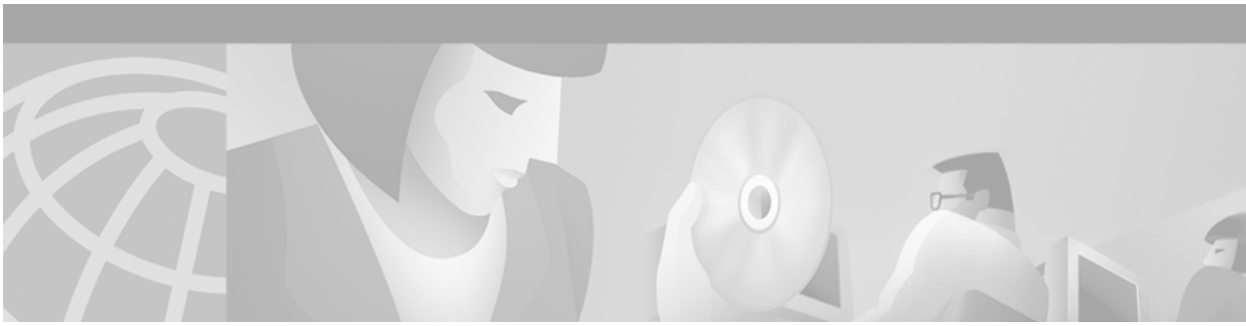

Mobile Wireless Commands

This book documents all of the Cisco IOS software commands for the mobile wireless technologies in alphabetical order. To locate the group of commands documented for a particular technology area, such as General Packet Radio Service (GPRS), see the chapter, "GPRS GGSN Command Set".

access-mode

To specify whether the GGSN requests user authentication at the access point to a PDN, use the **access-mode** access-point configuration command. To remove an access mode, use the **no** form of the command.

access-mode {**transparent** | **non-transparent**}

no access-mode {**transparent** | **non-transparent**}

Syntax Description

transparent	Specifies that the users who access the PDN through the access point associated with the current virtual template are allowed access without authorization or authentication.
non-transparent	Specifies that users who access the PDN through the current virtual template must be authenticated by the GGSN acting as a proxy for the authentication.

Defaults

transparent

Command Modes

Access-point configuration

Command History

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

Usage Guidelines

Use the **access-mode** command to specify whether users accessing a PDN through a particular access point associated with the virtual template interface have transparent or non-transparent access to the network.

Transparent access means that users who access the PDN through the current virtual template are granted access without further authentication.

Non-transparent access means that users who access the PDN through the current virtual template must be authenticated by the GGSN. You must configure non-transparent access to support RADIUS services at an access point.

Examples

The following example specifies non-transparent access to the PDN through an access point associated with a specified virtual template:

```
interface virtual-template 1
 gprs access-point-list abc
!
gprs access-point-list abc
 access-point 1
  access-point-name gprs.pdn.com
  access-mode non-transparent
```

Related Commands

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

access-point

To specify an access point number and enter access-point configuration mode, use the **access-point** access-point list configuration command. To delete an access point number, use the **no** form of the command.

access-point *ap_number*

no access-point *ap_number*

Syntax Description

ap_number	Integer from 0 to 4,294,967,295 (2^{32}-1) that identifies a GPRS access point.

Defaults

No default behavior or values.

Command Modes

Access-point list configuration

Command History

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

Usage Guidelines

Use the **access-point** command to create an access point to a PDN.

You can specify access point numbers in any sequence.

Note Memory and performance issues might occur if you define a large number of access points.

Examples

The following example configures an access point with an index number of 7 in an access-point-list named “abc” on the GGSN:

```
gprs access-point-list abc
 access-point 7
```

Related Commands

Command	Description
access-point-name	Specifies the network (or domain) name for a PDN that users can access from the GGSN at a defined access point.

access-point-name

To specify the network (or domain) name for a PDN that users can access from the GGSN at a defined access point, use the **access-point-name** access-point configuration command. To delete a current access point name, use the **no** form of the command.

access-point-name *apn_name*

no access-point-name *apn_name*

Syntax Description

apn_name	Specifies the network or domain name for a private data network that can be accessed through the current access point.

Defaults

There is no default value for this command.

Command Modes

Access-point configuration

Command History

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

Usage Guidelines

Use the **access-point-name** command to specify the PDN name of a network that can be accessed through a particular access point. An access-point name is mandatory for each access point.

To configure an access point, first set up an access-point list using the **gprs access-point-list** command and then add the access point to the access-point list.

The access-point name typically is the domain name of the service provider that users access, for example, acme.com.

Examples

The following example specifies the access-point name for a network:

```
access-point 1
 access-point-name acme.com
 exit
```

Related Commands

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

access-violation

To specify the action to take when a user attempts unauthorized access to a PDN through an access point, use the **access-violation** access-point configuration command. To restore the default value for the command, use the **no** form of the command.

access-violation {**discard-packets** | **deactivate-pdp-context**}

no access-violation {**discard-packets** | **deactivate-pdp-context**}

Syntax Description

discard-packets	Specifies that user packets are discarded when an unauthorized access attempt is detected.
deactivate-pdp-context	Specifies that the user's session is ended when an unauthorized access attempt is detected.

Defaults

discard-packets

Command Modes

Access-point configuration

Command History

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

Usage Guidelines

Use the **access-violation** command to specify the action that is taken if a user attempts unauthorized access through the specified access point. The default keyword, **discard-packets**, specifies that the GGSN simply drops user packets when an unauthorized access is attempted. If you specify **deactivate-pdp-context**, the user's session is terminated when unauthorized access is attempted.

Examples

The following example shows deactivation of a user's access:

```
access-point 1
 access-point-name acme.com
 ip-access-group 101 in
 access-violation deactivate-pdp-context
 exit
```

Related Commands

Command	Description
access-point-name	Specifies the network (or domain) name for a PDN that users can access from the GGSN at a defined access point.

clear gprs charging cdr

To clear GPRS call detail records (CDRs), use the **clear gprs charging cdr** privileged EXEC configuration command.

clear gprs charging cdr {**tid** *tunnel-id* | **access-point** *access-point-index* | **all**}

Syntax Description

tid *tunnel-id*	Tunnel ID of the connection for which to clear charging CDRs.
access-point *access-point-index*	Specifies clearing the CDRs for a specified access-point index.
all	Specifies clearing all CDRs 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(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

Usage Guidelines

Use the **clear gprs charging cdr** command to clear the CDRs for one or more PDP contexts.

The **clear gprs charging cdr** command is normally used before disabling the charging function.

To clear CDRs by tunnel ID (TID), first enter the **show gprs gtp pdp-context all** command to obtain a list of the currently active PDP contexts (mobile sessions). Then issue the **clear gprs charging cdr** command with the **tid** keyword and the tunnel ID for which you want to clear the CDRs.

To clear CDRs by access point, first issue the **show gprs access-point** command to obtain a list of the access points, and then issue the **clear gprs charging cdr** command. When you clear CDRs for a TID, an access point, or for all access points, charging data records for the specified TID or access point(s) are sent immediately to the charging gateway.

When you issue this command, the following things occur:

- The GGSN no longer sends charging data that has been accumulated for the PDP context to the charging gateway.
- The GGSN closes the current CDRs for the specified PDP contexts.
- The GGSN no longer generates CDRs for existing PDP contexts.

Examples

The following example shows how to clear CDRs by tunnel ID:

```
router# show gprs gtp pdp-context all

TID              MS_ADDR        dynamic?         GGSN_addr      APN
1111111111111111  2.0.0.1       0               1.1.1.1         gprs.somewhere.com
3333333333333331  10.10.10.30   1               1.1.1.1         gprs.somewhere.com
4444444444444441  60.0.0.4      1               1.1.1.1         xyz.com
5555555555555551  2.0.0.51      0               1.1.1.1         gprs.somewhere.com
)
router# clear gprs gtp charging cdr tid 4444444444444441
```

The following example shows how to clear CDRs for the access-point 1:

```
router# clear gprs charging cdr access-point 1
```

Related Commands

Command	Description
show gprs access-point	Displays information about an access point.
show gprs charging statistics	Displays current statistics about the transfer of charging packets between the GGSN and charging gateways.

clear gprs gtp pdp-context

To clear one or more PDP contexts (mobile sessions), use the **clear gprs gtp pdp-context** privileged EXEC configuration command.

clear gprs gtp pdp-context {**tid** *tunnel-id* | **imsi** *imsi_value* | **path** *ip-address* | **access-point** *access-point-index* | **all**}

Syntax Description

tid *tunnel-id*	Tunnel ID (TID) for which PDP contexts are to be cleared.
imsi *imsi_value*	International Mobile Subscriber Identity (IMSI) value for which PDP contexts are to be cleared.
path *ip-address*	Remote GSN IP address for which all PDP contexts associated with the GSN are to be cleared.
access-point *access-point-index*	Access-point index for which PDP contexts are to be cleared.
all	Clear all currently active PDP contexts.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

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

Usage Guidelines

Use the **clear gprs gtp pdp-context** command to clear one or more PDP contexts (mobile sessions). Use this command when operator intervention is required for administrative reasons—for example, when there are bad user sessions or the system must be taken down for maintenance.

After PDP contexts are cleared, users accessing the PDN through the specified TID, IMSI, path, or access point are disconnected.

To clear PDP contexts by tunnel ID, first enter the **show pdp-context** command to obtain a list of the currently active PDP contexts (mobile sessions). Then issue the **clear gprs gtp pdp-context** command with the **tid** keyword and the tunnel ID for which you want to clear the user sessions.

To clear PDP contexts by access point, first issue the **show gprs access-point** command to obtain a list of the access points, and then issue the **clear gprs gtp pdp-context** command.

If you know the IMSI of the PDP context, enter **clear gprs gtp pdp-context** and the IMSI of the connected user to clear the PDP context.

Examples

The following example shows how to clear PDP contexts by tunnel ID:

```
router# show gprs gtp pdp-context all

TID              MS_ADDR        dynamic?         SGSN_addr      APN

1111111111111111  2.0.0.1       0               1.1.1.1         gprs.somewhere.com
3333333333333331  10.10.10.30   1               1.1.1.1         gprs.somewhere.com
4444444444444441  60.0.0.4      1               1.1.1.1         xyz.com
5555555555555551  2.0.0.51      0               1.1.1.1         gprs.somewhere.com
8888888888888881  10.10.10.31   1               1.1.1.1         gprs.somewhere.com

router# clear gprs gtp pdp-context tid 5555555555555551
```

The following example shows how to clear PDP contexts for GPRS access-point 1:

```
router# clear gprs gtp pdp-context access-point 1
```

clear gprs gtp statistics

To clear the current GPRS GTP statistics, use the **clear gprs gtp statistics** privileged EXEC configuration command.

clear 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(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

Usage Guidelines

Use the **clear gprs gtp statistics** command to clear the current GPRS GTP statistics. This command clears the counters that are displayed by the **show gprs gtp statistics** command; however, it does not clear the counters that are displayed by the **show gprs gtp status** command.

Examples

The following example clears the GPRS GTP statistics:

```
router# clear gprs gtp statistics
```

dhcp-gateway-address

To specify the address returned by the DHCP server in DHCP requests for MS users entering a particular PDN access point, use the **dhcp-gateway-address** access-point configuration command. To restore the default setting for the command (to use the virtual template interface address), use the **no** form of the command.

dhcp-gateway-address *ip-address*

no dhcp-gateway-address *ip-address*

Syntax Description

ip-address	The IP address of the DHCP gateway to be used in DHCP requests for users who connect through the specified access point.

Defaults

The default value for this command is **no dhcp-gateway-address**. When you use the default, the system uses the virtual template interface address as the DHCP gateway address.

Command Modes

Access-point configuration

Command History

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

Usage Guidelines

Use the **dhcp-gateway-address** command to specify the address returned by the DHCP server in DHCP requests for MS users entering a particular PDN access point. The gateway address is the giaddr field that is passed in DHCP messages between the GGSN and the DHCP server.

If you do not specify a DHCP gateway address, the address assigned to the virtual template is used.

Examples

The following example specifies an IP address of the DHCP gateway:

```
access-point 2
 access-point-name xyz.com
 dhcp-server 60.0.0.1
 dhcp-gateway-address 60.0.0.1
 exit
```

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.
gprs default ip-address-pool	Specifies a dynamic address allocation method using IP address pools for the GGSN.
ip-address-pool	Specifies a dynamic address allocation method using IP address pools for the current access point.

dhcp-server

To specify a primary (and backup) DHCP server to allocate IP addresses to MS users entering a particular PDN access point, use the **dhcp-server** access-point configuration command. To delete the DHCP server from the access-point configuration, use the **no** form of the command.

dhcp-server {*ip-address* | *name*} [*ip-address* | *name*]

no dhcp-server {*ip-address* | *name*} [*ip-address* | *name*]

Syntax Description

ip-address	IP address of a DHCP server. The first *ip_address* argument specifies the IP address of the primary DHCP server. The second (optional) *ip_address* argument specifies the IP address of a backup DHCP server.
name	Host name of a DHCP server. The second (optional) *name* argument specifies the host name of a backup DHCP server.

Defaults

No default behavior or values.

Command Modes

Access-point configuration

Command History

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

Usage Guidelines

To configure DHCP on the router, you must first use the **ip address-pool** global configuration command.

If you use the **ip-address-pool** access-point configuration command to specify a DHCP proxy client for mobile station users who access the PDN through the current access point, then you must use the **dhcp-server** command to specify a DHCP server.

You can use the *ip-address* argument to specify the IP address of the DHCP server. Or, if the server has a host name associated with its IP address (through Domain Name Service configuration), you can use the *name* argument to specify the host name.

The optional second set of arguments can be used to specify the name or IP address of a backup DHCP server to be used in the event that the primary DHCP server is unavailable. If you do not specify a backup DHCP server, then no backup DHCP server is available.

The DHCP server can be specified in two ways:

- At the global configuration level, using the **gprs default dhcp-server** command.
- At the access-point configuration level, using the **dhcp-server** command.

If you specify a DHCP server at the access-point level using the **dhcp-server** command, then the server address specified at the access point overrides the address specified at the global level. If you do not specify a DHCP server address at the access-point level, then the address specified at the global level is used.

Therefore, you can have a global address setting and also one or more local access-point level settings if you need to use different DHCP servers for different access points.

Examples

The following example specifies a DHCP server to be used to allocate IP addresses to mobile station users:

```
access-point 2
 access-point-name xyz.com
 dhcp-server 60.0.0.1 60.0.0.2
 dhcp-gateway-address 60.0.0.1
 exit
```

Related Commands

Command	Description
dhcp-gateway-address	Specifies the address returned by the DHCP server in DHCP requests for MS users entering a particular PDN access point.
ip-address-pool	Specifies a dynamic address allocation method using IP address pools for the current access point.

encapsulation gtp

To specify the GPRS tunneling protocol (GTP) as the encapsulation type for packets transmitted over the virtual template interface, use the **encapsulation gtp** interface configuration command. To delete this encapsulation type, use the **no** form of the command.

encapsulation gtp

no encapsulation gtp

Syntax Description

This command has no arguments or keywords.

Defaults

PPP encapsulation

Command Modes

Interface configuration

Command History

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

Usage Guidelines

Use the **encapsulation gtp** command to specify the GTP as the encapsulation type for a virtual template. This is a mandatory setting for both the GGSN and the SGSN.

Examples

The following example specifies the GPRS tunneling protocol (GTP) as the encapsulation type:

```
interface virtual-template 1
 ip address 10.10.10.1 255.255.255.0
 no ip directed-broadcast
 encapsulation gtp
```

gprs access-point-list

To configure an access point list that you use to define PDN access points on the GGSN, use the **gprs access-point-list** global configuration command. To delete an existing access-point list, use the **no** form of the command.

gprs access-point-list *list_name*

no gprs access-point-list *list_name*

Syntax Description

list_name	The name of the access-point list.

Defaults

No access-point list is defined.

Command Modes

Global configuration

Command History

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

Usage Guidelines

Use the **gprs access-point-list** command to configure an access list that you use to define PDN access points on the GGSN. Currently, only one access list can be defined per virtual template.

Examples

The following example sets up an access list that is used to define two GPRS access points:

```
! Virtual Template configuration
interface virtual-template 1
 ip address 100.10.10.1 255.255.255.0
 no ip directed-broadcast
 encapsulation gtp
 gprs access-point-list abc
!
!
! Access point list configuration
gprs access-point-list abc
 access-point 1
  access-point-name gprs.somewhere.com
  exit
!
 access-point 2
  access-point-name xyz.com
  exit
```

Related Commands

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

gprs canonical-qos best-effort bandwidth-factor

To specify the bandwidth factor to be applied to the canonical best-effort Quality of Service (QoS) class, use the **gprs canonical-qos best-effort bandwidth-factor** global configuration command. To restore the default value for this command, use the **no** form of the command.

gprs canonical-qos best-effort bandwidth-factor *bandwidth_factor*

no gprs canonical-qos best-effort bandwidth-factor *bandwidth_factor*

Syntax Description

bandwidth_factor	Integer from 1 to 4000000 that specifies the desired bandwidth factor (in bits per second). The default is 10 bits per second.

Defaults

10 bits per second

Command Modes

Global configuration

Command History

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

Usage Guidelines

The **canonical qos best-effort bandwidth-factor** command specifies an average bandwidth that is assumed to be consumed by best-effort QoS class mobile sessions. The default value (10 bps) was chosen arbitrarily. If the users accessing the GGSN are observed using a higher average bandwidth, increase the bandwidth value.

Examples

The following example shows a bandwidth factor of 20:

```
gprs canonical-qos best-effort bandwidth-factor 20
```

Related Commands

Command	Description
gprs canonical-qos gsn-resource-factor	Specifies a value that is used by the GGSN to calculate the QoS level provided to mobile users.

gprs canonical-qos gsn-resource-factor

To specify a value that is used by the GGSN to calculate the QoS level provided to mobile users, use the **gprs canonical-qos gsn-resource-factor** global configuration command. To restore the default value of the command, use the **no** form of the command.

gprs canonical-qos gsn-resource-factor *resource-factor*

no gprs canonical-qos gsn-resource-factor *resource-factor*

Syntax Description

resource-factor	Integer between 1 and 4294967295 representing an amount of resource that the GGSN calculates internally for canonical QoS processing. The default value is 1048576.

Defaults

1048576

Command Modes

Global configuration

CommandHistory

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

Usage Guidelines

The default value for this command was chosen arbitrarily. If a greater throughput is required for GPRS user data, increase the resource factor value. However, selecting a high value may result in exceeding the actual processing capacity of the GGSN.

Examples

The following example shows a resource factor of 1572864:

```
gprs canonical-qos gsn-resource-factor 1572864
```

Related Commands

Command	Description
gprs canonical-qos best-effort bandwidth-factor	Specifies the bandwidth factor to be applied to the canonical best-effort, QoS class.

gprs canonical-qos map tos

To specify a QoS mapping from the canonical QoS classes to an IP type of service (ToS) category, use the **gprs canonical-qos map tos** global configuration command. To remove a QoS mapping, use the **no** form of the command.

gprs canonical-qos map tos [**premium** *tos_value* [**normal** *tos_value* [**best-effort** *tos_value*]]]

no gprs canonical-qos map tos [**premium** *tos_value* [**normal** *tos_value* [**best-effort** *tos_value*]]]

Syntax Description

premium *tos_value*	ToS mapping for a premium QoS. The *tos_value* can be a number from 0 to 5. A higher number indicates a higher service priority.
normal *tos_value*	ToS mapping for a normal QoS. The *tos_value* can be a number from 0 to 5. A higher number indicates a higher service priority.
best-effort *tos_value*	ToS mapping for a best effort QoS. The *tos_value* can be a number from 0 to 5. A higher number indicates a higher service priority.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

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

Usage Guidelines

Use the **gprs canonical-qos map tos** command to specify a mapping between various QoS categories and the ToS precedence bits in the IP header for packets transmitted over the Gn interface (GTP tunnels).

All the keyword arguments for the command are optional. However, if you specify a value for the **normal** argument, you must specify a value for the **premium** argument. And if you specify a value with the **best-effort** argument, then you must specify a value for both the **premium** and the **normal** arguments.

When a request for a user session comes in (a PDP context activation request), the router determines whether the requested QoS for the session packets can be handled based on the maximum packet handling capability of the GGSN. Based on this determination, one of the following occurs:

- If the requested QoS can be provided, then it is maintained.
- If the requested QoS cannot be provided, then the QoS for the requested session is either lowered, or the session is rejected.

Examples

The following example specifies a QoS mapping from the canonical QoS classes to a premium ToS category of five, a normal ToS category of three, and a best-effort ToS category of two:

```
gprs canonical-qos map tos premium 5 normal 3 best-effort 2
```

Related Commands

Command	Description
gprs canonical-qos best-effort bandwidth-factor	Specifies the bandwidth factor to be applied to the canonical best-effort QoS class.
gprs canonical-qos gsn-resource-factor	Specifies a value that is used by the GGSN to calculate the QoS level provided to mobile users.
gprs canonical-qos premium mean-throughput-deviation	Specifies a mean throughput deviation factor that the GGSN uses to calculate the allowable data throughput for QoS.
gprs qos map canonical-qos	Enables mapping of GPRS QoS categories to a canonical QoS method that includes best effort, normal, and premium QoS classes.

gprs canonical-qos premium mean-throughput-deviation

To specify a mean throughput deviation factor that the GGSN uses to calculate the allowable data throughput for QoS, use the **gprs canonical-qos premium mean-throughput-deviation** global configuration command. To restore the default value for the command (100), use the **no** form of the command.

gprs canonical-qos premium mean-throughput-deviation *deviation_factor*

no gprs canonical-qos premium mean-throughput-deviation *deviation_factor*

Syntax Description

deviation_factor	Value that specifies the deviation factor. This value can range from 1 to 1000. The default value is 100.

Defaults

100

Command Modes

Global configuration

Command History

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

Usage Guidelines

The **gprs canonical-qos premium mean-throughput-deviation** command is used by the GGSN to calculate a mean throughput value that is used to determine the amount of data throughput used for a premium QoS. The calculation is made based on the following formula, which includes the input deviation factor:

EB = Min[p, m + a (p - m)]

Where

EB = the effective bandwidth
p = peak throughput from the GPRS QoS profile in PDP context requests
m = mean throughput from the GPRS QoS profile in PDP context requests
a = the deviation factor divided by 1000 (a/1000)

Examples

The following example shows a mean throughput of 1000:

```
gprs canonical-qos premium mean-throughput-deviation 1000
```

Related Commands

Command	Description
gprs canonical-qos best-effort bandwidth-factor	Specifies the bandwidth factor to be applied to the canonical best-effort QoS class.
gprs canonical-qos gsn-resource-factor	Specifies a value that is used by the GGSN to calculate the QoS level provided to mobile users.
gprs canonical-qos map tos	Specifies a QoS mapping from the canonical QoS classes to an IP ToS category.
gprs charging map data tos	Specifies an IP ToS mapping for GPRS charging packets.