDP upon update failure	Current setting for the **gtp update qos-fail delete** command: • Enabled—The GGSN deletes a PDP context if a GGSN-initiated QoS update fails. • Disabled—The GGSN does not delete a PDP context if a GGSN-initiated QoS update fails.
dynamic_address_pool	Current setting for the **ip-address-pool** command.
GPRS vaccess interface	Name of the virtual access interface associated with the VPN. If no VPN is configured at the access point, the name of the virtual access interface for the GGSN virtual template is shown, which is always Virtual-Access1.
idle_timeout	Number of seconds the GGSN allows a PDP context to be idle before terminating the context as configured by using the **gprs gtp pdp-context timeout idle** global configuration command.
input ACL	IP access list for inbound packets (Gi to Gn interfaces).
input service-policy	Service policy attached to the APN using the **service-policy** access point configuration command.
input bandwidth pool	Name of the bandwidth pool, if any, applied to the output (Gn) interface in the downlink direction.
interim newinfo accounting	Indicates whether the ability to send interim accounting records to an accounting server after a routing area update or QoS change is made is enabled by using the **aaa-accounting interim update** command. The possible values are enabled or disabled.
interim periodic accounting	Indicates the time interval at which the periodic accounting records are sent by the GGSN. The possible values are Disabled' and Enabled (with periodic interval value in minutes) or Enabled with (use Attribute 85).
IPV6 base template	Virtual template interface, which contains IPv6 routing advertisements (RAs) parameters, for an APN to copy to create virtual subinterfaces for IPv6 PDP contexts.

Table 5   *show gprs access-point Field Descriptions (continued)*

Field	Description
IPV6 downlink access list	IPv6 access list for outbound packets.
IPV6 dynamic_address_pool	Current setting for the **ipv6 ipv6-address-pool** command.
IPV6 enable	Current setting for the **ipv6** command: • Enabled—Access point is configured to allow both IPv4 and IPv6 PDP contexts. • Exclusive—Access point is configured to allow only IPv6 PDP contexts.
IPV6 local prefix pool	Local IPv6 prefix pool.
IPV6 primary dns	IPv6 address of the primary IPv6 DNS to be sent in Create PDP Context responses at the access point.
IPV6 secondary dns	IPv6 address of the secondary (backup) IPv6 DNS to be sent in Create PDP Context responses at the access point
IPV6 uplink access list	IPv6 access list for inbound packets.
iSCSI profile	Name of the iSCSI target profile configured for the charging group. You can configure the charging group iSCSI target interface using the **iscsi** charging group configuration command.
iSCSI used as Primary:	Possible values are TRUE (the X) or FALSE (the x)
Mobile-to-Mobile	Current setting for the **redirect intermobile ip** command.
network_activation_allowed	Indicates whether network-initiated PDP context support is configured using the network-request-activation command: • No—Network-initiated PDP context support is disabled. • Yes—Network-initiated PDP context support is enabled.
number of ip_address_allocated	Number of IP addresses allocated to MS users.
output ACL	IP access list for outbound packets (Gn to Gi interfaces).
output bandwidth pool	Name of the bandwidth pool, if any, applied to the output (Gi) interface in the uplink direction.
P-CSCF Group Name	Name of the P-CSCF server group(s) used by this APN for P-CSCF Discovery.
Policy Control and Charging: Enable	Indicates whether the APN is enabled for Policy and Charging Control (PCC) using the **pcc** command: • Yes—PCC is enabled on the APN. • No—PCC is disabled on the APN.
Primary Charging Gateway Address	IP address of the charging group default primary charging gateway. You can configure the primary charging gateway for a charging group using the **primary** charging group configuration command.
primary dns	IP address of the primary DNS to be sent in Create PDP Context responses at the access point.

Table 5 *show gprs access-point Field Descriptions (continued)*

Field	Description
primary nbns	IP address of the primary NetBIOS Name Service (NBNS) to be sent in Create PDP Context responses at the access point.
RADIUS attribute suppress IMSI	Current setting for the **radius attribute suppress imsi** command: • Enabled—GGSN suppresses the 3GPP-IMSI number in its authentication and accounting requests to a RADIUS server. • Disabled—GGSN does not suppress the 3GPP-IMSI number in its authentication and accounting requests to a RADIUS server.
RADIUS attribute suppress MSISDN	Current setting for the **msisdn suppression** command: • Enabled—GGSN overrides or suppresses the Mobile Subscriber ISDN (MSISDN) number in its RADIUS authentication. • Disabled—GGSN does not override or suppress the MSISDN number in its RADIUS authentication.
RADIUS attribute suppress QoS	Current setting for the **radius attribute suppress qos** command: • Enabled—GGSN suppresses the 3GPP VSA 3GPP-QoS-Profile subattribute in its RADIUS authentication and accounting requests. • Disabled—GGSN does not suppress the 3GPP VSA 3GPP-QoS-Profile subattribute in its RADIUS authentication and accounting requests.
RADIUS attribute suppress SGSN Address	Current setting for the **radius attribute suppress sgsn-address** command: • Enabled—GGSN suppresses the 3rd Generation Partnership Program (3GPP) Vendor-Specific Attribute (VSA) 3GPP-SGSN-Address subattribute in its RADIUS authentication and accounting requests. • Disabled—GGSN does not suppress the 3GPP VSA 3GPP-SGSN-Address subattribute in its RADIUS authentication and accounting requests.
Secondary or Backup Charging Gateway Address	IP address of the charging group secondary (backup) charging gateway. You can configure the charging group secondary or backup charging gateway using the **secondary** charging group configuration command.
secondary dns	IP address of the secondary (backup) DNS to be sent in Create PDP Context responses at the access point
secondary nbns	IP address of the secondary (backup) NBNS to be sent in Create PDP Context response at the access point.
session timeout	Amount of time that the GGSN waits before purging mobile sessions for the access point configured by using the **gtp pdp-context timeout session** command in access point configuration mode.

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Table 5 **show gprs access-point Field Descriptions (continued)**

Field	Description
Service Mode	Indicates whether a GGSN is in operational mode or maintenance mode.
single pdp-session	Whether the GGSN is configured to delete the primary PDP context, and any associated secondary PDP contexts, of a *hanging* PDP session upon receiving a new Create PDP Context request from the same MS that shares the same IP address of the hanging PDP context.
	Possible values are:
	• Enabled—The feature is enabled on the APN and applies to all users for whom the "gtp-pdp-session=single-session" Cisco VSA is defined in their RADIUS user profile.
	• Disabled—The feature is disabled on the access point and does not apply to any user regardless of the RADIUS user profile configuration.
	• Mandatory—The feature is enabled on the APN and applies to all users on that APN regardless of the RADIUS user profile configuration.
Switchover Priority	Whether the GGSN is configured to switch to a charging gateway of higher priority when that gateway becomes active.
	The possible values are ENABLED (the GGSN switches to a charging gateway of higher priority when that gateway becomes active) or DISABLED (the GGSN does not switch to gateways of higher priority when they become active).
	You can configure the switchover priority using the **switchover priority** charging group configuration command.
subscribe_required	Current setting for the **subscription-required** command:
	• No—No subscription is required.
	• Yes—Subscription is required for access point users. The GGSN looks for the "subscription verified" selection mode in the Create PDP Context request to establish the session.
Tertiary Charging Gateway Address	IP address of the charging group tertiary (backup) charging gateway.
	You can configure the charging group tertiary charging gateway using the **tertiary** charging group configuration command.
Total number of PDP in this APN	Number of active PDP contexts for this access point.
Verify IPv4 mobile destination addr	Current setting for the **security verify destination** command:
	• Enabled—GGSN verifies the destination address of upstream Transport Protocol Data Unit (TPDUs) against the global list of Public Land Mobile Network (PLMN) addresses specified using the **gprs plmn ip address** command.
	• Disabled—GGSN does not verify the destination address of upstream TPDUs against the global list of PLMN addresses specified using the **gprs plmn ip address** command.

Table 5   show gprs access-point Field Descriptions (continued)

Field	Description
Verify IPv4 mobile source addr	Current setting for the **security verify source** command: • Enabled—GGSN verifies the source IP address of upstream TPDUs against addresses previously assigned to MSs. • Disabled—GGSN does not verify the source IP address of upstream TPDUs against addresses previously assigned to MSs.
Verify IPv6 mobile destination addr	Current setting for the **security verify destination** command: • Enabled—GGSN verifies the destination address of upstream Transport Protocol Data Unit (TPDUs) against the global list of Public Land Mobile Network (PLMN) addresses specified using the **gprs plmn ip address** command. • Disabled—GGSN does not verify the destination address of upstream TPDUs against the global list of PLMN addresses specified using the **gprs plmn ip address** command.
Verify IPv6 mobile source addr	Current setting for the **security verify source** command: • Enabled—GGSN verifies the source IP address of upstream TPDUs against addresses previously assigned to MSs. • Disabled—GGSN does not verify the source IP address of upstream TPDUs against addresses previously assigned to MSs.
VPN	Indicates whether a Virtual Private Network (VPN) is enabled or disabled at the access point. **Note** VRF is not supported for IPv6 PDPs. Therefore, if the **ipv6** command is configured on an APN on which VRF is enabled, the IPv4 PDPs are routed in VRF, but the IPv6 PDPs are routed in the global routing table.
VRF name	Name assigned to the VPN Routing and Forwarding instance. A value of None appears when VRF is not enabled at the access point.
wait_accounting	Current status of RADIUS accounting response message waiting at the APN: • Enable—GGSN waits for an accounting response message from the RADIUS server before sending an Activate PDP Context request to the SGSN. • Disable—GGSN sends an Activate PDP Context request to the SGSN after sending an accounting request to the RADIUS server. The GGSN does not wait for a RADIUS accounting response. You can configure RADIUS accounting response message waiting by using the **gprs gtp response-message wait-accounting** command in global configuration mode, or the **response-message wait-accounting** command in access point configuration mode.

Example 2

The following is sample output from the **show gprs access-point address-allocation** command:

```
router# show gprs access-point 8 address-allocation

TID                     PDP_ADDRESS

1111111100000099        10.88.105.227
1111111100000191        10.88.105.7
1111111100000192        10.88.105.70
1111111100000297        10.88.106.162
1111111100000298        10.88.106.169
1111111100000299        10.88.106.161
1111111100000391        10.88.106.150
1111111100000392        10.88.106.25
1111111100000442        10.88.106.196
1111111100000443        10.88.106.197
1111111100000886        10.88.108.153
1111111100000887        10.88.108.158
2222222200000000        10.88.111.255
```

Table 6 describes the fields show in the display.

Table 6   show gprs access-point address-allocation Field Descriptions

Field	Description
TID	Tunnel ID for the Create PDP Context request on the APN.
PDP_ADDRESS	IP address assigned to the Create PDP Context request on the APN.

Example 3

The following is sample output of the **show gprs access-point all** command:

```
Router# show gprs access-point all

There are 3 Access-Points configured

Index   Mode            Access-type   AccessPointName      VRF Name
-------------------------------------------------------------------------
1       transparent     Real          corporate_1.com      corporate_1.com
        ppp-regeneration (max-session: 10000, setup-time: 60)
-------------------------------------------------------------------------
2       non-transparent Real          corporate_2.com
-------------------------------------------------------------------------
3       transparent     Virtual       corporate_3.com
-------------------------------------------------------------------------
```

Table 7 describes the fields show in the display.

Table 7   show gprs access-point all Field Descriptions

Field	Description
Index	Integer assigned to the access point in the GGSN configuration. The index number is used to reference an APN in GGSN commands.
Mode	Authorization configured on the access point. The possible values are: • transparent—Users who access the PDN through the access point associated with the current virtual template are allowed access without authorization or authentication. • non-transparent—Users who access the PDN through the current virtual template must be authenticated by the GGSN acting as a proxy for the authentication.
Access-type	Type of access point. The possible values are: • Real—APN type that corresponds to an external physical network on the GGSN. This is the default value. • Virtual—APN type that is not associated with any specific physical target network on the GGSN. Virtual APNs are used to simply HLR provisioning in the PLMN.
AccessPointName	Access point network ID, which is commonly an Internet domain name.
VRF Name	Name of the VPN routing and forwarding instance associated with the APN.
ppp-regeneration (max-session, setup-time)	PPP regeneration session parameters configured at the access point: • max-session—Maximum number of PPP regenerated sessions allowed at the access point. • setup-time—Maximum amount of time (between 1 and 65535 seconds) within which a PPP regenerated session must be established.

Example 4

The following is sample output of the **show gprs access-point csg-mapping** command displays the subnet-to-CSG2 mapping under APN 1:

```
ggsn1# show gprs access-point 1 csg-mapping
MS Address              Netmask              CSG            Type
172.0.1.0               255.255.255.0        csg1           STATIC
172.0.2.1               255.255.255.255      csg2           DYNAMIC
```

Related Commands

Command	Description
access-point	Specifies an access point number and enters access point configuration mode.

show gprs access-point statistics

To display data volume and PDP activation and deactivation statistics for access points on the gateway GPRS support node (GGSN), use the **show gprs access-point statistics** command in privileged EXEC mode.

show gprs access-point statistics {*access-point-index* | **all**}

Syntax Description		
	access-point-index	Index number of an access point. Statistics for that access point are shown.
	all	Statistics for all access points on the GGSN are shown.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.2(4)MX	This command was introduced.
12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD.
12.2(8)YW	This command was integrated into Cisco IOS Release 12.2(8)YW.
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU and the following new output fields were added: • DHCP address requests sent by GGSN • DHCP address requests successful • DHCP address release sent by GGSN • downstream packet count • upstream packet count
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.

Release	Modification
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG and the following IPv6-related fields were added to the **show gprs access-point statistics access-point-index** command display: • ms init ipv6 pdp activation • successful ms init ipv6 pdp activation • dynamic ipv6 PDP activation • successful dynamic ipv6 activation • ms init ipv6 pdp deactivation • successful ms init ipv6 pdp deactivation • ggsn init ipv6 pdp deactivation • successful ggsn init ipv6 pdp deactivation • network init ipv6 pdp deactivation • successful network init ipv6 pdp deactivation • upstream ipv6 data bytes • upstream ipv6 data pak • downstream ipv6 data bytes • downstream ipv6 pak
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ and the following fields were added to the display: • PDP update initiated by GGSN • Successful PDP update initiated by GGSN • Total number of successful COA requests • Number of times direct tunnel enabled
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs access-point statistics** command to display data volume and PDP activation and deactivation statistics for access points on the GGSN.

Use the *access-point-index* argument to specify a particular access point number for which you want to obtain information.

Use the **all** keyword to obtain information about all access points in an abbreviated format.

Examples   The following example displays PDP context activation and deactivation statistics for access point 1 on the GGSN:

```
router# show gprs access-point statistics 1
    PDP activation intiated by MS:                54
    Successful PDP activation intiated by MS:     36
    Dynamic PDP activation initiated by MS:       0
    Successful dynamic activation initiated by MS:  0
    PDP deactivation initiated by MS:             0
    Successful PDP deactivation initiated by MS:  0
    Network initiated PDP activation:             0
    Successful network initiated PDP activation:  0
    PDP deactivation initiated by GGSN:           29
    Successful PDP deactivation initiated by GGSN:  27
    PDP update initiated by GGSN:                 0
    Successful PDP update initiated by GGSN:      0
    upstream data volume in octets:               11679
    downstream data volume in octets:             95505
    upstream packet count:                        165
    downstream packet count:                      144
    DHCP address requests sent by GGSN:           0
    DHCP address requests successful:             0
    DHCP address release sent by GGSN:            0
    Total number of COA requests received:        0
    Total number of successful COA requests:      0
    Number of times direct tunnel enabled:        0

    ms init ipv6 pdp activation:                  0
    successful ms init ipv6 pdp activation:       0
    dynamic ipv6 pdp activation:                  0
    successful dynamic v6 pdp activation:         0
    ms init ipv6 pdp deactivation:                0
    successful ms init v6 pdp deactivation:       0
    ggsn init ipv6 pdp deactivation:              0
    successful ggsn init v6 pdp deactivation:     0

    upstream ipv6 data bytes:                     0
    upstream ipv6 data pak:                       0
    downstream ipv6 data bytes:                   0
    downstream ipv6 data pak:                     0
```

Table 8   show gprs access-point statistics Field Descriptions

Field	Description
active PDP	Number of IPv4 PDP contexts that are currently established on the GGSN.
downstream data volume in octets	Number of bytes of data received by the GGSN from the PDN, or network.
downstream packet count	Downstream traffic byte counts.
DHCP address release sent by GGSN	Number of DHCP release packets sent by a DHCP server to the GGSN.
DHCP address requests sent by GGSN	Number of DHCP request packets sent to a DHCP server by the GGSN.
DHCP address requests successful	Number of DHCP requests that were successful.

Table 8   show gprs access-point statistics Field Descriptions (continued)

Field	Description
Dest addr violation	Number of IPv4 packets (and bytes) dropped by the GGSN because of a source address violation. This field displays only when the **security verify destination** command is configured. This field does not apply to APNs using VRF. In addition, verification of destination addresses does not apply to GTP-PPP regeneration or GTP-PPP with L2TP.
Dynamic PDP activation initiated by MS	Number of Create PDP Context Request messages received by the GGSN from an MS without a PDP address. (Duplicate requests are not counted.)
downstream ipv6 data bytes	Number of bytes of IPv6 data received by the GGSN from the PDN, or network.
downstream ipv6 pak	Downstream IPv6 traffic byte counts.
dynamic ipv6 PDP activation	Number of IPv6 Create PDP Context requests received by the GGSN from an MS requesting dynamic IPv6 address allocation.
ggsn init ipv6 pdp deactivation	Number of IPv6 PDP context deactivation requests initiated by the GGSN.
upstream ipv6 data bytes	Number of bytes of IPv6 data received by the GGSN from the SGSN.
upstream ipv6 data pak	Upstream IPv6 traffic byte counts.
ms init ipv6 pdp activation	Number of IPv6 Create PDP Context requests received by the GGSN that were initiated by the MS.
ms init ipv6 pdp deactivation	Number of IPv6 Delete PDP Context requests received by the GGSN that were initiated by the MS.
Number of times direct tunnel enabled	Number of direct tunnel PDPs established.
network init ipv6 pdp deactivation	Number of IPv6 Create PDP Context Request messages received by the GGSN that were network-initiated.
successful dynamic ipv6 activation	Number of successful IPv6 PDP context creations initiated by mobile user that used dynamic ipv6 address allocation.
successful ggsn init ipv6 pdp deactivation	Number of IPv6 PDP contexts that were successfully deactivated by a GGSN-initiated request.
successful ms init ipv6 pdp activation	Number of successful IPv6 PDP context creations initiated by an SGSN-initiated request.
successful ms init ipv6 pdp deactivation	Number of IPv6 PDP contexts that were successfully deactivated by an SGSN-initiated request.
successful network init ipv6 pdp activation	Number of IPv6 PDP contexts that were successfully activated by a network-initiated request.
successful network init ipv6 pdp deactivation	Number of IPv6 PDP contexts that were successfully deactivated by a network-initiated request.

Table 8   show gprs access-point statistics Field Descriptions (continued)

Field	Description
Network initiated PDP activation	Number of Create PDP Context Request messages received by the GGSN from network initiation.
PDP activation initiated by MS	Number of Create PDP Context Request messages received by the GGSN from an SGSN. (Duplicate requests are not counted.)
PDP deactivation initiated by GGSN	Number of Delete PDP Context Request messages sent by the GGSN to an SGSN.
PDP deactivation initiated by MS	Number of Delete PDP Context Request messages received by the GGSN from an SGSN. (Duplicate messages are not counted.)
PDP update initiated by GGSN	Number of Update PDP Context Requests that were initiated by the GGSN.
ppp-regeneration (max-session, setup-time)	PPP regeneration session parameters configured at the access point: max-session—Maximum number of PPP regenerated sessions allowed at the access point. setup-time—Maximum amount of time (between 1 and 65535 seconds) within which a PPP regenerated session must be established.
Redirected mobile-to-mobile traffic	Number of IPv4 packets (and bytes) dropped at the APN from which they exit because mobile-to-mobile traffic is redirected. This field displays only when the **redirect intermobile ip** command is configured.
Src addr violation	Number of IPv4 packets (and bytes) dropped because of source address violation. This field displays only when the **security verify source** command is configured.
Successful dynamic activation initiated by MS	Number of Create PDP Context Response messages sent by the GGSN with a cause value of "GTP_RES_REQACCEPTED", indicating that the PDP address is dynamically assigned.
Successful network initiated PDP activation	Number of PDP contexts activated on the GGSN that were initiated by the network.
Successful PDP activation initiated by MS	Number of Create PDP Context Response messages sent by the GGSN with a cause value of "GTP_RES_REQACCEPTED."
Successful PDP deactivation initiated by GGSN	Number of Delete PDP Context Response messages received by the GGSN from an SGSN.
Successful PDP deactivation initiated by MS	Number of Delete PDP Context Response messages sent by the GGSN to an SGSN with a cause value of "GTP_RES_REQACCEPTED".
Successful PDP update initiated by GGSN	Number of Update PDP Context Requests initiated by the GGSN that were successful.
Total number of successful CoA requests	Number of CoA requests, containing new QoS, that were successful.
upstream data volume in octets	Number of bytes of data received by the GGSN from the SGSN.
upstream packet count	Upstream traffic byte counts.

Related Commands

Command	Description
clear gprs access-point statistics	Clears statistics counters for a specific access point or for all access points on the GGSN.
show gprs access-point	Displays information about access points on the GGSN.

show gprs access-point status

To display the number of active PDPs on an access point, and how many of those PDPs are IPv4 PDPs and how many are IPv6 PDPs, use the **show gprs access-point status** command in privileged EXEC mode.

> **show gprs access-point status** *access-point-index*

Syntax Description

access-point-index	Index number of an access point. PDP-related status for that access point are shown.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(9)XG	This command was introduced.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   If no access point index is specified, the command displays PDP-related status for all APNs.

Examples   The following is sample output from the **show gprs access-point status** command:

```
Router#show gprs access-point status 4
  active PDP:                       1
  number of ip address allocated    0
  number of ipv6 address allocated  1
Router#
```

Table 9 describes the fields shown in the display.

Table 9   ***show gprs access-point status Field Descriptions***

Field	Description
active PDP	Number of active PDPs on the APN.
number of ip address allocated	Number of active PDPs with an IPv4 address allocated.
number of ipv6 address allocated	Number of active PDPs with an IPv6 address allocated.

show gprs access-point statistics

To display statistics for access points on a gateway GPRS support node (GGSN), use the **show gprs access-point statistics** command in privileged EXEC mode.

show gprs access-point statistics {*access-point-index* | **all**}

Syntax Description

access-point-index	Index number of an access point. Statistics for that access point are shown.
all	Statistics for all access points on the GGSN are shown.

Defaults　　　No default behavior or values.

Command Modes　　　Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines　　　Use the **show gprs access-point statistics** command to display statistics for access points on the GGSN.

Use the *access-point-index* argument to specify a particular access point number for which you want to obtain information.

Use the **all** keyword to obtain information about all access points in an abbreviated format.

Examples   The following example displays statistics for access point 1:

```
GGSN# show gprs access-point statistics 1

Collection interval - 1 min, Last collected at - 1 min back
    upstream data volume in octets:      0
    downstream data volume in octets:    0
    upstream packet count:               0
    downstream packet count:             0

  Collection interval - 2 min, Last collected at - 2 min back
    upstream data volume in octets:      0
    downstream data volume in octets:    0
    upstream packet count:               0
    downstream packet count:             0
```

Related Commands

Command	Description
clear gprs access-point statistics	Clears statistics counters for a specific access point or for all access points on the GGSN.
gprs interval	Configures the interval at which the GGSN collects data for APNs.
show gprs access-point	Displays information about access points on the GGSN.

show gprs bandwidth-pool status

To display a list of configured CAC bandwidth pools, along with their status, use the **show gprs bandwidth-pool status** command in privileged EXEC mode.

show gprs bandwidth-pool status *pool-name*

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs bandwidth-pool status** command to display a list of configured bandwidth pools and their status.

Examples   The following is sample output of the **show gprs bandwidth-pool status** command:

```
GGSN#show gprs bandwith-pool status bwpool1

BW Name:bwpool1
Total BW:1000000
Available BW:0
=====================================================================
conversational            Total BW:400000    Available BW:400000
streaming                 Total BW:300000    Available BW:300000
interactive               Total BW:200000    Available BW:200000
background                Total BW:100000    Available BW:100000
```

Table 10 describes the fields shown in the display.

Table 10   *show gprs bandwidth-pool status Field Descriptions*

Field	Description
BW Name	Name of the bandwith pool as defined using the **gprs bandwidth-pool** global configuration command and each sub traffic class -based pools defined using the **traffic-class** bandwidth pool configuration command.
Total BW	Total amount of bandwidth, in kilobits per second, allocated to a bandwidth pool using the **bandwidth** bandwidth pool configuration command. Also, the total bandwidth allocated to a sub traffic class-based pool, defined as a percentage or absolute value using the **traffic-class** bandwidth pool configuration command.
Available BW	Remaining amount of bandwidth, in kilobits per second, for a bandwidth pool and the remaining available bandwidth (in percentage or absolute value) for each sub traffic class-based pool.
conversational	Amount of the bandwidth pool bandwidth, in kilobits per second or as a percentage, allocated to the Conversational traffic class and the bandwidth currently available.
streaming	Amount of the bandwidth pool bandwidth, in kilobits per second or as a percentage, allocated to the Streaming traffic class and the bandwidth currently available.
interactive	Amount of the bandwidth pool bandwidth, in kilobits per second or as a percentage, allocated to the Interactive traffic class and the bandwidth currently available.
background	Amount of the bandwidth pool bandwidth, in kilobits per second or as a percentage, allocated to the Background traffic class and the bandwidth currently available.

Related Commands

Command	Description
bandwidth	Defines the total bandwidth, in kilobits per second, for a bandwidth pool.
bandwidth-pool	Applies a bandwidth pool to an APN.
gprs qos bandwidth-pool	Creates or modifies a bandwidth pool.
traffic-class	Allocates bandwidth pool bandwidth to a specific traffic class.

show gprs callrate

To display the latest call rate statistics, use the **show gprs callrate** command in privileged EXEC mode.

show gprs callrate

Defaults No default behavior or values.

Command Modes Privileged EXEC

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines Use the **show gprs callrate** command to display the latest call rate statistics.

Examples The following example displays the latest call rate statistics:

```
Router# show gprs callrate
```

Related Commands

Command	Description
gprs callrate history	Configures the number of history items to maintain for a call rate statistics collected during the interval configured.
gprs callrate interval	Configures the intervals at which global call rate statistics are collected for all APNs.
show gprs callrate history	Displays a history of the callrate statistics.

show gprs callrate history

To display a history of callrate statistics, use the s**how gprs callrate history** command in privileged EXEC mode.

> **show gprs callrate history** [*number*]

Syntax Description	*number*	Number of items maintained in history to display for the callrate statistics collected. Valid value is a number between 1 and 100.

Defaults No default behavior or values.

Command Modes Privileged EXEC

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines Use the **show gprs callrate history** command to display a history of callrate statistics.

Examples The following example displays 25 items maintained in history for callrate statistics collected for an interval:

```
Router# show gprs callrate history 25
```

Related Commands

Command	Description
gprs callrate history	Configures the number of history items to maintain for a call rate statistics collected during the interval configured.
gprs callrate interval	Configures the intervals at which global call rate statistics are collected for all APNs.
show gprs callrate	Displays the latest callrate statistics.

show gprs charging parameters

To display information about the current gateway GPRS support node (GGSN) charging configuration, use the **show gprs charging parameters** command in privileged EXEC mode.

show gprs charging parameters [**charging-group** [*group-num*]]

Syntax Description		
charging-group *group-num*	(Optional) Specifies the number of the charging group for which you want to display its current charging configuration.	

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History	Release	Modification
	12.1(1)GA	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
	12.2(4)MX	This command was integrated into Cisco IOS Release 12.2(4)MX.
		The following output fields were added to the display:
		• Charging CDR Option Local Record Sequence Number
		• Charging CDR Option No Partial CDR Generation
		• Charging CDR Option Node ID
		• Charging CDR Option Packet Count
		• Charging Change Condition Limit
		• Charging Send Buffer Size
		• Charging GTP' Port Number
		• Charging MCC Code
		• Charging MNC Code
		• Charging Roamers CDR Only
		• Charging HPLMN Matching Criteria
		• Charging SGSN Limit
		The following output fields were removed from the display:
		• Charging MCC Code
		• Charging MNC Code
		• Charging HPLMN Matching Criteria
	12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD.

Release	Modification
12.2(8)YW	This command was integrated into the Cisco IOS Release 12.2(8)YW. • The Charging Path Protocol field was changed from binary 0 and 1 to udp and tcp. • The Charging qos-info output field was changed to Charging release. • The following output fields were added to the display: – Charging Time Limit – Charging qos-info – Charging Transfer Format. – GTP' use short header
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU and the following fields were added to the display: • Access Point Name • ChCh Selection Mode • Default Tertiary Charging Gateway Address • Dynamic Address • External Charging ID • PDP Type • Served PDP Address • Service Mode • SGSN PLMN ID
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into the Cisco IOS Release 12.3(14)YU and the following fields were added to the display: • Access Point Name Virtual • Camel Charging Info • IMEISV • MS Time Zone • Radio Access Technology • User Location Information
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ and the following fields were added to the display: • GGSN's iSCSI profile • Charging Source Interface

Release	Modification
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE and the following fields were added to the display:
	• Primary Charging Gateway Address
	• Secondary or Backup Charging Gateway Address
	• Tertiary Charging Gateway Address
	• Switchover Priority
	• iSCSI Profile
	• iSCSI used as Primary
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs charging parameters** command to display the currently active charging parameters for the GGSN.

Optionally, specify the **charging-group** keyword option to display the current active charging parameters for a charging group. If you do not specify a charging group, the parameters for the global default are displayed.

Examples   **Example 1**

The following is sample output of the **show gprs charging parameters** command:

```
Router# show gprs charging parameters

GPRS Charging Protocol Parameters for Global Default charging gateway group
===============================================================================
* Primary Charging Gateway Address:      <172.17.1.2>
* Secondary Charging Gateway Address:    UNDEFINED.
* Tertiary Charging Gateway Address:     UNDEFINED.
* iSCSI profile :                        TARGET_LINUX.
* iSCSI used as Primary:                 FALSE.
* Backup data store (PSD) Address:       UNDEFINED.
* Retrieve only data store (PSD) Address: UNDEFINED.
* Current Active Charging Gateway Address: <172.17.1.2>
* Current Backup Charging Gateway Address: UNDEFINED.
* Current iSCSI Use State for group:     UNDEFINED
* Charging Server Switch-Over Timer:     <60> seconds.
* Charging Path Protocol:                udp.
* GTP' use short header:                 ENABLED.
* Charging Message Options:
   Transfer Request:
 - Packet Transfer Command IE:           DISABLED.
   Transfer Response:
 - Number Responded:                     DISABLED.
* Charging MAP DATA TOS:                 <3>
```

```
* Charging Transfer Interval:              <105> seconds.
* Charging Transfer Threshold:             <1048576> bytes.
* Charging CDR Aggregation Limit:          <255> CDRs per msg.
* Charging Packet Queue Size:              <128> messages.
* Charging Gateway Path Request Timer:     <0> Minutes.
* Charging Change Condition Limit:         <5>
* Charging service record limit:           DISABLED.
* Charging SGSN Limit:                     DISABLED.
* Charging Time Limit:                     <0>
* Charging Send Buffer Size:               <1460>
* Charging Port Number:                    <3386>
* Charging Roamers CDR Only:               DISABLED.
* Charging CDR Option:
 - Local Record Sequence Number:           DISABLED.
 - APN Selection Mode:                      DISABLED.
 - ChCh Selection Mode:                     DISABLED.
 - Radio Access Type - RAT:                 DISABLED.
 - User Location Information:               DISABLED.
 - MS Time Zone:                            DISABLED.
 - IMEISV:                                  DISABLED.
 - CAMEL Charging Info:                     DISABLED.
 - SGSN PLMN ID:                            DISABLED.
 - Dynamic Address:                         ENABLED.
 - Served PDP Address:                      ENABLED.
 - PDP Type:                                ENABLED.
 - Access Point Name:                       ENABLED.
 - Network Initiated PDP:                   ENABLED.
 - No Partial CDR Generation:               DISABLED.
 - Node ID:                                 DISABLED.
 - Packet Count:                            DISABLED.
 - Served MSISDN:                           DISABLED.
 - Private Echo:                            DISABLED.
* Charging release:                        99
* Charging Tariff Time Changes:
- NO Tariff Time Changes.
* Charging Service Mode:                   OPERATIONAL.
* Charging Gateway Priority Switchover:    DISABLED.
* Charging Source Interface:               Vt1 <30.30.1.6>
* ISCSI Record Format:                     gtp
```

Table 11 describes the fields shown in the display.

Table 11   *show gprs charging parameters Field Descriptions*

Field	Description
Backup data store (PSD) Address	IP address of the local Persistent Storage Device (PSD) to which G-CDRs are backed up if a charging gateway is unavailable.
Charging CDR Aggregation Limit	Maximum number of CDRs that the GGSN aggregates in a charging data transfer message to the charging gateway. You can configure this limit using the **gprs charging cdr-aggregation-limit** command.

Table 11 *show gprs charging parameters Field Descriptions (continued)*

Field	Description
Charging CDR Option: Access Point Name Charging CDR Option: Access Point Name Virtual	Status indicating if the GGSN provides the APN or virtual APN parameter in G-CDRs. Possible values are enabled or disabled. You can enable the GGSN to provide the APN or virtual PAN parameter in G-CDRs using the **gprs charging cdr-option apn** and **gprs charging cdr-option apn virtual** commands.
Charging CDR Option: APN Selection Mode	Status indicating if the GGSN provides the reason code for APN selection in G-CDRs. The possible values are enabled or disabled. You can enable the GGSN to provide the APN selection mode in G-CDRs using the **gprs charging cdr-option apn-selection-mode** command.
Charging CDR Option: CAMEL Charging Info	Status indicating if the GGSN includes a copy of the tag and length of the Customized Application for Mobile Enhanced Logic (CAMEL) from the S-CDR in G-CDRs. You can enable the GGSN to include a copy of the tag and length of the CAMEL in G-CDRs using the **gprs charging cdr-option camel-charge-info** command.
Charging CDR Option: ChCh Selection Mode	Status indicating if the GGSN includes the charging characteristics selection mode parameter in G-CDRs. Possible values are enabled or disabled.
Charging CDR Option: Dynamic Address	Status indicating if the GGSN includes the dynamic address flag parameter in G-CDRs. Possible values are enabled or disabled. You can enable the GGSN to provide the APN parameter in G-CDRs using the **gprs charging cdr-option dynamic-address** command.
Charging CDR Option: IMEISV	Status indicating if the GGSN includes the International Mobile Equipment Identity IMEI software version (IMEISIV) in G-CDRs. You can enable the GGSN to include the IMEISIV IE in G-CDRs using the **gprs charging cdr-option imeisv** command.
Charging CDR Option: Local Record Sequence Number	Status indicating if the GGSN uses the local record sequence field in G-CDRs. The possible values are enabled or disabled. You can enable the GGSN to use the local record sequence field in G-CDRs using the **gprs charging cdr-option local-record-sequence-number** command.

Table 11   *show gprs charging parameters Field Descriptions (continued)*

Field	Description
Charging CDR Option: MS Time Zone	Status indicating if the GGSN includes the MS time zone (MSTZ) in G-CDRs. You can enable the GGSN to provide MSTZ in G-CDRs using the **gprs charging cdr-option ms-time-zone** command.
Charging CDR Option: Network Initiated PDP	Status indicating if the GGSN includes the NIP parameter in G-CDRs. The possible values are enabled or disabled. You can enable the GGSN to use the local record sequence field in G-CDRs using the **gprs charging cdr-option nip** command.
Charging CDR Option: No Partial CDR Generation	Status indicating if the GGSN can create partial CDRs. The possible values are enabled or disabled. You can disable partial CDR generation by the GGSN using the **gprs charging cdr-option no-partial-cdr-generation** command.
Charging CDR Option: Node ID	Status indicating if the GGSN specifies the name of the node that generated the CDR in the node ID field of the G-CDR. The possible values are enabled or disabled. You can enable the GGSN to use the node ID field in G-CDRs using the **gprs charging cdr-option node-id** command.
Charging CDR Option: Packet Count	Status indicating if the GGSN provides uplink and downlink packet counts in the optional record extension field of a G-CDR. The possible values are ON or OFF. You can enable the GGSN to provide packet counts using the **gprs charging cdr-option packet-count** command.
Charging CDR Option: PDP Type	Status indicating if the GGSN includes the PDP type parameter in G-CDRs. The possible values are enabled or disabled. You can enable the GGSN to provide packet counts using the **gprs charging cdr-option pdp-type** command.
Charging CDR Option: Private Echo	Status indicating if the GGSN uses private echo signaling for flow control. The possible values are enabled or disabled. You can enable private echo signaling using the **gprs charging flow-control private-echo** command.
Charging CDR Option: Radio Access Type-RAT	Status indicating if the GGSN includes the radio access technology (RAT) IE in G-CDRs. You can enable the GGSN to provide the RAT IE in G-CDRs using the **gprs charging cdr-option rat-type** command.

Table 11   show gprs charging parameters Field Descriptions (continued)

Field	Description
Charging CDR Option: Served MSISDN	Status indicating if the GGSN provides the mobile station integrated services digital network number from the Create PDP Context request in a G-CDR. The possible values are enabled or disabled.
	You can enable the GGSN to provide the MSISDN number using the **gprs charging cdr-option served-msisdn** command.
Charging CDR Option: Served PDP Address	Status indicating if the GGSN provides the PDP address from the Create PDP Context request in a G-CDR. Possible values are enabled or disabled.
	You can enable this feature using the **gprs charging cdr-option pdp-address** command.
Charging CDR Option: SGSN PLMN ID	Status indicating if the GGSN includes the SGSN PLMN identifier in G-CDRs. The possible values are enabled or disabled.
	You can enable the GGSN to include the SGSN PLMN identifier using the **gprs charging cdr-option sgsn-plmn** command.
Charging CDR Option: User Location Information	Status indicating if the GGSN includes the user location information (ULI) IE in G-CDRs.
	You can configure the GGSN to include the ULI IE in G-CDRs using the **gprs charging cdr-option user-loc-info** command.
Charging Change Condition Limit	Maximum number of charging containers in each G-CDR.
	You can configure the change condition limit using the **gprs charging container change-limit** command.
Charging Gateway Path Request Timer	Number of minutes that the GGSN waits before trying to establish the TCP path to the charging gateway when TCP is the specified path protocol.
	You can configure the path request timer using the **gprs charging cg-path-requests** command.
Charging Gateway Priority Switchover	Whether or not the GGSN switches over to a charging gateway of higher priority when that gateway becomes active.
	The possible values are ENABLED (the GGSN switches over to a charging gateway of higher priority when that gateway becomes active) or DISABLED (the GGSN does not switch to gateways of higher priority when such a gateway becomes active).
	You can enable the GGSN to switch to a higher priority charging gateway using the **gprs charging switchover priority** command.

Table 11　　*show gprs charging parameters Field Descriptions (continued)*

Field	Description
Charging MAP DATA TOS	Type of service (ToS) priority currently configured for GGSN charging packets. Value (between 0 and 5) is set in the precedence bits of the IP header of charging packets.
	You can configure the ToS mapping using the **gprs charging map data tos** command.
Charging Message Options: Number Responded	Status indicating if the GGSN uses the Number of Requests Responded field instead of the Length field in the Requests Responded IE of Data Record Transfer Response messages. The possible values are enabled or disabled.
	You can enable the GGSN to use the Number of Requests Responded field using the **gprs charging message transfer-response number-responded** command.
Charging Message Options: Packet Transfer Command IE	Status indicating if the GGSN includes the Packet Transfer Command IE in the Data Record Transfer Request messages. The possible values are enabled or disabled.
	You can enable the GGSN to include the Packet Transfer Command IE in the Data Record Transfer Request messages using the **gprs charging message transfer-request command-ie** command.
Charging Message Options: Send Possibly Duplicated CDR	Status indicating if the GGSN retransmits Data Record Transfer Request messages (sent to a previously active charging gateway) with the value of the Packet Transfer Request IE set to Send Possibly Duplicate Data Record Packet (2). The possible values are enabled or disabled.
	To configure the GGSN to retransmit Data Record Transfer Request messages with the value of the Packet Transfer Request IE set to 2, use the **gprs charging message transfer-request possibly-duplicate** command.
Charging Message Options: Transfer Request	Whether the GGSN includes the Packet Transfer Command IE in the Data Record Transfer Response messages.
	The possible values are ENABLED (the GGSN includes the Packet Transfer Command IE) or DISABLED (the GGSN does not include the IE).
Charging Messages Options: Transfer Response	Whether the GGSN is using the Number of Requests Responded field instead or the Length field in the Requests Responded IE of Data Record Transfer Response messages.
	The possible values are ENABLED (the GGSN uses the Number of Requests Responded field) or DISABLED (the GGSN uses the Length field).

Table 11   show gprs charging parameters Field Descriptions (continued)

Field	Description
Charging Packet Queue Size	Maximum number of unacknowledged charging data transfer requests that the GGSN maintains in its queue. You can configure the maximum queue size using the **gprs charging packet-queue-size** command.
Charging Path Protocol	Protocol in use between the GGSN and the charging gateway. The possible values are udp or tcp. You can configure the charging path protocol using the **gprs charging path-protocol** command.
Charging Port Number	Destination port of the charging gateway. You can configure the destination port using the **gprs charging port** command.
Charging release	Charging release with which the GGSN is to comply when presenting G-CDRs. Possible values are 98, 99, 4, or 5. You can configure the charging release using the **gprs charging release** command.
Charging Roamers CDR Only	Status of the charging for roamers feature on the GGSN. The possible values are enabled or disabled. You can configure the GGSN to support creation of CDRs for roaming subscribers using the **gprs charging roamers** command.
Charging Send Buffer Size	Size (in bytes) of the buffer that contains the GTP' PDU and signaling messages on the GGSN. You can configure the buffer size using the **gprs charging send-buffer** command.
Charging Server Switch-Over Timer	Amount of time (in seconds) that the GGSN waits before sending charging data to the backup charging gateway, after the active charging gateway fails. You can configure this period of time using the **gprs charging server-switch-timer** command.
Charging SGSN Limit	Maximum number of SGSN changes that can occur before the GGSN closes a G-CDR for a particular PDP context.
Charging Source Interface	Loopback interface being used for charging traffic.
Charging Tariff Time Changes	Time of day when GGSN charging tariffs change. You can configure this time using the **gprs charging tariff-time** command.
Charging Transfer Interval	Amount of time (in seconds) that the GGSN waits before checking and sending any closed CDRs to the charging gateway. You can configure this period of time using the **gprs charging transfer interval** command.

Table 11 show gprs charging parameters Field Descriptions (continued)

Field	Description
Charging Transfer Threshold	Maximum size (in bytes) that the GGSN maintains in a charging container before closing it and updating the CDR.
	You can configure the container volume using the **gprs charging container volume-threshold** command.
Current Active Charging Gateway Address	IP address of the charging gateway to which the GGSN is currently sending charging data.
	You can configure the primary charging gateway using the **gprs default charging-gateway** command.
Current Backup Charging Gateway Address	IP address of the backup charging gateway to which the GGSN will send charging data if the current active charging gateway becomes unavailable.
	You can configure the backup charging gateway using the **gprs default charging-gateway** command.
Current iSCSI Use State for group	
GTP' use short header	Whether the GGSN is using the GTP short header (6-byte header). The possible values are ENABLED (the GGSN is using the GTP short header) or DISABLED (the GGSN is using the GTP long header).
	You can configure the GGSN to use the GTP short header using the **gprs charging header short** command.
iSCSI profile	Name of the iSCSI target profile configured on the GGSN.
ISCSI Record Storage Format	
iSCSI used as Primary	True or False.
Primary Charging Gateway Address	IP address of the default primary charging gateway.
	You can configure the default primary charging gateway using the **gprs default charging-gateway** command.
Retrieve only data store (PSD) Address	IP address of the remote Persistent Storage Device (PSD) from which G-CDRs are only retrieved.
Secondary Charging Gateway Address	IP address of the default secondary (backup) charging gateway.
	You can configure the default backup charging gateway using the **gprs default charging-gateway** command.
Tertiary Charging Gateway Address	IP address of the default tertiary (backup) charging gateway.
	You can configure the default backup charging gateway using the **gprs default charging-gateway** command.

Example 2

The following is sample output of the **show gprs charging parameter** command with a charging group specified:

```
Router# show gprs charging parameters charging group 10

Primary Charging Gateway Address:172.17.1.3
Secondary or Backup Charging Gateway Address:UNDEFINED
Tertiary Charging Gateway Address:UNDEFINED
Switchover Priority: DISABLED
iSCSI Profile: TARGETA
iSCSI used as Primary:TRUE
```

Table 12 describes the fields shown in the display.

Table 12   show gprs charging parameters Field Descriptions

Field	Description
Primary Charging Gateway Address	IP address of the charging group default primary charging gateway. You can configure the primary charging gateway for a charging group using the **primary** charging group configuration command.
Secondary or Backup Charging Gateway Address	IP address of the charging group secondary (backup) charging gateway. You can configure the charging group secondary or backup charging gateway using the **secondary** charging group configuration command.
Switchover Priority	Whether the GGSN is configured to switch to a charging gateway of higher priority when that gateway becomes active. The possible values are ENABLED (the GGSN switches to a charging gateway of higher priority when that gateway becomes active) or DISABLED (the GGSN does not switch to gateways of higher priority when they become active). You can configure the switchover priority using the **switchover priority** charging group configuration command.
Tertiary Charging Gateway Address	IP address of the charging group tertiary (backup) charging gateway. You can configure the charging group tertiary charging gateway using the **tertiary** charging group configuration command.
iSCSI profile	Name of the iSCSI target profile configured for the charging group. You can configure the charging group iSCSI target interface using the **iscsi** charging group configuration command.
iSCSI used as Primary:	Possible values are TRUE or FALSE.

Related Commands	Command	Description
	show gprs charging statistics	Displays cumulative charging statistics for the GGSN.

show gprs charging profile

To display the details of a charging profile, use the **show gprs charging profile** command in privileged EXEC mode.

show gprs charging profile [*profile-num*]

Syntax Description

profile-number	(Optional) Number of the charging profile for which you want to display information. If the name of a charging profile is not specified, information for all charging profiles displays.

Defaults   No default behavior or values.

Command Modes Privileged EXEC

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE and multiple DCCA profiles can display in the command output.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines Use the **show gprs charging profile** command to display the details of a specific charging profile. If you do not specify the name of a profile, information for all defined profiles is displayed.

Examples The following is sample output of the **show gprs charging profile** command:

```
Router# show gprs charging profile 1
----------- Slot 1/CPU 3, show gprs charging profile 1-------------

Charging Profile 1:
  Reference Count:                     0
  Volume Limit:                        1048576 bytes
    - Continue Option:                 ENABLED
  Time Limit:                          0 minutes
    - Continue Option:                 ENABLED
  SGSN Change Limit:                   DISABLED
  Tariff Time Change:                  DISABLED
  DCCA Profile Name(s):
    DCCA-PROF1
```

```
       DCCA-PROF2
       DCCA-PROF3
       DCCA-PROF4
       DCCA-PROF5
Default Rulebase ID:                      rule1
Content Postpaid Volume:                  1048576 bytes
Content Postpaid Volume Threshold:        209715 bytes
Content Postpaid Time:                    1048576 seconds
Content Postpaid Time Threshold:          209715 seconds
Content Postpaid Validity Time:           0 seconds
Content Postpaid SGSN Trigger:            DISABLED
Content Postpaid QoS Trigger:             DISABLED
Content Postpaid RAT Trigger:             DISABLED
Content Postpaid PLMN-Id Trigger:         DISABLED
Content Postpaid User-Loc-Info Trigger:   DISABLED
CDR Suppression:                          DISABLED
CDR Suppression for Prepaid:              DISABLED
```

Related Commands	Command	Description
	show gprs charging parameters	Displays information about the current GGSN charging configuration.
	show gprs charging statistics	Displays current charging statistics for the GGSN.
	show gprs charging summary	Displays a summary of all charging groups defined on the GGSN.

show gprs charging profile dcca status

To display the status of a DCCA profile under the charging profile, use the **show gprs charging profile dcca status** command in privileged EXEC mode.

show gprs charging profile [*profile-num*] **dcca status**

Syntax Description		
profile-number	(Optional) Number of the charging profile for which you want to display information. If the name of a charging profile is not specified, information for all charging profiles displays.
dcca status	Displays the status of all the DCCA profiles configured under the charging profile.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History	Release	Modification
	12.4(24)YE	This command was introduced.

Usage Guidelines   Use the show gprs charging profile DCCA status command to display the status of a DCCA profile configured under charging profile.

If the DCCA server associated with a DCCA profile is down, then that DCCA profile is not used again for a specific time-period. The time-period is calculated exponentially for each consecutive unsuccessful attempt, starting from four seconds to a maximum of 256 seconds (for example, 4, 8. 16, 32, 64, 128, 256).

If a response is received from the DCCA server at any time for a PDP under the charging profile, then the time-period is reset to four seconds.

The status of a DCCA profile within a charging profile is categorized by one of the following states:

- DOWN
- PROBE
- UP

1. Initially, all DCCA profiles are marked UP. DCCA profiles configured under a charging profile are selected via round-robin if their state is PROBE or UP.

2. If there is no response from the DCCA server, the DCCA profile it is marked DOWN, and the timer is started.

3. After the timer expires, the DCCA profile status under the charging profile is moved to PROBE

4. If a DCCA profile is in PROBE state, then the DCCA profile is used only once in round robin irrespective of the weight configured.

5. When in a PROBE state, if a response is received from the OCS under DCCA, then the state is moved to UP. If there is no response, the state is moved to DOWN, and the timer is started, doubling the previous time-period, but not exceeding 256 seconds.

Examples   The following is sample output of the **show gprs charging profile** command:

```
Router# show gprs charging profile 1 dcca status
----------- Slot 1/CPU 3, show gprs charging profile 1 dcca status -------------

Charging Profile 1:
  DCCA Profile(s):
    DCCA-PROF1
    DCCA-PROF2
    DCCA-PROF3
----------- Slot 1/CPU 4, show gprs charging profile 1 dcca status -------------

Charging Profile 1:
  DCCA Profile(s):
  Last used DCCA Profile DCCA-PROF3, Remaining Weight 0
    DCCA-PROF1
      Status UP
      Weight Configured 1
      DOWN Timer --:--:--
      Failed last 0 tries
      Message statistics under this charging profile
        Requests Sent 9
        Responses Received 9
    DCCA-PROF2
      Status PROBE
      Weight Configured 1
      DOWN Timer --:--:--
      Failed last 2 tries
      Message statistics under this charging profile
        Requests Sent 6
        Responses Received 0
    DCCA-PROF3
      Status DOWN
      Weight Configured 1
      DOWN Timer 00:02:02
      Failed last 6 tries
      Message statistics under this charging profile
        Requests Sent 6
        Responses Received 0

----------- Slot 1/CPU 5, show gprs charging profile 1 dcca status -------------
```

Related Commands	Command	Description
	show gprs charging parameters	Displays information about the current GGSN charging configuration.
	show gprs charging statistics	Displays current charging statistics for the GGSN.
	show gprs charging summary	Displays a summary of all charging groups defined on the GGSN.

show gprs charging session

To display iSCSI session information, use the **show gprs charging session** command in privileged EXEC mode.

show gprs charging session [*iscsi-profile-name*]

Syntax Description

iscsi-profile-name	(Optional) Name of the iSCSI profile for which you want to display session information. If the name of an iSCSI profile is not specified, session information for globally defined iSCSI profiles is displayed.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs charging session** command to display iSCSI session information for a specific iSCSI profile. If the name of an iSCSI profile is not specified, session information for globally defined iSCSI profiles is displayed.

Related Commands

Command	Description
show gprs charging parameters	Displays information about the current GGSN charging configuration.
show gprs charging statistics	Displays current charging statistics for the GGSN.
show gprs charging summary	Displays a summary of all charging groups defined on the GGSN.

show gprs charging statistics

To display cumulative charging statistics for the gateway GPRS support node (GGSN), use the **show gprs charging statistics** command in privileged EXEC mode.

show gprs charging statistics [**all** | **charging-group** [*group-num*]]

Syntax Description

all	Displays all charging statistics.
charging-group *group-num*	(Optional) Specifies the number of the charging group for which you want to display cumulative statistics.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(4)MX	This command was integrated into Cisco IOS Release 12.2(4)MX, and the statistics were changed to be cumulative since the last restart of the GGSN and the keyword options were removed.
12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD.
12.2(8)YW	This command was integrated into Cisco IOS Release 12.2(8)YW.
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE and the **charging group** keyword option was added.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs charging statistics** command to display cumulative charging statistics since the last restart of the GGSN.

Optionally, specify the **charging group** keyword option to display cumulative charging statistics for a charging group.

Examples   **Example 1**

The following is sample output of the **show gprs charging statistics all** command:

```
Router#show gprs charging statistics all
           GPRS Charging Protocol Statistics for Global Default Charging Group
           ====================================================================
* Total Number of CDRs for Charging:                      <0>
* Total Number of Containers for Charging:                <0>
* Total Number of Service Records:                        <0>
* Total Number of CDR_Output_Msgs sent:                   <0>
* Total Number of CDR_Output_Msgs sent to iSCSI:          <0>
* Total Number of CDR_Output_Msgs sent to Charging Gateway: <0>

-- Charging Gateway Statistics --
* Charging Gateway Down Count:                            <0>
```

Table 13 describes the fields shown in the display.

.

Table 13   show gprs charging statistics Field Descriptions

Field	Description
Total Number of CDRs for Charging	Cumulative number of open and closed G-CDRs on the GGSN since the last startup of the GGSN.
Total Number of Containers for Charging	Cumulative number of all open and closed charging containers for all G-CDRs on the GGSN since the last startup of the GGSN.
Total Number of CDR_Output_Msgs sent	Cumulative number of G-CDR output messages that the GGSN sent since the last startup of the GGSN.
Total Number of CDR_Output_Msgs sent to iSCSI.	Cumulative number of G-CDR output messages that the GGSN sent to the iSCSI target since the last startup of the GGSN.
Total Number of CDR_Output_Msgs sent to Charging Gateway	Cumulative number of G-CDR output messages that the GGSN sent to the charging gateway and received acknowledgment for since the last startup of the GGSN.
Charging Gateway Down Count	Number of times that the charging gateway has transitioned its state (from up or unknown, to down) since the last startup of the GGSN.

Related Commands

Command	Description
show gprs charging parameters	Displays information about the current GGSN charging configuration.
show gprs charging status	Displays current charging statistics for the GGSN.

show gprs charging status

To display current charging statistics for the gateway GPRS support node (GGSN), use the **show gprs charging status** command in privileged EXEC mode.

> **show gprs charging status** {**access-point** *access-point-index* | **all** | charging-group index | **tid** *tunnel_id*}

Syntax Description	**access-point** *access-point-index*	Displays charging statistics for a specific access point index.
	all	Displays all charging statistics.
	charging-group *index*	Displays charging statistics for a specific charging group index.
	tid *tunnel_id*	Displays charging statistics for a specific tunnel ID.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History	Release	Modification
	12.2(4)MX	This command was introduced.
	12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD and the Number of partial CDRs output field was changed to the Number of closed CDRs buffered.
	12.2(8)YW	This command was integrated into Cisco IOS Release 12.2(8)YW.
	12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB and the sgsn_plmn_id field was added to the display.
	12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU.
	12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
	12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
	12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
	12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
	12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
	12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
	12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE and the **charging-group** keyword option was added.
	12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
	12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
	12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
	12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
	12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.

Release	Modification
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines

Use the **show gprs charging status** command to display current charging statistics for the GGSN since the last G-CDR was sent.

Examples

Example 1

The following is sample output of the **show gprs charging status tid** command:

```
Router#show gprs charging status tid 1102334415151515
GPRS Charging Protocol Status for TID
       =========================================

* Number of CDRs :                           <1>
* Number of closed CDRs buffered:            <0>
* Number of Containers:                      <0>
* Number of Service Records:                 <0>
```

Table 14 describes the fields shown in the display.

Table 14   show gprs charging status tid Field Descriptions

Field	Description
Number of CDRs	Number of currently open and closed G-CDRs on the GGSN for the specified TID, since the last G-CDR was successfully sent to the charging gateway.
Number of closed CDRs buffered	Number of currently closed G-CDRs that the GGSN has not yet sent to the charging gateway for the specified TID.
Number of Containers	Number of all currently open and closed charging containers for the specified TID, since the last G-CDR was successfully sent to the charging gateway.
Number of Service Records	

Example 2

The following is sample output of the **show gprs charging status access-point** command:

```
Router#show gprs charging status access-point 1

                GPRS Charging Protocol Status for APN
                =========================================

      * Number of CDRs:                            <96>
      * Number of closed CDRs buffered:            <0>
      * Number of Containers:                      <0>
```

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Table 15 describes the fields shown in the display.

Table 15   show gprs charging status access-point Field Descriptions

Field	Description
Number of CDRs	Number of currently open and closed G-CDRs on the GGSN for the specified access point, since the last G-CDR was successfully sent to the charging gateway.
Number of closed CDRs buffered	Number of currently closed G-CDRs that the GGSN has not yet sent to the charging gateway for the specified access point.
Number of Containers	Number of all currently open and closed charging containers for the specified access point, since the last G-CDR was successfully sent to the charging gateway.

Example 3

The following is sample output of the **show gprs charging status all** command:

```
Router# show gprs charging status all
          GPRS Charging Protocol Status
          ================================

  * Number of APNs :                              <1>
  * Number of CDRs :                              <96>
  * Number of closed CDRs buffered:           <0>
  * Number of Containers buffered:            <0>
  * Number of pending unack. CDR_Output_Msgs:    <1>
```

Table 16 describes the fields shown in the display.

Table 16   show gprs charging status Field Descriptions

Field	Description
Number of APNs	Number of access points for which charging data has currently been collected. This statistic appears in the **all** version of this command only.
Number of CDRs	Number of currently open and closed G-CDRs on the GGSN since the last G-CDR was successfully sent to the charging gateway. For the **tid** and **access-point** versions of this command, this is the number of currently open and closed G-CDRs for the specified TID or access point.
Number of closed CDRs buffered	Number of currently closed G-CDRs that the GGSN has not yet sent to the charging gateway. For the **tid** and **access-point** versions of this command, this is the number of currently closed G-CDRs for the specified TID or access point that have not yet been sent to the charging gateway.

Table 16   *show gprs charging status Field Descriptions (continued)*

Field	Description
Number of Containers buffered	Number of all currently open and closed charging containers since the last G-CDR was successfully sent to the charging gateway.
Number of pending unack. CDR_Output_Msgs	Number of G-CDR output messages sent by the GGSN that are not acknowledged by the charging gateway.

Related Commands

Command	Description
show gprs charging parameters	Displays information about the current GGSN charging configuration.
show gprs charging statistics	Displays cumulative charging statistics for the GGSN.

show gprs charging summary

To display a summary of all charging groups defined on the Cisco GGSN, use the **show gprs charging summary** command in privileged EXEC mode.

show gprs summary

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values.

Command Modes Privileged EXEC

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines Use the **show gprs charging summary** command to display a summary of all charging groups configured on the Cisco GGSN, along with the IP addresses of the gateways and the configured iSCSI targets. Additionally, the globally defined default gateways are displayed.

Examples The following is sample output of the **show gprs charging summary** command:

```
Router#show gprs charging summary
======================================================
****** CHARGING ENABLED ******
======================================================

GPRS Charging Protocol Parameters for Global Default charging gateway group
============================================================================
* Primary Charging Gateway Address:        <45.1.1.2>
* Secondary Charging Gateway Address:      UNDEFINED.
* Tertiary Charging Gateway Address:       UNDEFINED.
* iSCSI profile :                          UNDEFINED.
* iSCSI used as Primary:                   FALSE.
======================================================

Router#
```

Related Commands	Command	Description
	gprs charging group	Defines or modifies a charging gateway group.
	show gprs charging parameters	Displays information about the current GGSN charging configuration.
	show gprs charging session	Displays iSCSI session information.
	show gprs charging statistics	Displays current charging statistics for the GGSN.

show gprs gtp ms

To display the currently active MSs on the gateway GPRS support node (GGSN), use the **show gprs gtp ms** command in privileged EXEC mode.

> **show gprs gtp ms** {**imsi** *imsi*| **access-point** *access-point-index* | **all**}

Syntax Description

imsi *imsi*	Displays MSs by International Mobile Subscriber Identity (IMSI). The IMSI can be up to 15 numeric digits. You can obtain the IMSI from the output for the **show gprs gtp ms all** command or the **show gprs gtp pdp-context tid** command.
access-point *access-point-index*	Displays MSs by access point.
all	Displays all MSs.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.2(8)YW	This command was introduced.
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
	• The MS Addr field was updated to reflect the virtual interface identifier for PPP PDP contexts and the status of PPP PDP with L2TP contexts.
	• The SGSN MCC/MNC field was added
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs gtp ms** command to display information about the mobile stations that are currently active on the GGSN. You can display the MS information according to access point or IMSI. You can also display information for all MSs.

Examples   The following example displays information for all MSs:

```
router# show gprs gtp ms all
MSI             SGSN MCCMNC MS Addr              APN
214300000000004  NA         1.2.3.18             gtpv1.com
214300000000009  NA         1.2.3.23             gtpv1.com
214300000000000  NA         1.2.3.14             gtpv1.com
214300000000005  NA         1.2.3.19             gtpv1.com
214300000000001  NA         1.2.3.15             gtpv1.com
214300000000006  NA         1.2.3.20             gtpv1.com
214300000000002  NA         1.2.3.16             gtpv1.com
214300000000007  NA         1.2.3.21             gtpv1.com
214300000000003  NA         1.2.3.17             gtpv1.com
214300000000008  NA         1.2.3.22             gtpv1.com
```

The following example displays information for all MSs on access point 1:

```
router# show gprs gtp ms access-point 1
MSI             SGSN MCCMNC MS Addr              APN
214300000000004  NA         1.2.3.18             gtpv1.com
214300000000009  NA         1.2.3.23             gtpv1.com
214300000000000  NA         1.2.3.14             gtpv1.com
214300000000005  NA         1.2.3.19             gtpv1.com
214300000000001  NA         1.2.3.15             gtpv1.com
214300000000006  NA         1.2.3.20             gtpv1.com
214300000000002  NA         1.2.3.16             gtpv1.com
214300000000007  NA         1.2.3.21             gtpv1.com
214300000000003  NA         1.2.3.17             gtpv1.com
214300000000008  NA         1.2.3.22             gtpv1.com
```

The following example displays information for all MSs on IMSI 110406080002045:

```
router# show gprs gtp ms imsi 214300000000004
IMSI             SGSN MCCMNC MS Addr              APN
214300000000004  NA         1.2.3.18             gtpv1.com

 number of pdp: 1
 reference count: 1
```

Table 17 describes the fields shown in the display.

Table 17   show gprs gtp ms Field Descriptions

Field	Description
IMSI	International mobile subscriber identity for the MSs.
MS ADDRESS	The IP address for the MSs. **Note** For PPP PDP contexts, this field will also display the virtual interface identifier. For PPP PDP with L2TP contexts, this field will also display the state of the PDP context. Possible states are Pending, Forwarded, or Terminating.
APN	Access point name.
number of pdp	Number of PDP contexts on the MSs.

Table 17   show gprs gtp ms Field Descriptions (continued)

Field	Description
reference count	Internal data structure field. It is used only for internal troubleshooting purposes.
SGSN MCCMNC	MCC/MNC of the SGSN.

Related Commands

Command	Description
show gprs gtp pdp-context	Displays a list of the currently active PDP contexts (mobile sessions).
show gprs gtp status	Displays information about the current status of the GTP on the GGSN (such as activated PDP contexts and QoS statistics).

show gprs gtp parameters

To display information about the current GPRS Tunneling Protocol (GTP) configuration on the gateway GPRS support node (GGSN), use the **show gprs gtp parameters** command in privileged EXEC mode.

show gprs gtp parameters

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(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(4)MX	This command was integrated into Cisco IOS Release 12.2(4)MX.
	The following output fields were added to the display:
	• Charging MCC Code
	• Charging MNC Code
	• Charging HPLMN Matching Criteria
	• GTP dynamic echo-timer minimum
	• GTP dynamic echo-timer smooth factor
	The following output field was removed:
	• GTP max hold time for old sgsn PDUs T3_tunnel
12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD and the following output field was removed from the display:
	• GPRS HPLMN Matching Criteria
12.2(8)YW	This command was integrated into Cisco IOS Release 12.2(8)YW.
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU and the following output fields were removed from the display:
	• GPRS MCC Code
	• GPRS MNC Code
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.

Release	Modification
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs gtp parameters** command to display the current GTP parameters configured on the GGSN.

Examples   The following is sample output of the **show gprs gtp parameters** command:

```
router# show gprs gtp parameters
    GTP path echo interval                   = 60
    GTP signal max wait time T3_response     = 1
    GTP max retry N3_request                 = 5
    GTP dynamic echo-timer minimum           = 5
    GTP dynamic echo-timer smooth factor     = 2
    GTP buffer size for receiving N3_buffer  = 8192
    GTP max pdp context                      = 45000
```

Table 18 describes the fields shown in the display.

.

Table 18   show gprs gtp parameters Field Descriptions

Field	Description
GTP buffer size for receiving N3_buffer	Current size of the receive buffer (in bytes) that the GGSN uses to receive GTP signaling messages and packets sent through the tunneling protocol.
	You can configure the N3 buffer using the **gprs gtp n3-buffer-size** command.
GTP dynamic echo-timer minimum	Current minimum time period (in seconds) used by the dynamic echo timer.
	You can configure the minimum value using the **gprs gtp echo-timer dynamic minimum** command.
GTP dynamic echo-timer smooth factor	Current multiplier used by the GGSN to calculate the T-dynamic for the dynamic echo timer.
	You can configure the smooth factor using the **gprs gtp echo-timer dynamic smooth-factor** command.

Table 18   show gprs gtp parameters Field Descriptions (continued)

Field	Description
GTP max pdp context	Current maximum number of PDP contexts (mobile sessions) that can be activated on the GGSN. You can configure the maximum number of PDP context requests using the **gprs maximum-pdp-context-allowed** command.
GTP max retry N3_request	Maximum number of times that the GGSN attempts to send a signaling request to an SGSN. You can configure the maximum number of signaling requests made by the GGSN using the **gprs gtp n3-requests** command.
GTP path echo interval	Interval, in seconds, that the GGSN waits before sending an echo-request message to the SGSN. You can configure the path echo interval using the **gprs gtp path-echo-interval** command.
GTP signal max wait time T3_response	Interval, in seconds, that the GGSN waits before responding to a signaling request message. You can configure the maximum interval using the **gprs gtp t3-response** command.

Related Commands

Command	Description
show gprs gtp statistics	Displays the current GTP statistics for the GGSN (such as IE, GTP signaling, and GTP PDU statistics).
show gprs gtp status	Displays information about the current status of the GTP on the GGSN (such as activated PDP contexts and QoS statistics).

show gprs gtp path

To display information about one or more GTP paths between the gateway GPRS support node (GGSN) and other GPRS/UMTS devices, use the **show gprs gtp path** command in privileged EXEC mode.

show gprs gtp path {**remote-address** *ip-address* [**remote-port** *remote-port-num*] | **version** *gtp-version* | **all**}

Syntax Description	**remote-address** *ip-address*	Displays GTP path information for a specified remote IP address. Optionally, displays GTP path information for a specified remote IP address and port number.
	remote-port *remote_port_num*	(Optional) Displays GTP path information for a specified remote IP address and port number.
	version *gtp-version*	Displays the GTP paths by the GTP version (0 or 1).
	all	Displays information for all GTP paths.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History	Release	Modification
	12.1(1)GA	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
	12.2(4)MX	This command was integrated into Cisco IOS Release 12.2(4)MX, and the following field was added to the display:
		• Dynamic echo timer
	12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD.
	12.2(8)YW	This command was integrated into Cisco IOS Release 12.2(8)YW.
		• The **version** keyword option and the option to display GTP path information for a remote IP address and remote port number were added.
		• The GTP version output field was added to the display.
	12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
	12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU.
	12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
	12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
	12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
	12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
	12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.

Release	Modification
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ, and the following field was added to the display: • Path Echo
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE and the VRF column was added to the display.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs gtp path** command to display information about one or more GTP paths from the GGSN.

Examples   **Example 1**

The following example shows the output for the GTP path to the remote device with an IP address of 10.49.85.100:

```
router# show gprs gtp path 10.49.85.100
Local address      Remote address        GTP version    Path Echo    Dynamic echo VRF
10.10.10.1(2123)   10.49.85.100(2123)    1              Disabled     5
10.10.10.1(2152)   10.49.85.100(2152)    1              Disabled     5
```

Example 2

The following example shows the output for the GTP path to the remote device with an IP address of 10.49.85.100 and remote port number 2123:

```
router# show gprs gtp path 10.49.85.100 2123
Local address      Remote address        GTP version    Path Echo    Dynamic echo VRF
10.10.10.1(2123)   10.49.85.100(2123)    1              Disabled     5
```

Example 3

The following example shows the output for all paths on the GGSN that are using GTP version 1:

```
router# show gprs gtp path version 1
Local address      Remote address        GTP version    Path Echo    Dynamic echo VRF
10.10.10.1(3386)   10.49.85.100(3386)    1              Disabled     5
10.10.10.1(3386)   10.7.7.7(3386)        1              Disabled     2
```

Example 4

The following example shows the output for all GTP paths on the GGSN:

```
router# show gprs gtp path all
Total number of path : 3
Local address      Remote address        GTP version    Path Echo    Dynamic echo VRF
10.10.10.1(3386)   10.49.85.100(3386)    1              Disabled     Disabled
10.10.10.1(3386)   10.1.1.1(3386)        0              Disabled     2
10.10.10.1(3386)   10.7.7.7(3386)        1              Disabled     5
```

Table 19 describes the fields shown in the display.

Table 19   *show gprs gtp path Field Descriptions*

Field	Description
Dynamic echo timer	Current setting (in seconds) for the dynamic echo timer. "Disabled" appears when the dynamic echo timer is not in use.
GTP version	Version of the GTP protocol (version 0 or 1) supported by the path.
VRF	Whether a VRF is configured on the path to segregate GRX traffic.
Local address	IP address and port number for the local end of the GTP path.
Path Echo	Whether echo requests have been disabled on this path.
Remote address	IP address and port number for the remote end of the GTP path, such as the address of the SGSN.
Total number of path	Total number of GTP paths currently established.

show gprs gtp path statistics history

To display statistics (such as the local address and remote port of the path, the GTP version, and the time that the path was deleted) for GTP path entries stored in history, use the **show gprs gtp path statistics history** command in privileged EXEC mode.

show gprs gtp path statistics history *number*

Syntax Description

number	Number of path entries for which to display statistics.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(9)XG	This command was introduced.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ and the following fields were added to the display: • Total Update requests sent • Total Update responses rcvd • Number of times DT enabled
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs gtp path statistics history** command to display statistics for the path entries stored in the path history table. The statistics includes information such as the local address, remote address, GTP version of the path, and the time at which the path was deleted.

The first group of statistics in the list are those of the most recently-deleted path.

The maximum number of path entries stored in the history table is configured by using the **gprs gtp path history** global configuration command.

Examples   The following is sample output from the **show gprs gtp path statistics history** command:

```
Router#show gprs gtp path statistics history
Path: IP address: 172.21.21.21, Remote port: 2152    Remote Entity: SGSN
GPRS GTP Path Statistics:
  Unexpected Data Message          0         Received PDU message          0
```

Total Data dropped	0	Sent PDU message	0
Received PDU bytes	0	Number of short messages	0
Sent PDU bytes	0	Number of unknown message	0
Unexpected signaling message	0	Roaming trusted PDPs	0
Roaming non-trusted PDPs	0	Non-roaming PDPs	0
Source Violations	0	Unsupported extension hdr recd	0
Path failures	0	Path fail due to local delete	0
Total packets dropped	0	Signaling messages dropped	0
Signaling msg received	2	Signaling msg sent	3
Number of PDPs created	0	Number of PDPs deleted	0
Number of PPP PDPs created	0	Number of PPP PDPs deleted	0
Single PDP cleared	0	Creates received as update	0
Local delete: version upgrade	0	Local delete due to no sgsn	0
Local delete: version fallback	0	Create collide with delete	0
Version changes	0	Retransmit for create	0
IPv6 PDP activation rejected	0	IPv6 PDPs created	0
IPv6 PDPs deleted	0	IPv6 signaling msg rcvd	0
IPv6 signaling msg sent	0	IPv6 pdus received	0
IPv6 pdus sent	0	IPv6 bytes received	0
IPv6 bytes sent	0	Total update requests sent	0
Total update responses rcvd	0	Number of times DT enabled	0

Path: IP address: 172.21.21.21, Remote port: 2123
GPRS GTP Path Statistics:

Unexpected Data Message	0	Received PDU message	0
Total Data dropped	0	Sent PDU message	0
Received PDU bytes	0	Number of short messages	0
Sent PDU bytes	0	Number of unknown message	0
Unexpected signaling message	0	Roaming trusted PDPs	0
Roaming non-trusted PDPs	0	Non-roaming PDPs	0
Source Violations	0	Unsupported extension hdr recd	0
Path failures	0	Path fail due to local delete	0
Total packets dropped	0	Signaling messages dropped	0
Signaling msg received	6	Signaling msg sent	12
Number of PDPs created	0	Number of PDPs deleted	0
Number of PPP PDPs created	0	Number of PPP PDPs deleted	0
Single PDP cleared	0	Creates received as update	0
Local delete: version upgrade	0	Local delete due to no sgsn	0
Local delete: version fallback	0	Create collide with delete	0
Version changes	0	Retransmit for create	3
IPv6 PDP activation rejected	0	IPv6 PDPs created	0
IPv6 PDPs deleted	0	IPv6 signaling msg rcvd	0
IPv6 signaling msg sent	0	IPv6 pdus received	0
IPv6 pdus sent	0	IPv6 bytes received	0
IPv6 bytes sent	0	Total update requests sent	0
Total update responses rcvd	0	Number of times DT enabled	0

Path: IP address: 172.10.1.1, Remote port: 2152
GPRS GTP Path Statistics:

Unexpected Data Message	0	Received PDU message	0
Total Data dropped	0	Sent PDU message	0
Received PDU bytes	0	Number of short messages	0
Sent PDU bytes	0	Number of unknown message	0
Unexpected signaling message	0	Roaming trusted PDPs	0
Roaming non-trusted PDPs	0	Non-roaming PDPs	0
Source Violations	0	Unsupported extension hdr recd	0
Path failures	0	Path fail due to local delete	0
Total packets dropped	0	Signaling messages dropped	0
Signaling msg received	1	Signaling msg sent	2
Number of PDPs created	1	Number of PDPs deleted	1
Number of PPP PDPs created	0	Number of PPP PDPs deleted	0
Single PDP cleared	0	Creates received as update	0
Local delete: version upgrade	0	Local delete due to no sgsn	0
Local delete: version fallback	0	Create collide with delete	0

```
  Version changes                    0          Retransmit for create             0
  IPv6 PDP activation rejected       0          IPv6 PDPs created                 0
  IPv6 PDPs deleted                  0          IPv6 signaling msg rcvd           0
  IPv6 signaling msg sent            0          IPv6 pdus received                0
  IPv6 pdus sent                     0          IPv6 bytes received               0
  IPv6 bytes sent                    0          Total update requests sent        0
  Total update responses rcvd        0          Number of times DT enabled        0

Path: IP address: 172.10.1.1, Remote port: 2123
GPRS GTP Path Statistics:
  Unexpected Data Message            0          Received PDU message              0
  Total Data dropped                 0          Sent PDU message                  0
  Received PDU bytes                 0          Number of short messages          0
  Sent PDU bytes                     0          Number of unknown message         0
  Unexpected signaling message       0          Roaming trusted PDPs              0
  Roaming non-trusted PDPs           0          Non-roaming PDPs                  0
  Source Violations                  0          Unsupported extension hdr recd    0
  Path failures                      0          Path fail due to local delete     0
  Total packets dropped              0          Signaling messages dropped        0
  Signaling msg received             0          Signaling msg sent                0
  Number of PDPs created             0          Number of PDPs deleted            0
  Number of PPP PDPs created         0          Number of PPP PDPs deleted        0
  Single PDP cleared                 0          Creates received as update        0
  Local delete: version upgrade      0          Local delete due to no sgsn       0
  Local delete: version fallback     0          Create collide with delete        0
  Version changes                    0          Retransmit for create             0
  IPv6 PDP activation rejected       0          IPv6 PDPs created                 0
  IPv6 PDPs deleted                  0          IPv6 signaling msg rcvd           0
  IPv6 signaling msg sent            0          IPv6 pdus received                0
  IPv6 pdus sent                     0          IPv6 bytes received               0
  IPv6 bytes sent                    0          Total update requests sent        0
  Total update responses rcvd        0          Number of times DT enabled        0

Router#
```

Table 20 describes the fields shown in the display.

Table 20   show gprs gtp path statistics history Command Field Descriptions

Field	Description
Creates collide with delete	Number of create PDP context requests that collided with a delete PDP context request.
Creates received as update	Number of create PDP context requests received as an update PDP context request.
IPv6 bytes received	Number of IPv6 bytes received.
IPv6 bytes sent	Number of IPv6 bytes sent.
IPv6 PDP activation rejected	Number of activate IPv6 PDP context request rejected.
IPv6 PDPs created	Number of IPv6 PDP contexts created.
IPv6 PDPs deleted	Number of IPv6 PDP contexts deleted.
IPv6 pdus received	Number of IPv6 PDUs received.
IPv6 pdus sent	Number of IPv6 PDUs sent.
IPv6 signaling msg rcvd	Number of IPv6 signaling messages received.

Table 20   *show gprs gtp path statistics history Command Field Descriptions (continued)*

IPv6 signaling msg sent	Number of IPv6 signaling messages sent.
Local delete due to no sgsn	Number of PDPs deleted locally because of no SGSN.
Local delete: version fallback	Number of PDPs deleted because of a version fallback.
Local delete: version upgrade	Number of PDPs deleted because of a version upgrade.
Non-roaming PDPs	Number of non-roaming PDPs.
Number of PDPs created	Number of IPv4 PDP contexts created.
Number of PDPs deleted	Number of IPv4 PDP contexts deleted.
Number of PPP PDPs created	Number of PPP PDP contexts created.
Number of PPP PDPs deleted	Number of PPP PDP contexts deleted.
Number of short messages	Number of GTP messages received which are too short.
Number of times DT enabled	Number of times direct tunnel was enabled for a PDP context.
Number of unknown messages	Number of unknown GTP messages received.
Path failures	Number of path failures.
Path fail due to local delete	Number of path failure due to a local delete PDP context request.
Received PDU bytes	Number of IPv4 PDU bytes transmitted.
Received PDU message	Number of IPv4 PDU messages received.
Retransmit for create	Number of retransmitted create PDP context requests received.
Roaming non-trusted PDPs	Number of roaming PDPs not in a trusted PLMN.
Roaming trusted PDPs	Number of roaming PDPs in a trusted PLMN.
Sent PDU bytes	Number of IPv4 PDU bytes transmitted.
Sent PDU message	Number of IPv4 PDU messages transmitted.
Signaling messages dropped	Number of GTP signaling messages dropped.
Signaling msg received	Number of signaling messages received.
Signaling msg sent	Number of signaling messages sent.
Single PDP cleared	Number of hanging single PDP contexts cleared on the GGSN.

Table 20   show gprs gtp path statistics history Command Field Descriptions (continued)

Source Violations	Number of PDPs terminated due to an access violation.
Total Data dropped	Total data dropped.
Total Update requests sent	Total number of GGSN-initiated Update PDP Context Requests sent.
Total Update responses rcvd	Total number responses to GGSN-initiated Update PDP Context Requests.
Total packets dropped	Total number of packets dropped.
Unexpected Data Message	Number of GTP PDUs received for nonexistent PDP contexts.
Unexpected signaling message	Number of unexpected GTP signaling messages received.
Unsupported extension hdr recd	Number of create PDP context requests received with unsupported extension headers when GGSN comprehension is required.
Version changes	Number of GTP version changes that have occurred on the SGSN path

Related Commands

Command	Description
gprs gtp path history	Configures the maximum number of path entries for which the GGSN stores statistics after the path is deleted.
show gprs gtp path statistics remote-address	Displays the statistics for a specific GTP path.

show gprs gtp path statistics remote-address

To display statistics for a specific path, use the **show gprs gtp path statistics remote-address** command in privileged EXEC mode.

> **show gprs gtp path statistics** **remote-address** *ip-address* [**remote-port** *port-num*]

Syntax Description

remote-address *ip-address*	IP address of the SGSN for which you want to view path details.
remote-port *port-num*	Port number on the SGSN of the entry for which you want to view details.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(9)XG	This command was introduced.
12.4(9)XG2	This command was integrated into Cisco IOS Release 12.4(9)XG2 and the following fields were added to the display: • Local delete: no req to sgsn • Local delete: no wait sgsn
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ and the following fields were added to the display: • Number of time DT enabled • Total Update requests sent • Total Update responses rcvd
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs gtp path statistics remote-address** command to display statistics for a specific GTP path. These details include the local address and remote address of the path, the GTP version used, and the time at which the path was deleted.

If a remote port is not specified, statistics for all entries of the path are displayed.

If the path specified does not currently exist, the statistics stored in the path history table will be searched and displayed if the entry exists in history.

Examples   The following is sample output from the **show gprs gtp path statistics remote-address** command:

```
router#show gprs gtp path statistics remote-address 172.10.10.10
Path: IP address: 172.10.10.10, Remote port: 2123

GPRS GTP Path Statistics:
  Unexpected Data Message       0       Received PDU message            0
  Total Data dropped            0       Sent PDU message                0
  Received PDU bytes            0       Number of short messages        0
  Sent PDU bytes                0       Number of unknown message       0
  Unexpected signaling message  0       Roaming trusted PDPs            0
  Roaming non-trusted PDPs      0       Non-roaming PDPs                0
  Source Violations             0       Unsupported extension hdr recd  0
  Path failures                 0       Path fail due to local delete   0
  Total packets dropped         0       Signaling messages dropped      0
  Signaling msg received    26504       Signaling msg sent          26504
  Number of PDPs created    26504       Number of PDPs deleted         35
  Number of PPP PDPs created    0       Number of PPP PDPs deleted      0
  Number of times DT enabled  0         Single PDP cleared              0
  Creates received as update    0       Local delete: version upgrade   0
  Local delete due to no sgsn   0       Local delete: version fallback  0
  Create collide with delete    0       Local delete: no wait sgsn      0
  Local delete: no req to sgsn  0       Version changes                 0
  Retransmit for create         0       IPv6 PDP activation rejected    0
  IPv6 PDPs created             0       IPv6 PDPs deleted               0
  IPv6 signaling msg rcvd       0       IPv6 signaling msg sent         0
  IPv6 pdus received            0       IPv6 pdus sent                  0
  IPv6 bytes received           0       IPv6 bytes sent                 0
  Total Update requests sent    2       Total Update responses rcvd     1

Path: IP address: 10.102.5.92, Remote port: 2152
GPRS GTP Path Statistics:
  Unexpected Data Message       0       Received PDU message            0
  Total Data dropped            0       Sent PDU message                0
  Received PDU bytes            0       Number of short messages        0
  Sent PDU bytes                0       Number of unknown message       0
  Unexpected signaling message  0       Roaming trusted PDPs            0
  Roaming non-trusted PDPs      0       Non-roaming PDPs                0
  Source Violations             0       Unsupported extension hdr recd  0
  Path failures                 0       Path fail due to local delete   0
  Total packets dropped         0       Signaling messages dropped      0
  Signaling msg received    26504       Signaling msg sent          26504
  Number of PDPs created    26504       Number of PDPs deleted         35
  Number of PPP PDPs created    0       Number of PPP PDPs deleted      0
  Number of times DT enabled  0         Single PDP cleared              0
  Creates received as update    0       Local delete: version upgrade   0
  Local delete due to no sgsn   0       Local delete: version fallback  0
  Create collide with delete    0       Local delete: no wait sgsn      0
  Local delete: no req to sgsn  0       Version changes                 0
  Retransmit for create         0       IPv6 PDP activation rejected    0
  IPv6 PDPs created             0       IPv6 PDPs deleted               0
  IPv6 signaling msg rcvd       0       IPv6 signaling msg sent         0
  IPv6 pdus received            0       IPv6 pdus sent                  0
  IPv6 bytes received           0       IPv6 bytes sent                 0
  Total Update requests sent    2       Total Update responses rcvd     1
router#
```

Table 21 describes the fields shown in the display.

Table 21   show gprs gtp path statistics remote-address Command Field Descriptions

Field	Description
Creates collide with delete	Number of create PDP context requests that collided with a delete PDP context request.
Creates received as update	Number of create PDP context requests received as an update PDP context request.
IPv6 bytes received	Number of IPv6 bytes received.
IPv6 bytes sent	Number of IPv6 bytes sent.
IPv6 PDP activation rejected	Number of activate IPv6 PDP context request rejected.
IPv6 PDPs created	Number of IPv6 PDP contexts created.
IPv6 PDPs deleted	Number of IPv6 PDP contexts deleted.
IPv6 pdus received	Number of IPv6 PDUs received.
IPv6 pdus sent	Number of IPv6 PDUs sent.
IPv6 signaling msg rcvd	Number of IPv6 signaling messages received.
IPv6 signaling msg sent	Number of IPv6 signaling messages sent.
Local delete due to no sgsn	Number of PDPs deleted locally because of no SGSN.
Local delete: version fallback	Number of PDPs deleted because of a version fallback.
Local delete: version upgrade	Number of PDPs deleted because of a version upgrade.
Local delete: no req to sgsn	Number of PDPs deleted when the GGSN is configured to delete PDP contexts locally without sending a delete PDP context request to the SGSN.
Local delete: no wait sgsn	Number of PDPs deleted when the GGSN is configured to not wait for the SGSN response to its delete PDP context request before deleting the PDP context.
Non-roaming PDPs	Number of non-roaming PDPs.
Number of times DT enabled	Number of direct tunnel PDP contexts created.
Number of PDPs created	Number of IPv4 PDP contexts created.
Number of PDPs deleted	Number of IPv4 PDP contexts deleted.
Number of PPP PDPs created	Number of PPP PDP contexts created.
Number of PPP PDPs deleted	Number of PPP PDP contexts deleted.
Number of short messages	Number of GTP messages received which are too short.
Number of unknown messages	Number of unknown GTP messages received.
Path failures	Number of path failures.
Path fail due to local delete	Number of path failure due to a local delete PDP context request.
Received PDU bytes	Number of IPv4 PDU bytes transmitted.
Received PDU message	Number of IPv4 PDU messages received.
Retransmit for create	Number of retransmitted create PDP context requests received.
Roaming non-trusted PDPs	Number of roaming PDPs not in a trusted PLMN.

Table 21 *show gprs gtp path statistics remote-address Command Field Descriptions*

Roaming trusted PDPs	Number of roaming PDPs in a trusted PLMN.
Sent PDU bytes	Number of IPv4 PDU bytes transmitted.
Sent PDU message	Number of IPv4 PDU messages transmitted.
Signaling messages dropped	Number of GTP signaling message dropped.
Signaling msg received	Number of signaling messages received.
Signaling msg sent	Number of signaling messages sent.
Single PDP cleared	Number of hanging single PDP contexts cleared on the GGSN.
Source Violations	Number of PDPs terminated due to a access violation.
Total Data dropped	Total data dropped.
Total packets dropped	Total number of packets dropped.
Total Update requests sent	Total number of GGSN-initiated Update PDP Context Requests sent.
Total Update responses rcvd	Total number responses to GGSN-initiated Update PDP Context Requests.
Unexpected Data Message	Number of GTP PDUs received for nonexistent PDP contexts.
Unexpected signaling message	Number of unexpected GTP signaling messages received.
Unsupported extension hdr recd	Number of create PDP context requests received with unsupported extension headers when GGSN comprehension is required.
Version changes	Number of GTP version changes that have occurred on the SGSN path.

Related Commands

Command	Description
gprs gtp path history	Configures the maximum number of path entries for which the GGSN stores statistics after the path is deleted.
show gprs gtp path statistics history	Displays summary of the counters for past GTP path entries stored in history.

show gprs gtp path

To display information for one or more GTP paths between a gateway GPRS support node (GGSN) and other GPRS/UMTS devices, use the **show gprs gtp path** command in privileged EXEC mode.

show gprs gtp path {**all** | **remote-address** *ip-address* [**remote-port** *remote-port*] | **version** *gtp-version*}

Syntax Description

all	Displays information for all GTP paths.
remote-address *ip-address*	Displays GTP path information for a specified remote IP address. Optionally, displays GTP path information for a specified remote IP address and port number.
remote-port *remote_port_num*	(Optional) Displays GTP path information for a specified remote IP address and port number.
version *gtp-version*	Displays the of GTP paths by the GTP version (0 or 1).

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs gtp path** command to display information for one or more GTP paths from the GGSN.

Examples

Example 1

The following example shows the output for all GTP paths on the GGSN:

```
GGSN# show gprs gtp path all
Total number of path:1

Local address          Remote address          GTP version     Dynamic echo
timer
33.33.33.1(3386)       11.0.0.1(3386)          0               Disabled

  Collection interval - 5 min, Last collected at - 3 min back
    upstream data volume in octets:     480
    downstream data volume in octets:   0
    upstream packet count:              4
    downstream packet count:            0

  Collection interval - 10 min, Last collected at - 8 min back
    upstream data volume in octets:     120
    downstream data volume in octets:   0
    upstream packet count:              1
    downstream packet count:            0
```

Table 22 describes the fields shown in the display.

Table 22   show gprs gtp path Field Descriptions

Field	Description
Total number of path	Total number of GTP paths currently established.
Local address	IP address and port number for the local end of the GTP path.
Remote address	IP address and port number for the remote end of the GTP path, such as the address of the SGSN.
GTP version	Version of the GTP protocol (version 0 or 1) supported by the path.
Dynamic echo timer	Current setting (in seconds) for the dynamic echo timer. "Disabled" appears when the dynamic echo timer is not in use.

show gprs gtp path statistics history

To display statistics (such as the local address and remote port of the path, the GTP version, and the time that the path was deleted) for GTP path entries stored in history, use the **show gprs gtp path statistics history** command in privileged EXEC mode.

> **show gprs gtp path statistics history** *number*

Syntax Description

number	Number of path entries for which to display statistics.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(9)XG	This command was introduced.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQand the following fields were added to the display: • Total Update requests sent • Total Update responses rcvd • Number of times DT enabled
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs gtp path statistics history** command to display statistics for the path entries stored in the path history table. The statistics includes information such as the local address, remote address, GTP version of the path, and the time at which the path was deleted.

The first group of statistics in the list are those of the most recently-deleted path.

The maximum number of path entries stored in the history table is configured by using the **gprs gtp path history** global configuration command.

Examples   The following is sample output from the **show gprs gtp path statistics history** command:

```
Router#show gprs gtp path statistics history
Path: IP address: 172.21.21.21, Remote port: 2152
GPRS GTP Path Statistics:
  Unexpected Data Message        0        Received PDU message        0
```

Total Data dropped	0	Sent PDU message	0
Received PDU bytes	0	Number of short messages	0
Sent PDU bytes	0	Number of unknown message	0
Unexpected signaling message	0	Roaming trusted PDPs	0
Roaming non-trusted PDPs	0	Non-roaming PDPs	0
Source Violations	0	Unsupported extension hdr recd	0
Path failures	0	Path fail due to local delete	0
Total packets dropped	0	Signaling messages dropped	0
Signaling msg received	2	Signaling msg sent	3
Number of PDPs created	0	Number of PDPs deleted	0
Number of PPP PDPs created	0	Number of PPP PDPs deleted	0
Single PDP cleared	0	Creates received as update	0
Local delete: version upgrade	0	Local delete due to no sgsn	0
Local delete: version fallback	0	Create collide with delete	0
Version changes	0	Retransmit for create	0
IPv6 PDP activation rejected	0	IPv6 PDPs created	0
IPv6 PDPs deleted	0	IPv6 signaling msg rcvd	0
IPv6 signaling msg sent	0	IPv6 pdus received	0
IPv6 pdus sent	0	IPv6 bytes received	0
IPv6 bytes sent	0	Total update requests sent	0
Total update responses rcvd	0	Number of times DT enabled	0

```
Path: IP address: 172.21.21.21, Remote port: 2123
GPRS GTP Path Statistics:
```

Unexpected Data Message	0	Received PDU message	0
Total Data dropped	0	Sent PDU message	0
Received PDU bytes	0	Number of short messages	0
Sent PDU bytes	0	Number of unknown message	0
Unexpected signaling message	0	Roaming trusted PDPs	0
Roaming non-trusted PDPs	0	Non-roaming PDPs	0
Source Violations	0	Unsupported extension hdr recd	0
Path failures	0	Path fail due to local delete	0
Total packets dropped	0	Signaling messages dropped	0
Signaling msg received	6	Signaling msg sent	12
Number of PDPs created	0	Number of PDPs deleted	0
Number of PPP PDPs created	0	Number of PPP PDPs deleted	0
Single PDP cleared	0	Creates received as update	0
Local delete: version upgrade	0	Local delete due to no sgsn	0
Local delete: version fallback	0	Create collide with delete	0
Version changes	0	Retransmit for create	3
IPv6 PDP activation rejected	0	IPv6 PDPs created	0
IPv6 PDPs deleted	0	IPv6 signaling msg rcvd	0
IPv6 signaling msg sent	0	IPv6 pdus received	0
IPv6 pdus sent	0	IPv6 bytes received	0
IPv6 bytes sent	0	Total update requests sent	0
Total update responses rcvd	0	Number of times DT enabled	0

```
Path: IP address: 172.10.1.1, Remote port: 2152
GPRS GTP Path Statistics:
```

Unexpected Data Message	0	Received PDU message	0
Total Data dropped	0	Sent PDU message	0
Received PDU bytes	0	Number of short messages	0
Sent PDU bytes	0	Number of unknown message	0
Unexpected signaling message	0	Roaming trusted PDPs	0
Roaming non-trusted PDPs	0	Non-roaming PDPs	0
Source Violations	0	Unsupported extension hdr recd	0
Path failures	0	Path fail due to local delete	0
Total packets dropped	0	Signaling messages dropped	0
Signaling msg received	1	Signaling msg sent	2
Number of PDPs created	1	Number of PDPs deleted	1
Number of PPP PDPs created	0	Number of PPP PDPs deleted	0
Single PDP cleared	0	Creates received as update	0
Local delete: version upgrade	0	Local delete due to no sgsn	0
Local delete: version fallback	0	Create collide with delete	0

```
     Version changes                    0        Retransmit for create          0
     IPv6 PDP activation rejected       0        IPv6 PDPs created              0
     IPv6 PDPs deleted                  0        IPv6 signaling msg rcvd        0
     IPv6 signaling msg sent            0        IPv6 pdus received             0
     IPv6 pdus sent                     0        IPv6 bytes received            0
     IPv6 bytes sent                    0        Total update requests sent     0
     Total update responses rcvd        0        Number of times DT enabled     0

Path: IP address: 172.10.1.1, Remote port: 2123
GPRS GTP Path Statistics:
     Unexpected Data Message            0        Received PDU message           0
     Total Data dropped                 0        Sent PDU message               0
     Received PDU bytes                 0        Number of short messages       0
     Sent PDU bytes                     0        Number of unknown message      0
     Unexpected signaling message       0        Roaming trusted PDPs           0
     Roaming non-trusted PDPs           0        Non-roaming PDPs               0
     Source Violations                  0        Unsupported extension hdr recd 0
     Path failures                      0        Path fail due to local delete  0
     Total packets dropped              0        Signaling messages dropped     0
     Signaling msg received             0        Signaling msg sent             0
     Number of PDPs created             0        Number of PDPs deleted         0
     Number of PPP PDPs created         0        Number of PPP PDPs deleted     0
     Single PDP cleared                 0        Creates received as update     0
     Local delete: version upgrade      0        Local delete due to no sgsn    0
     Local delete: version fallback     0        Create collide with delete     0
     Version changes                    0        Retransmit for create          0
     IPv6 PDP activation rejected       0        IPv6 PDPs created              0
     IPv6 PDPs deleted                  0        IPv6 signaling msg rcvd        0
     IPv6 signaling msg sent            0        IPv6 pdus received             0
     IPv6 pdus sent                     0        IPv6 bytes received            0
     IPv6 bytes sent                    0        Total update requests sent     0
     Total update responses rcvd        0        Number of times DT enabled     0

Router#
```

Table 20 describes the fields shown in the display.

Table 23   *show gprs gtp path statistics history Command Field Descriptions*

Field	Description
Creates collide with delete	Number of create PDP context requests that collided with a delete PDP context request.
Creates received as update	Number of create PDP context requests received as an update PDP context request.
IPv6 bytes received	Number of IPv6 bytes received.
IPv6 bytes sent	Number of IPv6 bytes sent.
IPv6 PDP activation rejected	Number of activate IPv6 PDP context request rejected.
IPv6 PDPs created	Number of IPv6 PDP contexts created.
IPv6 PDPs deleted	Number of IPv6 PDP contexts deleted.
IPv6 pdus received	Number of IPv6 PDUs received.
IPv6 pdus sent	Number of IPv6 PDUs sent.
IPv6 signaling msg rcvd	Number of IPv6 signaling messages received.

Table 23 *show gprs gtp path statistics history Command Field Descriptions (continued)*

IPv6 signaling msg sent	Number of IPv6 signaling messages sent.
Local delete due to no sgsn	Number of PDPs deleted locally because of no SGSN.
Local delete: version fallback	Number of PDPs deleted because of a version fallback.
Local delete: version upgrade	Number of PDPs deleted because of a version upgrade.
Non-roaming PDPs	Number of non-roaming PDPs.
Number of PDPs created	Number of IPv4 PDP contexts created.
Number of PDPs deleted	Number of IPv4 PDP contexts deleted.
Number of PPP PDPs created	Number of PPP PDP contexts created.
Number of PPP PDPs deleted	Number of PPP PDP contexts deleted.
Number of short messages	Number of GTP messages received which are too short.
Number of times DT enabled	Number of times direct tunnel was enabled for a PDP context.
Number of unknown messages	Number of unknown GTP messages received.
Path failures	Number of path failures.
Path fail due to local delete	Number of path failure due to a local delete PDP context request.
Received PDU bytes	Number of IPv4 PDU bytes transmitted.
Received PDU message	Number of IPv4 PDU messages received.
Retransmit for create	Number of retransmitted create PDP context requests received.
Roaming non-trusted PDPs	Number of roaming PDPs not in a trusted PLMN.
Roaming trusted PDPs	Number of roaming PDPs in a trusted PLMN.
Sent PDU bytes	Number of IPv4 PDU bytes transmitted.
Sent PDU message	Number of IPv4 PDU messages transmitted.
Signaling messages dropped	Number of GTP signaling messages dropped.
Signaling msg received	Number of signaling messages received.
Signaling msg sent	Number of signaling messages sent.
Single PDP cleared	Number of hanging single PDP contexts cleared on the GGSN.

Cisco GGSN Release 10.2 Command Reference, Cisco IOS Release 12.4(24)YE4

Table 23   show gprs gtp path statistics history Command Field Descriptions (continued)

Source Violations	Number of PDPs terminated due to an access violation.
Total Data dropped	Total data dropped.
Total Update requests sent	Total number of GGSN-initiated Update PDP Context Requests sent.
Total Update responses rcvd	Total number responses to GGSN-initiated Update PDP Context Requests.
Total packets dropped	Total number of packets dropped.
Unexpected Data Message	Number of GTP PDUs received for nonexistent PDP contexts.
Unexpected signaling message	Number of unexpected GTP signaling messages received.
Unsupported extension hdr recd	Number of create PDP context requests received with unsupported extension headers when GGSN comprehension is required.
Version changes	Number of GTP version changes that have occurred on the SGSN path

Related Commands

Command	Description
gprs gtp path history	Configures the maximum number of path entries for which the GGSN stores statistics after the path is deleted.
show gprs gtp path statistics remote-address	Displays the statistics for a specific GTP path.

show gprs gtp path statistics remote-address

To display statistics for a specific path, use the **show gprs gtp path statistics remote-address** command in privileged EXEC mode.

show gprs gtp path statistics r**emote-address** *ip-address* [**remote-port** *port-num*]

Syntax Description		
	remote-address *ip-address*	IP address of the SGSN for which you want to view path details.
	remote-port *port-num*	Port number on the SGSN of the entry for which you want to view details.

Command Modes   Privileged EXEC

Command History	Release	Modification
	12.4(9)XG	This command was introduced.
	12.4(9)XG2	This command was integrated into Cisco IOS Release 12.4(9)XG2 and the following fields were added to the display: • Local delete: no req to sgsn • Local delete: no wait sgsn
	12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ and the following fields were added to the display: • Number of time DT enabled • Total Update requests sent • Total Update responses rcvd
	12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
	12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
	12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
	12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
	12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
	12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
	12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
	12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs gtp path statistics remote-address** command to display statistics for a specific GTP path. These details include the local address and remote address of the path, the GTP version used, and the time at which the path was deleted.

If a remote port is not specified, statistics for all entries of the path are displayed.

If the path specified does not currently exist, the statistics stored in the path history table will be searched and displayed if the entry exists in history.

Examples The following is sample output from the **show gprs gtp path statistics remote-address** command:

```
router#show gprs gtp path statistics remote-address 172.10.10.10
Path: IP address: 172.10.10.10, Remote port: 2123

GPRS GTP Path Statistics:
  Unexpected Data Message       0       Received PDU message          0
  Total Data dropped            0       Sent PDU message              0
  Received PDU bytes            0       Number of short messages      0
  Sent PDU bytes                0       Number of unknown message     0
  Unexpected signaling message  0       Roaming trusted PDPs          0
  Roaming non-trusted PDPs      0       Non-roaming PDPs              0
  Source Violations             0       Unsupported extension hdr recd 0
  Path failures                 0       Path fail due to local delete 0
  Total packets dropped         0       Signaling messages dropped    0
  Signaling msg received    26504       Signaling msg sent        26504
  Number of PDPs created    26504       Number of PDPs deleted        35
  Number of PPP PDPs created    0       Number of PPP PDPs deleted     0
  Number of times DT enabled    0       Single PDP cleared            0
  Creates received as update    0       Local delete: version upgrade  0
  Local delete due to no sgsn   0       Local delete: version fallback 0
  Create collide with delete    0       Local delete: no wait sgsn     0
  Local delete: no req to sgsn  0       Version changes               0
  Retransmit for create         0       IPv6 PDP activation rejected   0
  IPv6 PDPs created             0       IPv6 PDPs deleted             0
  IPv6 signaling msg rcvd       0       IPv6 signaling msg sent       0
  IPv6 pdus received            0       IPv6 pdus sent                0
  IPv6 bytes received           0       IPv6 bytes sent               0
  Total Update requests sent    2       Total Update responses rcvd    1

Path: IP address: 10.102.5.92, Remote port: 2152
GPRS GTP Path Statistics:
  Unexpected Data Message       0       Received PDU message          0
  Total Data dropped            0       Sent PDU message              0
  Received PDU bytes            0       Number of short messages      0
  Sent PDU bytes                0       Number of unknown message     0
  Unexpected signaling message  0       Roaming trusted PDPs          0
  Roaming non-trusted PDPs      0       Non-roaming PDPs              0
  Source Violations             0       Unsupported extension hdr recd 0
  Path failures                 0       Path fail due to local delete 0
  Total packets dropped         0       Signaling messages dropped    0
  Signaling msg received    26504       Signaling msg sent        26504
  Number of PDPs created    26504       Number of PDPs deleted        35
  Number of PPP PDPs created    0       Number of PPP PDPs deleted     0
  Number of times DT enabled    0       Single PDP cleared            0
  Creates received as update    0       Local delete: version upgrade  0
  Local delete due to no sgsn   0       Local delete: version fallback 0
  Create collide with delete    0       Local delete: no wait sgsn     0
  Local delete: no req to sgsn  0       Version changes               0
  Retransmit for create         0       IPv6 PDP activation rejected   0
  IPv6 PDPs created             0       IPv6 PDPs deleted             0
  IPv6 signaling msg rcvd       0       IPv6 signaling msg sent       0
  IPv6 pdus received            0       IPv6 pdus sent                0
  IPv6 bytes received           0       IPv6 bytes sent               0
  Total Update requests sent    2       Total Update responses rcvd    1
router#
```

Table 21 describes the fields shown in the display.

Table 24   show gprs gtp path statistics remote-address Command Field Descriptions

Field	Description
Creates collide with delete	Number of create PDP context requests that collided with a delete PDP context request.
Creates received as update	Number of create PDP context requests received as an update PDP context request.
IPv6 bytes received	Number of IPv6 bytes received.
IPv6 bytes sent	Number of IPv6 bytes sent.
IPv6 PDP activation rejected	Number of activate IPv6 PDP context request rejected.
IPv6 PDPs created	Number of IPv6 PDP contexts created.
IPv6 PDPs deleted	Number of IPv6 PDP contexts deleted.
IPv6 pdus received	Number of IPv6 PDUs received.
IPv6 pdus sent	Number of IPv6 PDUs sent.
IPv6 signaling msg rcvd	Number of IPv6 signaling messages received.
IPv6 signaling msg sent	Number of IPv6 signaling messages sent.
Local delete due to no sgsn	Number of PDPs deleted locally because of no SGSN.
Local delete: version fallback	Number of PDPs deleted because of a version fallback.
Local delete: version upgrade	Number of PDPs deleted because of a version upgrade.
Local delete: no req to sgsn	Number of PDPs deleted when the GGSN is configured to delete PDP contexts locally without sending a delete PDP context request to the SGSN.
Local delete: no wait sgsn	Number of PDPs deleted when the GGSN is configured to not wait for a SGSN response to its delete PDP context request before deleting the PDP context.
Non-roaming PDPs	Number of non-roaming PDPs.
Number of times DT enabled	Number of direct tunnel PDP contexts created.
Number of PDPs created	Number of IPv4 PDP contexts created.
Number of PDPs deleted	Number of IPv4 PDP contexts deleted.
Number of PPP PDPs created	Number of PPP PDP contexts created.
Number of PPP PDPs deleted	Number of PPP PDP contexts deleted.
Number of short messages	Number of GTP messages received which are too short.
Number of unknown messages	Number of unknown GTP messages received.
Path failures	Number of path failures.
Path fail due to local delete	Number of path failure due to a local delete PDP context request.
Received PDU bytes	Number of IPv4 PDU bytes transmitted.
Received PDU message	Number of IPv4 PDU messages received.
Retransmit for create	Number of retransmitted create PDP context requests received.
Roaming non-trusted PDPs	Number of roaming PDPs not in a trusted PLMN.

Table 24   *show gprs gtp path statistics remote-address Command Field Descriptions*

Roaming trusted PDPs	Number of roaming PDPs in a trusted PLMN.
Sent PDU bytes	Number of IPv4 PDU bytes transmitted.
Sent PDU message	Number of IPv4 PDU messages transmitted.
Signaling messages dropped	Number of GTP signaling message dropped.
Signaling msg received	Number of signaling messages received.
Signaling msg sent	Number of signaling messages sent.
Single PDP cleared	Number of hanging single PDP contexts cleared on the GGSN.
Source Violations	Number of PDPs terminated due to a access violation.
Total Data dropped	Total data dropped.
Total packets dropped	Total number of packets dropped.
Total Update requests sent	Total number of GGSN-initiated Update PDP Context Requests sent.
Total Update responses rcvd	Total number responses to GGSN-initiated Update PDP Context Requests.
Unexpected Data Message	Number of GTP PDUs received for nonexistent PDP contexts.
Unexpected signaling message	Number of unexpected GTP signaling messages received.
Unsupported extension hdr recd	Number of create PDP context requests received with unsupported extension headers when GGSN comprehension is required.
Version changes	Number of GTP version changes that have occurred on the SGSN path.

Related Commands

Command	Description
gprs gtp path history	Configures the maximum number of path entries for which the GGSN stores statistics after the path is deleted.
show gprs gtp path statistics history	Displays summary of the counters for past GTP path entries stored in history.

show gprs gtp pdp-context

To display a list of the currently active packet data protocol (PDP) contexts (mobile sessions), use the **show gprs gtp pdp-context** command in privileged EXEC mode.

show gprs gtp pdp-context {**access-point** *access-point-index* | **all** | **gn-vrf** {**default-vrf** | **vrf-name** *name*} | **imsi** *imsi* [**nsapi** *nsapi* [**tft**]] | **ms-address** *ipv4_address* [**access-point** *access-point-index*] | **ms-ipv6-address** *ipv6_address* [**access-point** *access-point-index*] | **msisdn** [*msisdn*] **detail** | **path** *ip-address* [*remote-port-num*] | **pdp-type** {**ip** {**v4** | **v6**} | **ppp**} | **qos-umts-class** {**background** | **conversational** | **interactive** | **streaming**} | **tid** *tunnel_id* [**service** [**all** | **id** *id_string*] | **version** *gtp-version* | **egcdr-context**]

Syntax Description		
access-point *access-point-index*	Displays PDP contexts by access point. Possible values are 1 to 65535.	
all	Displays all PDP contexts.	
gn-vrf {**default-vrf**	**vrf-name** *name*}	Displays PDP contexts by VRF.	
imsi *imsi*	Displays PDP contexts by International Mobile Subscriber Identity (IMSI). The IMSI value can be up to 15 numeric digits.	
nsapi *nsapi* [**tft**]	(Optional) Displays a particular PDP context by Network Service Access Point Identifier (NSAPI) for the specified IMSI. Optionally, displays the traffic flow template (TFT) filters associated with the NSAPI.	
ms-address *ip_address*	Displays PDP contexts for the specified mobile station IPv4 address (in dotted-decimal format).	
	Optionally, displays PDP contexts for the specified mobile station IP address at a particular access point. This option is required to display mobile stations that are accessing a private VPN.	
ms-ipv6-address *ipv6_address*	Displays PDP contexts for the specified mobile station IPv6 address (in dotted-decimal format).	
	Optionally, displays PDP contexts for the specified mobile station IP address at a particular access point. This option is required to display mobile stations that are accessing a private VPN.	
msisdn [*msisdn*] **detail**	Displays all PDP contexts with MSISDN information. Optionally, displays particular PDPs filtered by the longest prefix match of the specified MSISDN.	
path *ip-address* [*remote_port_num*]	Displays PDP contexts by path. Optionally, displays PDP contexts by remote IP address and port number.	
pdp-type {**ip** {**v4**	**v6**}	**ppp**}	Displays PDP contexts that are transmitted using either IP or PPP.	
	Optionally, when displaying IP PDP contexts, specify **v4** to display all IPv4 contexts or specify **v6** to display all IPv6 contexts.	
qos-umts-class	Displays PDPs by UMTS QoS traffic class. You can specify the following traffic classes: **background**, **conversational**, **interactive**, and **streaming**. This option is available when UMTS QoS is enabled.	
tid *tunnel_id*	Displays PDP contexts by tunnel ID. This value corresponds to the IMSI plus NSAPI and can be up to 16 numeric digits. Optionally, displays the service category in a PDP context.	

**service [all	id** *id_string*]	Displays the service category in a PDP context.
version *gtp-version*	Displays PDP contexts by GTP version. The possible values are 0 or 1.
egcdr-context	Displays eG-CDR context information, the information about outstanding service control requests and the outstanding asynchronous service control usage messages.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(1)	The MS International PSTN/ISDN Number (MSISDN) field was added to the output display.

Release	Modification
12.2(4)MX	This command was integrated into Cisco IOS Release 12.2(4)MX.
	• The **pdp-type ppp** and **qos-delay** options were added to the command.
	• The following fields were added to the output display of the **tid** version of this command:
	– cef_down_byte
	– cef_down_pkt
	– cef_drop
	– cef_up_byte
	– cef_up_pkt
	– gtp pdp idle time
	• The Network Init Information section was added to the output display of the **tid** version of this command with the following new fields:
	– Buf.Bytes
	– MNRG Flag
	– NIP State
	– PDU Discard Flag
	– SGSN Addr
	• The following fields were removed from the output display of the **tid** version of this command:
	– fast_up_pkt
	– fast_up_byte
	– fast_down_pkt
	– fast_down_byte
	– fast_drop
	• The "dynamic?" and "Dynamic" fields were removed from the output display of the **all** and **tid** versions of this command, and were replaced by the Source field.
12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD and the following fields were added to the output display of the **tid** version of this command:
	• primary dns
	• secondary dns
	• primary nbns
	• secondary nbns

Release	Modification
12.2(8)YW	This command was integrated into the 12.2(8)YW.
	• The the option of displaying PDP contexts by remote IP address and port number was added.
	• The delay Qos class(req.) output field was added to the display of the **tid** version of this command when the mapping of GPRS QoS categories to delay QoS classes is enabled.
	• The **ms-address**, **imsi**, **qos-umts-class** and **version** options were added to the command.
	• The ggsn_addr_signal field was changed to the sgsn_addr_data in the output display of the **tid** version of this command.
	• The following fields were added to the output display of the **tid** version of this command: – control teid local – control teid remote – data teid local – data teid remote – primary pdp – nsapi
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB and the MS Addr field updated to reflect the virtual interface identifier for PPP PDP and PPP Regen contexts and the status of PPP PDP with L2TP contexts.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU.
	• The following fields were added to the output display of the **tid** version of this command: – charging characteristics – charging characteristics received – Framed_route – idle timeout – mask – roamer – session timeout – visitor
	• The gtp pdp idle time field were removed from the output display of the **tid** version of this command.
	• An overflow indicator (+) was added to the following fields of the output display of the **tid** version of this command: – cef_down_pkt – cef_up_pkt – rcv_pkt_count – send_pkt_count

Release	Modification
12.3(8)XU2	This command was integrated into Cisco IOS Release 12.3(8)XU2 and the single pdp-session field was added to the output display of the **tid** version of this command.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.

Release	Modification
12.3(14)YQ	This command was integrated into the Cisco IOS Release 12.3(14)YQ.

- The option of display the service category in a PDP context was added was added.

- The following fields were added to the **tid** version of this command when the **service** keyword option is specified:

  - Diameter Credit Control

  - Current Billing Status

  - Reason to convert to postpaid

  - DCCA profile name and Source

  - Rule base id and Source

  - ServiceID

  - State

  - Quota(octets)

  - Time

  - flags

  - Last pushed quota

    - Tariff Time Change

    - Time Quota

    - Volume Quota

    - Validity Time

    - Quota Consumption Time

    - Quota Holding time

    - Time Quota Threshold

    - Volume Quota Threshold

    - Trigger Flags

  - Last received quota

    - Tariff_time_change

    - Time_quota

    - Volume_quota

    - Validity_time

    - Quota Consumption Time

    - Quota Holding_Time

    - Time Quota Threshold

    - Volume Quota Threshold

    - Trigger Flags

Release	Modification
12.3(14)YU	This command was integrated into the Cisco IOS Release 12.3(14)YU and the **msisdn** [*msisdn*] keyword option was added.
	Additionally, the QoS for charging field was removed from the **show gprs gtp pdp-context tid** command display and when a PDP is created via a virtual APN, the following field is added to the **show gprs gtp pdp-context tid** command display:
	• virtual-apn: *virtual-apn-name*
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG and the **v6** and **v4** keyword options were added to the **pdp-type ip** keyword option, and the **ms-ipv6-addr** keyword option was added.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)YQ.
12.422)YE	This command was integrated into Cisco IOS Release 12.4(22)YE and the **gn-vrf** and related keyword options were added.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.

Release	Modification

12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2 and the egcdr-context keyword option was added to the show gprs gtp pdp-context tid version of the command.
	
	Additionally, the following fields were added to the **tid** version command display under Eggsn mode:
	
	• OS
	
	• EG-CDR
	
	• SVC-MESG
	
	The following fields were added to the tid **egcdr-context version** command display:
	
	• EGCDR Service Control Info
	  – expected_eGCDR_user_sequence_number
	  – current_eGCDR_user_sequence_window
	  – next_eGCDR_correlator_id
	
	• Outstanding Service Control Requests
	  – SCR
	  – Correlator ID
	  – CDR close cause
	  – Service Record close cause
	  – SCR flags
	  – SCR in radius accounting
	
	• Outstanding Service Control Usage
	  – SCU
	  – User Sequence number
	  – Missing Correlator ID
	  – Timestamp
	  – Service Record close cause
	  – Fragment

12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE and the following fields were added to the **tid** version command display: • Final units indication • FUI action • FUI redirect server • FUI IN filter-id • FUI OUT filter-id • csg • address
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.

Release	Modification
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3 and the following fields were added to the output display of the **tid** version of this command: • Redirect server • IN filter-id • OUT filter-id • Redirect interval • Remaining interval
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines

Use the **show gprs gtp pdp-context** command to display the currently active PDP contexts on the GGSN. You can display PDP contexts by tunnel ID, by IMSI, by access point, by PDP type, and by GPRS QoS precedence, UMTS QoS traffic class, or you can display all PDP contexts.

Several versions of the **show gprs gtp pdp-context** command display similar output. The examples provided show these two different types of output.

Examples

Example 1

The following is sample output of the **show gprs gtp pdp-context all** command:

```
router#show gprs gtp pdp-context all
TID              MS Addr          Source  SGSN Addr      APN
1234567890123456 10.11.1.1        Radius  10.4.4.11      www.pdn1.com
2345678901234567 Forwarded (Vi5)  IPCP    10.4.4.11      www.pdn2.com
3456789012345678 10.21.1.1 (Vi7)  IPCP    10.1.4.11      www.pdn3.com
4567890123456789 10.31.1.1 (Vi9)  IPCP    10.1.4.11      www.pdn4.com
5678901234567890 10.41.1.1        Static  10.4.4.11      www.pdn5.com
```

Note The same output fields shown in Example 1 also appear when you use the **access-point**, **path**, **pdp-type**, **qos-delay**, or **qos-precedence** keyword options of the **show gprs gtp pdp-context** command.

Table 25 describes the fields shown in the display.

Table 25   show gprs gtp pdp-context all Field Descriptions

Field	Description
APN	Access point name where the PDP context is active.
MS Addr	IP address of the mobile station. **Note** For PPP PDP and PPP Regen contexts, this field will also display the virtual interface identifier. For PPP PDP with L2TP contexts, this field will also display the state of the PDP context. Possible states are Pending, Forwarded, or Terminating.

Table 25   show gprs gtp pdp-context all Field Descriptions

Field	Description
SGSN Addr	IP address of the SGSN that is processing the packets.
Source	Source of IP addressing for the MS. The possible values are: • DHCP—Dynamic address allocation using DHCP. • IPCP—Dynamic address allocation for PPP PDP types, or for IP PDP types with PPP regeneration, using PPP IP Control Protocol. • Local—Dynamic address allocation using a local pool. • Pending—Waiting for dynamic address allocation. Dynamic address source is unknown. • Radius—Dynamic address allocation using RADIUS. • Static—IP address is not dynamically assigned.
TID	Tunnel ID for the PDP context.

Example 2

The following is sample output from the **show gprs gtp pdp-context tid** command:

```
router#show gprs gtp pdp-context tid 1234000000000014
TID             MS Addr                     Source  SGSN Addr        APN
1234000000000014 1.2.3.18                   Static  4.4.4.10         gtpv1.com

    current time :Feb 15 2010 04:11:17
    user_name (IMSI): 214300000000004    MS address: 1.2.3.18
    MS International PSTN/ISDN Number (MSISDN): 112000000000004
    sgsn_addr_signal: 4.4.4.10          sgsn_addr_data:   4.4.4.10
    control teid local:  0x0210001F
    control teid remote: 0x00000041
    data teid local:     0x02100020
    data teid remote:    0x00000042
    primary pdp: Y          nsapi: 1
    signal_sequence: 1                  seq_tpdu_up:      0
    seq_tpdu_down:    0
    upstream_signal_flow:   0           upstream_data_flow:   0
    downstream_signal_flow: 0           downstream_data_flow: 0
    RAupdate_flow:         0
    pdp_create_time:   Feb 15 2010 04:07:59
    last_access_time:  Feb 15 2010 04:07:59
    mnrgflag:          0                tos mask map: B8
    session timeout: 86400
    idle timeout: 720000

    Radius redirection info
    ----------------------
    Radius redirect server: 70.0.0.48
    Radius IN filter-id : inacl
    Radius OUT filter-id : outacl
    Redirection Interval:00:05:00 (300)
    Remaining Interval: 169

    umts qos_req: 0911012901010111050101
```

```
                        umts qos_neg: 0911012901010111050101
                        QoS class: conversational
                        rcv_pkt_count:     0              rcv_byte_count:    0
                        send_pkt_count:    0              send_byte_count:   0
                        cef_up_pkt:        0              cef_up_byte:       0
                        cef_down_pkt:      0              cef_down_byte:     0
                        cef_drop:          0              out-sequence pkt: 0
                        charging_id:       42194519
                        visitor: No        roamer: Unknown
                        charging characteristics:        1
                        charging characteristics received: 0
                        csg: csggroup1, address: 75.75.75.1
                        pdp reference count: 2
                        primary dns:       0.0.0.0
                        secondary dns:     0.0.0.0
                        primary nbns:      0.0.0.0
                        secondary nbns:    0.0.0.0
                        ntwk_init_pdp:     0
                        single pdp-session: Disabled

                        absolute session start time:  NOT SET
                        Accounting Session ID: 161616010283D657
                        Periodic accounting interval: NOT SET
                        AAA Unique ID: 16 (0x10)
                        Interim Update statistics:
                            records sent 0, records failed 0
                        Direct Tunnel: Disabled
                        Eggsn mode: 0x06 (QS: disabled, EGCDR: enabled, SVC-MESG: enabled)
                        PDP internal flags: 7C0001
                        MCB internal flags: 0
router#
```

Table 26 describes the fields shown in the display.

Note The Network Init Information section of the output appears only while network-initiated PDP contexts are being processed by the GGSN.

Note The same output fields shown in Example 2 also appear when you use the **imsi** keyword option of the **show gprs gtp pdp-context** command.

Note If the PDP context is created via a virtual APN, the "virtual-apn: *virtual-apn name*" field displays.

Table 26 describes the fields shown in the display.

Table 26   show gprs gtp pdp-context tid Field Descriptions

Field	Description
address	Address of the CSG2 being used.
APN	Access point name where the PDP context is active.
cef_down_byte	Total number of G-PDU bytes CEF switched on the downlink, from the GGSN to the SGSN.

Table 26 show gprs gtp pdp-context tid Field Descriptions (continued)

Field	Description
cef_down_pkt	Total number of G-PDU packets CEF switched on the downlink, from the GGSN to the SGSN. The plus (+) sign is an overflow indicator.
cef_drop	Total number of G-PDU packets dropped during CEF switching.
cef_up_byte	Total number of G-PDU bytes CEF switched on the uplink, from the SGSN to the GGSN.
cef_up_pkt	Total number of G-PDU packets CEF switched on the uplink, from the SGSN to the GGSN. The plus (+) sign is an overflow indicator.
charging characteristics	Number of the charging profile selected for the PDP context.
charging characteristics received	Charging characteristics IE received from the SGSN. The value of the charging characteristics received field is the decimal value of the two octets, with the first octet being the more significant byte than the second. The profile index, which is used to select the charging profile, is the integer obtained by dividing the charging characteristics received value by 256.
charging_id	Unique 4-octet value generated by the GGSN for the PDP context. The value 0 is reserved.
control teid local	Uplink tunnel endpoint identifier (TEID) chosen by the GGSN for control plane messages. This field displays for PDP contexts created with GTP version 1.
control teid remote	Downlink TEID chosen by the SGSN for control plane messages. This field displays for PDP contexts created with GTP version 1.
csg	Name of the CSG2 being used.
current time	Date and time of the show command output.
data teid local	Uplink TEID chosen by the GGSN for G-PDUs. This field displays for PDP contexts created with GTP version 1.
data teid remote	Downlink TEID chosen by the SGSN for PDUs. This field displays for PDP contexts created with GTP version 1.
Dest addr violation	Number of packets (and bytes) dropped by the GGSN because of a source address violation. This field displays only when the **security verify destination** command is configured. **Note** This field does not apply to APNs using VRF. In addition, verification of destination addresses does not apply to GTP-PPP regeneration or GTP-PPP with L2TP.
downstream_data_flow	Flow label of downlink G-PDUs.
downstream_signal_flow	Flow label of downlink signaling messages.

Table 26   show gprs gtp pdp-context tid Field Descriptions (continued)

Field	Description
Eggsn mode: eG-CDR	Indicates whether the GGSN has been configured to generate eG-CDRs for the APN of the PDP for this TID. Possible values are enabled or disabled.
Eggsn mode: QS	Indicates whether the GGSN is functioning as a quota server. Possible values are enabled or disabled.
Eggsn mode: SVC-MESG	Indicates whether eGCDR generation is based on the exchange of service control messages. Possible values are enabled or disabled.
Framed_route	Framed-Route, attribute 22, for the PDP context, downloaded from the RADIUS server during authentication and authorization.
idle timeout	Number of seconds the GGSN waits before purging idle PDP contexts.
last_access_time	Time when the PDP context for this TID was last accessed. The date format is MMM DD YYYY. The time format is hours:minutes:seconds. When a signaling packet or data packet for a PDP context arrives on the GGSN, the last_access_time is reset to the current date and time. If the last_access_time exceeds the purge timer for idle PDP contexts, then the PDP context is purged by the GGSN.
mask	Framed-Route subnet.
mnrgflag	Mobile not reachable flag, with the following values: • 0—flag is off. • 1—flag is on, indicating that the MS is not reachable
MS_ADDR and MS Address	IP address of the mobile station. Note For PPP PDP and PPP Regen contexts, this field will also display the virtual interface identifier. For PPP PDP with L2TP contexts, this field will also display the state of the PDP context. Possible states are Pending, Forwarded, or Terminating.
MS International PSTN/ISDN Number (MSISDN)	Integrated Services Digital Network (ISDN) number of the mobile station.
nsapi	Network Service Access Point Identifier (NSAPI). This field displays for PDP contexts created with GTP version 1.
ntwk_init_pdp	Network initiated PDP context indicator, with the following values: • 0—Not a network initiated PDP context. This indicates a mobile initiated PDP context. • 1—Network initiated PDP context
out-sequence pkt	
pdp_create_time	Time when the PDP context for this TID was created. The date format is MMM DD YYYY. The time format is hours:minutes:seconds.

Table 26   show gprs gtp pdp-context tid Field Descriptions (continued)

Field	Description
pdp reference count	Number of subsystems on the GGSN that are aware of the PDP context. For example, if both the charging and GTP subsystems are aware of the PDP context, then the pdp reference counter shows a value of 2.
primary dns	IP address of the primary DNS server.
primary nbns	IP address of the primary NetBIOS Name Service (NBNS).
primary pdp	Whether the PDP is primary or secondary. Possible values are Y (PDP is primary) or N (PDP is secondary). This field displays for PDP contexts created with GTP version 1.
RAupdate_flow	Flow Label Data II information element in GTP header. This IE contains the flow label for data transmission between old and new SGSNs for a particular PDP context. This IE is requested by the new SGSN.
rcv_byte_count	Total number of G-PDU bytes received. For the GGSN, this is the total byte count on the uplink.
rcv_pkt_count	Total packet count of received G-PDUs. For the GGSN, this is the total byte count on the uplink. The plus (+) sign is an overflow indicator.
Redirected mobile-to-mobile traffic	Number of packets (and bytes) dropped at the APN from which they exit because mobile-to-mobile traffic is redirected. This field displays only when the **redirect intermobile ip** command is configured.
roamer	Whether the PDP context is that of a roaming mobile subscriber (subscriber whose SGSN PLMN ID differs from the GGSN's). The possible values are yes or no.
secondary dns	IP address of the secondary DNS server.
secondary nbns	IP address of the secondary NBNS.
send_byte_count	Total number of G-PDU bytes sent by the GSN (GGSN or SGSN D-node).
send_pkt_count	Total number of G-PDU packets sent by the GSN (GGSN or SGSN D-node). The plus (+) sign is an overflow indicator.
seq_tpdu_down	Last sequence number used in the downlink T-PDU. This number wraps to 0 after 65535.
seq_tpdu_up	Last sequence number used in the uplink T-PDU. This number wraps to 0 after 65535.
session timeout	Number of seconds that the GGSN allows a session to remain active before purging all PDP contexts with the same IMSI or MS address.
sgsn_addr_signal	IP address of the SGSN that is processing the packets.
sgsn_addr_data	IP address of the SGSN that is processing tunnel packet data units (TPDUs).
signal_sequence	Last sequence number used in the GTP signaling message.

Table 26   show gprs gtp pdp-context tid Field Descriptions (continued)

Field	Description
single PDP-session	Whether the GGSN is configured to delete the primary PDP context, and any associated secondary PDP contexts, of a *hanging* PDP session upon receiving a new create request from the same MS that shares the same IP address of the hanging PDP context.
Source	Source of IP addressing for the MS. The possible values are: • DHCP—Dynamic address allocation using DHCP. • IPCP—Dynamic address allocation for PPP PDP types, or for IP PDP types with PPP regeneration, using PPP IP Control Protocol. • Local—Dynamic address allocation using a local pool. • Pending—Waiting for dynamic address allocation. Dynamic address source is unknown. • Radius—Dynamic address allocation using RADIUS. • Static—IP address is not dynamically assigned.
Src addr violation	Number of packets (and bytes) dropped because of source address violation. This field displays only when the **security verify source** command is configured.
TID	Tunnel ID for the PDP context.
tos mask map	ToS value in IP header of this PDP context.
umts qos_req	Requested UMTS quality of service by the PDP context. This field displays when UMTS QoS is enabled on the GGSN.
umts qos_neg	Negotiated UMTS quality of service for the PDP context. This field displays when UMTS QoS is enabled on the GGSN.
upstream_data_flow	Flow label of uplink G-PDUs.
upstream_signal_flow	Flow label of uplink signaling messages.
user_name (IMSI)	International mobile subscriber identity for the PDP context.
virtual APN	Virtual access point name where the PDP context is active.
visitor	Whether the PDP context is that of a visiting mobile subscriber (subscriber whose IMSI contains a foreign PLMN ID).). The possible values are yes or no.

Table 27 describes the fields shown in the Network Init Information section of the output.

Table 27 **show gprs gtp pdp-context tid Network Init Information Field Descriptions**

Field	Description
Buf.Bytes	Number of bytes currently buffered for this network-initiated PDP context.
last_access_time	Time when the PDP context for this TID was last accessed. The date format is MMM DD YYYY. The time format is hours:minutes:seconds. When a signaling packet or data packet for a PDP context arrives on the GGSN, the last_access_time is reset to the current date and time. If the last_access_time exceeds the purge timer for idle PDP contexts, then the PDP context is purged by the GGSN.
MNRG Flag	Mobile not reachable flag, with the following values: • 0—flag is off. • 1—flag is on, indicating that the MS is not reachable
NIP State	State information for the network initiated PDP process on the GGSN.
PDU Discard Flag	Discarded PDU indicator for a network initiated PDP context, with the following values: • 0—PDUs are not discarded. This indicates that PDUs for a network initiated PDP context are being sent to the SGSN. • 1—PDUs are being discarded by the GGSN. PDUs are discarded by the GGSN when a network initiated PDP context procedure is unsuccessful. This occurs when the SGSN sends a rejection of the PDP context request to the GGSN with a Cause value of either "MS Refuses" or "MS is not GPRS Responding." When the flag is set to 1, the GGSN ignores PDUs destined for that MS for the specified PDU discard period. The default period is 300 seconds (5 minutes). You can configure the PDU discard time using the **gprs ntwk-init-pdp pdu-discard-period** command.
SGSN Addr	IP address of the SGSN that is associated with the network-initiated procedure for this PDP context (used for paging).

Example 3

The following is sample output from the **show gprs gtp pdp-context tid service id** command (prepaid session):

```
ggsn1#show gprs gtp pdp-context tid 1122334444999910 service id 11
Diameter Credit Control: Enabled
Current Billing status: Prepaid(DCCA)
Reason to convert to postpaid: N/A
Charging Profile Index: 1
DCCA profile name: dcca-profile1, Source: charging profile
OCS Address Selection: Disabled
Rule base id: rule1, Source: Default
ServiceID State Quota(octets) Time Armed Triggers

11 AUTHORIZED 2500 0 USER_LOC_INFO:

Last pushed quota
-----------------
Tariff Time Change: 0 Time Quota: 0
Volume Quota: 2500 Validity Time: 1000
Quota ConsumptionTime: 0 Quota Holding time: 100
Time Quota Threshold: 0 Volume Quota Threshold: 500
Trigger Flags: 16

Final units indication
---------------------

FUI action: REDIRECT
FUI redirect server: 1.1.1.1
FUI IN filter-id: 20000
FUI OUT filter-id: 1000

Last received quota
-------------------
Tariff_time_change: 0 Time_quota: 0
Volume quota: 2500 Validity_time: 1000
Quota ConsumptionTime: 0 Quota Holding_Time: 100
Time Quota Threshold: 0 Volume Quota Threshold: 500
Trigger Flags: 16

Prepaid billing parameters
-------------------------
Billing Basis: VOLUME

Interval Usage:
---------------
Bytes up: 0 Bytes down: 0
Duration: 0:000000000 sec
First packet: NOT SET
Last packet : NOT SET

Prepaid balance(volume): 2500
Prepaid balance(time) : 0:000000000
Last_billed_time : NOT SET
Current time : 06:04:13 UTC Apr 6 2009
Quota expiry : 06:06:47 UTC Apr 6 2009
Idle expiry : 06:05:15 UTC Apr 6 2009
Time reauth expiry : NOT SET
Next quota fetch : NOT SET
Consumption expiry : NOT SET
Tariff SW time : NOT SET
Current running tmr : 06:05:15 UTC Apr 6 2009
```

Example 4

The following is sample output from the **show gprs gtp pdp-context tid service all** command (prepaid session converted to a postpaid session):

```
ggsn1#show gprs gtp pdp-context tid 1122334444990010 service all
Diameter Credit Control: Enabled
Current Billing status: Postpaid
Reason to convert to postpaid: DCCA server failed CCA
Charging Profile Index: 1
DCCA profile name: dcca-profile1, Source: charging profile
OCS Address Selection: Disabled
Rule base id: rule1, Source: Default
ServiceID: Not Available - Service based charging is disabled.
```

Example 5

The following is sample output from the **show gprs gtp pdp-context msisdn detail** command:

```
ggsn1#show gprs gtp pdp-context msisdn detail

TID             MS Addr       Source SGSN Addr      MSISDN             APN
2123456708000010 55.10.0.2    LOCAL  10.1.1.70      408525823010       ippdpl
2123456809000010 55.10.0.3    LOCAL  10.1.1.70      408525823011       ippdpl
2123456707000010 55.10.0.4    LOCAL  10.1.1.70      408525823110       ippdpl
2123456789990010 55.10.0.5    LOCAL  10.1.1.70      408525823210       ippdpl
```

> **Note** All PDP contexts are displayed

The following is sample output from the **show gprs gtp pdp-context msisdn** command with an MSISDN specified:

```
ggsn1#show gprs gtp pdp-context msisdn 4085258230 detail

TID             MS Addr       Source SGSN Addr      MSISDN             APN
2123456708000010 55.10.0.2    LOCAL  10.1.1.70      408525823010       ippdpl
2123456809000010 55.10.0.3    LOCAL  10.1.1.70      408525823011       ippdpl
```

> **Note** All PDP contexts whose MSISDN matches the prefix 4085258230 are displayed

Table 28 describes the fields shown in the display.

Table 28   show gprs gtp pdp-context msisdn Field Descriptions

Field	Description
TID	Tunnel ID for the PDP context request on the APN.
MS Addr	The IP address for the MS.

Table 28   *show gprs gtp pdp-context msisdn Field Descriptions (continued)*

Field	Description
Source	Source of IP addressing for the MS. The possible values are: • DHCP—Dynamic address allocation using DHCP. • IPCP—Dynamic address allocation for PPP PDP types, or for IP PDP types with PPP regeneration, using PPP IP Control Protocol. • Local—Dynamic address allocation using a local pool. • Pending—Waiting for dynamic address allocation. Dynamic address source is unknown. • Radius—Dynamic address allocation using RADIUS. • Static—IP address is not dynamically assigned.
SGSN Addr	IP address of the SGSN that is processing the packets.
MSISDN	Integrated Services Digital Network (ISDN) number of the mobile station.
APN	Access point name.

Example 6

The following is sample output from the **show gprs gtp pdp-context egcdr-context** command:

```
ggsn1#show gprs gtp pdp tid 2123456708000010 egcdr-context
EGCDR Service Control Info:
  expected_eGCDR_user_sequence_number  :
  current_eGCDR_user_sequence_window   :
  next_eGCDR_correlator_id             :

Outstanding Service Control Requests:
  SCR:
   Correlator ID                :
   CDR close cause              :
   Service Record close cause   :
   SCR flags                    :
   SCR in radius accounting     :

Outstanding Service Control Usage:
  SCU:
   User Sequence number         :
   Correlator ID                :
   Missing Correlator ID        :
   Timestamp                    :
   Service Record close cause   :
   Fragment                     :
```

Example 7

The following is sample output from the **show gprs gtp pdp-context path** command:

```
ggsn2#show gprs gtp pdp-context path 4.4.4.10

Signalling path(4.4.4.10,2123)
TID             MS Addr                     Source  SGSN Addr       APN
1234000000000014 1.2.3.18                   Static  4.4.4.10        gtpv1.com
1234000000000019 1.2.3.23                   Static  4.4.4.10        gtpv1.com
```

```
Data path(4.4.4.10,2152)
TID             MS Addr                 Source  SGSN Addr     APN
1234000000000014 1.2.3.18               Static  4.4.4.10      gtpv1.com
1234000000000019 1.2.3.23               Static  4.4.4.10      gtpv1.com

Signalling path(4.4.4.10,2123)
TID             MS Addr                 Source  SGSN Addr     APN
1234000000000010 1.2.3.14               Static  4.4.4.10      gtpv1.com
1234000000000015 1.2.3.19               Static  4.4.4.10      gtpv1.com

Data path(4.4.4.10,2152)
TID             MS Addr                 Source  SGSN Addr     APN
1234000000000010 1.2.3.14               Static  4.4.4.10      gtpv1.com
1234000000000015 1.2.3.19               Static  4.4.4.10      gtpv1.com

Signalling path(4.4.4.10,2123)
TID             MS Addr                 Source  SGSN Addr     APN
1234000000000011 1.2.3.15               Static  4.4.4.10      gtpv1.com
1234000000000016 1.2.3.20               Static  4.4.4.10      gtpv1.com

Data path(4.4.4.10,2152)
TID             MS Addr                 Source  SGSN Addr     APN
1234000000000011 1.2.3.15               Static  4.4.4.10      gtpv1.com
1234000000000016 1.2.3.20               Static  4.4.4.10      gtpv1.com

Signalling path(4.4.4.10,2123)
TID             MS Addr                 Source  SGSN Addr     APN
1234000000000012 1.2.3.16               Static  4.4.4.10      gtpv1.com
1234000000000017 1.2.3.21               Static  4.4.4.10      gtpv1.com

Data path(4.4.4.10,2152)
TID             MS Addr                 Source  SGSN Addr     APN
1234000000000012 1.2.3.16               Static  4.4.4.10      gtpv1.com
1234000000000017 1.2.3.21               Static  4.4.4.10      gtpv1.com

Signalling path(4.4.4.10,2123)
TID             MS Addr                 Source  SGSN Addr     APN
1234000000000013 1.2.3.17               Static  4.4.4.10      gtpv1.com
1234000000000018 1.2.3.22               Static  4.4.4.10      gtpv1.com

Data path(4.4.4.10,2152)
TID             MS Addr                 Source  SGSN Addr     APN
1234000000000013 1.2.3.17               Static  4.4.4.10      gtpv1.com
1234000000000018 1.2.3.22               Static  4.4.4.10      gtpv1.com
```

Related Commands

Command	Description
show gprs access-point	Displays information about access points on the GGSN.
show gprs gtp status	Displays information about the current status of the GTP on the GGSN (such as activated PDP contexts, throughput, and QoS statistics).

show gprs gtp statistics

To display the current GPRS Tunneling Protocol (GTP) statistics for the gateway GPRS support node (GGSN) (such as IE, GTP signaling, and GTP PDU statistics), use the **show gprs gtp statistics** command in privileged EXEC mode.

show gprs gtp 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(2)GB	This command was integrated into Cisco IOS Release 12.1(2)GB and the following fields were added to the output display: • total created_pdp • total deleted_pdp
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(4)MX	This command was integrated into Cisco IOS Release 12.2(4)MX, and the following fields were added to the output display: • ntwk_init_pdp_act_rej • ppp_regen_pending • ppp_regen_pending_peak • ppp_regen_total_drop • ppp_regen_no_resource • total created_ppp_pdp • total ntwkInit created pdp
12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD.
12.2(8)YW	This command was integrated into the Cisco IOS Release 12.2(8)YW and the following fields were added to the output display: • tft_semantic_error • tft_syntactic_error • packet_filter_semantic_error • packet_filter_syntactic_error • total deleted_ppp_pdp
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.

Release	Modification
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU and the following fields were added to the output display: • insert_download_route_fail • network_behind_ms APNs • pdp_wo_tft_exist • save_download_route_fail • total_download_route • total_insert_download_route • unsupported_comp_exthdr
12.3(8)XU2	This command was integrated into Cisco IOS Release 12.3(8)XU2 and the single pdp-session cleared output field was added.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB and the following fields were added to the output display: • create_as_update • create_collide_with_delete • no_sgsn_local_del_pdp • path_fail_local_del_pdp • rcv_retransmit_create_req • version_changes • ver_upgrade_local_del • ver_faillback_local_del
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG and the following IPv6-related fields were added to the display: • created ipv6 pdp • created ipv6 pdpmcb • deleted ipv6 pdp • deleted ipv6 pdpmcb • rejected ipv6 pdp • rcvd ipv6 data bytes • rcvd ipv6 pdu • rcvd ipv6 signal msg • sent ipv6 data bytes • sent ipv6 pdu • sent ipv6 signal msg

Release	Modification
12.4(9)XG2	This command was integrated into Cisco IOS Release 12.4(9)XG2 and the following fields were added to the display: • no_req_sgsn_local_del_pdp • no_wait_sgsn_local_del_pdp
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ and the following fields were added to the display: • Number of times DT enabled • total COA msg received • total COA msgs discarded • total COA triggered update • total EI rcvd on DT PDPs • total error indication sent • total error indication rcvd • total error indication rcvd DT PDPs • total update responses rcv • total update fail DT pdps
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs gtp statistics** command to display the GTP statistics for the GGSN. The counter values displayed by this command represent totals accumulated since the last time the statistical counters were cleared using the **clear gprs gtp statistics** command.

Examples   The following is sample output of the **show gprs gtp statistics** command:

```
router# show gprs gtp statistics
 GPRS GTP Statistics:
  version_not_support           0       msg_too_short                 0
  unknown_msg                   0       unexpected_sig_msg            0
  unexpected_data_msg           0       unsupported_comp_exthdr       0
  mandatory_ie_missing          0       mandatory_ie_incorrect        0
  optional_ie_invalid           0       ie_unknown                    0
  ie_out_of_order               0       ie_unexpected                 2
  ie_duplicated                 0       optional_ie_incorrect         0
  pdp_activation_rejected       1       tft_semantic_error            0
  tft_syntactic_error                   pkt_ftr_semantic_error        0
  pkt_ftr_syntactic_error       0       pdp_wo_tft_exist              0
```

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```
                        non_existent 1 path_failure      0
                        total_dropped                    0        signalling_msg_dropped       0
                        data_msg_dropped 0 no_resource   0
                        get_pak_buffer_failure           0        rcv_signalling_msg          11
                        snd_signalling_msg              11        rcv_pdu_msg                 53
                        snd_pdu_msg                     79        rcv_pdu_bytes              865
                        snd_pdu_bytes                 3319        total created_pdp            4
                        total deleted_pdp                3        total created_ppp_pdp        3
                        total deleted_ppp_pdp            3        ppp_regen_pending            0
                        ppp_regen_pending_peak           0        ppp_regen_total_drop         0
                        ppp_regen_no_resource            0        ntwk_init_pdp_act_rej        0
                        total ntwkInit created pdp       0        single pdp-session cleared   0
                        total ntwkInit update pdp        2        total update responses rcv   2
                        total COA msg received           2        total COA msgs discarded     0
                        total COA triggered update       2        total err indications rcvd   0
                        total err indications sent       0        Number of times DT enabled   0
                        total EI rcvd on DT PDPs         0        total update fail DT pdps    0
                        created ipv6 pdp                 0        rejected ipv6 pdp            0
                        deleted ipv6 pdp                 0        created ipv6 pdpmcb          0
                        deleted ipv6 pdpmcb              0
                        rcvd ipv6 pdu                    0        sent ipv6 pdu               10
                        rcvd ipv6 data bytes             0        sent ipv6 data bytes      1000

                     GPRS Network behind mobile Statistics:
                        network_behind_ms APNs           1        total_download_route         0
                        save_download_route_fail         0        insert_download_route_fail   0
                        total_insert_download_route      0

                     Debug info:
                        path_fail_local_del_pdp          0        ver_upgrade_local_del         0
                        no_sgsn_local_del_pdp            0        ver_fallback_local_del        0
                        no_wait_sgsn_local_del_pdp       0        no_req_sgsn_local_del_pdp     0
                        create_collide_with_delete       0        version_changes               0
                        rcv_retransmit_create_req        0           create_as_update                0
                     router#

                     router#show gprs gtp statistics | in DT
                        total err indications sent       0        Number of times DT enabled    0
                        total EI rcvd on DT PDPs 0 total update fail DT pdps 0
```

Table 29 describes the fields shown in the display:

Table 29   show gprs gtp statistics Field Descriptions

Field	Description
created ipv6 pdp	Number of IPv6 PDP contexts created since system startup.
created ipv6 pdpmcb	
data_msg_dropped	Number of GTP PDUs dropped.
Debug info: create_as_update	Number of create PDP context requests treated as update.
Debug info: create_collide_with_delete	Number of create PDP context requests that collided with delete PDP context requests.
Debug info: no_sgsn_local_del_pdp	Number of PDPs deletes because an SGSN could not be found.
Debug info: path_fail_local_del_pdp	Number of PDPs deletes because a path failure occurred.

Table 29   show gprs gtp statistics Field Descriptions (continued)

Field	Description
Debug info: rcv_retransmit_create_req	Number of create PDP context requests for which retransmit requests were received.
Debug info: ver_faillback_local_del	Number of PDP deletes due to version fallback.
Debug info: ver_upgrade_local_del	Number of PDP deletes due to version upgrade
Debug info: verson_changes	Number of PDPs locally deleted due to change in version.
deleted ipv6 pdp	Number of IPv6 PDP contexts deleted since system startup.
deleted ipv6 pdpmcb	
get_pak_buffer_failure	Number of times the GGSN has failed to obtain a GTP packet.
ie_duplicated	Number of GTP messages received with a duplicated information element.
ie_out_of_order	Number of GTP messages received with an information element (IE) out of order.
ie_unexpected	Number of GTP messages received with an information element that not expected in the GTP message, but is defined in GTP. GTP messages with unexpected IEs are processed as if the IE was not present.
ie_unknown	Number of GTP messages received with an information element of an unknown type.
insert_download_route_fail	Number of routes downloaded from the RADIUS server that failed to be inserted into the routing table because they conflicted with others.
mandatory_ie_incorrect	Number of GTP messages received with an incorrect mandatory information element—for example, with an information element that has an incorrect length.
mandatory_ie_missing	Number of GTP messages received with a missing mandatory information element.
msg_too_short	Number of GTP messages received that are too short to hold the GTP header for the supported GTP version.
network_behind_ms APNs	Number of APNs configured to support routing behind the MS.
no_resource	Number of times a resource was not available for transmitting GTP messages. For example, the router may be out of memory.
no_req_sgsn_local_del_pdp	Number of PDPs contexts deleted locally without the GGSN sending a delete PDP context request to the SGSN.[1]
no_sgsn_local_del_pdp	Number of PDPs deleted locally because of no SGSN.
no_wait_sgsn_local_del_pdp	Number of PDPs contexts without waiting for a response from the SGSN.[1]
non-existent	Number of create/update PDP requests received on non-existing PDP contexts.
ntwk_init_pdp_act_rej	Number of rejected PDP context requests that were initiated by the network (PDN).

Table 29   show gprs gtp statistics Field Descriptions (continued)

Field	Description
Number of times DT enabled	
optional_ie_incorrect	Number of GTP messages received with an optional IE that is incorrect, which prevents the GGSN from processing the GTP message correctly.
optional_ie_invalid	Number of GTP messages received with an information element that contains a value that is not within the defined range for that IE. GTP messages with invalid optional IEs are processed as if the IE was not present.
packet_filter_semantic_error	Number of GTP messages received with an IE element with packet filter semantic errors. A semantic error is when the defined format of the information element (IE) is valid but the content of the IE is inconsistent or invalid.
packet_filter_syntactic_error	Number of GTP messages received with an IE element with packet filter syntactic errors. A syntactic error is when the coding of the IE is invalid.
path_failure	Number of path failures on the GPRS Support Node (GSN).
pdp_activation_rejected	Number of times a request to activate a PDP context was rejected.
pdp_wo_tft_exist	Number of Create PDP Context requests received without traffic flow template information element.
ppp_regen_no_resource	Total number of rejected responses to create PDP context and delete PDP context requests due to unavailable resource on the GGSN for PPP regeneration.
ppp_regen_pending	Number of pending PPP regeneration sessions.
ppp_regen_pending_peak	Maximum number of pending PPP regeneration sessions since the statistic was cleared.
ppp_regen_total_drop	Total number of create PDP context and delete PDP context requests that were dropped due to the threshold limit being reached for maximum number of PPP regeneration sessions allowed on the GGSN.
rcvd ipv6 data bytes	Number of bytes received in IPv6 PDUs.
rcvd ipv6 pdu	Number of IPv6 PDU messages received.
rcvd ipv6 signal msg	Number of IPv6 GTP signaling messages received.
rcv_pdu_bytes	Number of bytes received in PDUs.
rcv_pdu_msg	Number of PDU messages received.
rcv_signaling_msg	Number of GTP signaling messages received.
rejected ipv6 pdp	Number of IPv6 PDP context rejected since system startup.
save_download_route_fail	Number of times a downloaded route could not be saved because there was not enough memory.
sent ipv6 data bytes	Number of IPv6 PDU bytes sent.
sent ipv6 pdu	Number of IPv6 PDU messages sent.
sent ipv6 signal msg	Number of IPv6 GTP signaling messages sent.
signalling_msg_dropped	Number of GTP signaling messages dropped.

Table 29   show gprs gtp statistics Field Descriptions (continued)

Field	Description
single pdp-session cleared	Number of hanging single PDP contexts cleared on the GGSN.
snd_pdu_bytes	Number of PDU bytes sent.
snd_pdu_msg	Number of PDU messages sent.
snd_signalling_msg	Number of GTP signaling messages sent.
tft_semantic_error	Number of GTP messages received with an IE element with traffic flow template (TFT) semantic errors. A semantic error is when the defined format of the information element (IE) is valid but the content of the IE is inconsistent or invalid.
tft_syntactic_error	Number of GTP messages received with an IE element with TFT syntactic errors. A syntactic error is when the coding of the IE is invalid.
total COA msg received	Number of CoA messages received on the GGSN.
total COA msg discarded	Number of CoA messages discarded because of error.
total COA triggered deleted	Number of Delete PDP Context Requests initiated because of a COA trigger.
total COA triggered update	Number of Update PDP Context Requests initiated because of a COA trigger.
total created DT PDPs	Number of direct tunnel PDP contexts established.
total created_pdp	Number of PDP contexts created since system startup (supports Special Mobile Group (SMG)-28 standards level and later)
total created_ppp_pdp	Number of PDP contexts created for PPP PDP PDU types.
total deleted_pdp	Number of PDP contexts deleted since system startup (supports SMG-28 standards level and later)
total deleted_ppp_pdp	Number of PDP contexts created for PPP PDP PDU types deleted since system startup.
total_download_route	Number of routes downloaded from the RADIUS server.
total_dropped	Number of GTP messages dropped.
total EI rcvd on DT PDPs	Number of error indications sent from the RNC received on the GGSN for direct tunnel PDPs.
total error indication rcvd	Number of error indications received on the GGSN.
total error indication sent	Number of error indications sent.
total_insert_download_route	Total number of routes downloaded from the RADIUS server that have been inserted into the routing table by the GGSN.
total ntwkInit created pdp	Number of PDP context requests activated by the GGSN that were initiated by the network (PDN).
total netwkInit update pdp	Number of Update PDP Context Requests sent by the GGSN.
total update fail DT PDPs	Number of direct tunnel PDP contexts deleted because a successful Update PDP Context Response was not received.
total update responses rcv	Number of update request responses received.
unexpected_data_msg	Number of GTP PDUs received for nonexistent PDP contexts.

Table 29 **show gprs gtp statistics Field Descriptions (continued)**

Field	Description
unexpected_sig_msg	Number of unexpected GTP signaling messages received—for example, a message received on the wrong end of the tunnel or a response message received for a request that was not sent by the GGSN.
unknown_msg	Number of unknown GTP messages received.
unsupported_comp_exthdr	Number of Create PDP Context requests received with unsupported extension headers when GGSN comprehension is required.
version_not_support	Number of GTP messages received from devices running an unsupported version of the GTP.

1. This field displays only when an APN is in maintenance mode (the **service-mode maintenance** access-point configuration command).

Related Commands

Command	Description
clear gprs gtp statistics	Clears the current GGSN GTP statistics.
clear gprs statistics all	Clears all GGSN counters and statistics (both global and per-APN).
show gprs gtp path statistics	Display information about one or more GTP paths between the GGSN and other GPRS/UMTS devices.

show gprs gtp status

To display information about the current status of the GPRS Tunneling Protocol (GTP) on the gateway GPRS support node (GGSN) (such as activated PDP contexts and QoS statistics), use the **show gprs gtp status** command in privileged EXEC mode.

show gprs gtp status

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(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(4)MX	This command was integrated into Cisco IOS Release 12.2(4)MX, and the following output fields were added: • activated_ppp_pdp • activated_ppp_regen_pdp • ntwk_init_pdp • qos_delay1_pdp • qos_delay2_pdp • qos_delay3_pdp • qos_delaybesteffort_pdp
12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD.
12.2(8)YW	This command was integrated into the Cisco IOS Release 12.2(8)YW and the following output fields were added: • activated gtpv0 pdp • activated gtpv1 pdp • activated ms
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU and the QoS information was removed.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.

Release	Modification
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ and the following output fields were added to YQ1: • Prepaid PDPs • Postpaid PDPs
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG and the following fields were added to the output display: • activated ipv6 ms • activated gtpv0 ipv6 pdp • activated gtpv1 ipv6 pdp • gtp ipv6 swidbs
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ and the following field was added to the display: • gtp direct tunnel PDPs • gtp's va swidbs
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs gtp status** command to display information about the status of GTP running on the GGSN.

Examples   The following example shows output from the **show gprs gtp status** command:

```
router#show gprs gtp status
 GPRS GTP Status:
   activated gtpv0 pdp     2
   activated gtpv1 pdp     7
   activated ms            9
   activated ipv6 ms       2
   activated gtpv0 v6 pdp  1
   activated gtpv1 v6 pdp  1
   activated ppp regen pdp 1
   activated ppp pdp       2
   gtp's va hwidbs         2
   gtp's va swidbs         1
   gtp ipv6 swidbs         2
   gtp direct tunnel PDPs  7
 Service-aware Status:
```

```
     Prepaid PDPs            0
     Postpaid PDPs           0
router#
```

Table 30 describes the fields shown in the display.

Table 30   ***show gprs gtp status Field Descriptions***

Field	Description
activated gtpv0 pdp	Number of IPv4 PDP contexts created with GTP version 0.
activated gtpv0 ipv6 pdp	Number of IPv6 PDP contexts created with GTP version 0.
activated gtpv1 pdp	Number of IPv4 PDP contexts created with GTP version 1.
activated gtpv1 ipv6 pdp	Number of IPv6 PDP contexts created with GTP version 1.
activated ipv6 ms	Number of active IPv6 mobile stations (MS).
activated ms	Number of active IPv4 MSs.
activated_ppp_pdp	Number of point-to-point protocol IPv4 PDP contexts currently active.
activated_ppp_regen_pdp	Number of IPv4 point-to-point protocol PDP contexts created on the GGSN.
gtp direct tunnel PDPs	Number of direct tunnel PDPs currently active.
gtp ipv6 swidb	Number of virtual access created for IPv6 PDP contexts.
gtp's ppp va hwidbs	Number of virtual access created for IPv4 PPP PDP contexts.
gtp's va swidbs	Number of virtual access created for
ntwk_init_pdp	Current number of active IPv4 PDP contexts that are initiated by the network to an MS.
Prepaid PDPs	Current number of active prepaid IPv4 PDP contexts.
Postpaid PDPs	Current number of active postpaid IPv4 PDP contexts.

Related Commands

Command	Description
show gprs gtp statistics	Displays the current GTP statistics for the GGSN.

show gprs memory threshold statistics

To display information about the number of PDP contexts that have been rejected or dropped because the memory threshold is exceeded, use the **show gprs memory threshold statistics** command in privileged EXEC mode:

show gprs memory threshold statistics

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs memory threshold statistics** command to obtain information about the number of PDP contexts that have been deleted or the number of Create PDP Context requests that have been rejected because the memory threshold is exceeded.

Examples   The following example shows output from the **show gprs memory threshold statistics** command:

```
router# show gprs memory threshold statistics
h gprs memory threshold statistics
----------- Slot 8/CPU 3, show gprs memory threshold statistics -------------

     Memory Threshold Statistics
     ===================================================
     GGSN memory threshold status : NOT IN THRESHOLD

     Number of times reached :        0
     Number of PDPs rejected :        0
     Number of PDPs dropped due to
             duration limit :        0
             volume limit :          0
             update request :        0
             service record :        0

     Time when last memory threshold was reached : NEVER

----------- Slot 8/CPU 4, show gprs memory threshold statistics -------------

     Memory Threshold Statistics
     ===================================================
     GGSN memory threshold status : NOT IN THRESHOLD

     Number of times reached :        0
     Number of PDPs rejected :        0
     Number of PDPs dropped due to
             duration limit :        0
             volume limit :          0
             update request :        0
             service record :        0

     Time when last memory threshold was reached : NEVER

----------- Slot 8/CPU 5, show gprs memory threshold statistics -------------

     Memory Threshold Statistics
     ===================================================
     GGSN memory threshold status : NOT IN THRESHOLD

     Number of times reached :        0
     Number of PDPs rejected :        0
     Number of PDPs dropped due to
             duration limit :        0
             volume limit :          0
             update request :        0
             service record :        0

     Time when last memory threshold was reached : NEVER

----------- Slot 8/CPU 6, show gprs memory threshold statistics -------------

     Memory Threshold Statistics
     ===================================================
     GGSN memory threshold status : NOT IN THRESHOLD

     Number of times reached :        0
     Number of PDPs rejected :        0
     Number of PDPs dropped due to
             duration limit :        0
             volume limit :          0
             update request :        0
```

```
                service record :        0

    Time when last memory threshold was reached : NEVER

----------- Slot 8/CPU 7, show gprs memory threshold statistics -------------

    Memory Threshold Statistics
    ==================================================
    GGSN memory threshold status : NOT IN THRESHOLD

    Number of times reached :        0
    Number of PDPs rejected :        0
    Number of PDPs dropped due to
            duration limit :        0
            volume limit :          0
            update request :        0
            service record :        0

    Time when last memory threshold was reached : NEVER

----------- Slot 8/CPU 8, show gprs memory threshold statistics -------------

    Memory Threshold Statistics
    ==================================================
    GGSN memory threshold status : NOT IN THRESHOLD

    Number of times reached :        0
    Number of PDPs rejected :        0
    Number of PDPs dropped due to
            duration limit :        0
            volume limit :          0
            update request :        0
            service record :        0

    Time when last memory threshold was reached : NEVER
```

Table 31 describes the fields shown in the display.

Table 31   show gprs memory threshold statistics Field Descriptions

Field	Description
GGSN memory threshold status	Current status of the GGSN memory threshold. Possible values are "in threshold" and "not in threshold."
Number of times reached	Number of times the GGSN memory threshold is reached since last startup.
Number of PDPs rejected	Number of Create PDP Contexts rejected because the GGSN exceeded its memory threshold.
Number of PDPs dropped due to: duration limit	Number of existing PDP contexts dropped while in memory threshold because of the generation of a CDR with the duration limt trigger configured by using the **limit duration** charging profile configuration command.
Number of PDPs dropped due to: volume limit	Number of existing PDP contexts dropped while in memory threshold because of the generation of a CDR with the volume limit trigger configured by using the **limit volume** charging profile configuration command.

Table 31 **show gprs memory threshold statistics Field Descriptions**

Field	Description
Number of PDPs dropped due to: update request	Number of existing PDP contexts dropped while in memory threshold because of a PDP context update message.
Time when the last memory threshold was reached	Last time the GGSN memory threshold was exceeded.

show gprs ms-address exclude-range

To display the IP address range(s) configured on the gateway GPRS support node (GGSN) for the GPRS/UMTS network, use the **show gprs ms-address exclude-range** command in privileged EXEC mode.

show gprs ms-address exclude-range

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values.

Command Modes Privileged EXEC

Command History

Release	Modification
12.2(4)MX	This command was introduced.
12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD.
12.2(8)YW	This command was integrated into Cisco IOS Release 12.2(8)YW
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines Use the **show gprs ms-address exclude-range** command to display the IP address range(s) configured on the GGSN for the GPRS network.

IP addresses are 32-bit values.

Examples   The following is sample output of the **show gprs ms-address exclude-range** command:

```
router# show gprs ms-address exclude-range
Start IP        End IP
10.0.0.1        10.10.10.10
```

Table 32 describes the fields shown in the display.

Table 32   *show gprs ms-address exclude-range Field Descriptions*

Field	Description
Start IP	IP address at the beginning of the range.
End IP	IP address at the end of the range.

Related Commands

Command	Description
gprs ms-address exclude-range	Specifies the IP address range(s) used by the GPRS network and thereby excluded from the mobile station (MS) IP address range.

show gprs pcscf

To display a summary of the P-CSCF server group(s) configured on the GGSN for P-CSCF Discovery, use the **show gprs pcscf** command in privileged EXEC mode.

show gprs pcscf

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(2)XB	This command was introduced.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG and the command is modified to display IPv6 servers that are a part of a P-CSCF server group.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs pcscf** command to display a summary of the P-CSCF server group(s) configured on the GGSN.

Examples   The following example shows the output for the **show gprs pcscf** command:

```
router#show gprs pcscf
P-CSCF Group name:groupA
List of IP addresses in the group:
172.76.82.77
192.3.3.3

P-CSCF Group name:groupB
List of IP addresses in the group:
172.76.82.77
192.4.4.4
```

```
P-CSCF Group name:groupC
List of IP addresses in the group:
2001:999::9
```

Related Commands

Command	Description
gprs pcscf	Configures a P-CSCF server group on the GGSN and enters P-CSCF group configuration mode.
pcscf	Assigns a P-CSCF server group to an APN.
server	Specifies the IP address of a P-CSCF server you want to include in the P-CSCF server group.
show gprs access-point	Displays information about access points on the GGSN.

show gprs plmn

To display the mobile country code (MCC) and mobile network code (MNC) of the home and trusted PLMNs, use the **show gprs plmn** command in privileged EXEC mode.

> **show gprs plmn**

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values.

Command Modes Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines Use the **show gprs plmn** command to display the configured MCCs and MNCs of the home and trusted PLMNs.

Examples   The following is sample output of the **show gprs plmn ip address** command:

```
router# show gprs plmn
Home PLMN
  MCC = 302  MNC = 678
Trusted PLMN
  MCC = 346  MNC = 123
  MCC = 234  MNC = 67
  MCC = 123  MNC = 45
  MCC = 100  MNC = 35
```

Related Commands

Command	Description
gprs mcc mnc	Configure MCC and MNC that the GGSN uses to determine if a Create PDP Context request is from a roamer.

show gprs plmn ip address

To display the IP address range(s) configured for a PLMN, use the **show gprs plmn ip address** command in privileged EXEC mode.

show gprs plmn ip address

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.2(8)YW	This command was introduced.
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs plmn ip address** command to display the IP address range(s) configured for a PLMN.

IP addresses are 32-bit values.

Examples   The following is sample output of the **show gprs plmn ip address** command:

```
router# show gprs plmn ip address
PLMN Start IP    End IP            Range Type
9.9.9.9          9.9.9.9
10.2.25.1        10.2.25.255
16.0.0.9         16.0.0.9
99.100.0.1       99.100.0.255
101.0.1.1        101.0.1.1        sgsn
105.0.1.1        105.0.1.1        sgsn
106.0.1.1        106.0.1.1        sgsn
110.12.0.2       110.12.0.2
110.13.0.2       110.13.0.2
```

Table 32 describes the fields shown in the display.

Table 33   *show gprs plmn ip address Field Descriptions*

Field	Description
PLMN Start IP	IP address at the beginning of the range.
End IP	IP address at the end of the range.

Related Commands

Command	Description
gprs plmn ip address	Specifies the PLMN IP address range(s) used by the GGSN.

show gprs prepaid quota sanity

To display sanity statistics of the GPRS quota grant parameters, use the **show gprs prepaid quota sanity** command in privileged EXEC mode.

show gprs prepaid quota sanity

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs qos status** command to display the sanity statistics for the GPRS quota parameters.

Examples   The following example shows output from the **show gprs prepaid quota sanity** command:

```
ggsn# show gprs prepaid quota sanity
GPRS quota parameters sanity statistics:
  Last cleared: never

  Quota threshold limit is 80 percent of received grant
  Volume quota threshold too high:      0
  Time quota threshold too high:        0
ggsn#
```

Related CommandsE

Command	Description
clear gprs prepaid quota sanity	Clears sanity statistics of the GPRS quota grant parameters.
clear gprs prepaid statistics	Clears GGSN quota-manager statistics.

Command	Description
gprs prepaid quota threshold	Sets the internal maximum threshold, as a percentage, of the quota grant received from the DCCA server on the threshold received.
gprs prepaid stand-alone	Configures the GGSN to perform prepaid quota enforcement in standalone mode.
show gprs prepaid statistics	Displays GGSN quota-manager statistics.

show gprs prepaid statistics

To display GGSN quota-manager statistics, use the **show gprs prepaid statistics** command in privileged EXEC mode.

show gprs prepaid statistics

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs qos statistics** command to display the prepaid quota statistics.

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

```
ggsn# show gprs prepaid statistics
GGSN quota-manager statistics:
Last cleared: 00:07:29

stand alone prepaid feature: ENABLED
Service Auth Req: 0
Service Reauth Req: 0
Service (Re)auth Resp: 0
Quota Return: 0
Quota Return Req: 0
Quota Return Accept: 0
Service Stop: 0
Service Stop Req: 0
Quota Push: 0
Quota Push resp: 0
ggsn#
```

Related CommandsE	Command	Description
	clear gprs prepaid quota sanity	Clears sanity statistics of the GPRS quota grant parameters.
	clear gprs prepaid statistics	Clears GGSN quota-manager statistics.
	gprs prepaid quota threshold	Sets the internal maximum threshold, as a percentage, of the quota grant received from the DCCA server on the threshold received.
	gprs prepaid stand-alone	Configures the GGSN to perform prepaid quota enforcement in standalone mode.
	show gprs prepaid quota sanity	Displays sanity statistics of the GPRS quota grant parameters.

show gprs qos status

To display the number of PDP contexts currently active on the gateway GPRS support node (GGSN) for a particular QoS class, use the **show gprs qos status** command in privileged EXEC mode.

> **show gprs qos status**

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.2(8)YW	This command was introduced.
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs qos status** command to display the number of PDP contexts currently active on the GGSN for a particular QoS class.

Examples

Example 1

The following example shows output from the **show gprs qos status** command for UMTS QoS:

```
router# show gprs qos status
GPRS QoS Status:
  type:UMTS
  conversational_pdp     100    streaming_pdp     150
  interactive_pdp        1345   background_pdp    2000
```

Table 34 describes the fields shown in the display.

Table 34   show gprs qos status Field Descriptions

Field	Description
type	Type of QoS. Possible QoS types are: • UMTS—Configured by using the **gprs qos map umts** command. • None—No QoS is configured on the GGSN.
conversational_pdp	Current number of PDP contexts that have a conversational UMTS QoS traffic class.
streaming_pdp	Current number of PDP contexts that have a streaming UMTS QoS traffic class.
interactive_pdp	Current number of PDP contexts that have a interactive UMTS QoS traffic class.
background_pdp	Current number of PDP contexts that have a background UMTS QoS traffic class.

Example 2

The following example shows output from the **show gprs qos status** command when no QoS is configured on the GGSN:

```
router# show gprs qos status
GPRS QoS Status:
type:None
```

Related Commands

Command	Description
gprs qos map umts	Enables UMTS QoS on the GGSN.

show gprs redundancy

To display statistics related to GTP-SR, use the **show gprs redundancy** command in privileged EXEC mode.

show gprs redundancy [**statistics** | **queues**]

Syntax Description	statistics	Displays GTP-SR statistics.

Defaults　　　　　No default behavior or values.

Command Modes　　Privileged EXEC

Command History

Release	Modification
12.3(11)YJ	This command was introduced.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines　　Use the **show gprs redundancy** command to display GTP-SR related event queues and/or statistics.

Examples　　The following example shows the output for the **show gprs redundancy statistics** command:

```
router#show gprs redundancy statistics

tb10-7600-5-2#show  gprs redundancy statistics
GPRS Redundancy Statistics
  Last cleared:never

  CheckPointed-From-Active Statistics
    Total Number of Messages:            9
```

```
          Number of Context Setup messages:       0
          Number of Context Modify messages:      0
          Number of Context Remove messages:      0
          Number of Path Setup messages:          0
          Number of Path Modify messages:         0
          Number of Path Remove messages:         0
          Number of CGF Ready messages:           1
          Number of CGF Modify messages:          0
          Number of CGF Remove messages:          0
          Number of Internal State messages:      8
```

The following example shows the output for the **show gprs redundancy** command:

```
GGSN#show gprs redundancy
GPRS redundancy is enabled and Unit-Status is Standby

Redundancy Transport Infrastructure status
  Redundancy Infrastructure state:              STANDBY HOT
  Peer Redundancy Infrastructure state:         ACTIVE

  GGSN Redundancy system up since:              00:01:16 UTC Mar 1 2002
  Time of last switchover:                      never
  Total Number of Switchovers:                  0

GPRS Redundancy Statistics
  Last cleared:never

  CheckPointed-From-Active Statistics

    Total Number of Messages:                   9
      Number of Context Setup messages:         0
      Number of Context Modify messages:        0
      Number of Context Remove messages:        0
      Number of Path Setup messages:            0
      Number of Path Modify messages:           0
      Number of Path Remove messages:           0
      Number of CGF Ready messages:             1
      Number of CGF Modify messages:            0
      Number of CGF Remove messages:            0
      Number of Internal State messages:        8
```

Table 35 describes the fields shown in the display.

Table 35   show gprs redundancy Field Descriptions

Field	Description
Redundancy Transport Infrastructure state	Current state of the local redundancy infrastructure.
Peer Redundancy Infrastructure state	Current state of the redundancy infrastructure on the peer GGSN. Possible values are ACTIVE or STANDBY.
GGSN Redundancy system up since	Time at which the GTP-SR system was established.
Time of last switchover	Time the last switchover occurred.
Total Number of Switchovers	Total number of times a switchover has occurred since GTP-SR system is up.
Last cleared	Time GTP-SR statistics were last cleared.
Total number of Messages	Total number of GTP-SR related messages received.
Number of Context Setup messages	Number of Create PDP Context messages received.

Table 35 *show gprs redundancy Field Descriptions (continued)*

Field	Description
Number of Context Modify messages	Number of modify PDP context messages received.
Number of Context Remove messages	Number of delete PDP context messages received.
Number of Path Setup messages	Number of SGSN-to-GGSN path setup messages received.
Number of Path Modify messages	Number of SGSN-to-GGSN path modify messages received.
Number of Path Remove messages	Number of SGSN-to-GGSN path deletion messages received.
Number of CGF Ready messages	Number of GGSN-to-charging gateway functionality ready messages received.
Number of CGF Modify messages	Number of GGSN-to-charging gateway path change messages received.
Number of CGF Remove messages	Number of GGSN-to-charging gateway path deletion messages received.
Number of Internal State messages	Number of internal state messages.

Related Commands

Command	Description
clear gprs redundancy statistics	Clears statistics related to GTP-SR.
gprs redundancy	Enables GTP-SR on a GGSN.
gprs redundancy charging sync-window cdr rec-seqnum	Configures the window size used to determine when the CDR record sequence number must be synchronized to the standby GGSN.
gprs redundancy charging sync-window gtpp seqnum	Configures the window size used to determine when the GTP' sequence number must be synchronized to the standby GGSN.

show gprs service-aware statistics

To view statistics related to the service-aware features of the gateway GPRS support node (GGSN), such as packets sent to, and received from, the Diameter server or CSG, use the **show gprs service-aware statistics** command in privileged EXEC mode:

show gprs service-aware statistics

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.3(14)YQ	This command was introduced.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs service-aware statistics** command to display the statistics related to service-aware features for the GGSN.

The counter values displayed by this command represent totals accumulated since the last time the statistical counters were cleared using the **clear gprs service-aware statistics** command.

Examples   The following is sample output of the **show gprs service-aware statistics** command:

```
router#show gprs service-aware statistics
GGSN service-aware statistics:
  num service aware apn 1
  total_ggsn_event            4          total_ggsn_failure         0
  total_csg_event             23999      total_csg_failure          0
  total_dcca_event            23996      total_dcca_failure         5
  total_category_created      23996      total_category_deleted     4
  total_sync_object_created   6000       total_sync_object_deleted  6000
  category_fsm_return_error   0          total_quota_push_ack       23995
  total_service_auth          0          total_service_reauth       0
  total_service_stop          4          total_quota_return         0
  total_quota_granted         23995      total_terminate_category   0
  total_blacklisted_category 1           total_unknown_category     0
  total_RAR_event             0          total_rating_change        0
  total_delete_pdp            0          total_convert_to_postpaid  0
  report_final_convert_to_postpaid 0     total_send_dummy_quota     0
  category_wait_csg_timeout   0          sync_timeout_ser_stop      1
  sync_timeout_qr             0          sync_timeout_other         0

GGSN service-aware pdp session statistics:
  total_prepaid_users         5994       total_postpaid_users          10
  reject_due_to_dcca_failure 0           reject_due_to_csg_failure     0
  reject_due_to_other_reason 0
```

Table 36 describes the fields shown in the display.

Table 36   *show gprs service-aware statistics Field Descriptions*

Field	Description
num service aware apn	Number of APNS that are service-aware (i.e., for which credit-control will be performed using a Diameter server).
total_ggsn_event	Number of PDP-level events received, such as GTP update event or sending an accounting-stop message.
total_ggsn_failure	Number of internal failures associated with creating, accessing, or manipulating various category-related dtat structures.
total_csg_event	Number of CSG-related events received by various categories, such as Quota Push Ack, Service-Auth, or Service-Reauth.
total_csg_failure	Number of CSG-related errors received, such as GTP' NACK.
total_dcca_event	Number of DCCA-server related events received by various categories, such as Quota Grants, Blacklists, or Authorization Denied.
total_dcca_failure	Number of times the DCCA server has not responded during a specified time period.
total_category_created	Number of categories created across all PDP contexts.
total_category_deleted	Number of categories deleted across all PDP contexts.
total_sync_object_created	Number of sync objects created, to which to send multiple messages associated with an event.
total_sync_object_deleted	Number of sync objects deleted. A sync object is required when a DCCA procdure such as Quota-Push must be performed for multiple categories in a single CCR/CCA.

Table 36   show gprs service-aware statistics Field Descriptions (continued)

Field	Description
category_fsm_return_error	Number of internal erros while executing the category state machine.
total_quota_push_ack	Number of Quota Push acknowledgements received from the CSG.
total_service_auth	Number of Service-Auth requests received from the CSG.
total_service_reauth	Number of Service-Reauth requests received from the CSG.
total_service_stop	Number of Service-Stop responses received from the CSG.
total_quota_return	Number of Quota-Return messages received from the CSG.
total_quota_granted	Number of times quota is granted by the DCCA server for various categories.
total_terminate_category	Number of times the DCCA server has terminated the service because authorization was denied or the user's credit was exhausted.
total_blacklisted_category	Number of times the DCCA server blacklisted a category.
total_unknown_category	Number of times the DCCA server has responded with a DIAMETER_RATING_FAILED message.
total_RAR_event	Number of times an update PDP context request is received by category.
total_rating_change	Number of times an update PDP context event is received by category.
total_delete_pdp	Not currently used.
total_convert_to_postpaid	Number of times a CC session is converted to postpaid session because of an unresponsive DCCA server.
report_final_convert_to_postpaid	Number of times a session was converted to a postpaid session because of an invalid answer from the DCCA server.
total_send_dummy_quota	Number of times dummy quota is granted because of a slow DCCA server (for example, a server that didn't respond in the required Tx time interval).
category_wait_csg_timeout	Number of times a category timeout occurred on service stop.
sync_timeout_ser_stop	Sync_object timeout on service stop.
sync_timeout_qr	Sync_object timeout on quota return.
sync_timeout_other	Sync_object timeout on other reasons.
total_prepaid_users	Number of service-aware users treated as pre-paid users.
total_postpaid_users	Number of service-aware users treated as post-paid users.
reject_due_to_dcca_failure	Number of times a PDP context is rejected because of a failure to communicate with a DCCA server.
reject_due_to_csg_failure	Number of times a PDP context is rejected because of a failure to communicate with a CSG server.
reject_due_to_other_reason	Number of times a PDP contect is rejected for other reasons.

Related Commands

Command	Description
clear gprs service-aware statistics	Displays information about access points on the GGSN.

show gprs slb detail

To display all Cisco IOS SLB-related information, such as operation mode, virtual server addresses, SLB notifications, and statistics, use the **show gprs slb detail** command in privileged EXEC mode.

> **show gprs slb detail**

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU and the Subscriber exit field was added to the output.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB and the following fields were removed from the display: • SLB Notifications sent – CAC failure – Subscriber ext The following fields were added to the SLB Statistics section of the display: • CAC-failure notifications sent • Session-deletion notifications sent • PDP status notifications sent • PDP status negative response sent • PDP status requests received
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.

Release	Modification
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs slb detail** command to display to all Cisco IOS SLB-related information, including statistics associated with GTP SLB sticky database support.

Examples   The following example shows the output for the **show gprs slb detail** command:

```
router#show gprs slb detail
SLB Operation Mode:dispatched
SLB vservers:
  10.10.195.1
SLB Statistics:
  CAC-failure notifications sent:         0
  Session-deletion notifications sent:    0
  PDP status notifications sent:          0
  PDP status negative response sent:      0
  PDP status requests received:           0
router#
```

Table 37 describes the fields shown in the display.

Table 37   show gprs slb detail Field Descriptions

Field	Description
CAC-failure notifications sent	Number of times the GGSN has notified the Cisco IOS SLB that a Call Admission Control (CAC) or canonical QoS failure has occurred.
PPP status negative response sent	Number of responses sent to the IOS SLB after the sticky object idle timer has expired that indicate that the PDP context associated with the sticky object has ended.
PPP status notifications sent	Number of status notifications sent to the IOS SLB after the idle timer on associated sticky object has expired that indicate whether a PDP context is active or has ended.
PPP status requests received	Number of IOS SLB requests received by the GGSN.
Session-deletion notifications sent	Number of times the GGSN has notified the Cisco IOS SLB that the last PDP context associated with an IMSI is deleted.
SLB Operation Mode:	Mode of operation in which the Cisco IOS SLB is functioning. Possible values are dispatched and directed.
SLB vservers	IP addresses of the virtual servers to be notified by the GGSN when the specific type of condition defined using the **gprs slb notify** command occurs.

Related Commands

Command	Description
clear gprs slb statistics	Clears Cisco IOS SLB statistics.
gprs slb mode	Defines the Cisco IOS SLB operation mode.
gprs slb notify	Enables the GGSN to notify the Cisco IOS SLB when a specific type of condition occurs.
gprs slb vserver	Configures the Cisco IOS SLB virtual servers to be notified by the GGSN when the specific type of condition defined using the **gprs slb notify** command occurs.
show gprs slb mode	Displays the Cisco IOS SLB mode of operation.
show gprs slb statistics	Displays Cisco IOS SLB statistics.
show gprs slb vservers	Displays the list of defined Cisco IOS SLB virtual servers.

show gprs slb mode

To display the Cisco IOS SLB mode of operation defined on the gateway GPRS support node (GGSN), use the **show gprs slb mode** command in privileged EXEC mode.

show gprs slb mode

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs slb mode** command to display the Cisco IOS SLB operation mode defined on the GGSN.

Examples   The following example shows that the Cisco IOS SLB operation mode is defi ned as dispatch mode:

```
router#show gprs slb mode
SLB Operation Mode:dispatched
```

Related Commands

Command	Description
clear gprs slb statistics	Clears Cisco IOS SLB statistics.
gprs slb mode	Defines the Cisco IOS SLB operation mode.
gprs slb notify	Enables the GGSN to provide feedback to the Cisco IOS SLB when a specific condition occurs.
gprs slb vserver	Configures the Cisco IOS SLB virtual servers to be notified by the GGSN when the specific type of condition defined by the **gprs slb notify** command occurs.
show gprs slb detail	Displays Cisco IOS SLB related information, such as the operation mode, virtual servers addresses, and statistics.
show gprs slb statistics	Displays Cisco IOS SLB statistics.
show gprs slb vservers	Displays the list of defined Cisco IOS SLB virtual servers.

show gprs slb statistics

To display Cisco IOS SLB statistics, use the **show gprs slb mode** command in privileged EXEC mode.

show gprs slb statistics

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into the Cisco IOS Release 12.3(14)YU and the Subscriber exit field was added to the output.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB and the following fields were removed from the display: • SLB Notifications sent – CAC failure – Subscriber exit The following fields were added to the SLB Statistics section of the display: • CAC-failure notifications sent • Session-deletion notifications sent • PDP status notifications sent • PDP status negative response sent • PDP status requests received
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs slb statistics** command to display IOS SLB statistics, including statistics associated with GTP SLB sticky database support.

Examples   The following example displays IOS SLB-related statistics on the GGSN:

```
router#show gprs slb statistics
SLB Statistics:
    CAC-failure notifications sent:          0
    Session-deletion notifications sent:     0
    PDP status notifications sent:           0
    PDP status negative response sent:       0
    PDP status requests received:            0
```

Table 37 describes the fields shown in the display.

Table 38   show gprs slb statistics Field Descriptions

Field	Description
CAC-failure notifications sent	Number of times the GGSN has notified the Cisco IOS SLB that a Call Admission Control (CAC) or canonical QoS failure has occurred.
PPP status negative response sent	Number of responses sent to the IOS SLB after the sticky object idle timer has expired that indicate that the PDP context associated with the sticky object has ended.
PPP status notifications sent	Number of status notifications sent to the IOS SLB after the idle timer on associated sticky object has expired that indicate whether a PDP context is active or has ended.
PPP status requests received	Number of IOS SLB requests received by the GGSN.
Session-deletion notifications sent	Number of times the GGSN has notified the IOS SLB that the last PDP context associated with an IMSI is deleted.

Related Commands

Command	Description
clear gprs slb statistics	Clears Cisco IOS SLB statistics.
gprs slb mode	Defines the Cisco IOS SLB operation mode.
gprs slb notify	Enables the GGSN to notify the Cisco IOS SLB when a specific type of condition occurs.
gprs slb vserver	Configures the Cisco IOS SLB virtual servers to be notified by the GGSN when the specific type of condition defined using the **gprs slb notify** command occurs.
show gprs slb detail	Displays Cisco IOS SLB related information, such as the operation mode, virtual servers addresses, and statistics.
show gprs slb mode	Displays the Cisco IOS SLB mode of operation defined on the GGSN.
show gprs slb vservers	Displays the list of defined Cisco IOS SLB virtual servers.

show gprs slb vservers

To display a list of Cisco IOS SLB virtual servers to be notified by the gateway GPRS support node (GGSN) when the specific type of condition defined using the **gprs slb notify** command occurs, use the **show gprs slb vservers** command in privileged EXEC mode.

show gprs slb vservers

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs slb vservers** command to display a list of Cisco IOS SLB virtual servers to use for GGSN-SLB messaging.

Examples   The following example shows a list of virtual servers that were defined using the **gprs slb vservers global** configuration command:

```
router#show gprs slb vservers
SLB vservers:
10.10.10.10
11.11.11.11
```

Related Commands	**Command**	**Description**
	clear gprs slb statistics	Clears Cisco IOS SLB statistics.
	gprs slb mode	Defines the Cisco IOS SLB operation mode.
	gprs slb notify	Enables the GGSN to notify the Cisco IOS SLB when a specific type of condition occurs.
	gprs slb vserver	Configures the Cisco IOS SLB virtual servers to be notified by the GGSN when the specific type of condition defined by the **gprs slb notify** command occurs.
	show gprs slb detail	Displays Cisco IOS SLB related information, such as the operation mode, virtual servers addresses, and statistics.
	show gprs slb mode	Displays the Cisco IOS SLB mode of operation defined on the GGSN.
	show gprs slb statistics	Displays Cisco IOS SLB statistics.

show gprs service-mode

To display the current service mode of the gateway GPRS support node (GGSN) and the last time the service mode was changed, issue the **show gprs service-mode** command in privileged EXEC mode.

show gprs service-mode

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs service-mode** command to display the current service mode of a GGSN and the last time the service mode was changed.

Examples

Example 1

The following example shows output from the **show gprs service-mode** command when no service-mode change has occurred:

```
router# show gprs service-mode
Service mode:operational
GGSN#
```

Example 2

The following example shows output from the **show gprs service-mode** command when a service-mode change has occurred:

```
router# show gprs service-mode
Service mode:maintenance last change at: 23:49:21 UTC Mon January 20, 2004
GGSN#
```

Related Commands

Command	Description
gprs charging service-mode	Configures the service-mode state of a GGSN's charging functions.
gprs service-mode	Configures the service-mode state of a GGSN.
service-mode	Configures the service-mode state of an APN.

show gprs throughput

To display the latest throughput statistics, use the **show gprs throughput** command in privileged EXEC mode.

show gprs throughput

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs throughput** command to display the latest throughput statistics.

Examples   The following example displays the latest statistics:

```
Router#show gprs throughput
```

Related Commands

Command	Description
gprs throughput history	Configures the number of history items to be maintained for the throughput statistics collected.
gprs throughput intervals	Configures the intervals at which throughput statistics are collected for APNs.
show gprs throughput history	Displays a history of throughput statistics.

show gprs throughput history

To display a history of throughput statistics, use the **show gprs throughput history** command in privileged EXEC mode.

show gprs throughput history [**interval-one** | **interval-two**] *number*

Syntax Description		
	interval-one	Displays statistics for interval one.
	interval-two	Displays statistics for interval two.
	number	Number of lines of history to display. Valid value is a number between 1 and 100.

Defaults   All available throughput history data.

Command Modes   Global configuration

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs throughput history** command to display a history of throughput statistics.

Examples   The following example displays all available throughput statistics history for both intervals:

```
Router#show gprs throughput history

                        Throughput history for interval-one
Collection End Time   Intvl   U/S Octets       D/S Octets   U/S Pkts   D/S Pkts
-------------------   -----   --------------   --------------   ----------   ----------
Nov 28 2008 17:42:44    2            0                0            0            0
Nov 28 2008 17:40:44    2            0                0            0            0
Nov 28 2008 17:38:44    2            0                0            0            0
Nov 28 2008 17:36:44    2            0                0            0            0
Nov 28 2008 17:34:44    2            0                0            0            0
Nov 28 2008 17:32:08    2            0                0            0            0
Nov 28 2008 17:30:08    2            0                0            0            0
Nov 28 2008 17:28:08    2            0                0            0            0
```

```
Throughput history for interval-two
Collection End Time  Intvl  U/S Octets       D/S Octets      U/S Pkts    D/S Pkts
-------------------- ----- --------------- --------------- ---------- ----------
Nov 28 2008 17:36:44    5               0               0          0          0
Nov 28 2008 17:31:44    5               0               0          0          0
Router#
```

The following example displays three lines of throughput stastics history for interval-one:

```
Router#show gprs throughput history interval-one 3

                        Throughput history for interval-one
Collection End Time  Intvl   U/S Octets       D/S Octets   U/S Pkts   D/S Pkts
-------------------  -----  ---------------  ---------------  ----------  ----------
Nov 28 2008 17:42:44   2          0                0            0          0
Nov 28 2008 17:40:44   2          0                0            0          0
Nov 28 2008 17:38:44   2          0                0            0          0
Router#
```

Related Commands

Command	Description
gprs throughput history	Configures the number of history items to be maintained for the throughput statistics collected.
gprs throughput intervals	Configures the intervals at which throughput statistics are collected for APNs.
show gprs throughput	Displays the latest throughput statistics.

show gprs umts-qos map traffic-class

To display UMTS QoS mapping information, use the **show gprs umts-qos map traffic-class** command in privileged EXEC mode.

> **show gprs umts-qos map traffic-class** {**all** | **signalling** | **conversational** | **streaming** | **interactive** | **background**}

Syntax Description

all	Displays information for all UMTS QoS traffic classes.
signalling	Displays information for the UMTS QoS traffic class signalling.
conversational	Displays information for the UMTS QoS traffic class conversational.
streaming	Displays information for the UMTS QoS traffic class streaming.
interactive	Displays information for the UMTS QoS traffic class interactive.
background	Displays information for the UMTS QoS traffic class background.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.2(8)YW	This command was introduced.
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs umts-qos map traffic-class** command to display information about UMTS QoS mapping.

Examples   The following example shows output from the **show gprs umts-qos map traffic-class** command for all UMTS QoS traffic classes:

```
router# show gprs umts-qos map traffic-class all
Traffic Class      Diffserv PHB Group      Diffserv Code Point

signaling          Signaling Class         40

conversational     EF Class                46

streaming          AF2 Class               18,20,22

interactive        AF3 Class               26,28,30

background         Best Effort             0
```

Table 39 describes the fields shown in the display.

Table 39   show gprs umts-qos map traffic-class Field Descriptions

Field	Description
Traffic Class	Type of UMTS QoS traffic class as specified in the **gprs umts-qos map traffic-class** command. The UMTS QoS traffic classes are: • signaling • conversational • streaming • interactive • background
Diffserv PHB Group	Type of DiffServ PHB group as specified in the **gprs umts-qos map diffserv-phb** command. Possible DiffServ PHB groups are: • signalling-class • ef-class • af1-class • af2-class • af3-class • af4-class • best-effort
Diffserv Code Point	Number of DSCPs as specified in the **gprs umts-qos map diffserv-phb** command.

Related Commands	Command	Description
	gprs umts-qos map traffic-class	Specifies a QoS mapping from the UMTS traffic classes to a differentiated services (DiffServ) per-hop behavior (PHB) group
	gprs umts-qos map diffserv-phb	Assigns a differentiated services code point (DSCP) to a DiffServ PHB group.

show gprs umts-qos police pdp-context tid

To display policing statistics for a PDP context, use the **show gprs umts-qos police pdp tid** command in privileged EXEC mode.

> **show gprs umts-qos police pdp-context tid** *tid*

Syntax Description

tid	Specifies the tunnel ID for which you want to display policing statistics.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines

Use the **show gprs umts-qos police pdp-context tid** command to display policing information for a PDP context.

Examples The following example shows output from the **show gprs umts-qos police pdp-context tid** command for a PDP context:

```
router#sh gprs umts-qos police pdp-context tid 1203000000000010
DOWNLINK POLICING STATISTICS
Flow id:1
     police:
         rate 5184000 , bc 1500 bytes
        peak-rate 7424000, be 1800 bytes
       conformed 2 packets, 200 bytes; actions:
         set-dscp-transmit 15
       exceeded 0 packets, 0 bytes; actions:
         set-dscp-transmit 15
       violated 0 packets, 0 bytes; actions:
         drop

   Flow id:Identifier used in communication with IOS QoS regarding a
           particular flow.

   rate :Average rate in bits per second.

   bc :Normal burst size in bytes

   peak-rate :peak rate in bits per second

   be :Excess burst size in bytes.
```

Related Commands

Command	Description
police rate	Configures traffic policing using the police rate.
service-policy	Attaches a service policy to an APN to use as the service policy for PDP flows of that APN.

show gprs umts-qos profile pdp tid

To display requested and negotiated QoS information for a PDP context, use the **show gprs umts-qos profile pdp tid** command in privileged EXEC mode.

> **show gprs umts-qos profile pdp tid** *tid*

Syntax Description	*tid*	Specifies the tunnel ID for which you want to display policing statistics.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show gprs umts-qos profile pdp tid** command to display requested and negotiated QoS information for a PDP context.

Examples   The following example shows output from the **show gprs umts-qos profile pdp tid** command for R97/R98 QoS:

```
show gprs umts-qos profile pdp tid 1203000000000010
Requested QoS Profile            Negotiated QoS Profile
=================                =================
Delay Class:2                    Delay Class:2
```

```
Reliability:1                        Reliability:1
Peak :1                   Peak :1
Precedence:1                         Precedence:1
Mean :1                   Mean Throughput:1
```

The following example shows output from the **show gprs umts-qos profile pdp tid** command for R99 QoS:

```
Requested QoS Profile            Negotiated QoS Profile
================            ==================
Allocation/Retention:1           Allocaion/Retention:1
Delay Class:2                    Delay Class:2
Reliability:1                    Reliability:1
Peak :1                   Peak :1
Precedence:1                     Precedence:1
Mean :1                   Mean Throughput:1
Traffic Class:conversational     Traffic Class:conversational
Delivery Order:2                 Delivery Order:2
Delivery of Err:2                Delivery of Err:2
Max SDU Size(bytes):1520         Max SDU Size(bytes):1520
MBR for Uplink(kbps):20          MBR for Uplink(kbps):20
MBR for Downlink(kbps):20        MBR for Downlink(kbps):20
Residual BER:1                   Residual BER:1
SDU Error Ratio:1*10^-2          SDU Error Ratio:1*10^-2
Transfer Delay(ms):10            Transfer Delay(ms):10
Handling Priority:1              Handling Priority:1
GBR for Uplink(kbps):10          GBR for Uplink(kbps):10
GBR for Downlink(kbps):5         GBR for Downlink(kbps):5
Source Statistics Des:Speech     Source Statistics Des:Speech
```

show ip iscsi name

To display the name of an iSCSI initiator, use the **show ip iscsi name** command in privileged EXEC mode.

> **show ip iscsi name**

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.4(15)XQ	This command was introduced.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines

Use the **show ip iscsi name** command to display the name of an iSCSI initiator.

Examples

The following example shows output from the **show ip iscsi session** command:

```
Router#show ip iscsi name
sh ip iscsi name
----------- Slot 6/CPU 3, show ip iscsi name ------------

iSCSI initiator name: iqn.1987-07.com.cisco:mwtbg23-sup-06-33
iSCSI initiator port names:
 iqn.1987-07.com.cisco:mwtbg23-sup-06-33:EMC-ISCSI-A1
 iqn.1987-07.com.cisco:mwtbg23-sup-06-33:UNIX
----------- Slot 6/CPU 4, show ip iscsi name ------------

iSCSI initiator name: iqn.1987-07.com.cisco:mwtbg23-sup-06-34
iSCSI initiator port names:
 iqn.1987-07.com.cisco:mwtbg23-sup-06-34:EMC-ISCSI-A1
 iqn.1987-07.com.cisco:mwtbg23-sup-06-34:UNIX
----------- Slot 6/CPU 5, show ip iscsi name ------------
```

```
iSCSI initiator name: iqn.1987-07.com.cisco:mwtbg23-sup-06-35
iSCSI initiator port names:
 iqn.1987-07.com.cisco:mwtbg23-sup-06-35:EMC-ISCSI-A1
 iqn.1987-07.com.cisco:mwtbg23-sup-06-35:UNIX
----------- Slot 6/CPU 6, show ip iscsi name -------------

iSCSI initiator name: iqn.1987-07.com.cisco:mwtbg23-sup-06-36
iSCSI initiator port names:
 iqn.1987-07.com.cisco:mwtbg23-sup-06-36:EMC-ISCSI-A1
 iqn.1987-07.com.cisco:mwtbg23-sup-06-36:UNIX
----------- Slot 6/CPU 7, show ip iscsi name -------------

iSCSI initiator name: iqn.1987-07.com.cisco:mwtbg23-sup-06-37
iSCSI initiator port names:
 iqn.1987-07.com.cisco:mwtbg23-sup-06-37:EMC-ISCSI-A1
 iqn.1987-07.com.cisco:mwtbg23-sup-06-37:UNIX
----------- Slot 6/CPU 8, show ip iscsi name -------------

iSCSI initiator name: iqn.1987-07.com.cisco:mwtbg23-sup-06-38
iSCSI initiator port names:
 iqn.1987-07.com.cisco:mwtbg23-sup-06-38:EMC-ISCSI-A1
 iqn.1987-07.com.cisco:mwtbg23-sup-06-38:UNIX
```

Related Commands	Command	Description
	show ip iscsi session	Displays information about the iSCSI sessions on the GGSN.
	show ip iscsi target	Displays information about iSCSI targets.

show ip iscsi session

To display the status of iSCSI sessions on the GGSN, use the **show ip iscsi session** command in privileged EXEC mode.

>   **show ip iscsi session** [*session_id*] [**detail**]

Syntax Description		
session_id	(Optional) Identification number of the session.	
detail	(Optional) Displays detailed information about the iSCSI session.	

Syntax Description   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(15)XQ	This command was introduced.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show ip iscsi session** command to display iSCSI sessions.

Examples   The following example shows output from the **show ip iscsi session** command:

```
Router#show ip iscsi session 12
ID TARGET STATE CONNECTIONS
-------------------------------------------------------------
12 LINUX Logged In 1

Router#show ip iscsi session
----------- Slot 6/CPU 3, show ip iscsi session ------------

ID        TARGET           STATE              CONNECTIONS
-------------------------------------------------------------
6         UNIX             Logged In          1
----------- Slot 6/CPU 4, show ip iscsi session ------------

ID        TARGET           STATE              CONNECTIONS
-------------------------------------------------------------
```

```
3          UNIX            Logged In         1
----------- Slot 6/CPU 5, show ip iscsi session -------------

ID       TARGET          STATE             CONNECTIONS
-------------------------------------------------------------
3          UNIX            Logged In         1
----------- Slot 6/CPU 6, show ip iscsi session -------------

ID       TARGET          STATE             CONNECTIONS
-------------------------------------------------------------
3          UNIX            Logged In         1
----------- Slot 6/CPU 7, show ip iscsi session -------------

ID       TARGET          STATE             CONNECTIONS
-------------------------------------------------------------
3          UNIX            Logged In         1
----------- Slot 6/CPU 8, show ip iscsi session -------------

ID       TARGET          STATE             CONNECTIONS
-------------------------------------------------------------
3          UNIX            Logged In         1

Router#show ip iscsi session detail
ID: 12
Profile: LINUX
State: Logged In
Connections: 1
First Burst Length: 16384
Max Burst Length: 16384
Max Recv Data Segment: 32768
Max Xmit Data Segment: 8192
Initial R2T: Yes
Immediate data: Yes
Data PDU in order: Yes
Data PDU in order: Yes

Router#show ip iscsi session 12 detail
ID: 12
Profile: LINUX
State: Logged In
Connections: 1
First Burst Length: 16384
Max Burst Length: 16384
Max Recv Data Segment: 32768
Max Xmit Data Segment: 8192
Initial R2T: Yes
Immediate data: Yes
Data PDU in order: Yes
Data PDU in order: Yes

Router#
```

show ip iscsi stats

To display iSCSI statistics, use the **show ip iscsi stats** command in privileged EXEC mode.

> **show ip iscsi stats** [**detail**]

Syntax Description

| detail | (Optional) Displays detailed information about the iSCSI statistics. |

Defaults　No default behavior or values.

Command Modes　Privileged EXEC

Command History

Release	Modification
12.4(15)XQ	This command was introduced.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines　Use the **show ip iscsi stats** command to display iSCSI statistics.

Examples　The following example shows output from the **show ip iscsi stats** command:

```
Router#show ip iscsi stats
 iSCSI Stats:
  Login Requests - 2, Login Responses - 2
  Logout Requests - 0, Logout Responses - 0
  Login Timeouts - 0, Logout Timeouts - 0
  SCSI Commands - 27, SCSI Responses - 27
  Data In PDUs - 25, Data Out PDUs - 0
  Immed Data - 1, Unsolicited Data - 0
  NOP Ins - 35, NOP Outs - 35
  Async Requests - 0, Async Req Logout - 0
  Async Drop Conn - 0, Async Drop Conns - 0
  R2t Requests - 0, Rejects - 0

 System Stats:
  TX Queue Overflow - 0, RX Queue Overflow - 0
  Connection Resets - 0, Tasks aborted - 0
```

```
 SCSI Stats:
  Total Requests - 27
  Test Unit Ready Requests - 1, Test Unit Ready Failures - 0
  Report Luns Requests - 1, Report Luns Failures - 0
  Lun Inquiry Requests - 5, Lun Inquiry Failures - 0
  Read Capacity Requests - 5, Read Capacity Failures - 0
  Read Requests - 14, Read Failures - 0
  Write Requests - 1, Write Failures - 0
  Blocks Read- 49, Blocks Written - 8

Router#show ip iscsi stats detail
 iSCSI Stats:
  Login Requests - 2, Login Responses - 2
  Logout Requests - 0, Logout Responses - 0
  Login Timeouts - 0, Logout Timeouts - 0
  SCSI Commands - 27, SCSI Responses - 27
  Data In PDUs - 25, Data Out PDUs - 0
  Immed Data - 1, Unsolicited Data - 0
  NOP Ins - 36, NOP Outs - 36
  Async Requests - 0, Async Req Logout - 0
  Async Drop Conn - 0, Async Drop Conns - 0
  R2t Requests - 0, Rejects - 0

 System Stats:
  TX Queue Overflow - 0, RX Queue Overflow - 0
  Connection Resets - 0, Tasks aborted - 0

 SCSI Stats:
  Total Requests - 27
  Test Unit Ready Requests - 1, Test Unit Ready Failures - 0
  Report Luns Requests - 1, Report Luns Failures - 0
  Lun Inquiry Requests - 5, Lun Inquiry Failures - 0
  Read Capacity Requests - 5, Read Capacity Failures - 0
  Read Requests - 14, Read Failures - 0
  Write Requests - 1, Write Failures - 0
  Blocks Read- 49, Blocks Written - 8
```

Related Commands	Command	Description
	clear ip iscsi stats	Clears iSCSI statistics.

show ip iscsi target

To display details about an iSCSI target, use the **show ip iscsi target** command in privileged EXEC mode.

show ip iscsi target

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(15)XQ	This command was introduced.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show ip iscsi target** command to display information about an iSCSI target.

Examples   The following example shows output from the **show ip iscsi target** command:

```
Router#show ip iscsi target
----------- Slot 6/CPU 3, show ip iscsi target -------------

Target Profile= EMC-ISCSI-A1 AVAILABLE
  Target: name= iqn.1992-04.com.emc:cx.sl7e2084000056.a1
  Target: ip= 10.64.110.121, port= 3260, portal group= 0
  vrf= , sync read offset= 100, batch write= 500
  write interval= 5 sec, file size= 1 MB
  file-closure-interval = 2 Min
Target Profile= UNIX IN USE
  Target: name= iqn.2001-04.com.example:storage.disk1.sys1.xyz
  Target: ip= 10.64.110.99, port= 3260, portal group= 0
  vrf= , sync read offset= 100, batch write= 500
  write interval= 5 sec, file size= 100 MB
  file-closure-interval = 2 Min
----------- Slot 6/CPU 4, show ip iscsi target -------------
```

```
Target Profile= EMC-ISCSI-A1 AVAILABLE
  Target: name= iqn.1992-04.com.emc:cx.sl7e2084000056.a1
  Target: ip= 10.64.110.121, port= 3260, portal group= 0
  vrf= , sync read offset= 100, batch write= 500
  write interval= 5 sec, file size= 1 MB
  file-closure-interval = 2 Min
Target Profile= UNIX IN USE
  Target: name= iqn.2001-04.com.example:storage.disk1.sys1.xyz
  Target: ip= 10.64.110.99, port= 3260, portal group= 0
  vrf= , sync read offset= 100, batch write= 500
  write interval= 5 sec, file size= 100 MB
----------- Slot 6/CPU 5, show ip iscsi target -------------

Target Profile= EMC-ISCSI-A1 AVAILABLE
  Target: name= iqn.1992-04.com.emc:cx.sl7e2084000056.a1
  Target: ip= 10.64.110.121, port= 3260, portal group= 0
  vrf= , sync read offset= 100, batch write= 500
  write interval= 5 sec, file size= 1 MB
  file-closure-interval = 2 Min
Target Profile= UNIX IN USE
  Target: name= iqn.2001-04.com.example:storage.disk1.sys1.xyz
  Target: ip= 10.64.110.99, port= 3260, portal group= 0
  vrf= , sync read offset= 100, batch write= 500
  write interval= 5 sec, file size= 100 MB
  file-closure-interval = 2 Min
----------- Slot 6/CPU 6, show ip iscsi target -------------

Target Profile= EMC-ISCSI-A1 AVAILABLE
  Target: name= iqn.1992-04.com.emc:cx.sl7e2084000056.a1
  Target: ip= 10.64.110.121, port= 3260, portal group= 0
  vrf= , sync read offset= 100, batch write= 500
  write interval= 5 sec, file size= 1 MB
  file-closure-interval = 2 Min
Target Profile= UNIX IN USE
  Target: name= iqn.2001-04.com.example:storage.disk1.sys1.xyz
  Target: ip= 10.64.110.99, port= 3260, portal group= 0
  vrf= , sync read offset= 100, batch write= 500
  write interval= 5 sec, file size= 100 MB
  file-closure-interval = 2 Min
----------- Slot 6/CPU 7, show ip iscsi target -------------

Target Profile= EMC-ISCSI-A1 AVAILABLE
  Target: name= iqn.1992-04.com.emc:cx.sl7e2084000056.a1
  Target: ip= 10.64.110.121, port= 3260, portal group= 0
  vrf= , sync read offset= 100, batch write= 500
  write interval= 5 sec, file size= 1 MB
  file-closure-interval = 2 Min
Target Profile= UNIX IN USE
  Target: name= iqn.2001-04.com.example:storage.disk1.sys1.xyz
  Target: ip= 10.64.110.99, port= 3260, portal group= 0
  vrf= , sync read offset= 100, batch write= 500
  write interval= 5 sec, file size= 100 MB
  file-closure-interval = 2 Min
----------- Slot 6/CPU 8, show ip iscsi target -------------

Target Profile= EMC-ISCSI-A1 AVAILABLE
  Target: name= iqn.1992-04.com.emc:cx.sl7e2084000056.a1
  Target: ip= 10.64.110.121, port= 3260, portal group= 0
  vrf= , sync read offset= 100, batch write= 500
  write interval= 5 sec, file size= 1 MB
  file-closure-interval = 2 Min
Target Profile= UNIX IN USE
  Target: name= iqn.2001-04.com.example:storage.disk1.sys1.xyz
```

```
Target: ip= 10.64.110.99, port= 3260, portal group= 0
vrf= , sync read offset= 100, batch write= 500
write interval= 5 sec, file size= 100 MB
file-closure-interval = 2 Min
```

Related Commands	Command	Description
	show ip iscsi session	Displays iSCSI sessions.
	show ip iscsi stats	Display iSCSI statistics.

show ip local pool

To display statistics for any defined IP address pools, use the **show ip local pool** command in privileged EXEC mode.

show ip local pool [*poolname* | **group** [*group-name*]]

Syntax Description

poolname	(Optional) Named IP address pool.
group	(Optional) Displays statistics of all pools in the base system group.
group [*group-name*]	(Optional) Displays statistics of all pools in the named group.
	Note The **ip local pool** command's **group** keyword option is not supported on the Cisco GGSN.

Command Modes   Privileged EXEC

Command History

Release	Modification
11.1	This command was introduced.
12.1(5)DC	This command was enhanced to allow pool group statistics to be displayed.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T and support was added for the Cisco 6400 node route processor 25v (NRP-25v) Cisco 7400 platforms.
12.4(X)X	This command was integrated into Cisco IOS Release 12.XXX and following fields related to the hold back timer feature were added to the output display: • Blocked • Held addresses: Time Remaining
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   If you omit the *poolname* argument, the command displays a generic list of all defined address pools and the IP addresses that belong to them. If you specify the *poolname* argument, the command displays detailed information about that pool.

When you supply the **group** keyword without the associated group name, the command displays all pools in the base system group. When you supply the **group** keyword with the associated group name, the command displays all pools in that group.

Note   The IP local pool groups are not supported on the Cisco GGSN.

Examples   The following is sample output from the **show ip local pool** command when pool groups have not been created:

```
router# show ip local pool

Pool     Begin            End          Free InUse              Blocked
Dialin   172.30.228.11    172.30.228.26   16    0
Available addresses:
   172.30.228.12
   172.30.228.13
   172.30.228.14
   172.30.228.15
   172.30.228.16
   172.30.228.17
   172.30.228.18
   172.30.228.19
   172.30.228.20
   172.30.228.21
   172.30.228.22
   172.30.228.23
   172.30.228.24
   172.30.228.25
   172.30.228.26
   172.30.228.11        Async5

Inuse addresses:
     None

Held addresses: Time Remaining
     None
```

The following sample output from the **show ip local pool group** command shows the base system group (lcl1):

```
router# show ip local pool group

Pool                    Begin        End          Free  In useBlocked
lcl1                    10.2.2.1     10.2.2.10      10     00
                        10.2.2.21    10.2.2.30      10     00
                        10.2.2.41    10.2.2.50      10     00
```

Table 40 describes the significant fields shown in the displays.

Table 40   show ip local pool Field Descriptions

Field	Description
Pool	Pool and group names and associations, if created.
Begin	The first IP address in the defined range of addresses in this pool.
End	The last IP address in the defined range of addresses in this pool.

Table 40   show ip local pool Field Descriptions (continued)

Field	Description
Free	The number of addresses available.
InUse	The number of addresses in use.
Blocked	Number of times a request for an IP address is blocked because there were elements in the free queue, but the elements were held until the recycle delay was completed.
Held addresses: Time Remaining	Addresses held from reassignment, and the remaining amount of time they will be held.

Related Commands

Command	Description
ip address-pool	Enables an address pooling mechanism used to supply IP addresses to dial asynchronous, synchronous, or ISDN point-to-point interfaces.
ip local pool	Configures a local pool of IP addresses to use when a remote peer connects to a point-to-point interface.

show policy-map apn

To display statistical and configuration information for all input and output policies attached to an APN, use the **show policy-map apn** command in privileged EXEC mode.

> **show policy-map apn** *access-point-index*

Syntax Description

access-point-index	Integer (from 1 to 65535) that identifies an access point. Information about that access point is shown.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show policy-map apn** command to display statistical and configuration information for all input and output policies attached to an APN.

Examples This section provides sample outputs of the **show policy-map apn** command. The output you see might vary slightly from the ones shown below.

Example 1: Non Flow-Based Policing

The example provides sample output of the **show policy-map apn** command for non flow-based policing for access point 1, to which a service policy called "policy-non-flow" is attached (configured as shown below).

```
! Configures a class map with dscp based classification

class-map match-all class-dscp
 match ip dscp default

! Configures a policy with this class map

policy-map policy-nonflow
 class class-dscp
 police rate pdp
    conform-action transmit
    exceed-action set-dscp-transmit 15
    violate-action drop

! Attaches the policy to an APN

gprs access-point-list gprs
  access-point 1
    access-point-name static
    service-policy input policy-nonflow
    !
```

```
 GGSN#show policy-map apn 1
 APN 1

  Service-policy input:policy-nonflow

    Class-map:class-dscp (match-all)
      3 packets, 300 bytes
      30 second offered rate 0 bps, drop rate 0 bps
      Match:ip dscp default
      police:
          rate 8000 bps, burst 1000 bytes
          peak-rate 10000 bps, peak-burst 1400 bytes
        conformed 3 packets, 300 bytes; actions:
          transmit
        exceeded 0 packets, 0 bytes; actions:
          set-dscp-transmit 15
        violated 0 packets, 0 bytes; actions:
          drop
        conformed 0 bps, exceed 0 bps, violate 0 bps
    Class-map:class-default (match-any)
      0 packets, 0 bytes
      30 second offered rate 0 bps, drop rate 0 bps
      Match:any
```

With the above configuration, the **show gprs umts-qos police pdp-context tid** command does not display any information for the configuration is not per-PDP based.

```
GGSN#show gprs umts-qos police pdp-context tid 1203000000000010
No Policing Statistics Available
```

Example 2: Flow-Based Policing

The example provides sample output of the **show policy-map apn** command for flow-based policing for access point 1, to which a service policy called "policy-non-flow" is attached (configured as shown below).

```
! Configures a class map with flow based classification.

class-map match-all class-pdp
 match flow pdp
!
! Configures a policy-map and attch this class map into it.

policy-map policy-gprs
 class class-pdp
  police rate pdp
    conform-action set-dscp-transmit 15
    exceed-action set-dscp-transmit 15
    violate-action drop
!
```

Note With non flow-based policing, the police rate is not provided using the police rate command but is taken dynamically from the configure maximum and guaranteed bit rates.

```
! Attaches the policy-map to the apn.

gprs access-point-list gprs
  access-point 1
   access-point-name static
   service-policy input policy-gprs
   !

GGSN#show policy-map apn 1
 APN 1

  Service-policy input:policy-gprs

    Class-map:class-pdp (match-all)
      3 packets, 300 bytes
      30 second offered rate 0 bps, drop rate 0 bps
      Match:flow pdp
      police:
          rate pdp, bc 1500 bytes
        peak-rate pdp, be 1800 bytes
       conformed 0 packets, 0 bytes; actions:
         set-dscp-transmit 15
       exceeded 0 packets, 0 bytes; actions:
         set-dscp-transmit 15
       violated 0 packets, 0 bytes; actions:
         drop

    Class-map:class-default (match-any)
      0 packets, 0 bytes
      30 second offered rate 0 bps, drop rate 0 bps
      Match:any
```

The **show policy-map** command displays the aggregated traffic count. To display the policing counters, issues the **show gprs umts-qos police pdp-context tid** command:

```
GGSN#show gprs umts-qos police pdp-context tid 1203000000000010
```

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```
DOWNLINK POLICING STATISTICS
Flow id:1
      police:
          rate 5184000 , bc 1500 bytes
         peak-rate 7424000, be 1800 bytes
        conformed 2 packets, 200 bytes; actions:
          set-dscp-transmit 15
        exceeded 0 packets, 0 bytes; actions:
          set-dscp-transmit 15
        violated 0 packets, 0 bytes; actions:
          drop
```

Example 3: Flow and DSCP-Based Policing

In the following example, a policy map is created with both flow-based and DSCP-based classication. In this configuration, per-PDP policing occurs when both conditions are met. For example, if a packet is received by the GGSN for a PDP with a different DSCP value than the one configured in the class-map, policing does not occur.

```
! Configures a class map with match flow + DSCP based classification.
!
class-map match-all class-flow-dscp
 match ip dscp default
 match flow pdp
!
! Configure a policy-map with this class map
!
policy-map policy-flow-dscp
 class class-flow-dscp
  police rate pdp
    conform-action transmit
    exceed-action set-dscp-transmit 15
    violate-action drop

! Attaches the policy to an apn.

gprs access-point-list gprs
  access-point 1
   access-point-name static
   service-policy input policy-flow-dscp
   !
```

Note Data with DSCP value 0 is processed.

```
GGSN#show policy-map apn 1
 APN 1

  Service-policy input:policy-flow-dscp

    Class-map:class-flow-dscp (match-all)
      4 packets, 456 bytes
      30 second offered rate 0 bps, drop rate 0 bps
      Match:ip dscp default
      Match:flow pdp
      police:
          rate pdp, bc 1500 bytes
         peak-rate pdp, be 1800 bytes
        conformed 0 packets, 0 bytes; actions:
          transmit
        exceeded 0 packets, 0 bytes; actions:
          set-dscp-transmit 15
        violated 0 packets, 0 bytes; actions:
          drop

    Class-map:class-default (match-any)
      0 packets, 0 bytes
      30 second offered rate 0 bps, drop rate 0 bps
      Match:any
```

```
GGSN#show gprs umts-qos police pdp-context tid 1203000000000010
DOWNLINK POLICING STATISTICS
Flow id:1
      police:
          rate 5184000 , bc 1500 bytes
         peak-rate 7424000, be 1800 bytes
        conformed 3 packets, 342 bytes; actions:
          transmit
        exceeded 0 packets, 0 bytes; actions:
          set-dscp-transmit 15
        violated 0 packets, 0 bytes; actions:
          drop
```

A packet with a different DSCP value does not get policed.

	Command	Description
Related Commands	**match flow**	Specifies PDP flows as the match criterion in a class map.
	police rate	Configures traffic policing using the police rate.
	service-policy	Attaches a service policy to an APN to use as the service policy for PDP flows of that APN.
	show gprs umts-qos police pdp-context tid	Displays policing statistics for a PDP context.

show record-storage-module stats

To display current record storage module (RSM) statistics, use the **show record-storage-module stats** command in privileged EXEC mode.

show record-storage-module stats

Syntax Description   This command has no arguments or keywords.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(15)XQ	This command was introduced.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show record-storage-module stats** command to display RSM statistics.

Examples   The following example shows output from the **show record-storage-module stats** command:

```
Router#show record-storage-module stats
RSM Appl Stats:
 requests:
  open= 1, read= 0, write= 0
  ping= 0, close= 0
 request fail:
  open= 0, read= 0, write= 0
  ping= 0, close= 0 | ta
 alloc fail:
  appl info= 0, appl msg= 0, appl req= 0,
  data buffer= 0, drive= 0
 RSM Clear:
    Statistics = 1

Router#
```

Related Commands

Command	Description
clear record-storage-module stats	Clears current RSM-related statistics.

show record-storage-module target-info

To display the number of record storage module (RSM) disks available their current status, use the **show record-storage-module target-info** command in privileged EXEC mode.

show record-storage-module target-info [all | target-profile *profile_name***] [detail]**

Syntax Description		
	all	Displays statistics for all targets for which there are profiles.
	target-profile *profile_name*	Displays statistics for a specific profile.
	detail	Displays detailed information about the RSM drives.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(15)XQ	This command was introduced.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show record-storage-module target-info** command to display RSM statistics by profile.

Examples   The following example shows output from the **show record-storage-module target-info** command:

```
Router#show record-storage-module target-info all detail
  Target profile = TARGET_LINUX
  Application name = GGSN, Target State = Active, Disk = Usable
  Application id = 2, iSCSI handle = 2
  Number of drives = 5, Read drive = sda3, Write drive = sda3
  Active drives:
   Drive = sda3
   File system id = 19
   Descriptors: read = -1, write = -1, master = -1
   Current File: bytes written = 0, bytes read = 0
   Master file in memory:
   Drive full = No
   Write: dir = 1, file = 1
```

```
 Read: dir = 1, file = 1, offset = 62675
 Salvage file = 0, CRC = 0x91C816C0
Failed drives:
 Drive = sda0
 Reason = Unexpected IFS error (Invalid DOS media or no media in slot)
 Drive = sda1
 Reason = Unexpected IFS error (Invalid DOS media or no media in slot)
 Drive = sda2
 Reason = Unexpected IFS error (Invalid DOS media or no media in slot)
 Drive = sda4
 Reason = Unexpected IFS error (Invalid DOS media or no media in slot)
```

show tech-support

To display GPRS/UMTS protocol-specific information about the router when reporting a problem, use the **show tech-support** command in privileged EXEC mode and specify the **ggsn** keyword option.

> **show tech-support** [**ggsn**]

Syntax Description	**ggsn** (Optional) Displays show command output specific to GPRS/UMTS.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU and the **ggsn** keyword option was added.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   The output of **show tech-support ggsn** includes the ggsn-specific output displayed by the following commands:

- **show gprs charging parameters**
- **show gprs charging statistics**
- **show gprs charging status all**
- **show gprs gtp parameters**

- **show gprs gtp statistics**

- **show gprs gtp status**

- **show gprs memory threshold statistics**

- **show gprs qos status**

- **show running-config**

- **show version**

Examples   The following example shows the output of the **show tech-support ggsn** command:

```
router#  show tech-support ggsn

------------------ show version ------------------

ROM: System Bootstrap, Version 12.2(4r)B2, RELEASE SOFTWARE (fc2)
BOOTLDR: 7xxx Software (C7xxx-KBOOT-M), Version 12.1(8a)E, EARLY DEPLOYMENT RELEASE
SOFTWARE (fc1)

ggsn uptime is 1 day, 21 hours, 4 minutes
System returned to ROM by reload at 19:48:49 EST Fri Jan 30 2004
System image file is "tftp://9.1.0.1/gota/c7xxx-g8is-mz"
Last reload reason: Reload command

Cisco 7206VXR (NPE400) processor (revision A) with 491520K/32768K bytes of memory.
Processor board ID 29550562
R7000 CPU at 350MHz, Implementation 39, Rev 3.3, 256KB L2, 4096KB L3 Cache
6 slot VXR midplane, Version 2.7

Last reset from s/w nmi

PCI bus mb0_mb1 has 600 bandwidth points
PCI bus mb2 has 40 bandwidth points

4 Ethernet interfaces
3 FastEthernet interfaces
125K bytes of NVRAM.

46976K bytes of ATA PCMCIA card at slot 0 (Sector size 512 bytes).
8192K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x0

------------------ show running-config ------------------

Building configuration...

Current configuration : 6770 bytes
!
version 12.3
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
service udp-small-servers
service tcp-small-servers
service gprs ggsn
!
hostname ggsn
!
boot-start-marker
```

```
boot-end-marker
!
logging queue-limit 100
no logging buffered
enable secret 5 <removed>
enable password <removed>
!
clock timezone EST -4
aaa new-model
!
aaa group server radius mwg
!
aaa group server radius list1
 server 10.76.82.75 auth-port 1645 acct-port 1646
!
aaa authentication ppp default local
aaa authentication ppp list1 local
aaa authorization network default local
aaa authorization network list1 local
aaa authorization configuration list1 group radius
aaa accounting network default start-stop group radius
aaa accounting network list1 start-stop group radius
aaa session-id common
ip subnet-zero
!
ip cef
no ip domain lookup
ip host PAGENT-SECURITY-V3 39.26.7.9 17.99.0.0
!
ip dhcp pool TEST
   network 100.0.0.0 255.0.0.0
!
ip vrf vpn1
 rd 100:1
!
ip address-pool dhcp-proxy-client
vpdn enable
!
ipv6 unicast-routing
!
interface Tunnel0
 description to handle vrf traffic from APN1 on GGSN SAMI 1
 ip unnumbered Loopback3
 tunnel source Loopback3
 tunnel destination 20.20.120.20
!
interface Tunnel1
 no ip address
 shutdown
 tunnel source 17.1.101.1
 tunnel destination 13.1.101.1
!
interface Tunnel2
 no ip address
 shutdown
 tunnel source 17.1.102.1
 tunnel destination 13.1.102.1
!
interface Loopback0
 ip address 100.0.0.1 255.255.255.255
 no ip route-cache
 no ip mroute-cache
 shutdown
!
```

```
interface Loopback1
 ip address 33.44.55.66 255.255.0.0
 no ip route-cache
 no ip mroute-cache
 shutdown
!
interface Loopback2
 ip address 35.0.0.1 255.0.0.0
 no ip route-cache
 no ip mroute-cache
 shutdown
!
interface Loopback3
 description interface for ggsn SAMI 1
 ip address 20.20.120.21 255.255.255.255
 no ip route-cache
 no ip mroute-cache
 shutdown
!
interface FastEthernet0/0
 ip address 9.3.66.3 255.255.0.0
 no ip route-cache
 no ip mroute-cache
 duplex auto
 speed auto
 no cdp enable
!
interface FastEthernet0/1
 ip address 20.20.51.31 255.255.255.0
 shutdown
 duplex auto
 speed auto
!
interface FastEthernet1/0
 ip address 1.1.1.1 255.255.255.0
 shutdown
 duplex half
!
interface Ethernet2/0
 ip address 10.3.12.1 255.255.0.0
 no ip route-cache
 no ip mroute-cache
 shutdown
 duplex half
 no cdp enable
!
interface Ethernet2/1
 ip address 11.3.12.1 255.255.0.0
 no ip route-cache
 no ip mroute-cache
 shutdown
 duplex half
 no cdp enable
!
interface Ethernet2/2
 ip address 12.3.12.1 255.255.0.0
 no ip route-cache
 no ip mroute-cache
 shutdown
 duplex half
 no cdp enable
!
interface Ethernet2/3
 ip address 10.10.10.2 255.255.255.0
```

```
 no ip route-cache
 no ip mroute-cache
 shutdown
 duplex half
 no cdp enable
!
interface Virtual-Template1
 ip address 72.72.72.1 255.255.0.0
 encapsulation gtp
 gprs access-point-list 1
!
interface Virtual-Template2
 ip unnumbered Loopback0
 no peer default ip address
!
interface Virtual-Template3
 description VT for PPP and PPP L2TP
 ip unnumbered Loopback1
 peer default ip address pool mypool
 no keepalive
!
ip local pool pdsn-pool 6.6.10.1 6.6.10.255
ip local pool pdsn-pool 6.6.11.1 6.6.26.255
ip local pool pdsn-pool 6.6.27.1 6.6.42.255
ip local pool pdsn-pool 6.6.43.1 6.6.58.255
ip local pool pdsn-pool 6.6.59.1 6.6.64.255
ip local pool pdsn-pool 6.6.65.1 6.6.80.255
ip local pool pdsn-pool 55.55.10.1 55.55.25.253
ip local pool ha-pool 24.24.1.1 24.24.16.255
ip local pool mypool 85.0.0.0 85.0.0.255
ip local pool mypool 85.1.0.0 85.1.255.255
ip local pool mypool 85.2.0.0 85.2.255.255
ip local pool mypool 85.3.0.0 85.3.255.255
ip local pool pooltest 180.180.1.1 180.180.1.10
ip default-gateway 9.15.0.1
ip classless
ip route 7.7.7.1 255.255.255.255 Ethernet2/3
ip route 9.1.0.1 255.255.255.255 9.3.0.1
ip route 9.100.0.1 255.255.255.255 9.15.0.1
ip route 20.20.120.20 255.255.255.255 FastEthernet0/1
no ip http server
!
access-list 112 deny    tcp any any
access-list 120 permit ip any host 10.1.102.1
access-list 150 permit icmp any 60.0.0.0 0.0.0.255
access-list 150 permit icmp 60.0.0.0 0.0.0.255 any
dialer-list 1 protocol ip permit
ipv6 router rip TEST2
  poison-reverse
!
gprs maximum-pdp-context-allowed 45000
gprs qos map umts
gprs access-point-list 1
  access-point 1
   access-point-name gprs.cisco.com
   aaa-group authentication list1
   aggregate 1.1.0.0 255.255.0.0
   access-violation deactivate-pdp-context
   !
  access-point 2
   access-point-name ppp.com
   ppp-regeneration
   !
  !
```

```
!
gprs gtp path-echo-interval 0
gprs gtp ppp vtemplate 3
gprs gtp ppp-regeneration vtemplate 2
gprs default ip-address-pool radius-client
gprs default charging-gateway 12.3.11.1  13.3.11.1
gprs default map-converting-gsn 10.3.11.1
!
gprs charging server-switch-timer 0
gprs charging cdr-aggregation-limit 1
!
radius-server host 10.76.82.75 auth-port 1645 acct-port 1646
radius-server key <removed>
!
control-plane
!
mgcp modem passthrough voip mode ca
no mgcp timer receive-rtcp
!
dial-peer cor custom
!
!
gatekeeper
 shutdown
!
alias exec pdp sh gprs gtp pdp all
alias exec pdptid show gprs gtp pdp tid
alias exec pdptid1 show gprs gtp pdp tid  1111111111111111
alias exec pdptid2 show gprs gtp pdp tid 2222222222222222
alias exec pdpclear clear gprs gtp pdp all
!
line con 0
 exec-timeout 0 0
 password <removed>
 logging synchronous
 login authentication console
 transport preferred all
 transport output all
 stopbits 1
line aux 0
 transport preferred all
 transport output all
 stopbits 1
line vty 0 4
 exec-timeout 0 0
 password <removed>
 transport preferred all
 transport input all
 transport output all
line vty 5 15
 transport preferred all
 transport input all
 transport output all
!
no scheduler max-task-time
!
end


------------------ show gprs gtp status ------------------

 GPRS GTP Status:
    activated gtpv0 pdp      2
    activated gtpv1 pdp      7
    activated ms             9
```

```
    activated ipv6 ms      2
    activated gtpv0 v6 pdp  1
    activated gtpv1 v6 pdp  1
    activated ppp regen pdp 1
    activated ppp pdp       2
    gtp's va hwidbs         2
    gtp's va swidbs         1
    gtp ipv6 swidbs         2
    gtp direct tunnel PDPs  7
 Service-aware Status:
    Prepaid PDPs            0
    Postpaid PDPs           0


----------------- show gprs gtp parameters ------------------

    GTP path echo interval                     = 0
    GTP signal max wait time T3_response       = 1
    GTP max retry N3_request                   = 5
    GTP dynamic echo-timer minimum             = 5
    GTP dynamic echo-timer smooth factor       = 2
    GTP buffer size for receiving N3_buffer    = 8192
    GTP max pdp context                        = 45000

----------------- show gprs gtp statistics ------------------

GGSN# show gprs gtp statistics
GPRS GTP Statistics:
 version_not_support       0        msg_too_short             0
 unknown_msg               0        unexpected_sig_msg        0
 unexpected_data_msg       0        unsupported_comp_exthdr   0
 mandatory_ie_missing      0        mandatory_ie_incorrect    0
 optional_ie_invalid       0        ie_unknown                0
 ie_out_of_order           0        ie_unexpected             0
 ie_duplicated             0        optional_ie_incorrect     0
 pdp_activation_rejected   2        tft_semantic_error        0
 tft_syntactic_error       0        pkt_ftr_semantic_error    0
 pkt_ftr_syntactic_error   0        non_existent              0
 path_failure              0        total_dropped             0
 signalling_msg_dropped    0        data_msg_dropped          0
 no_resource               0        get_pak_buffer_failure    0
 rcv_signalling_msg        7        snd_signalling_msg        7
 rcv_pdu_msg               0        snd_pdu_msg               0
 rcv_pdu_bytes             0        snd_pdu_bytes             0
 total created_pdp         3        total deleted_pdp         2
 total created_ppp_pdp     0        total deleted_ppp_pdp     0
 ppp_regen_pending         0        ppp_regen_pending_peak    0
 ppp_regen_total_drop      0        ppp_regen_no_resource     0
 ntwk_init_pdp_act_rej     0        total ntwkInit created pdp 0

GPRS Network behind mobile Statistics:
  network_behind_ms APNs     1       total_download_route         5
  save_download_route_fail   0       insert_download_route_fail 2
  total_insert_download_route 3

----------------- show gprs charging status all ------------------

        GPRS Charging Protocol Status
        ================================

* Number of APNs :                           <0>
* Number of CDRs :                           <0>
* Number of closed CDRs buffered:            <0>
* Number of Containers buffered:             <0>
* Number of pending unack. CDR_Output_Msgs:  <0>
```

```
------------------ show gprs charging parameters ------------------

        GPRS Charging Protocol Parameters
        =================================

* Default Charging Gateway Address:        <12.3.11.1>
* Default Backup Charging Gateway Address: <13.3.11.1>
* Default Tertiary Charging Gateway Address: UNDEFINED.
* Current Active Charging Gateway Address: <12.3.11.1>
* Current Backup Charging Gateway Address: <13.3.11.1>
* Charging Server Switch-Over Timer:       <0> seconds.
* Charging Path Protocol:                  udp
* GTP' use short header:                   DISABLED
* Charging Message Options:
   Transfer Request:
 - Packet Transfer Command IE:             DISABLED.
   Transfer Response:
 - Number Responded:                       DISABLED.
* Charging MAP DATA TOS:                   <3>
* Charging Transfer Interval:              <105> seconds.
* Charging Transfer Threshold:             <1048576> bytes.
* Charging CDR Aggregation Limit:          <1> CDRs per msg.
* Charging Packet Queue Size:              <128> messages.
* Charging Gateway Path Request Timer:     <0> Minutes.
* Charging Change Condition Limit:         <5>
* Charging SGSN Limit:                     DISABLED.
* Charging Time Limit:                     <0>
* Charging Send Buffer Size:               <1460>
* Charging Port Number:                    <3386>
* Charging Roamers CDR Only:               DISABLED.
* Charging CDR Option:
 - Local Record Sequence Number:           DISABLED.
 - APN Selection Mode:                     DISABLED.
 - ChCh Selection Mode:                    DISABLED.
 - IMS Signaling Context:                  DISABLED.
 - External Charging ID:                   DISABLED.
 - SGSN PLMN ID:                           DISABLED.
 - Dynamic Address:                        ENABLED.
 - Served PDP Address:                     ENABLED.
 - PDP Type:                               ENABLED.
 - Access Point Name:                      ENABLED.
 - Network Initiated PDP:                  ENABLED.
 - No Partial CDR Generation:              DISABLED.
 - Node ID:                                DISABLED.
 - Packet Count:                           DISABLED.
 - Served MSISDN:                          DISABLED.
 - Private Echo:                           DISABLED.
* Charging release:                        99
* Charging Tariff Time Changes:
- NO Tariff Time Changes
* Charging Service Mode:                   OPERATIONAL

------------------ show gprs charging statistics ------------------

        GPRS Charging Protocol Statistics
        =================================

* Total Number of CDRs for Charging:            <0>
* Total Number of Containers for Charging:      <0>
* Total Number of CDR_Output_Msgs sent:         <0>

-- Charging Gateway Statistics --
* Charging Gateway Down Count:                  <0>
```

```
----------------- show gprs qos status -----------------

GPRS QoS Status:
  type: UMTS
  conversational_pdp        0   streaming_pdp      0
  interactive_pdp           0   background_pdp     0

----------------- show gprs memory threshold statistics --

Memory Threshold Statistics
=================================================
GGSN memory threshold status :NOT IN THRESHOLD

Number of times reached :        0
Number of PDPs rejected :        0
Number of PDPs dropped due to
        duration limit :         0
        volume limit :           0
        update request :         0

Time when last memory threshold was reached :NEVER
```

show wiretap

To display all of the taps that are currently configured on the GGSN for the Mediation Devices that have been configured to see, use the s**how wiretap** command in privileged EXEC mode:

> **show wiretap** [*CCCid* [*StreamIndex*]]

Syntax Description

CCCid	Displays all of the intercepts that are currently configured on the GGSN that correspond to the entered CCCid.
StreamIndex	Displays the intercept that is configured on the GGSN with the entered CCCid and StreamIndex combination.

Defaults   No default behavior or values.

Command Modes   Privileged EXEC

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **show wiretap** command to display taps that are currently configured on the GGSN.

The **show wiretap** *CCCid* command displays all of the intercepts that are currently configured on the GGSN that correspond to the entered CCCid. The user is only allowed to see these intercepts if they have been granted access to that Mediation Device with the given CCCid through a cTap2DebugUserEntry.

The **show wiretap** *CCCid StreamIndex* command displays the intercept that is configured on the GGSN with the entered CCCid and StreamIndex combination. The user is only allowed to see the intercept if they have been granted access to that Mediation Device with the given CCCid through a cTap2DebugUserEntry.

Note   To use the **show wiretap** command, you must create a cTap2DebugUserEntry in the CISCO-Tap2-MIB with a username that matches the username used to log into the console terminal, a valid cTap2-DebugUserTimeout, and a cTap2DebugUserStatus of "active."

Examples

The following example shows output from the **show wiretap** command. In the example, the user is only allowed to view intercepts that are associated with the mediation device wtih a CCCid of 3:

```
Router#show wiretap
Debug User = "userid" CCCId = 3
  Time left = 1016 minutes
Mediation Device 3
  Time left = 1016 minutes
  MD IP Address = 172.19.24.92
  MD UDP port = 162
  DSCP value = af41
  Stream count = 1
  Streams associated with MD
Generic stream 1
  Status = 1
  Packets intercepted = 0
  Packets dropped = 0
  Type = Mobility Stream
    Stream 1
      Called Subscriber ID Type = 1
      Called Subscriber ID  =
      Subscriber ID Type = 3
      Subscriber ID = 214365870921435
      Storage Type = 2
      Status = 1
Router#
```

standby ip

To activate the Hot Standby Router Protocol (HSRP) on an interface, use the **standby ip** command in interface configuration mode. To disable HSRP, use the **no** form of this command.

standby [*group-number*] **ip** [*ip-address* [**secondary**] | **none**]

no standby [*group-number*] **ip** [*ip-address* | **none**]

Syntax Description

group-number	(Optional) Group number on the interface for which HSRP is being activated. The default is 0. The group number range is from 0 to 4095 for HSRP version 2.
ip-address	(Optional) IP address of the Hot Standby interface.
secondary	(Optional) Indicates the IP address is a secondary Hot Standby router interface. Useful on interfaces with primary and secondary addresses; you can configure primary and secondary HSRP addresses.
none	Disables group address learning from HSRP messages.

Command Default

The default group number is 0.
HSRP is disabled by default.
Group address learning from HSRP messages is enabled.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1 and the **none** keyword option was added.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines

The **standby ip** command activates HSRP on the configured interface.

L2 HSRP

If an IP address is specified, that address is used as the designated address for the Hot Standby group. If no IP address is specified, the designated address is learned through the standby function. For HSRP to elect a designated router, at least one router on the cable must have been configured with, or have learned, the designated address. Configuration of the designated address on the active router always overrides a designated address that is currently in use.

When the **standby ip** command is enabled on an interface, the handling of proxy Address Resolution Protocol (ARP) requests is changed (unless proxy ARP was disabled). If the Hot Standby state of the interface is active, proxy ARP requests are answered using the MAC address of the Hot Standby group. If the interface is in a different state, proxy ARP responses are suppressed.

When group number 0 is used, no group number is written to NVRAM, providing backward compatibility.

HSRP version 2 permits an expanded group number range from 0 to 4095. The increased group number range does not imply that an interface can, or should, support that many HSRP groups. The expanded group number range was changed to allow the group number to match the VLAN number on subinterfaces.

L3 HSRP

Virtual IP (VIP) learning should only apply when two devices are on the same LAN. For L3 HSRP, the two devices do not have to be on the same LAN, therefore, group address learning from HSRP messages must be disabled on an interface using the **standby ip none** command.

Examples

The following example activates HSRP for group 1 on Ethernet interface 0. The IP address used by the Hot Standby group will be learned using HSRP.

```
interface ethernet 0
 standby 1 ip
```

In the following example, all three virtual IP addresses appear in the ARP table using the same (single) virtual MAC address. All three virtual IP addresses are using the same HSRP group (group 0).

```
ip address 10.1.1.1. 255.255.255.0
ip address 10.2.2.2. 255.255.255.0 secondary
ip address 10.3.3.3. 255.255.255.0 secondary
ip address 10.4.4.4. 255.255.255.0 secondary
standby ip 10.1.1.254
standby ip 10.2.2.254 secondary
standby ip 10.3.3.254 secondary
```

The following example activates HSRP for group 1 on GigabitEthernet0/0.7 and disables group address learning from HSRP messages.

```
interface GigabitEthernet0/0.7
 encapsulation dot1Q 21
 ip address 10.0.0.3 255.255.0.0
 standby 1 ip none
```

standby unicast

To configure an HSRP group to use IP unicast routing, and set the IP addresses of the peer devices, use the **standby unicast** command in interface configuration mode. To return to the default value, use the **no** form of the command.

standby *group-number* **unicast destination** *destination-ip* [**source** *source-ip*]

no standby *group-number* **unicast destination** *destination-ip*

Syntax Description		
	group-number	Group number of the HSRP group that is being configured to use IP unicast transport. The default is 0. The group number range is from 0 to 4095 for HSRP version 2.
	unicast	Configures the HSRP group to use IP unicast routing.
	destination *destination-ip*	Configures the IP address of the destination interface. Up to four destinations can be defined.
	source *source-ip*	(Optional) Configures the IP address of the source interface.

Command Default   No default behavior or values.

Command Modes   Interface configuration (config-if)

Command History	Release	Modification
	12.4(22)YE1	This command was introduced in the Cisco IOS Release 12.4(22)YE1.
	12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
	12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
	12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
	12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
	12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
	12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   The **standby unicast** command configures an HSRP group to use IP unicast routing and sets the IP addresses of the peer devices.

Note   Configuring the standby **unicast command** sets the Virtual IP (VIP) to 0.0.0.0 and the virtual MAC address to that of the interface.

The **source** *ip-address* keyword option, if specified, is the source IP address of the HSRP packet. If not specified, the source IP address is taken from the corresponding interface configuration.

Examples

Primary GGSN

```
interface GigabitEthernet0/0.7
 encapsulation dot1Q 21
 ip address 10.0.0.3 255.255.0.0
 standby 1 ip none
 standby 1 name geo
 standby 1 unicast destination 172.0.0.1 source 10.0.0.3
```

Standby GGSN

```
interface GigabitEthernet0/0.8
 encapsulation dot1Q 21
 ip address 172.0.0.1 255.255.0.0
 standby 1 ip none
 standby 1 name geo
 standby 1 unicast destination 10.0.0.3
```

subscription-required

To specify that the gateway GPRS support node (GGSN) checks the value of the selection mode in a PDP context request to determine if a subscription is required to access a PDN through a particular access point, use the **subscription-required** command in access point configuration mode. To specify that no subscription is required, use the **no** form of this command.

subscription-required

no subscription-required

Syntax Description   This command has no arguments or keywords.

Defaults   No subscription is required

Command Modes   Access point configuration.

Command History

Release	Modification
12.1(1)GA	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2(4)MX	This command was integrated into Cisco IOS Release 12.2(4)MX.
12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD.
12.2(8)YW	This command was integrated into Cisco IOS Release 12.2(8)YW
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **subscription-required** command to specify that the GGSN checks the value of the selection mode in a PDP context request to determine if a subscription is required for user access to PDNs through the current access point. When you configure the **subscription-required** command at the APN, the GGSN looks for the "subscription verified" selection mode in the PDP context request to establish the session. If the GGSN finds that the selection mode is designated as subscription not verified in the PDP context request, then the GGSN rejects the PDP context request.

The subscription must be set up by the service provider, and subscription information must be passed with the mobile user's PDP context requests.

Examples   The following example specifies that the GGSN checks for subscription verification in the selection mode before establishing a session at the access point:

```
access-point 1
 access-point-name gprs.somewhere.com
 dhcp-server 10.100.0.3
 dhcp-gateway-address 10.88.0.1
 subscription-required
 exit
```

switchover priority (charging group)

To configure the gateway GPRS support node (GGSN) to switch to the gateway of higher priority in a charging gateway group (1 through 29) when that gateway becomes active, use the **switchover priority** command in charging group configuration mode. To disable the switchover priority feature, use the **no** form of this command.

switchover priority

no switchover priority

Syntax Description   This command has no keywords or variables.

Defaults   Disabled.

Command Modes   Charging group configuration

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   When configured for priority switchover using the **switchover priority** command, when a higher priority gateway comes up, regardless of the state of the current active charging gateway, the GGSN switches to and sends call detail records (CDRs) to that gateway.

This command configures the switchover priority for charging groups 1 through 29. The switchover priority for the default charging group (charging group 0) is set using the **gprs charging switchover priority** global configuration command.

Examples   The following example enables switchover priority for charging gateway group 5:

```
Router(config)# gprs charging group 5
Router(config-chrg-group)# description groupA
Router(config-chrg-group)# primary 10.100.0.3
Router(config-chrg-group)# secondary 10.100.0.4
Router(config-chrg-group)# tertiary 10.100.0.5
Router(config-chrg-group)# switchover priority
```

Related Commands

Command	Description
description	Adds a description to a charging gateway group.
gprs charging group	Defines or modifies a charging gateway group.
iscsi	Configures an iSCSI target to use for CDR storage for a charging gateway group when no charging gateway defined in the group is available.
primary	Configures a primary charging gateway for a charging gateway group.
secondary	Configures a secondary charging gateway for a charging gateway group.
service-mode	Configures the service-mode state of a charging group.
show gprs charging statistics	Displays cumulative charging statistics for the GGSN.
show gprs charging summary	Displays a summary of all charging groups defined on the GGSN.
tertiary	Configures a tertiary charging gateway for a charging gateway group.

t3-response

To specify the initial time that the quota server waits before resending a signaling request message when a response to a request has not been received, use the **t3-response** command in quota server configuration mode. To return to the default value, use the **no** form of this command

> **t3-response** *response-interval*

> **no t3-response**

Syntax Description

response-interval	Value between 1 and 65535 that specifies the length of the T3 response interval, in seconds.

Defaults   1 second.

Command Modes   Quota server configuration

Command History

Release	Modification
12.3(14)YQ	This command was introduced.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   The **t3-response** command is used by the GGSN to process delete PDP context requests and to perform the default method of echo timing.

For delete PDP context requests, the **t3-response** command is used to specify how long the quota server waits before sending a retry of the delete PDP context request when a response is not received from the CSG, until the n3-requests limit is reached.

Examples   The following example configures a T3 interval response interval of 524 seconds:

```
ggsn quota-server qs1
 interface loopback1
 echo-interval 90
 n3-requests 3
 t3-response 524
```

Related Commands .

Command	Description
clear ggsn quota-server statistics	Clears the quota server-related statistics displayed using the **show ggsn quota-server statistics** command.
csg-group	Associates the quota server to a CSG group to use for quota server-to-CSG communication.
echo-interval	Specifies the number of seconds that the quota server waits before sending an echo-request message to the CSG.
ggsn quota-server	Configures the quota server process that interfaces with the CSG for enhanced service-aware billing.
interface	Specifies the logical interface, by name, that the quota server will use to communicate with the CSG.
n3-requests	Specifies the maximum number of times that the quota server attempts to send a signaling request to the CSG.
show ggsn quota-server	Displays quota server parameters or statistics about the message and error counts.

tariff-time

To specify that a charging profile use the tariff changes configured by using the **gprs charging tariff-time** global configuration command, use the **tariff-time** command in charging profile configuration mode. To return to the default value, use the **no** form of this command.

tariff-time

no tariff-time

Syntax Description   This command has no arguments or keywords.

Defaults   No tariff-time changes

Command Modes   Charging profile configuration.

Command History

Release	Modification
12.3(8)XU	This command was introduced.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines Use the **tariff-time** charging profile configuration command to specify that the time configured for tariff changes on the GGSN (using the **gprs charging tariff-time** global configuration command) apply to a charging profile created using the **gprs charging profile** global configuration or **charging profile** access point configuration commands.

Note With Cisco GGSN Release 9.2 and later, when an enhanced quota server interface is configured, the Cisco GGSN does not function as a quota server for service-aware postpaid users. Therefore, with Cisco IOS Release 12.2(22)YE2 and later, the **content** charging profile configuration commands are ignored as well as the charging profile configuration commands that configure trigger conditions for postpaid users not using an enhanced quota server interface.

For more information about configuring enhanced service-aware billing, see *Cisco GGSN Configuration Guide*.

Examples The following example specifies that tariff-changes apply to a charging profile:

```
charging profile 10
 tarrif-time
 exit
```

Related Commands..

Command	Description
category	Identifies the subscriber category to which a charging profile applies.s
cdr suppression	Specifies that CDRs be suppressed as a charging characteristic in a charging profile.
charging profile	Associates a default charging profile to an access point.
content dcca profile	Defines a DCCA client profile in a GGSN charging profile.
content postpaid time	Specifies for postpaid subscribers when service-aware billing is enabled, the time duration limit that when exceeded, causes the GGSN to collect upstream and downstream traffic byte counts and close and update the G-CDR for a particular PDP context.
content postpaid validity	Specifies for postpaid subscribers when service-aware billing is enabled, the amount of time quota granted to a postpaid subscriber is valid.
content postpaid volume	Specifies for postpaid subscribers when service-aware billing is enabled, the maximum number of bytes that the GGSN maintains across all containers for a particular PDP context before closing and updating the G-CDR.
content rulebase	Associates a default rule-base ID with a charging profile.
description (charging profile)	Specifies the name or a brief description of a charging profile.
gprs charging characteristics reject	Specifies that Create PDP Context requests for which no charging profile can be selected be rejected by the GGSN.
gprs charging container time-trigger	Specifies a global time limit that, when exceeded by a PDP context, causes the GGSN to close and update the G-CDR for that particular PDP context.
gprs charging profile	Creates a new charging profile (or modifies an existing one), and enters charging profile configuration mode.

Command	Description
limit duration	Specifies the time duration limit that when exceeded, causes the GGSN to collect upstream and downstream traffic byte counts and close and update the G-CDR for a particular PDP context.
limit sgsn-change	Specifies the maximum number of SGSN changes that can occur before closing and updating the G-CDR for a particular PDP context.
limit volume	Specifies the maximum number of bytes that the GGSN maintains across all containers for a particular PDP context before closing and updating the G-CDR.

tertiary (charging group)

To configure a tertiary charging gateway for a charging gateway group, use the **tertiary** command in charging group configuration mode. To delete the primary charging gateway configuration, use the **no** form of this command.

> **tertiary** {*ip-address* | *name*}

> **no tertiary** {*ip-address* | *name*}

Syntax Description

ip-address	IP address of a tertiary charging gateway.
name	Hostname of the tertiary charging gateway.

Defaults

No default behavior or values.

Command Modes

Charging group configuration

Command History

Release	Modification
12.4(22)YE	This command was introduced.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines

Use the **tertiary** command to configure a primary charging gateway for a charging gateway group.

A charging gateway that is used in any charging group or as a global default gateway cannot be reused for any other charging group at any level (primary, secondary, or tertiary).

Examples

The following example configures a tertiary charging gateway with "10.100.0.5" as the IP address in charging profile group 5:

```
Router(config)# gprs charging group 5
Router(config-chrg-group)# description groupA
Router(config-chrg-group)# primary 10.100.0.3
Router(config-chrg-group)# secondary 10.100.0.4
Router(config-chrg-group)# tertiary 10.100.0.5
```

Related Commands

Command	Description
description	Adds a description to a charging gateway group.
gprs charging group	Defines or modifies a charging gateway group.
iscsi	Configures an iSCSI target to use for CDR storage for a charging gateway group when no charging gateway defined in the group is available.
primary	Configures a primary charging gateway for a charging gateway group.
secondary	Configures a secondary charging gateway for a charging gateway group.
service-mode	Configures the service-mode state of a charging group.
show gprs charging statistics	Displays cumulative charging statistics for the GGSN.
show gprs charging summary	Displays a summary of all charging groups defined on the GGSN.
switchover priority	Configures the GGSN to switch to the gateway of higher priority in the charging gateway group when the gateway becomes active.

traffic-class

To allocate bandwidth from a bandwidth pool to a specific traffic class, use the **traffic-class** command in bandwidth pool configuration mode. To return to the default value, use the **no** form of this command.

> **traffic-class** *traffic-class-name* **[percent]** *value*

> **no traffic-class** *traffic-class-name* **[percent]** *value*

Syntax Description		
traffic-class-name	Specifies the traffic class for which you are allocating bandwidth. Valid values are conversational, streaming, interactive, or background.	
percent	(Optional) Specifies that the bandwidth be allocated as a percentage rather than absolute value.	
value	Specifies the bandwith in either a percentage (1 to 100% when used with the optional **percent** keyword), or absolute value in kilobits per second (0 to 4292967295). Note that the same unit (percentage or absolute value) must be used for all traffic classes.	

Defaults No bandwidth reservation is configured for any of the traffic classes, therefore, all PDPs are accepted.

Command Modes Bandwidth pool configuration

Command History	Release	Modification
	12.3(8)XU	This command was introduced.
	12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
	12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
	12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
	12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
	12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
	12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
	12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
	12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
	12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
	12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
	12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
	12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
	12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
	12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines Use the **traffic-class** bandwidth pool configuration command to allocate bandwidth to a specific traffic class.

✎ **Note** Before allocating the bandwidth in a bandwidth pool to a specific traffic class, the pool must be created using the **gprs qos bandwidth-pool** global configuration command.

The bandwidth can be allocated as a percentage or absolute value, however, the bandwidth unit must be consistent for all traffic classes (percentage and absolute value cannot be mixed within the same bandwidth pool).

If a traffic class is configured with 0 (absolute value) as the allocated bandwidth, the total bandwidth available for that traffic class is 0 kbps. Therefore, if a Create PDP Context request with that traffic class is received, it is rejected by the GGSN.

✎ **Note** Bandwidth reservation can be configured for real-time (conversational and streaming) and non real-time (interactive and background) class PDPs, however, bandwidth checking is performed only for real-time PDP contexts. All Create PDP Context requests for non real-time PDPs are allowed.

Examples The following example reserves 15% of the total available bandwidth to the Background class of PDPs:

```
traffic-class background percent 15%
```

Related Commands

Command	Description
bandwidth	Defines the total bandwidth, in kilobits per second, for a bandwidth pool. Valid values are 1 to 4292967295.
bandwidth-pool	Applies a bandwidth pool to an APN.
gprs qos bandwidth-pool	Creates or modifies a bandwidth pool.
traffic-class	Allocates bandwidth pool bandwidth to a specific traffic class.

trigger

To configure a condition that, when it occurs, triggers a DCCA client to request quota-reauthorization for a service-aware prepaid PDP context, use the **trigger** command in DCCA profile configuration mode. To remove the configuration, use the **no** form of this command.

trigger {plmn-change | qos-change | rat-change | sgsn-change | user-loc-info-change}

no trigger {plmn-change | qos-change | rat-change | sgsn-change | user-loc-info-change}

Syntax Description

plmn-change	Configures a public land mobile network (PLMN) ID change to trigger a quota-reauthorization request.
qos-change	Configures the DCCA client to request quota-reauthorization if a QoS changes should occur.
rat-change	Configures a radio access technology (RAT) change to trigger a quota-reauthorization request. The RAT indicates whether the SGSN serves the user equipment (UE) UMTS or GSM/EDGE RAN (GERAN).
sgsn-change	Configures the DCCA client to request quota-reauthorization if SGSN changes occur.
user-loc-info-change	Configures a user location change to trigger a quota-reauthorization request.

Defaults   No default behavior or values.

Command Modes   DCCA profile configuration

Command History

Release	Modification
12.3(14)YQ	This command was introduced.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG and the **rat-change** and **plmn-change** keyword options were added.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into the Cisco IOS Release 12.4(22)YE and the **user-loc-info-change** keyword option was added.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines Use the **trigger** command to configure changes that trigger the GGSN to request quota reauthorization for service-aware prepaid PDP contexts.

Modifying this command will not affect existing PDP contexts using a DCCA client.

When configuring triggers:

• The **trigger** command is supported by the generic DCCA client and 3GPP Gy-DCCA only.

• All triggers must be explicitly enabled for both prepaid and postpaid subscribers.

• Configured prepaid triggers apply to all of the services that flow through the PDP context. The triggers received for a given service from the OCS take precedence over the ones configure using the **trigger** command.

Examples The following configuration example configures several conditions in a DCCA profile, "dcca-profile1" for prepaid PDP contexts that, when the condition occurs, triggers quota reauthorization:

```
gprs dcca profile dcca-profile1
  tx-timeout 100
  ccfh continue
  authorization dcca-net
  destination-realm cisco.com
  trigger sgsn-change
  trigger qos-change
  trigger rat-change
  trigger plmn-change
  trigger user-loc-info-change
```

Related Commands .

Command	Description
authorization	Defines a method of authorization (AAA method list), in the DCCA client profile, that specifies the Diameter server groups.
ccfh	Configures the Credit Control Failure Handling (CCFH) AVP locally for a credit-control session when the Credit Control Answer (CCA) sent by the DCCA server does not contain CCFH value.
content dcca profile	Defines the DCCA client profile in a GGSN charging profile.
destination-realm	Configures the destination realm to be sent in CCR initial requests to a DCCA server.
gprs dcca profile	Defines a DCCA client profile on the GGSN and enters DCCA client profile configuration mode.
session-failover	Configures Credit Control Session Failover (CCSF) AVP support when a credit control answer (CCA) message from the DCCA server does not contain a value for the CCSF AVP.
tx-timeout	Configures a TX timeout value used by the DCCA client to monitor the communication of Credit Control Requests (CCRs) with a Diameter server.

tx-timeout

To configure a TX timeout value used by the DCCA client to monitor the communication of Credit Control Requests (CCRs) with a Diameter server, use the **tx-timeout** command in DCCA client profile configuration mode. To return to the default values, use the **no** form of this command

tx-timeout *value*

no tx-timeout

Syntax Description	*value*	Amount of time, in seconds, a CRR can wait for a response from the Diameter sever before the DCCA client takes action. Valid range is 0 to 1000 seconds.

Defaults 10 seconds.

Command Modes DCCA client profile configuration

Command History

Release	Modification
12.3(14)YQ	This command was introduced.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines Typically, the Diameter base detects transport failures that occur with a Diameter server. For prepaid services, the time it takes for a response from the network is crucial, therefore the DCCA client can be configured to react faster than the Diameter base if necessary.

The Tx timer is used by the DCCA client to supervise the communication with the Diameter server. The timer is started with each initial and updated CCR. If the time configured for the timer elapses, the DCCA client takes an action on the PDP context depending on the current value of the Credit Control Fault Handling (CCFH) AVP for the credit control (CC) session.

When a response to all pending CCRs is received, the Tx timer is stopped.

Examples   The following configuration example sets the Tx time for a DCCA client to 25 seconds:

```
gprs dcca profile dcca-profile1
  authorization dcca-method
  tx-timeout 25
```

Related Commands

Command	Description
authorization	Defines a method of authorization (AAA method list), in the DCCA client profile, that specifies the Diameter server groups.
ccfh	Configures the Credit Control Failure Handling (CCFH) AVP locally for a credit-control session when the Credit Control Answer (CCA) sent by the DCCA server does not contain CCFH value.
content dcca profile	Defines the DCCA client profile in a GGSN charging profile.
gprs dcca profile	Defines a DCCA client profile on the GGSN and enters DCCA client profile configuration mode.
session-failover	Configures Credit Control Session Failover (CCSF) AVP support when a credit control answer (CCA) message from the DCCA server does not contain a value for the CCSF AVP

virtual-address

To configure a virtual IP address to which a quota server sends all CSG requests, use the **virtual-address** command in CSG group configuration mode. To deconfigure the virtual IP address, use the **no** form of this command

> **virtual-address** *ip-address*

> **no virtual-address** *ip-address*

Syntax Description

ip-address	Virtual IP address of the CSG group.

Defaults   No default behavior or values.

Command Modes   CSG group configuration

Command History

Release	Modification
12.3(14)YQ	This command was introduced.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **virtual-address** to configure the virtual IP address of a CSG group.

The virtual IP address is the address to which the quota server will send all requests, and is required before a path between the quota server and the CSG can come up.

⚠
Caution   Issuing the **no** form of this command will bring down a quota server-to-CSG path if is up.

Examples   The following configuration example configures CSG group csg1 to use the virtual IP address 5.5.5.14:

```
ggsn csg-group csg1
  virtual-address 5.5.5.14
  port 4444
  real-address 5.1.1.1
  real-address 5.1.1.2
```

Related Commands

Command	Description
ggsn csg-group	Configures a CSG group on the GGSN for quota server-to-CSG communication.
port	Configures the port number on which the CSG listens for quota server traffic.
real-address	Configures the IP address of a real CSG for source checking on inbound messages from a CSG.
show ggsn csg	Displays the parameters used by the CSG group or the number of path and quota management messages sent and received by the quota server.

vrf

To configure VPN routing and forwarding (VRF) at a gateway GPRS support node (GGSN) access point and associate an access point with a particular VRF instance, use the **vrf** command in access point configuration mode.

vrf *vrf-name*

Syntax Description

vrf-name	Name of the corresponding VRF instance with which the access point is associated.

Defaults No default behavior or values.

Command Modes Access point configuration

Command History

Release	Modification
12.2(4)MX	This command was introduced.
12.2(8)YD	This command was integrated into Cisco IOS Release 12.2(8)YD.
12.2(8)YW	This command was integrated into Cisco IOS Release 12.2(8)YW
12.3(2)XB	This command was integrated into Cisco IOS Release 12.3(2)XB.
12.3(8)XU	This command was integrated into Cisco IOS Release 12.3(8)XU.
12.3(11)YJ	This command was integrated into Cisco IOS Release 12.3(11)YJ.
12.3(14)YQ	This command was integrated into Cisco IOS Release 12.3(14)YQ.
12.3(14)YU	This command was integrated into Cisco IOS Release 12.3(14)YU.
12.4(2)XB	This command was integrated into Cisco IOS Release 12.4(2)XB.
12.4(9)XG	This command was integrated into Cisco IOS Release 12.4(9)XG.
12.4(15)XQ	This command was integrated into Cisco IOS Release 12.4(15)XQ.
12.4(22)YE	This command was integrated into Cisco IOS Release 12.4(22)YE.
12.4(22)YE1	This command was integrated into Cisco IOS Release 12.4(22)YE1.
12.4(22)YE2	This command was integrated into Cisco IOS Release 12.4(22)YE2.
12.4(24)YE	This command was integrated into Cisco IOS Release 12.4(24)YE.
12.4(24)YE1	This command was integrated into Cisco IOS Release 12.4(24)YE1.
12.4(24)YE2	This command was integrated into Cisco IOS Release 12.4(24)YE2.
12.4(24)YE3	This command was integrated into Cisco IOS Release 12.4(24)YE3.
12.4(24)YE4	This command was integrated into Cisco IOS Release 12.4(24)YE4.

Usage Guidelines   Use the **vrf** command to configure VRF at a GGSN access point and associate an access point with a
particular VRF instance.

> **Note**   The **vrf** command configuration applies to IPv4 PDPs only.

> **Note**   With GGSN Release 5.0 and later, you can assign mutliple APNs to the same VRF.

> **Note**   Multiple VRFs can be associated with the same VRF instance.

The *vrf-name* should match the name configured in an **ip vrf** global configuration command, and also
the **ip vrf forwarding** command at the Gi interface.

To support VRF, you must also enable Cisco Express Forwarding (CEF) switching on the router using
the **ip cef** global configuration command.

If you are also configuring DHCP services at the APN, then you must also configure the **dhcp-server**
ip-address **vrf** command.

> **Note**   On the GGSN, VRF is not supported for IPv6 PDPs. Therefore, if an access point on which VRF is
> enabled is configured to support IPv6 PDPs (via the **ipv6** command), the IPv4 PDPs are routed in the
> VRF, but the IPv6 PDPs are routed in the global routing table.

> **Note**   Memory constraints might occur if you define a large number of access points to support VRF.

> **Note**   VRF is not supported on the Cisco 7600 MSFC2. Therefore, to support VRF on the Cisco 7600 series
> router platform when using the MSFC2, you must tunnel VRF encapsulated traffic through the
> supervisor engine via a GRE tunnel. For more information, see *Cisco GGSN Configuration Guide*.

Examples   The following example shows a VRF configuration for vpn3 (without tunneling) using the **ip vrf** global
configuration command. Because the **ip vrf** command establishes both VRF and CEF routing tables,
notice that **ip cef** also is configured at the global configuration level to enable CEF switching at all of
the interfaces.

The following other configuration elements must also associate the same VRF named vpn3:

- FastEthernet0/0 is configured as the Gi interface using the **ip vrf forwarding** interface configuration
  command.

- Access point 2 implements VRF using the **vrf** command access point configuration command.

The DHCP server at access point 2 also is configured to support VRF. Notice that access point 1 uses
the same DHCP server, but is not supporting the VRF address space. The IP addresses for access point 1
will apply to the global routing table:

```
aaa new-model
!
aaa group server radius abc
```

```
 server 10.2.3.4
 server 10.6.7.8
!
aaa authentication ppp abc group abc
aaa authorization network default group radius
aaa accounting exec default start-stop group abc
!
ip cef
!
ip vrf vpn3
 rd 300:3
!
interface Loopback1
 ip address 10.30.30.30 255.255.255.255
!
interface Loopback2
 ip vrf forwarding vpn3
 ip address 10.27.27.27 255.255.255.255
!
interface FastEthernet0/0
 ip vrf forwarding vpn3
 ip address 10.50.0.1 255.255.0.0
 duplex half
!
interface FastEthernet1/0
 ip address 10.70.0.1 255.255.0.0
 duplex half
!
interface loopback 1
 ip address 10.8.0.1 255.255.255.0
!
interface Virtual-Template1
 ip unnumber loopback 1
 encapsulation gtp
 gprs access-point-list gprs
!
ip route 10.10.0.1 255.255.255.255 Virtual-Template1
ip route vrf vpn3 10.100.0.5 255.255.255.0 fa0/0 10.50.0.2
ip route 10.200.0.5 255.255.255.0 fa1/0 10.70.0.2
!
no ip http server
!
gprs access-point-list gprs
 access-point 1
  access-point-name gprs.pdn.com
  ip-address-pool dhcp-proxy-client
  dhcp-server 10.200.0.5
  dhcp-gateway-address 10.30.30.30
  network-request-activation
  exit
  !
```

```
 access-point 2
  access-point-name gprs.pdn2.com
  access-mode non-transparent
  ip-address-pool dhcp-proxy-client
  dhcp-server 10.100.0.5 10.100.0.6 vrf
  dhcp-gateway-address 10.27.27.27
  aaa-group authentication abc
  vrf vpn3
  exit
!
gprs default ip-address-pool dhcp-proxy-client
!
radius-server host 10.2.3.4 auth-port 1645 acct-port 1646 non-standard
radius-server host 10.6.7.8 auth-port 1645 acct-port 1646 non-standard
radius-server key ggsntel
```

Related Commands	Command	Description
	dhcp-server	Specifies a primary (and backup) DHCP server to allocate IP addresses to MS users entering a particular PDN access point.
	ip cef	Enables CEF on the RP card.
	ip vrf	Configures a VRF routing table.
	ip vrf forwarding	Associates a VRF with an interface or subinterface.
	rd	Creates routing and forwarding tables for a VRF and and specifies the default route distinguisher for a VPN.