

# gprs fastswitch

To enable the GPRS fast switching feature on the GGSN, use the **gprs fastswitch** command. To disable fast switching, use the **no** form of the command.

**gprs fastswitch**

**no gprs fastswitch**

**Syntax Description** This command has no arguments or keywords.

**Defaults** GPRS fast switching is disabled.

**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 **gprs fastswitch** command to enable the GPRS fast switching feature. This feature implements a fast switching packet cache and fast switching functions that enable faster processing of user packets transmitted using the user datagram protocol (UDP), significantly increasing the performance of the GGSN.



**Note**

If you enable fast switching for the GTP protocol or for a virtual template (using the **gprs fastswitch** command), be sure to enable fast switching on each physical interface that a mobile station uses to access the GTP or the virtual template.

To enable fast switching on a physical interface, use the **ip route-cache** command.

Note also that if you enable fast switching on an SGSN, you should enable fast switching on the GGSNs with which the SGSN communicates.

**Examples** The following example shows how to enable fast switching:

```
gprs fastswitch
```

Related Commands	Command	Description
	<b>ip route-cache</b>	Enables fast switching on a physical interface.

## gprs gtp error-indication throttle

To specify the maximum number of error indication messages that the GGSN sends out in one second, use the **gprs gtp error-indication throttle** command. To restore the default value (no error indication throttle is used), use the **no** form of the command (GGSN only).

**gprs gtp error-indication throttle window-size** *size*

**no gprs gtp error-indication throttle**

<b>Syntax Description</b>	<b>window-size</b> <i>size</i> Counter that is decremented when an error indication message is sent and reset to the configured value after one second, with a value between 0 and 256.
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<b>Defaults</b>	Error indication throttling is disabled.
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<b>Command Modes</b>	Global configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.1(1)GA	This command was introduced.
	12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

<b>Usage Guidelines</b>	<p>Use the <b>gprs gtp error-indication throttle</b> command to specify the maximum number of error indication messages that are sent by the GGSN in one second. This provides a way to implement flow control for transmission of GTP error messages.</p> <p>If you do not issue the command, error indication throttling is not enabled. To restore the default value (error indication throttling is disabled) use the <b>no</b> form of the command.</p>
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<b>Examples</b>	<p>The following example shows a throttle value of 150:</p> <pre>gprs gtp error-indication throttle window-size 150</pre>
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# gprs gtp map signalling tos

To specify an IP ToS mapping for GPRS tunneling protocol (GTP) signaling packets, use the **gprs gtp map signalling tos** global configuration command. To restore the default value for the command (5) use the **no** form of the command.

```
gprs gtp map signalling tos tos_value
```

```
no gprs gtp map signalling tos tos_value
```

<b>Syntax Description</b>	<i>tos_value</i>	Value between 0 and 7 that specifies the IP ToS mapping. The default value is 5.
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<b>Defaults</b>	ToS value 5
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<b>Command Modes</b>	Global configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.1(1)GA	This command was introduced.
	12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

<b>Usage Guidelines</b>	Use the <b>gprs gtp map signalling tos</b> command to specify the IP ToS mapping for GTP signaling packets transmitted by the GGSN. The higher the value, the higher the class of service provided to the packets.
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<b>Examples</b>	The following example specifies a IP ToS mapping value of 3: <pre>gprs gtp map signalling tos 3</pre>
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<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<a href="#">gprs canonical-qos map tos</a>	Specifies a QoS mapping from the canonical QoS classes to an IP ToS category.
	<a href="#">gprs charging container volume-threshold</a>	Specifies the maximum number of bytes that the GGSN maintains in a user's charging container before closing the charging container and updating the CDR.
	<a href="#">gprs charging map data tos</a>	Specifies an IP ToS mapping for GPRS charging data packets.
	<a href="#">gprs charging packet-queue-size</a>	Specifies the maximum number of unacknowledged charging data transfer requests that the GGSN maintains in its queue.
	<a href="#">gprs charging transfer interval</a>	Specifies the number of seconds that the GGSN waits before it transfers charging data to the charging gateway.

## gprs gtp n3-buffer-size

To specify the size of the receive buffer that the GGSN uses to receive GTP signaling messages and packets sent through the tunneling protocol, use the **gprs gtp n3-buffer-size** global configuration command. To restore the default value for the N3 buffer, use the **no** form of the command.

**gprs gtp n3-buffer-size** *bytes*

**no gprs gtp n3-buffer-size**

<b>Syntax Description</b>	<i>bytes</i>	Value between 2048 and 65535 that specifies the size of the N3 buffer, in bytes. The default is 8192 bytes.
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<b>Defaults</b>	8192 bytes
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<b>Command Modes</b>	Global configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	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 gtp n3-buffer-size** command to specify the size of the GTP N3 buffer on the GGSN. The N3 buffer is a receive buffer that the GGSN uses to receive GTP signaling messages and packets sent through the tunneling protocol. The recommended value for the N3 buffer size is 8192 (the default size).

**Examples** The following example specifies a buffer size of 2084 bytes:

```
gprs gtp n3-buffer-size 2084
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<a href="#">gprs gtp n3-requests</a>	Specifies the maximum number of times that the GGSN attempts to send a signaling request.

## gprs gtp n3-requests

To specify the maximum number of times that the GGSN attempts to send a signaling request, use the **gprs gtp n3-requests** global configuration command. To restore the default value (5 request attempts), use the **no** form of the command.

**gprs gtp n3-requests** *requests*

**no gprs gtp n3-requests** *requests*

<b>Syntax Description</b>	<i>requests</i>	A number between 1 and 65535 that specifies the number of times a request is attempted. The default is 5 requests.
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<b>Defaults</b>	5 requests
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<b>Command Modes</b>	Global configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.1(1)GA	This command was introduced.
	12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

<b>Usage Guidelines</b>	Use the <b>gprs gtp n3-requests</b> command to specify the number of times that the GGSN attempts to send a signaling request. The recommended value is 5 requests (the default).
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<b>Examples</b>	The following example shows the GGSN attempting to send a signaling request 3 times: <pre>gprs gtp n3-requests 3</pre>
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<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<a href="#">gprs gtp n3-buffer-size</a>	Specifies the size of the receive buffer that the GGSN uses to receive GTP signaling messages and packets sent through the tunneling protocol.

# gprs gtp path-echo-interval

To specify the number of seconds that the GGSN waits before sending an echo-request message to check for GTP path failure, use the **gprs gtp path-echo-interval** global configuration command. To restore the default value for the path echo interval (60 seconds), use the **no** form of the command.

**gprs gtp path-echo-interval** *interval*

**no gprs gtp path-echo-interval** *interval*

<b>Syntax Description</b>	<i>interval</i>	Number of seconds that the GGSN waits before sending an echo-request message. Specify a value between 60 and 65535 seconds. The value 0 disables the echo-request feature. The default is 60 seconds.
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<b>Defaults</b>	60 seconds
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<b>Command Modes</b>	Global configuration mode
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	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 gtp path-echo-interval** command to specify the interval that the GGSN waits before sending an echo-request message to check for GTP path failure.



**Note**

A value of 0 seconds disables the echo-request feature.

**Examples** The following example shows the GGSN waiting 90 seconds before sending an echo-request message:

```
gprs gtp path echo-interval 90
```

## gprs gtp t3-response

To specify the maximum time that the GGSN waits to respond to a signaling request message, use the **gprs gtp t3-response** global configuration command. To restore the default value for the response interval (1 second), use the **no** form of the command.

**gprs gtp t3-response** *response\_interval*

**no gprs gtp t3-response** *response\_interval*

<b>Syntax Description</b>	<i>response_interval</i> A value between 1 and 65535 that specifies the length of the T3 response interval, in seconds. The default is 1 second.
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<b>Defaults</b>	1 second
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<b>Command Modes</b>	Global configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.1(1)GA	This command was introduced.
	12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

<b>Usage Guidelines</b>	Use the <b>gprs gtp t3-response</b> command to specify the maximum time that the GGSN waits to respond to a signaling request message.
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<b>Examples</b>	The following example shows a T3 interval response interval of 524 seconds:
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```
gprs gtp t3-response 524
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<a href="#">gprs gtp t3-tunnel</a>	Specifies the length of time that the GGSN waits, after receiving a GTP context request message from the SGSN, before forwarding a protocol data unit (PDU) to the requesting SGSN.

## gprs gtp t3-tunnel

To specify the length of time that the GGSN waits, after receiving a GTP context request message from the SGSN and before forwarding a protocol data unit (PDU) to the requesting SGSN, use the **gprs gtp t3-tunnel** global configuration command. To restore the default value for the command (20 seconds), use the **no** form of the command.

**gprs gtp t3-tunnel** *seconds*

**no gprs gtp t3-tunnel** *seconds*

<b>Syntax Description</b>	<i>seconds</i>	A value between 1 and 65535 that specifies the interval the GGSN waits before forwarding a PDU to a requesting SGSN. The default is 20 seconds.
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<b>Defaults</b>	20 seconds
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<b>Command Modes</b>	Global configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.1(1)GA	This command was introduced.
	12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

<b>Usage Guidelines</b>	Use the <b>gprs gtp t3-tunnel</b> command to specify the interval for which a GGSN waits to forward a PDU to a requesting SGSN. The recommended value is 20 seconds.
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<b>Examples</b>	The following example shows GGSN waiting 60 seconds before forwarding a PDU to a requesting SGSN:
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```
gprs gtp t3-tunnel 60
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<a href="#">gprs gtp t3-response</a>	Specifies the maximum time that the GGSN waits to respond to a signaling request message.

# gprs idle-pdp-context purge-timer

To specify the time that the GGSN waits before purging idle mobile sessions, use the **gprs idle-pdp-context purge-timer** global configuration command. To restore the default value for the command (72 hours), use the **no** form of the command.

**gprs idle-pdp-context purge-timer** *hours*

**no gprs idle-pdp-context purge-timer** *hours*

<b>Syntax Description</b>	<i>hours</i>	Value between 0 and 255 that specifies the number of hours that the GGSN waits before purging idle sessions. The value 0 disables the purge timer. The default is 72 hours.
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<b>Defaults</b>	72 hours
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<b>Command Modes</b>	Global configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.1(1)GA	This command was introduced.
	12.1(3)T	This command was integrated in Cisco IOS Release 12.1(3)T.

<b>Usage Guidelines</b>	To specify the time that the GGSN waits before purging idle mobile sessions, use the <b>gprs idle-pdp-context purge-timer</b> command. To disable this feature, specify a purge-timer value of 0.
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<b>Examples</b>	The following example specifies that the GGSN wait for 60 hours before purging idle sessions: <pre>gprs idle-pdp-context purge-timer 60</pre>
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# gprs maximum-pdp-context-allowed

To specify the maximum number of PDP contexts (mobile sessions) that can be activated on the GGSN, use the **gprs maximum-pdp-context-allowed** global configuration command. To restore the default value for the command (1000 PDP contexts), use the **no** form of the command.

**gprs maximum-pdp-context-allowed** *pdp\_contexts*

**no gprs maximum-pdp-context-allowed** *pdp\_contexts*

<b>Syntax Description</b>	<i>pdp_contexts</i>	Integer between 1 and 4296967295 that specifies the number of active PDP contexts allowed. The default is 1000 PDP contexts.
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<b>Defaults</b>	1000 PDP contexts
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<b>Command Modes</b>	Global configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	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 maximum-pdp-context-allowed** command to specify the maximum number of PDP contexts allowed on the GGSN. When the maximum allowable number of PDP contexts is reached, the GGSN refuses new PDP contexts (mobile sessions) until sessions are available.



**Note**

The practical upper limit for the maximum number of PDP contexts depends on the router platform that you are using and the amount of memory available on the router.

**Examples** In the following example 10000 PDP contexts are allowed on the GGSN:

```
gprs maximum-pdp-context-allowed 10000
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<a href="#">gprs idle-pdp-context</a> <a href="#">purge-timer</a>	Specifies the time that the GGSN waits before purging idle mobile sessions.

# gprs qos default-response requested

To configure the GGSN to set its default QoS values in the response message exactly as requested in the create PDP context request message, use the **gprs qos default-response requested** global configuration command. To return the GGSN to its QoS default of best-effort, use the **no** form of this command.

**gprs qos default-response requested**

**no gprs qos default-response requested**

**Syntax Description** This command has no arguments or keywords.

**Defaults** Disabled. The GGSN sets its QoS default to the best-effort class.

**Command Modes** Global configuration

Command History	Release	Modification
	12.2(2)	This command was introduced.

**Usage Guidelines** The **gprs qos default-response requested** command is only useful when canonical QoS is not configured on the GGSN. Canonical QoS is enabled using the **gprs qos map canonical-qos** command. When canonical QoS is not enabled, and the **gprs qos default-response requested** command has not been configured on the GGSN, the GGSN always sets its QoS values to best-effort in the response message.

**Examples** The following example enables the GGSN to set its QoS values in the response message according to the QoS values requested in the create PDP context request message:

```
gprs qos default-response requested
```

Related Commands	Command	Description
	<a href="#">gprs qos map canonical-qos</a>	Enables mapping of GPRS QoS categories to a canonical QoS method that includes best-effort, normal, and premium QoS classes.

# gprs qos map canonical-qos

To enable mapping of GPRS QoS categories to a canonical QoS method that includes best-effort, normal, and premium QoS classes, use the **gprs qos map canonical-qos** global configuration command. To disable this mapping, use the **no** form of the command.

**gprs qos map canonical-qos**

**no gprs qos map canonical-qos**

**Syntax Description** This command has no arguments or keywords.

**Defaults** Canonical QoS mapping is disabled.

**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 qos map canonical-qos** command to map GPRS QoS into the following canonical categories: best effort, normal, and premium.

**Examples** The following example shows canonical QoS mapping enabled:

```
gprs qos map canonical-qos
```

Related Commands	Command	Description
	<a href="#">gprs canonical-qos</a> <a href="#">gsn-resource-factor</a>	Specifies a value that is used by the GGSN to calculate the QoS level provided to mobile users.
	<a href="#">gprs canonical-qos map tos</a>	Specifies a QoS mapping from the canonical QoS classes to an IP ToS category.
	<a href="#">gprs canonical-qos premium</a> <a href="#">mean-throughput-deviation</a>	Specifies a mean throughput deviation factor that the GGSN uses to calculate the allowable data throughput for QoS.

## gprs radius msisdn first-byte

To specify that the first byte of the Mobile Stations International PSTN/ISDN (MSISDN) information element (IE) is included in a Remote Access Dial-In User Service (RADIUS) request, use the **gprs radius msisdn first-byte** global configuration command. To remove the first byte from the MSISDN IE in a RADIUS request, use the **no** form of the command.

**gprs radius msisdn first-byte**

**no gprs radius msisdn first-byte**

**Syntax Description** This command has no arguments or keywords.

**Defaults** The first byte is not included.

**Command Modes** Global configuration

Command History	Release	Modification
	12.2(1)	This command was introduced.

**Usage Guidelines** Use the **gprs radius msisdn first-byte** command when configuring RADIUS security on the GGSN. The first octet of an MSISDN IE using E.164 addressing is 91 in hexadecimal, that is 10010001. In this 91 code, the 1 is the extension bit, 001 is the international number, and 0001 indicates E.164 numbering.

**Examples** The following example specifies that the first byte of the MSISDN IE is included in a RADIUS request:

```
gprs radius msisdn first-byte
```

Related Commands	Command	Description
	<a href="#">gprs default radius-server</a>	Specifies a primary (and backup) RADIUS server that the GGSN uses to authenticate mobile users for access to PDNs.
	<a href="#">radius-server</a>	Specifies a primary (and backup) RADIUS server that the GGSN uses at a particular access point to authenticate mobile users for access to a PDN.

# ip-access-group

To specify access permissions between an MS and a PDN through the GGSN at a particular access point, use the **ip-access-group** access-point configuration command. To disable the input access list, use the **no** form of the command.

**ip-access-group** *access\_list\_number* {**in** | **out**}

**no ip-access-group** *access\_list\_number* {**in** | **out**}

## Syntax Description

<i>access_list_number</i>	Number of an access list that has been set up using the <b>access-list</b> command.
<b>in</b>	The specified access list controls access from the PDN to the mobile station.
<b>out</b>	The specified access list controls access from the mobile station to the PDN.

## Defaults

No access list is enforced.

## 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 **ip-access-group** command to specify an access list that indicates whether users are given or denied permission to access the mobile station from the PDN through the GGSN using a specified access point.

## Examples

The following example grants access-list 101 inbound access to the mobile station from the PDN through the GGSN:

```
access-list 101 permit ip 2.0.0.0 0.255.255.255 any
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
!
gprs access-point-list abc
 access-point 1
  access-point-name gprs.somewhere.com
  dhcp-server 99.100.0.3
  ip-access-group 101 in
  exit
!
```

# ip-address-pool

To specify a dynamic address allocation method using IP address pools for the current access point, use the **ip-address-pool** access-point configuration command. To restore the default value (to use the globally defined address-allocation method, which is set using the **gprs default ip-address-pool** command), use the **no** form of the command.

**ip-address-pool** { **dhcp-proxy-client** | **radius-client** | **disable** }

**no ip-address-pool** { **dhcp-proxy-client** | **radius-client** | **disable** }

## Syntax Description

<b>dhcp-proxy-client</b>	The access-point IP address pool is allocated using a DHCP server.
<b>radius-client</b>	The access-point IP address pool is allocated using a RADIUS server.
<b>disable</b>	Disables dynamic address allocation for this access point.

## Defaults

The global setting specified with the **gprs default ip-address-pool** command is used. The default value for the global configuration command is that IP address pools are disabled.

## 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

You can specify an IP allocation method for an access point in two ways:

- Enter access-point configuration mode and use the **ip address-pool** command to specify an IP address allocation method for the current access point.
- Specify a global value for the IP address pool by issuing the **gprs default ip-address-pool** command. In that case, you do not need to specify an address-pool method for the specific access point.

If you specify **dhcp-proxy-client** as the method for allocating IP addresses, then you must configure a DHCP server for IP address allocation. You can do this at the global configuration level using the **gprs default-dhcp server** command, or at the access point level using the **dhcp-server** command.

If you specify **radius-client** as the method for allocating IP addresses, then you must configure a RADIUS server for IP address allocation. You can do this at the global configuration level using the **gprs default radius-server** command, or at the access point level using the **radius-server** command.

**Examples**

The following example sets up DHCP as the IP address pool allocation method for access-point 1 and specifies that the other access points use the global default, which is specified as RADIUS.

```
gprs default ip-address-pool radius-client
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
!
gprs access-point-list abc
 access-point 1
  access-point-name gprs.everywhere.com
  ip address-pool dhcp-proxy-client
  dhcp-server 99.100.0.3
  exit
!
 access-point 2
  access-point-name xyz.com
  access-mode non-transparent
  radius-server 99.100.0.2
  exit
!
 access-point 3
  access-point-name www.acme.com
  access-mode non-transparent
  radius-server 99.100.0.2
  exit
```

**Related Commands**

Command	Description
<a href="#">dhcp-server</a>	Specifies a primary (and backup) DHCP server to allocate IP addresses to MS users entering a particular PDN access point.
<a href="#">gprs default dhcp-server</a>	Specifies a default DHCP server from which the GGSN obtains IP address leases for mobile users.
<a href="#">gprs default ip-address-pool</a>	Specifies a dynamic address allocation method using IP address pools for the GGSN.
<a href="#">gprs default radius-server</a>	Specifies a primary (and backup) RADIUS server that the GGSN uses to authenticate mobile users for access to PDNs.
<a href="#">radius-server</a>	Specifies a primary (and backup) RADIUS server that the GGSN uses at a particular access point to authenticate mobile users for access to a PDN.

# msisdn suppression

To specify that the GGSN overrides the mobile station integrated services digital network (MSISDN) number with a pre-configured value in its authentication requests to a RADIUS server, use the **msisdn suppression** access point configuration command. To enable the GGSN to send the MSISDN number in authentication requests to a RADIUS server, use the **no** form of the command.

**msisdn suppression** [*value*]

**no msisdn suppression** [*value*]

<b>Syntax Description</b>	<i>value</i>	(Optional) String (up to 20 characters long) that the GGSN sends in place of the MSISDN number in authentication requests to a RADIUS server. Valid characters for the string are any of those accepted by the MSISDN encoding specifications, including the integers 0–9, and characters a, b, c, *, and #. The default value is that no string is sent.
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<b>Defaults</b>	The MSISDN number is suppressed, and no ID string is sent to the RADIUS server in place of the MSISDN number.
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<b>Command Modes</b>	Access point configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.2(2)	This command was introduced.

<b>Usage Guidelines</b>	Certain countries have privacy laws which prohibit service providers from identifying the MSISDN number of mobile stations in authentication requests. Use the <b>msisdn suppression</b> command to specify a value that the GGSN sends in place of the MSISDN number in its authentication requests to a RADIUS server. If no value is configured, then no number is sent to the RADIUS server.
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To use the **msisdn suppression** command, you must configure a RADIUS server either globally or at the access point and specify non-transparent access mode.

<b>Examples</b>	The following example will override the MSISDN ID sent in the create request and will not send any ID to the RADIUS server:
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```
gprs access-point-list abc
  access-point 1
    radius-server 192.168.1.1
    access-mode non-transparent
    msisdn suppression
```

Related Commands	Command	Description
	<a href="#">access-mode</a>	Specifies whether the GGSN requests user authentication at the access point to a PDN.
	<a href="#">radius-server</a>	Specifies a primary (and backup) RADIUS server that the GGSN uses at a particular access point to authenticate mobile users for access to a PDN.

# protocol-type

To specify the protocol type for the current access point, use the **protocol-type** access-point configuration command.

**protocol-type ip**

**no protocol-type ip**

Syntax Description	ip	Specifies that the access point will use the IP protocol
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Defaults	IP
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Command Modes	Access-point configuration
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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 only protocol type supported is IP. This is enabled by default. Since the X.25 protocol is not being implemented in the GSM standards, this command is no longer relevant.
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Examples	The following example shows IP protocol is chosen: <pre>protocol-type ip</pre>
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# radius-server

To specify a primary (and backup) RADIUS server that the GGSN uses at a particular access point to authenticate mobile users for access to a PDN, use the **radius-server** access-point configuration command. To delete the RADIUS server identification, use the **no** form of the command.

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

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

## Syntax Description

<i>ip-address</i>	IP address of a RADIUS server. The first IP address is the name of the primary RADIUS server. The second (optional) <i>ip-address</i> argument specifies the IP address of a backup RADIUS server.
<i>name</i>	Host name of a RADIUS server. The second (optional) <i>name</i> argument specifies the host name of a backup RADIUS 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

You can specify a RADIUS server that the GGSN uses at a particular access point to authenticate mobile users for access to a PDN in two ways:

- Enter access-point configuration mode and use the **radius-server** command to specify a RADIUS server for the current access point.
- Specify a global value for the RADIUS server using the **gprs default radius-server** command. In this case, you do not need to specify a RADIUS server for the specific access point.

The optional second set of arguments specifies the name, or IP address, of a backup RADIUS server to use if the primary RADIUS server is unavailable. If you do not specify a backup RADIUS server, then there is not a backup available if the primary server fails.

You must specify a RADIUS server either at the global configuration level or at the access-point configuration level if you have specified **radius-client** as the method for maintaining an IP address pool using the **gprs default ip-address-pool** command, or at the access-point level using the **ip-address-pool** command. The RADIUS server is used for authentication of mobile station users; if the GGSN is used as a RADIUS client, it is used to authenticate users.

**Examples**

The following example specifies a RADIUS server for access-point 3:

```
access-point 3
 access-point-name www.acme.com
 ip-address-pool radius-client
 access-mode non-transparent
 radius-server 99.100.0.2 99.100.0.3
 exit
```

**Related Commands**

Command	Description
<a href="#">gprs default ip-address-pool</a>	Specifies a dynamic address allocation method using IP address pools for the GGSN.
<a href="#">gprs default radius-server</a>	Specifies a primary (and backup) RADIUS server that the GGSN uses to authenticate mobile users for access to PDNs.
<a href="#">ip-address-pool</a>	Specifies a dynamic address allocation method for the current access point.

# service gprs

To specify the type of GPRS support node that is enabled on the router, use the **service gprs** command. To disable GPRS support node functionality, use the **no** form of the command.

```
service gprs {sgsn-datacom | ggsn}
```

```
no service gprs {sgsn-datacom | ggsn}
```

Syntax Description	sgsn-datacom	sgsn-datacom
		Specifies that the router will function as a Serving GPRS Support Node (SGSN) datacom unit.
	ggsn	Specifies that the router will function as a Gateway GPRS Support Node (GGSN).

**Defaults** SGSN

**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 **service gprs** command to specify the type of GPRS support node that will be maintained on the router.

**Examples** The following example configures the GPRS support node as a GGSN:

```
service gprs ggsn
```