

MobileNext Broadband Gateway

GPRS Tunneling Protocol (GTP) for GGSN/PDN Gateway



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MobileNext Broadband Gateway GPRS Tunneling Protocol (GTP) for GGSN/PDN Gateway

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- Documentation Feedback on page xiii
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Documentation and Release Notes

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <http://www.juniper.net/techpubs/>.

If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

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Supported Platforms

For the features described in this document, the following platforms are supported:

- MX240 Routers
- MX960 Routers
- MX480 Routers

Documentation Conventions

Table 1 on page xii defines notice icons used in this guide.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.

Table 2 on page xii defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: user@host> configure
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces important new terms. Identifies book names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos OS System Basics Configuration Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; interface names; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Enclose optional keywords or variables.	stub <default-metric <i>metric</i> >;

Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast <i>(string1 string2 string3)</i>
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Enclose a variable for which you can substitute one or more values.	community name members [community-ids]
Indentation and braces ({ })	Identify a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop address; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> In the Logical Interfaces box, select All Interfaces. To cancel the configuration, click Cancel.
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web selections.	In the configuration editor hierarchy, select Protocols>Ospf .

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>. If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release version (if applicable)

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or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf> .
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/> .
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- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://www.juniper.net/alerts/>
- Join and participate in the Juniper Networks Community Forum: <http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://tools.juniper.net/SerialNumberEntitlementSearch/>

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/> .
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see <http://www.juniper.net/support/requesting-support.html> .

PART 1

Overview

- [GTP Overview on page 3](#)
- [Path and Tunnel Management Overview on page 11](#)

CHAPTER 1

GTP Overview

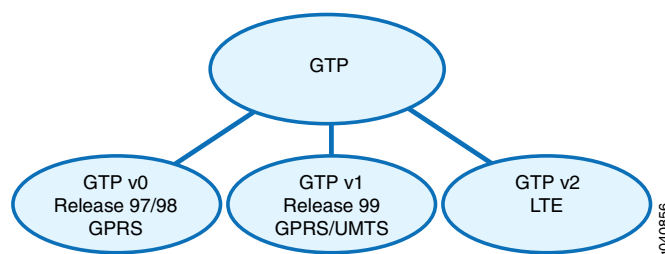
- [GTP Versions and GPRS Interfaces Overview on page 3](#)
- [GPRS Tunneling Protocol \(GTP\) Overview on page 5](#)
- [Restart Counters Overview on page 5](#)
- [Understanding CSID Signaling on page 6](#)
- [Configuring GTP Services Overview on page 7](#)

GTP Versions and GPRS Interfaces Overview

The General Packet Radio Service (GPRS) tunneling protocol (GTP) is used to tunnel GTP packets through 3G and 4G networks. A MobileNext Broadband Gateway configured as a gateway GPRS support node (GGSN), Packet Data Network Gateway (P-GW), or GGSN/P-GW automatically selects the appropriate GTP version based on the capabilities of the serving GPRS support node (SGSN) or Serving Gateway (S-GW) to which it is connected.

[Figure 1 on page 3](#) shows the GTP versions that the broadband gateway supports.

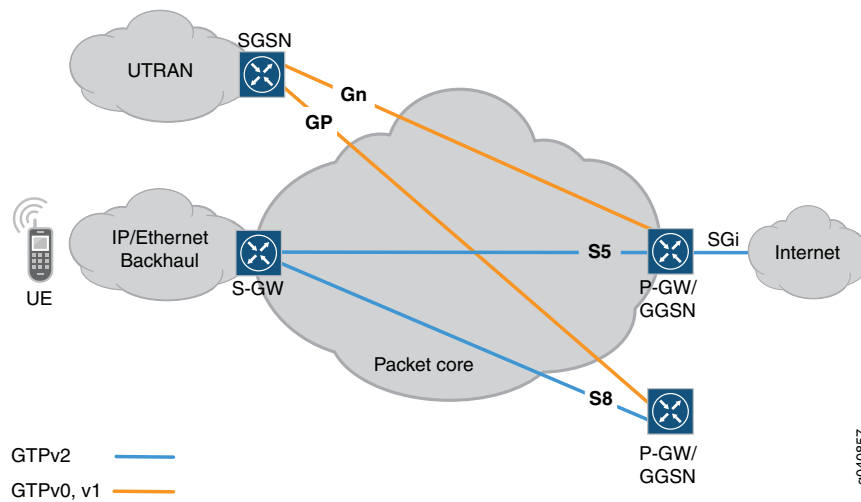
Figure 1: GTP Versions Supported on a MobileNext Broadband Gateway



GTP is the primary protocol used in a GPRS core network and allows users in a 3G or 4G network to move from one location to another while remaining connected to the Internet as if from one location at the GGSN or P-GW by carrying user traffic from the user's current SGSN or S-GW to the GGSN or P-GW that handles the user's session.

[Figure 2 on page 4](#) shows the GTP-C versions the broadband gateway supports for the 3G and 4G network interfaces.

Figure 2: GTP-C Versions Supported for 3G/4G Network Interfaces



For 3G networks, a broadband gateway uses GTP v0, or GTPv1, or both to transport GTP packets on the GPRS interfaces:

- Gn—The Gn interface is the connection between an SGSN and a GGSN within the same public land mobile network (PLMN).
- Gp—The Gp interface is the connection between two PLMNs.



NOTE: GTPv1 is used for both GTP-C and GTP-U. The GTPv1-C protocol runs on UDP port 2123. The GTPv1-U protocol runs on UDP port 2152.

For 4G networks, a broadband gateway uses GTP v2 to transport GTP packets on the GPRS interfaces:

- S5—The S5 interface is the connection between an S-GW and a P-GW within the same PLMN.
- S8—The S8 interface is the connection between two PLMNs.



NOTE: The GTPv2 protocol is a control-only protocol and runs on UDP port 2123.

Related Documentation

- [GPRS Tunneling Protocol \(GTP\) Overview on page 5](#)
- [GTP Tunnel Management Overview on page 15](#)
- [Configuring General GTP Service on the S-GW](#)

GPRS Tunneling Protocol (GTP) Overview

The GPRS Tunneling Protocol (GTP) is the tunneling protocol defined by the 3GPP standards to carry General Packet Radio Service (GPRS) within 3G/4G networks.

GTP is used to establish a GTP tunnel, for user equipment, between a Serving Gateway (S-GW) and Packet Data Network Gateway (P-GW), and an S-GW and Mobility Management Entity (MME). A GTP tunnel is a channel between two GPRS support nodes through which two hosts exchange data. The S-GW receives packets from the user equipment and encapsulates them within a GTP header before forwarding them to the P-GW through the GTP tunnel. When the P-GW receives the packets, it decapsulates them and forwards them to the external host.

GTP comprises the following separate protocols:

- GTP-C— Performs signaling between the S-GW and P-GW in the core GPRS network to activate and deactivate subscriber sessions, adjust the quality of service parameters, or update sessions for roaming subscribers who have arrived from another S-GW. GTP-C supports transport of control packets in IPv4 format.
- GTP-U— Transports user data within the core GPRS network and between the Radio Access Network (RAN) and the core network. GTP-U supports IPv4 and IPv6 user data, but transport is IPv4.

Related Documentation

- [Configuring GTP Services Overview on page 7](#)
- [GTP Path Management Overview on page 11](#)
- [GTP Tunnel Management Overview on page 15](#)
- [Configuring General GTP Service on the S-GW](#)

Restart Counters Overview

The MobileNext Broadband Gateway configured as a P-GW includes the P-GW restart counter (IE) in all GTPv2 messages that it sends to peers. The broadband gateway also receives the S-GW restart counters in GTPv2 messages from the S-GW.

A broadband gateway configured as a P-GW increments the restart counter each time the P-GW is restarted. A broadband gateway receives the peer restart count from the recovery IE in the following GTP-C messages:

- Echo request
- Echo response
- Bearer/PDP context create
- Update messages

A broadband gateway identifies a peer restart by comparing the locally stored peer restart event with the most recent restart count that is received from a peer. If the broadband

gateway detects that a peer has restarted by comparing the previously received restart count with the currently received restart count, the broadband gateway deletes all the subscriber sessions associated with the down peer.

- Related Documentation**
- [Configuring GTP Services Overview on page 7](#)
 - [GTP Path Management Overview on page 11](#)
 - [GTP Tunnel Management Overview on page 15](#)
 - [Configuring General GTP Service on the S-GW](#)

Understanding CSID Signaling

A Connection Set Identifier (CSID) identifies a group of subscribers and is used during recovery procedures or, when recovery is not possible, to inform peer nodes when a partial failure occurs on the Serving Gateway (S-GW) or Packet Data Network Gateway (P-GW). A *partial failure* is a hardware or software failure that affects a significant number of (but not all) Packet Data Network (PDN) connections. CSIDs are supported on GTPv2 interfaces only.

The CSID can represent a large number of PDN connections within a node (S-GW, P-GW). Each node maintains a local mapping of a CSID to its internal resources. When one or more of those local resources fail, GTPv2 Connection Set Delete request messages send one or more corresponding fully qualified CSIDs to the peer nodes. A fully qualified CSID (FQ-CSID) is the combination of the node identity and the CSID that the node assigns, which together globally identify a set of PDN connections.

A CSID provides notifications based on a set of PDN connections. When the node needs to delete the PDN connections identified by a CSID, the P-GW or S-GW sends a single message to its peers, rather than sending a separate message for each PDN connection. For example, if the S-GW wants to delete a set of PDN connections identified by a CSID, it sends one PDN delete message with FQ-CSID IE (with the value set to CSID) to all connected P-GWs. The receiving P-GWs then delete the PDN connections associated with the received CSID.

- Related Documentation**
- [GPRS Tunneling Protocol \(GTP\) Overview on page 5](#)
 - [GTP Path Management Overview on page 11](#)
 - [GTP Tunnel Management Overview on page 15](#)
 - [Understanding Tunnel Endpoint Identifiers on page 19](#)
 - [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services Overview

You can configure GPRS tunneling protocol (GTP) services on a MobileNext Broadband Gateway that is configured as a gateway GPRS support node (GGSN), Packet Data Network Gateway (P-GW), or GGSN/P-GW. At minimum, to configure a broadband gateway requires that you specify a loopback address on which GTP packets for the 3GPP interfaces are received. When configured as a GGSN, a broadband gateway uses only the Gn and Gp interfaces. When configured as a P-GW, a broadband gateway uses only S5 and S8 interfaces. When configured as a GGSN/P-GW, the broadband gateway uses all these 3GPP interfaces: Gn, Gp, S5, and S8.

This topic covers the following:

- [GTP-C and GTP-U Path Management on page 7](#)
- [Configuring GTP Services at Different Levels on a Broadband Gateway on page 7](#)
- [GTP Services Default Settings on page 8](#)
- [GTP Version Support on page 9](#)

GTP-C and GTP-U Path Management

When you configure a Broadband Gateway, you can specify that GTP-C packets and GTP-U packets are received on different loopback addresses. GTP packets for a GTP-C peer address handle control packets, and GTP packets for a GTP-U peer address handle user (data) packets. Each peer in the GTP path is marked a GTP-C peer or a GTP-U peer, or both.

Configuring GTP Services at Different Levels on a Broadband Gateway

When you configure a broadband gateway as a GGSN, P-GW, or GGSN/P-GW, GTP services can be configured at the following levels:

- Gateway—The mobile gateway appears as a single address, which comprises a loopback interface/IP address pair, and all GTP packets for the broadband gateway are received on this loopback address.



NOTE: To specify a single loopback address on which all GTP packets (GTP-C and GTP-U) are received, the Gn, Gp, S5, and S8 interfaces must be configured in the same VRF routing instance.

- Control plane—GTP-C control (signaling) packets are received on a loopback address.

- Data plane—GTP-U data packets are received on a loopback address.
- 3GPP interface—GTP packets transported on the following 3G and 4G interfaces are received on a loopback address:
 - Gn interface—GTP packets on the Gn interface (3G) are received on a single loopback address. Optionally, GTP control or GTP user packets that are transported on the Gn interface also can be received on separate loopback addresses.
 - Gp interface—GTP packets are received on the Gp interface (3G). Optionally, GTP control or user packets that are transported on the Gp interface also can be received on separate loopback addresses.
 - S5 interface—GTP packets are received on the S5 interface (4G). Optionally, GTP control or user packets that are transported on the S5 interface also can be received on separate loopback addresses.
 - S8 interface—GTP packets are received on the S8 interface (4G). Optionally, GTP control or user packets that are transported on the S8 interface also can be received on separate loopback addresses.

If the Gn, Gp, S5, and S8 interfaces for the broadband gateway are each configured in a different Virtual Routing and Forwarding (VRF) routing instance, you must configure GTP services for each interface separately. In this case, each interface (Gn, Gp, S5, and S8) must specify a different loopback interface. In addition, the IP address (that you specify for each loopback interface) must be the same in each VRF because the GTP-C, Mobility Management Entity (MME), and Home Subscriber Server (HSS) applications are not VRF aware and a mobile device could attach from anywhere.

GTP Services Default Settings

To configure GTP services with all default settings on a P-GW, you can simply configure the loopback address on which GTP packets are received without explicitly configuring any other GTP statements. The GTP defaults configuration is automatically configured on the broadband gateway at the level that you specify the loopback address. For example, the following configuration statement shows a minimum but complete configuration for enabling GTP services on a P-GW:

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp]
user@host# set interface lo0.0 v4-address 10.10.10.1
```



NOTE: If no address is specified for the interface, the broadband gateway uses the default interface IP address, which is configured under interface configuration.

When you do not explicitly configure path management options for GTP services, the broadband gateway uses the defaults, as described in [“GTP Path Management Overview” on page 11](#).

When you do not explicitly configure tunnel management options for GTP services, the broadband gateway uses the defaults, as described in [“GTP Tunnel Management Overview” on page 15](#).

GTP Version Support

When you configure GTP services on the Broadband Gateway, the type of gateway you configure determines the GTP versions that the broadband gateway supports:

- A broadband gateway configured as a GGSN supports GTPv0 and GTPv1 packets
- A broadband gateway configured as a P-GW supports GTPv2 packets
- A broadband gateway configured as a GGSN/P-GW supports GTPv0, GTPv1, and GTPv2 packets

Related Documentation

- [GPRS Tunneling Protocol \(GTP\) Overview on page 5](#)
- [GTP Path Management Overview on page 11](#)
- [GTP Tunnel Management Overview on page 15](#)
- [Configuring General GTP Service on the S-GW](#)

CHAPTER 2

Path and Tunnel Management Overview

- [GTP Path Management Overview on page 11](#)
- [Understanding Path Management on page 13](#)
- [GTP Tunnel Management Overview on page 15](#)
- [Understanding Tunnel Management on page 16](#)
- [Restart Counters Overview on page 18](#)
- [Understanding Tunnel Endpoint Identifiers on page 19](#)

GTP Path Management Overview

A GPRS tunneling protocol (GTP) path is active only when both the Packet Data Network Gateway (P-GW) and Serving Gateway (S-GW) are active. The MobileNext Broadband Gateway performs the following functions to check that a peer is active:

- If path management is enabled, the broadband gateway sends periodic echo requests to all peers identified in the peer information table.
- When an echo-request message is received from a peer, the broadband gateway sends an echo-response message.
- If a peer does not respond after a specified number of echo requests, the peer is declared down and all subscriber sessions with the peer are brought down

This topic covers:

- [Default Path Management Configuration on page 11](#)
- [GTP Version Support for Echo Requests and Echo Responses on page 12](#)

Default Path Management Configuration

When you configure a broadband gateway as a P-GW without explicitly configuring path management, the following options are automatically enabled with their default values:

- **echo-n3-requests**—Specifies the maximum number of times that the gateway attempts to send a echo-request message. The default is 8 times.
- **echo-t3-response**—Specifies the number of seconds that the gateway waits for a response from a peer gateway before sending the next echo-request message. The default is 15 seconds.

- **echo-interval**—Specifies the number of seconds that the gateway waits before resending a signaling-request message after a response to an echo request is received. The default is 60 seconds.

While an echo response from the peer is pending, the broadband gateway does not send new echo requests even if the path management **echo-interval** elapses. This would occur if echo-t3/echo-n3 is greater than the echo interval and the peer does not respond to the echo request.



NOTE: The echo-interval timer functions independently from the echo-n3-requests/echo-t3-response timer.

- **path-management**—Specifies whether path management is enabled or disabled on the broadband gateway. By default, control path management is enabled and data path management is disabled.



NOTE: If path-management is disabled, the broadband gateway does continue to send echo-response messages to peer-initiated echo-request messages.

GTP Version Support for Echo Requests and Echo Responses

Echo messages are sent to the peer using the GTP version that the peer supports. A broadband gateway configured as a GGSN, P-GW, or GGSN/P-GW supports sending echo replies to GTPv0, GTPv1, and GTPv2 echo requests from a peer SGSN or S-GW.

Related Documentation

- [Configuring GTP Services Overview on page 7](#)
- [GTP Tunnel Management Overview on page 15](#)
- [Understanding Tunnel Endpoint Identifiers on page 19](#)
- [Configuring General GTP Service on the S-GW](#)

Understanding Path Management

For a GTP path to be active, the Packet Data Network Gateway (P-GW) and its peer Serving Gateway (S-GW) must be active. To determine that a peer gateway is active, the P-GW exchanges echo-request and echo-response messages. The exchange of the echo-request and echo-response messages between a MobileNext Broadband Gateway and an S-GW allows for quick detection if a GTP path failure occurs.

An echo-request sequence begins when the broadband gateway (P-GW) sends an echo-request message to the S-GW and ends when the S-GW sends a corresponding echo-response message back to the broadband gateway. Path failure occurs when the broadband gateway does not receive a response after a certain number of retries, and all subscriber sessions associated with the down peer are deleted.

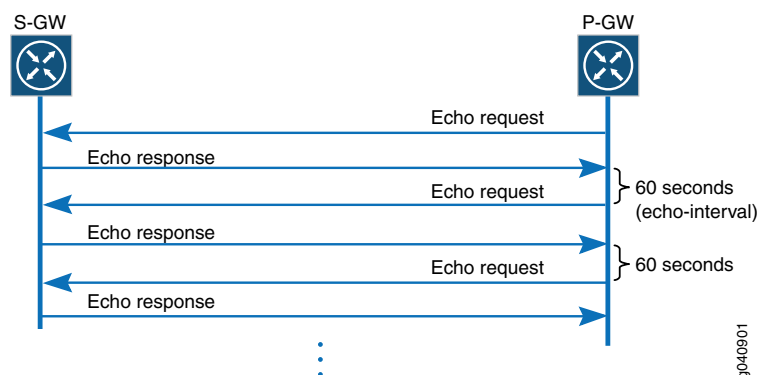
This topic includes the following sections:

- [Successful Echo-Request Sequence for Path Management on page 13](#)
- [Failed Echo Request Sequence for Path Management on page 14](#)

Successful Echo-Request Sequence for Path Management

In a successful echo-request sequence, the broadband gateway sends an echo-request message to the S-GW and the S-GW sends a corresponding echo-response message back to the broadband gateway, within the configured **echo-n3-requests** and **echo-t3-response** time. [Figure 3 on page 13](#) shows a successful echo-request sequence, in which the P-GW receives an echo response for each echo request.

Figure 3: Successful Echo-Request Sequence for Path Management



The following steps describe the echo request/response sequence in [Figure 3 on page 13](#):

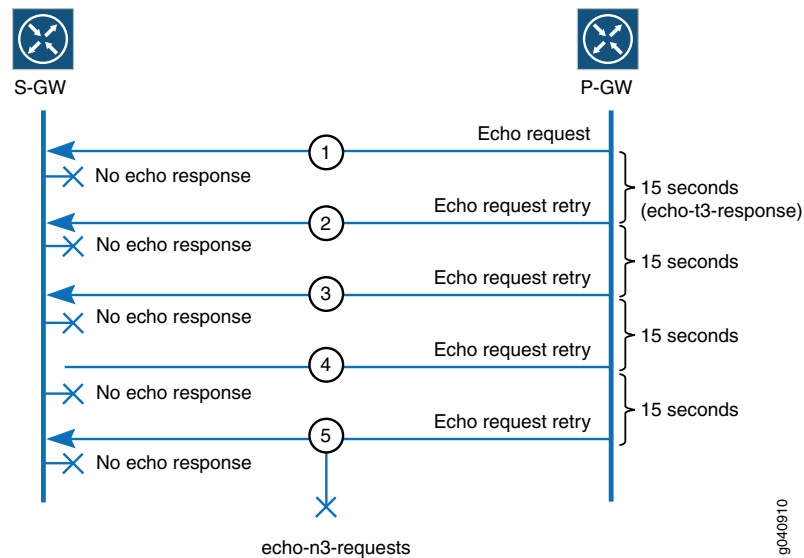
1. An echo request is sent, and the P-GW receives an echo response within the specified **echo-t3-response** time.
2. The P-GW waits for the configured echo-interval (or default echo-interval of 60 seconds) before sending another echo request, and the P-GW receives an echo response within the specified **echo-t3-response** time.

3. The P-GW waits for the configured echo-interval (or default echo-interval of 60 seconds) before sending another echo request, and the P-GW receives an echo response within the specified **echo-t3-response** time.

Failed Echo Request Sequence for Path Management

If, after sending a specified number of echo-request messages to the S-GW, the broadband gateway fails to receive a corresponding echo-response message from the S-GW, the GTP path is determined to be down. [Figure 4 on page 14](#) shows a failed echo-request and response sequence in which the P-GW does not receive an echo response within the configured number of **echo-n3-requests** (5 requests) and default **echo-t3-response** time (15 seconds).

Figure 4: Failed Echo-Request Sequence for Path Management



The following steps describe the echo-request and echo-response sequence in [Figure 4 on page 14](#):

1. The first echo request is sent, but the P-GW does not receive an echo response from the peer within the configured **echo-t3-response** time of 15 seconds.
2. The second echo request is sent, but the P-GW does not receive an echo response within 15 seconds.
3. The third echo request is sent, but the P-GW does not receive an echo response within 15 seconds.
4. The fourth echo request is sent, but the P-GW does not receive an echo response within 15 seconds.
5. The fifth echo request is sent, but the P-GW does not receive an echo response within 15 seconds. At this point, the message flow stops, and the P-GW clears the GTP path and deletes all bearers.

- Related Documentation**
- [Configuring GTP Services Overview on page 7](#)
 - [GTP Path Management Overview on page 11](#)
 - [GTP Tunnel Management Overview on page 15](#)
 - [Understanding Tunnel Endpoint Identifiers on page 19](#)
 - [Configuring General GTP Service on the S-GW](#)

GTP Tunnel Management Overview

GTP-C controls and manages tunnels for the nodes connecting to the network in order to establish the user data path. A GTP tunnel is used to deliver packets between the P-GW and S-GW, and is identified in each node by a tunnel endpoint identifier (TEID), an IP address, and a UDP port number. Tunnel management involves creating and deleting end-user sessions and creating, modifying, and deleting bearers during the time a user is connected and using network services.

This tunnel management topic covers:

- [GTP Tunnel Management Functions on page 15](#)
- [Default Tunnel Management Configuration on page 15](#)
- [GTP Version Support for Tunnel Management Requests and Responses on page 15](#)

GTP Tunnel Management Functions

A broadband gateway provides the following tunnel management functions to manage the GTP tunnel between a GGSN and SGSN or a P-GW and S-GW:

- Send Update bearer request to all peers identified in the Peer Information table.
- Send Delete bearer request to all peers identified in the Peer Information table.
- Send Delete Session request to all peers identified in the Peer Information table.

Default Tunnel Management Configuration

When you configure a broadband gateway as a P-GW, the tunnel management options are automatically enabled with the following default values:

- **n3-requests**—Specifies the maximum number of times that the gateway attempts to send a Create/Update/Delete tunnel request message. The default is 3 times.
- **t3-response**—Specifies the number of seconds that the gateway waits for a Create/Update/Delete tunnel response from a peer gateway before retransmitting a Create/Update/Delete tunnel request message. The default is 5 seconds.

GTP Version Support for Tunnel Management Requests and Responses

Create/update/delete tunnel requests are sent to the peer using the GTP version that the peer supports. A broadband gateway configured as a P-GW supports sending

Create/Update/Delete responses to GTPv0, GTPv1, and GTPv2 requests from a peer S-GW.

**Related
Documentation**

- [Configuring GTP Services Overview on page 7](#)
- [GTP Path Management Overview on page 11](#)
- [Understanding Tunnel Endpoint Identifiers on page 19](#)
- [Configuring General GTP Service on the S-GW](#)

Understanding Tunnel Management

You can configure tunnel management on the MobileNext Broadband Gateway to specify the maximum number of request messages to send and how long to wait for a response from a peer before sending a retransmit message.

A tunnel management request-and-response sequence begins when the broadband gateway (P-GW) sends a request message to the S-GW and ends when the S-GW sends a corresponding response message back to the broadband gateway. If the broadband gateway does not receive a response from the S-GW after a certain number of retries, tunnel failure results. When tunnel failure occurs, the broadband gateway deletes the subscriber session associated with the down peer and all Modify or Delete requests associated with that GPRS tunneling protocol (GTP) tunnel.

This topic covers:

- [Successful Create Request Sequence for Tunnel Management on page 16](#)
- [Successful Update/Delete Request Sequence for Tunnel Management on page 17](#)
- [Failed Update/Delete Request Sequence for Tunnel Management on page 17](#)

Successful Create Request Sequence for Tunnel Management

The tunnel management process begins when the Serving Gateway (S-GW) sends a Create request message to the broadband gateway (P-GW), and the broadband gateway sends a corresponding response message back to the S-GW, signaling that the GTP tunnel is active. [Figure 5 on page 16](#) shows a successful Create request sequence in which the S-GW receives a response after sending a request.

Figure 5: Successful Create Request Sequence for Tunnel Management



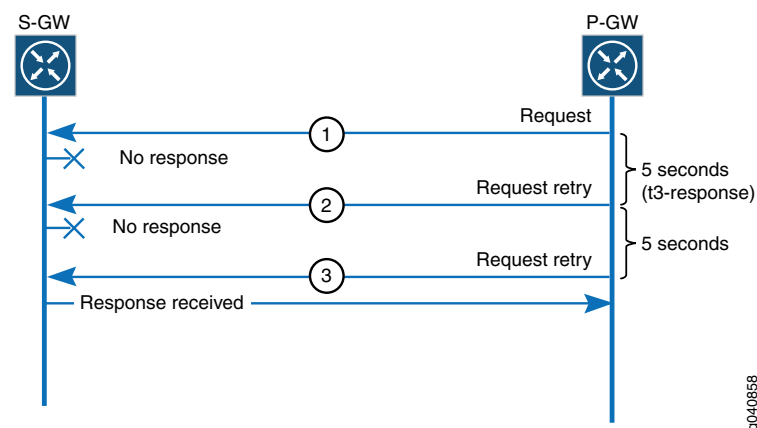
The following steps describe the tunnel management Create request sequence in [Figure 5 on page 16](#):

1. The S-GW sends a Create request message to the P-GW.
2. The P-GW sends a response back to the S-GW.

Successful Update/Delete Request Sequence for Tunnel Management

The tunnel management process begins when the broadband gateway (P-GW) sends an Update or Delete request message to the S-GW, and the S-GW sends a corresponding response message back to the broadband gateway, signaling that the GTP tunnel is active. [Figure 6 on page 17](#) shows a successful Update or Delete request sequence in which the P-GW receives a response to each request within the specified default values for number of requests and response time.

Figure 6: Successful Update/Delete Request Sequence for Tunnel Management



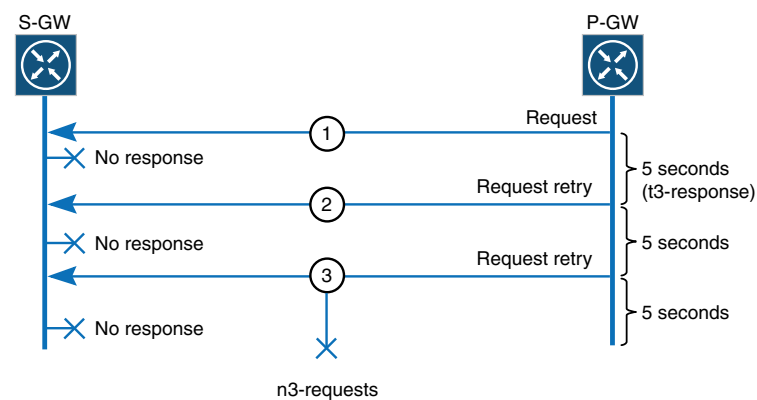
The following steps describe the tunnel management Update or Delete request sequence in [Figure 6 on page 17](#):

1. A request is sent, but the P-GW receives no response within the specified **t3-response** time.
2. A second request is sent, but the P-GW receives no response within the specified **t3-response** time.
3. A third request is sent, and the P-GW receives a response within the specified **t3-response** time.

Failed Update/Delete Request Sequence for Tunnel Management

If, after sending a specified number of Update or Delete request messages to the S-GW, the broadband gateway fails to receive a corresponding response message from the S-GW, the tunnel path is determined to be down. [Figure 7 on page 18](#) shows a failed tunnel management request sequence in which the P-GW does not receive a response within the specified defaults for number of requests and the response time.

Figure 7: Failed Update/Delete Request Sequence for Tunnel Management



g040900

The following steps describe the Update or Delete request failed sequence in [Figure 7 on page 18](#):

1. The first request is sent, but the P-GW receives no response from the peer within the specified **t3-response** time (5 seconds).
2. The second request is sent, but the P-GW receives no response from the peer within the specified **t3-response** time.
3. The third request is sent, but the P-GW receives no response from the peer within the specified **t3-response** time.
4. At this point, the message flow stops, and the P-GW deletes the subscriber session associated with the down peer and all Update or Delete requests associated with that GTP tunnel.

Related Documentation

- [Configuring GTP Services Overview on page 7](#)
- [GTP Path Management Overview on page 11](#)
- [GTP Tunnel Management Overview on page 15](#)
- [Understanding Tunnel Endpoint Identifiers on page 19](#)
- [Configuring General GTP Service on the S-GW](#)

Restart Counters Overview

The MobileNext Broadband Gateway configured as a P-GW includes the P-GW restart counter (IE) in all GTPv2 messages that it sends to peers. The broadband gateway also receives the S-GW restart counters in GTPv2 messages from the S-GW.

A broadband gateway configured as a P-GW increments the restart counter each time the P-GW is restarted. A broadband gateway receives the peer restart count from the recovery IE in the following GTP-C messages:

- Echo request
- Echo response
- Bearer/PDP context create
- Update messages

A broadband gateway identifies a peer restart by comparing the locally stored peer restart event with the most recent restart count that is received from a peer. If the broadband gateway detects that a peer has restarted by comparing the previously received restart count with the currently received restart count, the broadband gateway deletes all the subscriber sessions associated with the down peer.

Related Documentation

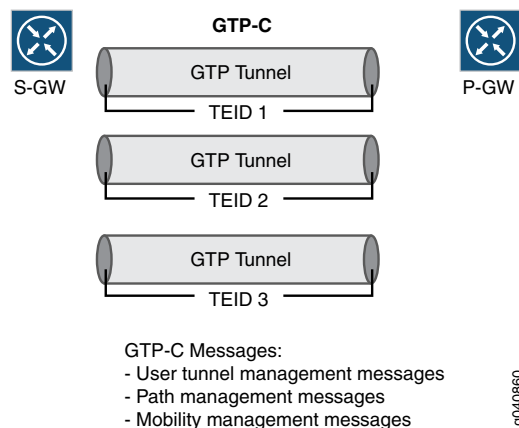
- [Configuring GTP Services Overview on page 7](#)
- [GTP Path Management Overview on page 11](#)
- [GTP Tunnel Management Overview on page 15](#)
- [Configuring General GTP Service on the S-GW](#)

Understanding Tunnel Endpoint Identifiers

The GPRS tunneling protocol (GTP) stack assigns a unique tunnel endpoint identifier (TEID) to each GTP control connection to the peers. The GTP stack also assigns a unique TEID to each GTP user connection (bearer) to the peers. The TEID is a 32-bit number field in the GTP (GTP-C or GTP-U) packet.

Figure 8 on page 19 shows a GTP tunnel with its associated TEID.

Figure 8: GTP-C Performs Signaling Between the Serving Gateway and Packet Data Network Gateway



GTP-C allocates a TEID to identify a set of endpoints for a GTP-C tunnel, as shown in Figure 8 on page 19. For each bearer, a separate GTP-U tunnel with its own TEID is established.

An ingress Packet Forwarding Engine performs GTP-C TEID route lookup to identify the target services PIC for the received packet for the following types of GTP-C messages:

- Create PDP context request (for secondary)
- Update PDP context request and response (GTPv1)
- Delete PDP context request and response (GTPv1)
- Create Session response (GTPv2)
- Create bearer request and response (GTPv2)
- Modify bearer request and response (GTPv2)
- Delete Session request and response (GTPv2)
- Delete bearer request and response (GTPv2)

Each GTP-U tunnel is also assigned a TEID. For example, the GTP-U tunnel for a default bearer would have its own TEID.

**Related
Documentation**

- [Configuring GTP Services Overview on page 7](#)
- [GTP Path Management Overview on page 11](#)
- [GTP Tunnel Management Overview on page 15](#)
- [Configuring General GTP Service on the S-GW](#)

PART 2

Configuration

- [Configuration Tasks on page 23](#)
- [Configuration Statements on page 43](#)

CHAPTER 3

Configuration Tasks

- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
- [Configuring GTP Services on a Broadband Gateway on page 24](#)
- [Configuring GTP Services on the Control Plane on page 26](#)
- [Configuring GTP Services on the Data Plane on page 27](#)
- [Configuring GTP Services on the S5 Interface on page 28](#)
- [Configuring GTP Services on the S8 Interface on page 30](#)
- [Configuring GTP Services on the Gn Interface on page 31](#)
- [Configuring GTP Services on the Gp Interface on page 33](#)
- [Configuring GTP Services When the S5 and S8 Interfaces Are in Different VRFs on page 34](#)
- [Configuring GTP Services When the S5 and S8 Interfaces Are in the Same VRF on page 36](#)
- [Configuring GTP Services When 3GPP Interfaces Are in Different VRFs on page 37](#)
- [Configuring GTP Services on a GGSN Broadband Gateway on page 39](#)
- [Configuring GTP Services on a Peer Group on page 40](#)
- [Disabling Path Management on a Broadband Gateway or Peer Group on page 42](#)

Configuring a Loopback Interface for Transport of GTP Packets

You must configure a loopback interface on an MX Series router before you can configure GTP services for Broadband Gateway.

To configure a loopback interface:

1. Edit the loopback interface.

```
[edit]  
user@host# edit interfaces lo0
```

2. Edit the loopback interface unit.

```
[edit interfaces lo0]  
user@host# set unit 1
```

3. Edit the loopback interface family.

```
[edit interfaces lo0 unit 1]
user@host# set family inet
```

4. Specify the loopback interface address.

```
[edit interfaces lo0 unit 1 family inet]
user@host# set address 10.10.10.1/32
```

**Related
Documentation**

- [Configuring GTP Services on a Broadband Gateway on page 24](#)
- [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services on a Broadband Gateway

To configure a MobileNext Broadband Gateway as a GGSN/P-GW and enable GTP services, at minimum, you must configure a loopback interface and IP address on which GTP packets are received. Configuring GTP services on the GGSN/P-GW at the data plane, control plane, or (Gn, Gp, S5, or S8) interface level is optional.

The following configuration specifies a loopback address on which all GTP packets are received for the S5, S8, Gn, and Gp interfaces.



NOTE: To configure a loopback address on which all GTP packets are received, all 3GPP interfaces (S5, S8, Gn, and Gp) must be in the same VRF.

To configure GTP services on a broadband gateway configured as a GGSN/P-GW:

1. Configure the maximum number of peer entries for which the gateway stores statistics after the peer is deleted.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set peer-history 1000
```



NOTE: In this configuration example, *ggsn-pgw* specifies the gateway personality and *MBG1* is the logical name of the gateway.

2. Configure an IPv4 address on a loopback interface to specify the transport address on which GTP-C and GTP-U packets are received for the S5, S8, Gn, and Gp interfaces.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set interface lo0.0 v4-address 10.10.10.1
```

3. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set n3-requests 6
```

4. For tunnel management, configure the time that the gateway waits before resending a signaling-request message when a response to the request has not been received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
```

```
user@host# set t3-response 8
```

5. For path management, configure the maximum number of times that the gateway will attempt to send echo-request messages to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set echo-n3-requests 6
```

6. For path management, configure the time that the gateway waits before resending an echo-request message when an echo response to the echo request is not received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set echo-t3-response 4
```

7. For path management, configure the number of seconds that the gateway waits before sending an echo-request message after an echo response is received from the peer.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set echo-interval 65
```

8. Configure security trace options for the gateway:

- a. Specify a name for the file that receives the output of the tracing operation.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp traceoptions]
user@host# set file gtp_log
```

- b. Configure the maximum size for the trace file.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp traceoptions]
user@host# set size 50m
```

- c. Configure the level of tracing to match all levels, including error conditions, informational messages, notice messages, verbose messages, and warning messages.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp traceoptions]
user@host# set level all
```

- d. Configure the tracing operation to trace all operations.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp traceoptions]
user@host# set flag all
```

Related Documentation

- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
- [Configuring GTP Services on the Data Plane on page 27](#)
- [Configuring GTP Services on the Control Plane on page 26](#)
- [Configuring GTP Services Overview on page 7](#)
- [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services on the Control Plane

To configure a separate address to receive GTP-C packets, you configure services on the router's loopback address. The following configuration specifies an IPv4 transport address on which GTP control packets other than Create Session request are received for the S5, S8, Gn, and Gp interfaces.

To configure GTP services on the control plane for a broadband gateway configured as a GGSN/P-GW:

1. Configure an IPv4 address on a loopback interface to specify the address on which GTP-C packets are received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp control]
user@host# set interface lo0.0 v4-address 10.10.10.1
```

2. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp control]
user@host# set n3-requests 6
```

3. For tunnel management, configure the time that the gateway waits before resending a signaling-request message when a response to the request has not been received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp control]
user@host# set t3-response 8
```

4. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp control]
user@host# set echo-n3-requests 6
```

5. For path management, configure the time that the gateway waits before resending an echo-request message when an echo response to the echo request is not received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp control]
user@host# set echo-t3-response 4
```

6. For path management, configure the number of seconds that the gateway waits before sending an echo-request message after an echo response is received from the peer.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp control]
user@host# set echo-interval 65
```

7. Specify a forwarding class for outbound control packets.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set forwarding-class assured-forwarding
```

8. Specify a Differentiated Services Code Point (DSCP) value in the IP packet header for outbound control packets.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set dscp-code-point 010110
```


- Related Documentation**
- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
 - [Configuring GTP Services on the Data Plane on page 27](#)
 - [Configuring GTP Services on a Broadband Gateway on page 24](#)
 - [Configuring GTP Services Overview on page 7](#)
 - [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services on the Data Plane

On a Broadband Gateway, user data is transported through the GTP-U tunnel. To configure a separate address to receive GTP-U packets, you configure services on the router's loopback interface.

The following configuration specifies a separate address on which GTP-U packets are received for the S5, S8, Gn, and Gp interfaces, unless overridden at the 3GPP interface level.

To configure GTP services on the data plane for a broadband gateway configured as a GGSN/P-GW:

1. Configure an IPv4 address on a loopback interface to specify the transport address on which GTP-U packets are received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp data]
user@host# set interface lo0.0 v4-address 10.10.10.1
```

2. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp data]
user@host# set n3-requests 6
```

3. For tunnel management, configure the time that the gateway waits before resending a signaling-request message when a response to the request has not been received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp data]
user@host# set t3-response 8
```

4. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp data]
user@host# set echo-n3-requests 6
```

5. For path management, configure the time that the gateway waits before resending an echo-request message when an echo response to the echo request is not received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp data]
user@host# set echo-t3-response 4
```

6. For path management, configure the number of seconds that the gateway waits before sending an echo-request message after an echo response is received from the peer.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp data]
```

```
user@host# set echo-interval 65
```

7. Configure the number of seconds that the gateway waits before sending a TEID error message to the peer.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp data]  
user@host# set error-indication-interval 5
```

Related Documentation

- [Understanding Tunnel Endpoint Identifiers on page 19](#)
- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
- [Configuring GTP Services on the Control Plane on page 26](#)
- [Configuring GTP Services on a Broadband Gateway on page 24](#)
- [Configuring GTP Services Overview on page 7](#)
- [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services on the S5 Interface

The following configuration specifies a separate address on which GTP packets (other than Create Session request) are received for a 3GPP S5 interface.

The address you specify for an S5 interface must be the same address specified for the S8 interface although the VRF can be different. In addition, to allow mobility across 3G and Long Term Evolution (LTE), the S5 address must be the same as Gn and Gp addresses, optionally, with each interface in a different VRF, whether or not these addresses are specified explicitly or implicitly (through inheritance or from a higher level).

To configure GTP services on an S5 interface for a broadband gateway configured as a GGSN/P-GW:

1. Configure an IPv4 address on a loopback interface to specify the transport addresses on which GTP packets on the S5 interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s5]  
user@host# set interface lo0.1 v4-address 10.10.10.1
```

2. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s5]  
user@host# set n3-requests 6
```

3. For tunnel management, configure the time that the gateway waits before resending a signaling-request message when a response to the request has not been received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s5]  
user@host# set t3-response 8
```

4. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s5]  
user@host# set echo-n3-requests 6
```

5. For path management, configure the time that the gateway waits before resending an echo-request message when an echo response to the echo request is not received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s5]
user@host# set echo-t3-response 4
```

6. For path management, configure the number of seconds that the gateway waits before sending an echo-request message after an echo response is received from the peer.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s5]
user@host# set echo-interval 65
```

7. To configure a separate address on which GTP control packets are received for the S5 interface:

- a. Configure a loopback address to specify the address on which GTP control packets are received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s5 control]
user@host# set interface lo0.6 v4-address 10.10.10.2
```



NOTE: The path management and tunnel management configuration you specified at the S5 interface level will also apply to GTP control packets unless you configure path management, or tunnel management, or both at the S5 control level.

- b. To interoperate with older gateways that support a GTP version with 16-bit sequence-number-length, configure the following option.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s5 control]
user@host# set sequence-number-length 16-bits
```

- c. Specify a forwarding class for outbound control packets.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s5 control]
user@host# set forwarding-class assured-forwarding
```

- d. Specify a DSCP value in the IP packet header for outbound control packets.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s5 control]
user@host# set dscp-code-point 010110
```

Related Documentation

- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
- [Configuring GTP Services on the S8 Interface on page 30](#)
- [Configuring GTP Services on the Data Plane on page 27](#)
- [Configuring GTP Services on the Control Plane on page 26](#)
- [Configuring GTP Services on a Broadband Gateway on page 24](#)
- [Configuring GTP Services Overview on page 7](#)
- [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services on the S8 Interface

The following configuration specifies a separate address on which GTP packets (other than Create Session request) are received for a 3GPP S8 interface.

The address you specify for an S8 interface must be the same address specified for the S5 interface although the VRF can be different. In addition, to allow mobility across 3G and LTE, the S8 address must be the same as Gn and Gp addresses, whether or not these addresses are specified explicitly or implicitly (through inheritance or from a higher level).

To configure GTP services on an S8 interface for a broadband gateway configured as a GGSN/P-GW:

1. Configure an IPv4 address on a loopback interface to specify the transport address on which GTP packets are received for the S8 interface.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s8]
user@host# set interface lo0.0 v4-address 10.10.10.10
```

2. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s8]
user@host# set n3-requests 6
```

3. For tunnel management, configure the time that the gateway waits before resending a signaling-request message when a response to the request has not been received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s8]
user@host# set t3-response 8
```

4. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s8]
user@host# set echo-n3-requests 6
```

5. For path management, configure the time that the gateway waits before resending an echo-request message when an echo response to the echo request is not received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s8]
user@host# set echo-t3-response 4
```

6. For path management, configure the number of seconds that the gateway waits before sending an echo-request message after an echo response is received from the peer.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s8]
user@host# set echo-interval 65
```

7. To configure a separate address on which GTP data packets are received for the S8 interface:

- a. Configure a loopback address.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s8 data]
user@host# set interface lo0.4 v4-address 10.1.1.8
```



NOTE: The path management and tunnel management configuration you specified at the S8 interface level will also apply to GTP data packets unless you configure path management, or tunnel management, or both at the S8 interface data level.

Related Documentation

- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
- [Configuring GTP Services on the S5 Interface on page 28](#)
- [Configuring GTP Services on the Data Plane on page 27](#)
- [Configuring GTP Services on the Control Plane on page 26](#)
- [Configuring GTP Services on a Broadband Gateway on page 24](#)
- [Configuring GTP Services Overview on page 7](#)
- [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services on the Gn Interface

The following configuration specifies the loopback address on which GTP packets are received for a Gn interface.

The IP address you specify for a Gn interface must be the same address that is specified for the Gp interface, although the Gn and Gp interfaces can be in different VRFs. In addition, to support mobility across 3G and 4G networks, the Gn IP address must be the same as the S5 and S8 addresses, optionally, with each interface in a different VRF, whether or not these addresses are specified explicitly or implicitly (through inheritance or from a higher level).

To configure GTP services on a Gn interface for a broadband gateway configured as a GGSN/P-GW:

1. Configure an IPv4 address on a loopback interface to specify the transport address on which GTP packets on the Gn interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gn]
user@host# set interface lo0.0 v4-address 10.10.10.1
```

2. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gn]
user@host# set n3-requests 6
```

3. For tunnel management, configure the time that the gateway waits before resending a signaling-request message when a response to the request has not been received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gn]
user@host# set t3-response 8
```

4. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gn]
user@host# set echo-n3-requests 6
```

5. For path management, configure the time that the gateway waits before resending an echo-request message when an echo response to the echo request is not received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gn]
user@host# set echo-t3-response 4
```

6. For path management, configure the number of seconds that the gateway waits before sending an echo-request message after an echo response is received from the peer.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gn]
user@host# set echo-interval 65
```

7. To configure a separate loopback address on which GTP control packets are received for the Gn interface:

- a. Configure an IPv4 address on a loopback interface to specify the transport addresses on which GTP control packets on the Gn interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gn control]
user@host# set interface lo0.5 v4-address 10.10.10.2
```



NOTE: The path management and tunnel management configuration you specified at the Gn interface level will also apply to GTP control packets unless you configure path management, or tunnel management, or both at the Gn interface control level.

- b. Specify a forwarding class for outbound control packets.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gn control]
user@host# set forwarding-class assured-forwarding
```

- c. Specify a DSCP value in the IP packet header for outbound control packets.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gn control]
user@host# set dscp-code-point 010110
```

Related Documentation

- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
- [Configuring GTP Services on the Gp Interface on page 33](#)
- [Configuring GTP Services on the Data Plane on page 27](#)
- [Configuring GTP Services on the Control Plane on page 26](#)
- [Configuring GTP Services on a Broadband Gateway on page 24](#)
- [Configuring GTP Services Overview on page 7](#)
- [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services on the Gp Interface

The following configuration specifies a separate address on which GTP packets are received for a 3GPP Gp interface.

The IP address you specify for a Gp interface must be the same address that is specified for the Gn interface, although the Gp and Gn interfaces can be in different VRFs. In addition, to allow mobility across 3G and 4G networks, the Gp IP address must be the same as the S5 and S8 addresses (optionally, with each interface in a different VRF) whether or not these addresses are configured explicitly or implicitly (through inheritance or from a higher level).

To configure GTP services on a Gp interface for a broadband gateway configured as a GGSN/P-GW:

1. Configure an IPv4 address on a loopback interface to specify the transport address on which GTP packets on the Gp interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gp]
user@host# set interface lo0.0 v4-address 10.10.10.1
```

2. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gp]
user@host# set n3-requests 6
```

3. For tunnel management, configure the time that the gateway waits before resending a signaling-request message when a response to the request has not been received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gp]
user@host# set t3-response 8
```

4. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gp]
user@host# set echo-n3-requests 6
```

5. For path management, configure the time that the gateway waits before resending an echo-request message when an echo response to the echo request is not received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gp]
user@host# set echo-t3-response 4
```

6. For path management, configure the number of seconds that the gateway waits before sending an echo-request message after an echo response is received from the peer.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gp]
user@host# set echo-interval 65
```

7. To configure a separate loopback address on which GTP control packets are received for the Gp interface:

- a. Configure an IPv4 address on a loopback interface to specify the transport addresses on which GTP control packets on the Gp interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gp control]
user@host# set interface lo0.5 v4-address 10.10.10.2
```



NOTE: The path management and tunnel management configuration you specified at the Gp interface level will also apply to GTP control packets unless you configure path management, or tunnel management, or both at the Gp interface control level.

- b. Specify a forwarding class for outbound control packets.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gp control]
user@host# set forwarding-class assured-forwarding
```

- c. Specify a DSCP value in the IP packet header for outbound control packets.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gp control]
user@host# set dscp-code-point 010110
```

**Related
Documentation**

- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
- [Configuring GTP Services on the Gn Interface on page 31](#)
- [Configuring GTP Services on the Data Plane on page 27](#)
- [Configuring GTP Services on the Control Plane on page 26](#)
- [Configuring GTP Services on a Broadband Gateway on page 24](#)
- [Configuring GTP Services Overview on page 7](#)
- [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services When the S5 and S8 Interfaces Are in Different VRFs

To configure GTP services on a MobileNext Broadband Gateway configured as a P-GW, you specify a different loopback interface but same IP address for each interface when the S5 and S8 interfaces are in different VRF routing instances.

To configure GTP services for a broadband gateway configured as a P-GW when the S5 and S8 interfaces are in different VRFs:

1. Configure the maximum number of peer entries for which the gateway stores statistics collected for deleted peers.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp]
user@host# set peer-history 1000
```

2. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a peer (S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp]
user@host# set n3-requests 6
```

3. For tunnel management, configure the time that the gateway waits before resending a signaling-request message when a response to the request has not been received.


```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp]
user@host# set t3-response 8
```

4. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp]
user@host# set echo-n3-requests 6
```

5. For path management, configure the time that the gateway waits before resending an echo-request message when an echo response to the echo request is not received.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp]
user@host# set echo-t3-response 4
```

6. For path management, configure the number of seconds that the gateway waits before sending an echo-request message after an echo response is received from the peer.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp]
user@host# set echo-interval 65
```

7. Configure a loopback interface and IP address to specify the transport address on which all GTP packets transported on the S5 interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp s5]
user@host# set interface lo0.1 v4-address 10.10.10.10
```



NOTE: This interface uses lo0.1.

8. Configure a loopback interface and IP address to specify the transport address on which all GTP packets transported on the S8 interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp s8]
user@host# set interface lo0.2 v4-address 10.10.10.10
```



NOTE: This interface uses lo0.2.

9. Configure security trace options for the gateway:
 - a. Specify a name for the file that receives the output of the tracing operation.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp traceoptions]
user@host# set file gtp_log
```

- b. Configure the maximum size for the trace file.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp traceoptions]
user@host# set size 50m
```

Related Documentation

- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
- [Configuring GTP Services on the Data Plane on page 27](#)
- [Configuring GTP Services on the Control Plane on page 26](#)

- [Configuring GTP Services on a Broadband Gateway on page 24](#)
- [Configuring GTP Services Overview on page 7](#)
- [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services When the S5 and S8 Interfaces Are in the Same VRF

When the interfaces are in the same VRF routing instances, you specify a single loopback interface IP address for the S5 and S8 interfaces.

To configure GTP services for a MobileNext Broadband Gateway configured as a P-GW when the S5 and S8 interfaces are in the same VRF:

1. Configure the maximum number of peer entries for which the gateway stores statistics collected for deleted peers.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-vrf-green gtp]
user@host# set peer-history 1000
```

2. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw pgw-vrf-green gtp]
user@host# set n3-requests 6
```

3. For tunnel management, configure the time that the gateway waits before resending a signaling-request message when a response to the request has not been received.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-vrf-green gtp]
user@host# set t3-response 8
```

4. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw pgw-vrf-green gtp]
user@host# set echo-n3-requests 6
```

5. For path management, configure the time that the gateway waits before resending an echo-request message when an echo response to the echo request is not received.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-vrf-green gtp]
user@host# set echo-t3-response 4
```

6. For path management, configure the number of seconds that the gateway waits before sending an echo-request message after an echo response is received from the peer.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-vrf-green gtp]
user@host# set echo-interval 65
```

7. Configure a loopback interface and IP address to specify the transport address on which all GTP packets transported on the S5 interface are received

```
[edit unified-edge mobile gateways ggsn-pgw pgw-vrf-green gtp s5]
user@host# set interface lo0.1 v4-address 10.10.10.10
```



NOTE: This interface uses lo0.1.

8. Configure a loopback interface and IP address to specify the transport address on which all GTP packets transported on the S8 interface are received

```
[edit unified-edge mobile gateways ggsn-pgw pgw-vrf-green gtp s8]
user@host# set interface lo0.1 v4-address 10.10.10.10
```



NOTE: This interface also uses lo0.1.

9. Configure security trace options for the gateway:

- a. Specify a name for the file that receives the output of the tracing operation.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-vrf-green gtp traceoptions]
user@host# set file gtp_log
```

- b. Configure the maximum size for the trace file.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-vrf-green gtp traceoptions]
user@host# set size 50m
```

Related Documentation

- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
- [Configuring GTP Services on the Data Plane on page 27](#)
- [Configuring GTP Services on the Control Plane on page 26](#)
- [Configuring GTP Services on a Broadband Gateway on page 24](#)
- [Configuring GTP Services Overview on page 7](#)
- [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services When 3GPP Interfaces Are in Different VRFs

To configure GTP services on a MobileNext Broadband Gateway when the Gn , Gp, S5, and S8 interfaces are in different VRFs, you configure each interface with a different loopback interface but must specify the same IP address for the Gn , Gp, S5, and S8 interfaces.

In this example configuration, the same GTP services configuration is applied across the Gn, Gp, S5, and S8 interfaces. However, for each interface, GTP packets will be received on a separate loopback interface but specifying the same IP address.

To configure GTP services for a broadband gateway configured as a GGSN/P-GW on which the interfaces use different VRFs:

1. Configure the maximum number of peer entries for which the gateway stores statistics collected for deleted peers.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
```

```
user@host# set peer-history 1000
```

2. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set n3-requests 6
```

3. For tunnel management, configure the time that the gateway waits before resending a signaling-request message when a response to the request has not been received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set t3-response 8
```

4. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set echo-n3-requests 6
```

5. For path management, configure the time that the gateway waits before resending an echo-request message when an echo response to the echo request is not received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set echo-t3-response 4
```

6. For path management, configure the number of seconds that the gateway waits before sending an echo-request message after an echo response is received from the peer.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# set echo-interval 65
```

7. Configure a loopback interface and IP address to specify the transport address on which all GTP packets transported on the S5 interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s5]
user@host# set interface lo0.1 v4-address 10.10.10.10
```

8. Configure a loopback interface and IP address to specify the transport address on which all GTP packets transported on the S8 interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp s8]
user@host# set interface lo0.2 v4-address 10.10.10.10
```

9. Configure a loopback interface and IP address to specify the transport address on which all GTP packets transported on the Gn interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gn]
user@host# set interface lo0.3 v4-address 10.10.10.10
```

10. Configure a loopback interface and IP address to specify the transport address on which all GTP packets transported on the Gp interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp gp]
user@host# set interface lo0.4 v4-address 10.10.10.10
```

11. Configure security trace options for the gateway:

- a. Specify a name for the file that receives the output of the tracing operation.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp traceoptions]
```

```
user@host# set file gtp_log
```

- b. Configure the maximum size for the trace file.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp traceoptions]
user@host# set size 50m
```

Related Documentation

- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
- [Configuring GTP Services on the Data Plane on page 27](#)
- [Configuring GTP Services on the Control Plane on page 26](#)
- [Configuring GTP Services on a Broadband Gateway on page 24](#)
- [Configuring GTP Services Overview on page 7](#)
- [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services on a GGSN Broadband Gateway

When you configure GTP services on a MobileNext Broadband Gateway configured as a GGSN, you can optionally specify a different address on which GTP control or data packets are received for the Gn and Gp interfaces.

In this example 3G configuration, the Gn and Gp interfaces are in the same VRF routing instance. The Gn interface configuration specifies that GTP-C and GTP-U packets (on the Gn interface) are each received on a different transport address. The Gp interface configuration specifies that all GTP packets (on the Gp interface) are received on a single transport address.

To configure GTP services for a broadband gateway configured as a GGSN:

1. Configure the maximum number of peer entries for which the gateway stores statistics collected for deleted peers.

```
[edit unified-edge mobile gateways ggsn-pgw ggsn-1 gtp]
user@host# set peer-history 1000
```

2. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw ggsn-1 gtp]
user@host# set n3-requests 6
```

3. For tunnel management, configure the time that the gateway waits before resending a signaling-request message when a response to the request has not been received.

```
[edit unified-edge mobile gateways ggsn-pgw ggsn-1 gtp]
user@host# set t3-response 8
```

4. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw ggsn-1 gtp]
user@host# set echo-n3-requests 6
```

5. For path management, configure the time that the gateway waits before resending an echo-request message when an echo response to the echo request is not received.

```
[edit unified-edge mobile gateways ggsn-pgw ggsn-1 gtp]
user@host# set echo-t3-response 4
```

6. For path management, configure the number of seconds that the gateway waits before sending an echo-request message after an echo response is received from the peer.

```
[edit unified-edge mobile gateways ggsn-pgw ggsn-1 gtp]
user@host# set echo-interval 65
```

7. Configure a loopback address to specify the transport address on which GTP packets transported on the Gn interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw ggsn-1 gtp gn]
user@host# set interface lo0.1 v4-address 10.10.10.10
```

8. Configure a loopback address to specify a different transport address on which GTP data packets transported on the Gn interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw ggsn-1 gtp gn data]
user@host# set interface lo0.1 v4-address 10.10.10.20
```

9. Configure a loopback interface and IP address to specify the transport address on which all GTP packets transported on the Gp interface are received.

```
[edit unified-edge mobile gateways ggsn-pgw ggsn-1 gtp gp]
user@host# set interface lo0.1 v4-address 10.10.10.30
```

Related Documentation

- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
- [Configuring GTP Services Overview on page 7](#)
- [Configuring GTP Services on the Data Plane on page 27](#)
- [Configuring GTP Services on the Control Plane on page 26](#)
- [Configuring GTP Services on a Broadband Gateway on page 24](#)
- [Configuring GTP Services When 3GPP Interfaces Are in Different VRFs on page 37](#)
- [Configuring General GTP Service on the S-GW](#)

Configuring GTP Services on a Peer Group

You can configure GTP services to overwrite default configurations for a group of SGSN or S-GW peers.

To configure GTP services on a peer group:

1. Specify a name for the peer group.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp]
user@host# edit peer-groups peer-grp-1
```

2. Specify the name of the routing instance to which all peers in the peer group belong.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp peer-groups peer-grp-1]
user@host# set routing-instance vrf-instance-peers-green
```

3. Configure the IP addresses for the peers in the peer group.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp peer-groups peer-grp-1]
user@host# set peer 22.1.1.10/16
```

4. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp peer-groups peer-grp-1]
user@host# set n3-requests 6
```

5. For tunnel management, configure the time that the gateway waits before resending a signaling-request message when a response to the request has not been received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp peer-groups peer-grp-1]
user@host# set t3-response 8
```

6. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a peer (SGSN or S-GW).

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp peer-groups peer-grp-1]
user@host# set echo-n3-requests 6
```

7. For path management, configure the time that the gateway waits before resending an echo-request message when an echo response to the echo request is not received.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp peer-groups peer-grp-1]
user@host# set echo-t3-response 4
```

8. For path management, configure the number of seconds that the gateway waits before sending an echo-request message after an echo response is received from the peer.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp peer-groups peer-grp-1]
user@host# set echo-interval 65
```

9. Configure the peer gateways to transport a 16-bit sequence number when GTP control packets are sent to and received from the peer gateways.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp peer-groups peer-grp-1 control]
user@host# set sequence-number-length 16-bits
```

Related Documentation

- [Configuring a Loopback Interface for Transport of GTP Packets on page 23](#)
- [Configuring GTP Services on the Data Plane on page 27](#)
- [Configuring GTP Services on the Control Plane on page 26](#)
- [Configuring GTP Services on a Broadband Gateway on page 24](#)
- [Configuring GTP Services Overview on page 7](#)
- [Configuring General GTP Service on the S-GW](#)

Disabling Path Management on a Broadband Gateway or Peer Group

You can temporarily disable path management on the MobileNext Broadband Gateway so that echo-request messages are not sent from the P-GW to a peer.

When you configure the broadband gateway as a P-GW, the path management options are automatically enabled using the default echo-timing values. You can configure the **path-management** option to temporarily disable path management on the entire gateway, or on the control plane, data plane, or interface (S5, S8, Gn, or Gp) level.

- To disable path management on the Broadband Gateway:

```
[edit unified-edge mobile gateways ggsn-pdn-gateway MBG1 gtp
user@host# set path-management disable
```

To enable echo-request processing again on the GGSN/P-GW:

```
[edit unified-edge mobile gateways ggsn-pdn-gateway MBG1 gtp
user@host# set path-management enable
```

- To disable path management on a peer group:

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp peer-groups peer-grp-1]
user@host# set path-management disable
```

To enable path management again on the peer group:

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 gtp peer-groups peer-grp-1]
user@host# set path-management enable
```

Related Documentation

- [GTP Path Management Overview on page 11](#)
- [Configuring GTP Services Overview on page 7](#)
- [Configuring General GTP Service on the S-GW](#)

CHAPTER 4

Configuration Statements

- [\[edit unified-edge gateways\] Hierarchy Level](#) on page 43

[\[edit unified-edge gateways\] Hierarchy Level](#)

Each of the following topics lists the statements at a sub-hierarchy of the **[edit unified-edge gateways]** hierarchy.

- [\[edit unified-edge gateways ggsn-pgw <gateway-name>\] Hierarchy Level](#)
- [\[edit unified-edge gateways sgw <gateway-name>\] Hierarchy Level](#)

Related Documentation

- [\[edit unified-edge\] Hierarchy Level](#)
- [Notational Conventions Used in Junos OS Configuration Hierarchies](#)

control (GTP)

Syntax	<pre>control { ddn-delay-sync (disable enable); #S-GW only dscp-code-point <i>value</i>; echo-interval <i>interval</i>; echo-n3-requests <i>requests</i>; echo-t3-response <i>response-interval</i>; forwarding-class <i>class-name</i>; interface { interface-name; v4-address <i>v4-address</i>; } n3-requests <i>requests</i>; no-response-cache; path-management (disable enable); response-cache-timeout <i>interval-in-seconds</i>; t3-response <i>response-interval</i>; ttl-value <i>ttl-value</i>; #S-GW only }</pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>name</i> gtp], [edit unified-edge gateways sgw <i>name</i> gtp]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> gtp] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the path and tunnel management parameters for the control plane. This configuration overrides the parameters configured at a higher hierarchy level.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• gtp (GGSN or P-GW) on page 62• gtp (S-GW)

control (GTP Gn, Gp, S4, S5, and S8 Interfaces)

Syntax	<pre>control { dscp-code-point <i>value</i>; echo-interval <i>interval</i>; echo-n3-requests <i>requests</i>; echo-t3-response <i>response-interval</i>; forwarding-class <i>class-name</i>; interface { interface-name; v4-address <i>v4-address</i>; } n3-requests <i>requests</i>; path-management (disable enable); support-16-bit-sequence; #P-GW: S5 and S8 only t3-response <i>response-interval</i>; ttl-value <i>ttl-value</i>; #S-GW: S4, S5, and S8 only }</pre>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp gn], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp gp], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8], [edit unified-edge gateways sgw <i>name</i> gtp s4], [edit unified-edge gateways sgw <i>name</i> gtp s5], [edit unified-edge gateways sgw <i>name</i> gtp s8]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W. Support at the following hierarchy levels introduced in Junos OS Mobility Release 11.4W:</p> <ul style="list-style-type: none"> • [edit unified-edge gateways sgw <i>gateway-name</i> gtp s4] hierarchy level • [edit unified-edge gateways sgw <i>gateway-name</i> gtp s5] hierarchy level • [edit unified-edge gateways sgw <i>gateway-name</i> gtp s8] hierarchy level
Description	<p>Configure the path and tunnel management parameters for the control plane for the Gn, Gp, S4, S5, or S8 interfaces. This configuration overrides the parameters configured at a higher hierarchy level.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring GTP Services Overview on page 7 • gn on page 58 • gp on page 60 • s4 • s5 on page 77

- [s8 on page 79](#)

control (Peer Group)

Syntax	<pre>control { support-16-bit-sequence; }</pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>name</i> gtp peer-group <i>peer-group</i>]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	<p>Configure support for 16-bit sequence numbers for interoperation with older gateways that support a GTP version with a 16-bit sequence number length.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• peer-group (GTP) on page 73

data (GTP)

Syntax	<pre> data { echo-interval <i>interval</i>; echo-n3-requests <i>requests</i>; echo-t3-response <i>response-interval</i>; error-indication-interval <i>seconds</i>; indirect-tunnel (disable enable); #S-GW only interface { interface-name; v4-address <i>v4-address</i>; } num-gtpu-end-markers <i>num-gtpu-end-markers</i>; #S-GW only path-management (disable enable); } </pre>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp], [edit unified-edge gateways sgw <i>name</i> gtp]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> gtp] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the path and tunnel management parameters for the data plane. This configuration overrides the parameters configured at a higher hierarchy level.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring GTP Services Overview on page 7 • gtp (GGSN or P-GW) on page 62 • gtp (S-GW)

data (GTP Gn, Gp, S4, S5, and S8 Interfaces)

Syntax	<pre>data { echo-interval <i>interval</i>; echo-n3-requests <i>requests</i>; echo-t3-response <i>response-interval</i>; interface { interface-name; v4-address <i>v4-address</i>; } n3-requests <i>requests</i>; #P-GW only path-management (disable enable); t3-response <i>response-interval</i>; #P-GW only }</pre>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp gn], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp gp], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8], [edit unified-edge gateways sgw <i>name</i> gtp s4], [edit unified-edge gateways sgw <i>name</i> gtp s5], [edit unified-edge gateways sgw <i>name</i> gtp s8]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W. Support at the following hierarchy levels introduced in Junos OS Mobility Release 11.4W:</p> <ul style="list-style-type: none">• [edit unified-edge gateways sgw <i>gateway-name</i> gtp s4] hierarchy level• [edit unified-edge gateways sgw <i>gateway-name</i> gtp s5] hierarchy level• [edit unified-edge gateways sgw <i>gateway-name</i> gtp s8] hierarchy level
Description	<p>Configure the path and tunnel management parameters for the data plane for the Gn, Gp, S4, S5, or S8 interfaces. This configuration overrides the parameters configured at a higher hierarchy level.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• gn on page 58• gp on page 60• s4• s5 on page 77• s8 on page 79

dscp-code-point (GTP)

Syntax	<code>dscp-code-point <i>value</i>;</code>
Hierarchy Level	<code>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp control],</code> <code>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp gn control],</code> <code>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp gp control],</code> <code>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5 control],</code> <code>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8 control],</code> <code>[edit unified-edge gateways sgw <i>name</i> gtp control],</code> <code>[edit unified-edge gateways sgw <i>name</i> gtp s11],</code> <code>[edit unified-edge gateways sgw <i>name</i> gtp s4 control],</code> <code>[edit unified-edge gateways sgw <i>name</i> gtp s5 control],</code> <code>[edit unified-edge gateways sgw <i>name</i> gtp s8 control]</code>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the following hierarchy levels introduced in Junos OS Mobility Release 11.4W:</p> <ul style="list-style-type: none"> • <code>[edit unified-edge gateways sgw <i>name</i> gtp control]</code> • <code>[edit unified-edge gateways sgw <i>name</i> gtp s11]</code> • <code>[edit unified-edge gateways sgw <i>name</i> gtp s4 control]</code> • <code>[edit unified-edge gateways sgw <i>name</i> gtp s5 control]</code> • <code>[edit unified-edge gateways sgw <i>name</i> gtp s8 control]</code>
Description	Specify the value of the Differentiated Services (DiffServ) field within the IP header. DiffServ code point (DSCP) is used exclusively for GTP messages.
Options	<i>value</i> —DSCP value.
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring GTP Services Overview on page 7 • control (GTP) on page 44

echo-interval (GTP)

Syntax `echo-interval interval;`

Hierarchy Level [edit unified-edge gateways ggsn-pgw *name* gtp],
 [edit unified-edge gateways ggsn-pgw *name* gtp control],
 [edit unified-edge gateways ggsn-pgw *name* gtp data],
 [edit unified-edge gateways ggsn-pgw *name* gtp gn],
 [edit unified-edge gateways ggsn-pgw *name* gtp gn control],
 [edit unified-edge gateways ggsn-pgw *name* gtp gn data],
 [edit unified-edge gateways ggsn-pgw *name* gtp gp],
 [edit unified-edge gateways ggsn-pgw *name* gtp gp control],
 [edit unified-edge gateways ggsn-pgw *name* gtp gp data],
 [edit unified-edge gateways ggsn-pgw *name* gtp peer-group *name*],
 [edit unified-edge gateways ggsn-pgw *name* gtp s5],
 [edit unified-edge gateways ggsn-pgw *name* gtp s5 control],
 [edit unified-edge gateways ggsn-pgw *name* gtp s5 data],
 [edit unified-edge gateways ggsn-pgw *name* gtp s8],
 [edit unified-edge gateways ggsn-pgw *name* gtp s8 control],
 [edit unified-edge gateways ggsn-pgw *name* gtp s8 data],
 [edit unified-edge gateways sgw *name* gtp],
 [edit unified-edge gateways sgw *name* gtp control],
 [edit unified-edge gateways sgw *name* gtp data],
 [edit unified-edge gateways sgw *name* gtp s11],
 [edit unified-edge gateways sgw *name* gtp s12],
 [edit unified-edge gateways sgw *name* gtp s1u],
 [edit unified-edge gateways sgw *name* gtp s4],
 [edit unified-edge gateways sgw *name* gtp s4 control],
 [edit unified-edge gateways sgw *name* gtp s4 data],
 [edit unified-edge gateways sgw *name* gtp s5],
 [edit unified-edge gateways sgw *name* gtp s5 control],
 [edit unified-edge gateways sgw *name* gtp s5 data],
 [edit unified-edge gateways sgw *name* gtp s8],
 [edit unified-edge gateways sgw *name* gtp s8 control],
 [edit unified-edge gateways sgw *name* gtp s8 data]

Release Information Statement introduced in Junos OS Mobility Release 11.2W.
 Support at the following hierarchy levels introduced in Junos OS Mobility Release 11.4W:

- [edit unified-edge gateways sgw *name* gtp]
- [edit unified-edge gateways sgw *name* gtp control]
- [edit unified-edge gateways sgw *name* gtp data]
- [edit unified-edge gateways sgw *name* gtp s11]
- [edit unified-edge gateways sgw *name* gtp s12]
- [edit unified-edge gateways sgw *name* gtp s1u],
- [edit unified-edge gateways sgw *name* gtp s4]
- [edit unified-edge gateways sgw *name* gtp s4 control]
- [edit unified-edge gateways sgw *name* gtp s4 data]

- [edit unified-edge gateways *sgw name* gtp s5]
- [edit unified-edge gateways *sgw name* gtp s5 control]
- [edit unified-edge gateways *sgw name* gtp s5 data]
- [edit unified-edge gateways *sgw name* gtp s8]
- [edit unified-edge gateways *sgw name* gtp s8 control]
- [edit unified-edge gateways *sgw name* gtp s8 data]

Description Configure the echo request interval for path management.

- For the Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW), the echo request interval is the number of seconds that the GGSN or P-GW waits before sending an echo request message to its peer (SGSN or S-GW).
- For the Serving Gateway (S-GW), the echo request interval is the number of seconds that the S-GW waits before sending an echo request message to its peer (MME, S4-SGSN, or P-GW).

This interval applies to both GTP-C and GTP-U echo messages.

Options *interval*—Echo request interval, in seconds.

Range: 60 through 65535 seconds.

Default: 60 seconds.

Required Privilege Level unified-edge—To view this statement in the configuration.
unified-edge-control—To add this statement to the configuration.

Related Documentation

- [GTP Path Management Overview on page 11](#)
- [gtp \(GGSN or P-GW\) on page 62](#)
- [gtp \(S-GW\)](#)

echo-n3-requests

Syntax `echo-n3-requests requests;`

Hierarchy Level

```
[edit unified-edge gateways ggsn-pgw name gtp],
[edit unified-edge gateways ggsn-pgw name gtp control],
[edit unified-edge gateways ggsn-pgw name gtp data],
[edit unified-edge gateways ggsn-pgw name gtp gn],
[edit unified-edge gateways ggsn-pgw name gtp gn control],
[edit unified-edge gateways ggsn-pgw name gtp gn data],
[edit unified-edge gateways ggsn-pgw name gtp gp],
[edit unified-edge gateways ggsn-pgw name gtp gp control],
[edit unified-edge gateways ggsn-pgw name gtp gp data],
[edit unified-edge gateways ggsn-pgw name gtp peer-group name],
[edit unified-edge gateways ggsn-pgw name gtp s5],
[edit unified-edge gateways ggsn-pgw name gtp s5 control],
[edit unified-edge gateways ggsn-pgw name gtp s5 data],
[edit unified-edge gateways ggsn-pgw name gtp s8],
[edit unified-edge gateways ggsn-pgw name gtp s8 control],
[edit unified-edge gateways ggsn-pgw name gtp s8 data],
[edit unified-edge gateways sgw name gtp],
[edit unified-edge gateways sgw name gtp control],
[edit unified-edge gateways sgw name gtp data],
[edit unified-edge gateways sgw name gtp s11],
[edit unified-edge gateways sgw name gtp s12],
[edit unified-edge gateways sgw name gtp s1u],
[edit unified-edge gateways sgw name gtp s4],
[edit unified-edge gateways sgw name gtp s4 control],
[edit unified-edge gateways sgw name gtp s4 data],
[edit unified-edge gateways sgw name gtp s5],
[edit unified-edge gateways sgw name gtp s5 control],
[edit unified-edge gateways sgw name gtp s5 data],
[edit unified-edge gateways sgw name gtp s8],
[edit unified-edge gateways sgw name gtp s8 control],
[edit unified-edge gateways sgw name gtp s8 data]
```

Release Information Statement introduced in Junos OS Mobility Release 11.2W.
Support at the following hierarchy levels introduced in Junos OS Mobility Release 11.4W:

- [edit unified-edge gateways sgw *name* gtp]
- [edit unified-edge gateways sgw *name* gtp control]
- [edit unified-edge gateways sgw *name* gtp data]
- [edit unified-edge gateways sgw *name* gtp s11]
- [edit unified-edge gateways sgw *name* gtp s12]
- [edit unified-edge gateways sgw *name* gtp s1u]
- [edit unified-edge gateways sgw *name* gtp s4]
- [edit unified-edge gateways sgw *name* gtp s4 control]
- [edit unified-edge gateways sgw *name* gtp s4 data]

- [edit unified-edge gateways *sgw name* gtp s5]
- [edit unified-edge gateways *sgw name* gtp s5 control]
- [edit unified-edge gateways *sgw name* gtp s5 data]
- [edit unified-edge gateways *sgw name* gtp s8]
- [edit unified-edge gateways *sgw name* gtp s8 control]
- [edit unified-edge gateways *sgw name* gtp s8 data]

Description Configure the maximum number of retries of GTP echo request messages for path management. Echo request messages are resent only when there is no response to the transmitted echo request messages within the configured response timeout value (for GTP echo request messages).

Options *requests*—Maximum number of times that the broadband gateway attempts to send an echo request message.

Range: 1 through 8

Default: 8

Required Privilege Level unified-edge—To view this statement in the configuration.
unified-edge-control—To add this statement to the configuration.

Related Documentation

- [Configuring GTP Services Overview on page 7](#)
- [gtp \(GGSN or P-GW\) on page 62](#)
- [gtp \(S-GW\)](#)

echo-t3-response

Syntax `echo-t3-response response-interval;`

Hierarchy Level [edit unified-edge gateways ggsn-pgw *name* gtp],
[edit unified-edge gateways ggsn-pgw *name* gtp control],
[edit unified-edge gateways ggsn-pgw *name* gtp data],
[edit unified-edge gateways ggsn-pgw *name* gtp gn],
[edit unified-edge gateways ggsn-pgw *name* gtp gn control],
[edit unified-edge gateways ggsn-pgw *name* gtp gn data],
[edit unified-edge gateways ggsn-pgw *name* gtp gp],
[edit unified-edge gateways ggsn-pgw *name* gtp gp control],
[edit unified-edge gateways ggsn-pgw *name* gtp gp data],
[edit unified-edge gateways ggsn-pgw *name* gtp peer-group *name*],
[edit unified-edge gateways ggsn-pgw *name* gtp s5],
[edit unified-edge gateways ggsn-pgw *name* gtp s5 control],
[edit unified-edge gateways ggsn-pgw *name* gtp s5 data],
[edit unified-edge gateways ggsn-pgw *name* gtp s8],
[edit unified-edge gateways ggsn-pgw *name* gtp s8 control],
[edit unified-edge gateways ggsn-pgw *name* gtp s8 data],
[edit unified-edge gateways sgw *name* gtp],
[edit unified-edge gateways sgw *name* gtp control],
[edit unified-edge gateways sgw *name* gtp data],
[edit unified-edge gateways sgw *name* gtp s11],
[edit unified-edge gateways sgw *name* gtp s12],
[edit unified-edge gateways sgw *name* gtp s1u],
[edit unified-edge gateways sgw *name* gtp s4],
[edit unified-edge gateways sgw *name* gtp s4 control],
[edit unified-edge gateways sgw *name* gtp s4 data],
[edit unified-edge gateways sgw *name* gtp s5],
[edit unified-edge gateways sgw *name* gtp s5 control],
[edit unified-edge gateways sgw *name* gtp s5 data],
[edit unified-edge gateways sgw *name* gtp s8],
[edit unified-edge gateways sgw *name* gtp s8 control],
[edit unified-edge gateways sgw *name* gtp s8 data]

Release Information Statement introduced in Junos OS Mobility Release 11.2W.
Support at the following hierarchy levels introduced in Junos OS Mobility Release 11.4W:

- [edit unified-edge gateways sgw *name* gtp]
- [edit unified-edge gateways sgw *name* gtp control],
- [edit unified-edge gateways sgw *name* gtp data]
- [edit unified-edge gateways sgw *name* gtp s11]
- [edit unified-edge gateways sgw *name* gtp s12]
- [edit unified-edge gateways sgw *name* gtp s1u]
- [edit unified-edge gateways sgw *name* gtp s4]
- [edit unified-edge gateways sgw *name* gtp s4 control]
- [edit unified-edge gateways sgw *name* gtp s4 data]

- [edit unified-edge gateways *sgw name* gtp s5]
- [edit unified-edge gateways *sgw name* gtp s5 control]
- [edit unified-edge gateways *sgw name* gtp s5 data]
- [edit unified-edge gateways *sgw name* gtp s8]
- [edit unified-edge gateways *sgw name* gtp s8 control]
- [edit unified-edge gateways *sgw name* gtp s8 data]

Description	Configure the response timeout for a GTP echo request message. The response timeout indicates the time (in seconds) that the broadband gateway waits before transmitting the next echo request message if it does not receive a response.
Default	If you do not include this statement, the response timeout is set to 5 seconds.
Options	<i>response interval</i> —Time, in seconds, that the gateway waits before transmitting the next echo request message if it does not receive a response. Range: 1 through 65,535 seconds Default: 15 seconds
Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• gtp (GGSN or P-GW) on page 62• gtp (S-GW)

error-indication-interval

Syntax	<code>error-indication-interval <i>seconds</i>;</code>
Hierarchy Level	[edit unified-edge gateways <i>ggsn-pgw name</i> gtp data], [edit unified-edge gateways <i>ggsn-pgw name</i> gtp s8 data], [edit unified-edge gateways <i>sgw name</i> gtp data], [edit unified-edge gateways <i>sgw name</i> gtp s8 data]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	Configure the interval at which the broadband gateway generates an error indication (Tunnel Endpoint Identifier [TEID] error message) to the peer per bearer. One error indication is generated per bearer for the interval configured, in seconds.
Options	<i>seconds</i> — Number of seconds that the gateway waits before indicating an error message to the peer. Range: 1 through 20 seconds Default: 2 seconds
Required Privilege Level	unified-edge —To view this statement in the configuration. unified-edge-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• gtp (GGSN or P-GW) on page 62• gtp (S-GW)

forwarding-class (GTP)

Syntax	<code>forwarding-class class-name;</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp gn control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp gp control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5 control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8 control], [edit unified-edge gateways sgw <i>name</i> gtp control], [edit unified-edge gateways sgw <i>name</i> gtp s4 control], [edit unified-edge gateways sgw <i>name</i> gtp s5 control], [edit unified-edge gateways sgw <i>name</i> gtp s8 control], [edit unified-edge gateways sgw <i>name</i> gtp s11]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W. Support at the following hierarchy levels introduced in Junos OS Mobility Release 11.4W:</p> <ul style="list-style-type: none"> • [edit unified-edge gateways sgw <i>name</i> gtp control] • [edit unified-edge gateways sgw <i>name</i> gtp s4 control] • [edit unified-edge gateways sgw <i>name</i> gtp s5 control] • [edit unified-edge gateways sgw <i>name</i> gtp s8 control] • [edit unified-edge gateways sgw <i>name</i> gtp s11]
Description	Specify a forwarding class for outbound control packets.
Options	<i>class-name</i> —Name of the forwarding class.
Required Privilege Level	<p>unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • control (GTP) on page 44 • control (GTP Gn, Gp, S4, S5, and S8 Interfaces) on page 45 • s11

gn

```

Syntax  gn {
        control {
            dscp-code-point value;
            echo-interval interval;
            echo-n3-requests requests;
            echo-t3-response response-interval;
            forwarding-class class-name;
            interface {
                interface-name;
                v4-address v4-address;
            }
            n3-requests requests;
            path-management (disable | enable);
            t3-response response-interval;
        }
        data {
            echo-interval interval;
            echo-n3-requests requests;
            echo-t3-response response-interval;
            interface {
                interface-name;
                v4-address v4-address;
            }
            n3-requests requests;
            path-management (disable | enable);
            t3-response response-interval;
        }
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        interface {
            interface-name;
            v4-address v4-address;
        }
        n3-requests requests;
        path-management (disable | enable);
        t3-response response-interval;
    }

```

Hierarchy Level [edit unified-edge gateways ggsn-pgw *name* gtp]

Release Information Statement introduced in Junos OS Mobility Release 11.2W.

Description Configure the path and tunnel management parameters for the 3GPP Gn interface. This configuration overrides the parameters configured at a higher level in the hierarchy and applies to all GTP peers that connect to the Gn interface. You can also configure parameters only for GTP control packets or GTP user plane packets—these parameters override the parameters at the higher hierarchy levels.

The remaining statements are explained separately.

Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• gtp (GGSN or P-GW) on page 62

gp

```

Syntax  gp {
        control {
            dscp-code-point value;
            echo-interval interval;
            echo-n3-requests requests;
            echo-t3-response response-interval;
            forwarding-class class-name;
            interface {
                interface-name;
                v4-address v4-address;
            }
            n3-requests requests;
            path-management (disable | enable);
            t3-response response-interval;
        }
        data {
            echo-interval interval;
            echo-n3-requests requests;
            echo-t3-response response-interval;
            interface {
                interface-name;
                v4-address v4-address;
            }
            n3-requests requests;
            path-management (disable | enable);
            t3-response response-interval;
        }
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        interface {
            interface-name;
            v4-address v4-address;
        }
        n3-requests requests;
        path-management (disable | enable);
        t3-response response-interval;
    }

```

Hierarchy Level [edit unified-edge gateways ggsn-pgw *name* gtp]

Release Information Statement introduced in Junos OS Mobility Release 11.2W.

Description Configure the path and tunnel management parameters for the 3GPP Gp interface. This configuration overrides the parameters configured at a higher level in the hierarchy and applies to all GTP peers that connect to the Gp interface. You can also configure parameters only for GTP control packets or GTP user plane packets—these parameters override the parameters at the higher hierarchy levels.

The remaining statements are explained separately.

Required Privilege	unified-edge—To view this statement in the configuration.
Level	unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• gtp (GGSN or P-GW) on page 62

gtp (GGSN or P-GW)

```
Syntax  gtp {
        control {
            dscp-code-point value;
            echo-interval interval;
            echo-n3-requests requests;
            echo-t3-response response-interval;
            forwarding-class class-name;
            interface {
                interface-name;
                v4-address v4-address;
            }
            n3-requests requests;
            no-response-cache;
            path-management (disable | enable);
            response-cache-timeout t interval-in-seconds;
            t3-response response-interval;
        }
        data {
            echo-interval interval;
            echo-n3-requests requests;
            echo-t3-response response-interval;
            error-indication-interval seconds;
            interface {
                interface-name;
                v4-address v4-address;
            }
            path-management (disable | enable);
        }
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        gn {
            control {
                dscp-code-point value;
                echo-interval interval;
                echo-n3-requests requests;
                echo-t3-response response-interval;
                forwarding-class class-name;
                interface {
                    interface-name;
                    v4-address v4-address;
                }
                n3-requests requests;
                path-management (disable | enable);
                t3-response response-interval;
            }
            data {
                echo-interval interval;
                echo-n3-requests requests;
                echo-t3-response response-interval;
                interface {
                    interface-name;
```

```

        v4-address v4-address;
    }
    n3-requests requests;
    path-management (disable | enable);
    t3-response response-interval;
}
echo-interval interval;
echo-n3-requests requests;
echo-t3-response response-interval;
interface {
    interface-name;
    v4-address v4-address;
}
n3-requests requests;
path-management (disable | enable);
t3-response response-interval;
}
gp {
    control {
        dscp-code-point value;
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        forwarding-class class-name;
        interface {
            interface-name;
            v4-address v4-address;
        }
        n3-requests requests;
        path-management (disable | enable);
        t3-response response-interval;
    }
    data {
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        interface {
            interface-name;
            v4-address v4-address;
        }
        n3-requests requests;
        path-management (disable | enable);
        t3-response response-interval;
    }
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    interface {
        interface-name;
        v4-address v4-address;
    }
    n3-requests requests;
    path-management (disable | enable);
    t3-response response-interval;
}
interface {

```

```
    interface-name;  
    v4-address v4-address;  
  }  
  n3-requests requests;  
  path-management (disable | enable);  
  peer-group name {  
    control {  
      support-16-bit-sequence;  
    }  
    echo-interval interval;  
    echo-n3-requests requests;  
    echo-t3-response response-interval;  
    n3-requests requests;  
    path-management (disable | enable);  
    peer {  
      [ip-addr-prefix];  
    }  
    routing-instance routing-identifier;  
    t3-response response-interval;  
  }  
  peer-history number;  
  s5 {  
    control {  
      dscp-code-point value;  
      echo-interval interval;  
      echo-n3-requests requests;  
      echo-t3-response response-interval;  
      forwarding-class class-name;  
      interface {  
        interface-name;  
        v4-address v4-address;  
      }  
      n3-requests requests;  
      path-management (disable | enable);  
      support-16-bit-sequence;  
      t3-response response-interval;  
    }  
    data {  
      echo-interval interval;  
      echo-n3-requests requests;  
      echo-t3-response response-interval;  
      interface {  
        interface-name;  
        v4-address v4-address;  
      }  
      n3-requests requests;  
      path-management (disable | enable);  
      t3-response response-interval;  
    }  
    echo-interval interval;  
    echo-n3-requests requests;  
    echo-t3-response response-interval;  
    interface {  
      interface-name;  
      v4-address v4-address;  
    }  
  }
```

```

n3-requests requests;
path-management (disable | enable);
t3-response response-interval;
}
s8 {
  control {
    dscp-code-point value;
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    forwarding-class class-name;
    interface {
      interface-name;
      v4-address v4-address;
    }
    n3-requests requests;
    path-management (disable | enable);
    support-16-bit-sequence;
    t3-response response-interval;
  }
  data {
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    interface {
      interface-name;
      v4-address v4-address;
    }
    n3-requests requests;
    path-management (disable | enable);
    t3-response response-interval;
  }
  echo-interval interval;
  echo-n3-requests requests;
  echo-t3-response response-interval;
  interface {
    interface-name;
    v4-address v4-address;
  }
  n3-requests requests;
  path-management (disable | enable);
  t3-response response-interval;
}
t3-response response-interval;
traceoptions {
  file filename {
    files files;
    (no-world-readable | world-readable);
    size size;
  }
  flag {
    flag;
  }
  level level;
  no-remote-trace;
}

```

```
}
```

Hierarchy Level [edit unified-edge gateways ggsn-pgw]

Release Information Statement introduced in Junos OS Mobility Release 11.2W.

Description Configure the parameters related to the GPRS tunneling protocol (GTP) on the Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW). GTP is used to tunnel GTP packets through 3G and 4G networks. GTP is the primary protocol used in a GPRS core network and allows users in a 3G or 4G network to move from one location to another while remaining connected to the Internet. A MobileNext Broadband Gateway configured as a GGSN, P-GW, or GGSN/P-GW automatically selects the appropriate GTP version based on the capabilities of the Serving GPRS Support Node (SGSN) or Serving Gateway (S-GW) to which it is connected.

The remaining statements are explained separately.

Required Privilege Level unified-edge—To view this statement in the configuration.
unified-edge-control—To add this statement to the configuration.

Related Documentation

- [edit unified-edge gateways ggsn-pgw <gateway-name>] Hierarchy Level
- [Configuring GTP Services Overview on page 7](#)

interface (GTP)

Syntax	<pre>interface { interface-name; v4-address v4-address; }</pre>
Hierarchy Level	<pre>[edit unified-edge gateways ggsn-pgw name gtp], [edit unified-edge gateways ggsn-pgw name gtp control], [edit unified-edge gateways ggsn-pgw name gtp data], [edit unified-edge gateways ggsn-pgw name gtp gn], [edit unified-edge gateways ggsn-pgw name gtp gn control], [edit unified-edge gateways ggsn-pgw name gtp gn data], [edit unified-edge gateways ggsn-pgw name gtp gp], [edit unified-edge gateways ggsn-pgw name gtp gp control], [edit unified-edge gateways ggsn-pgw name gtp gp data], [edit unified-edge gateways ggsn-pgw name gtp s5], [edit unified-edge gateways ggsn-pgw name gtp s5 control], [edit unified-edge gateways ggsn-pgw name gtp s5 data], [edit unified-edge gateways ggsn-pgw name gtp s8], [edit unified-edge gateways ggsn-pgw name gtp s8 control], [edit unified-edge gateways ggsn-pgw name gtp s8 data], [edit unified-edge gateways sgw name gtp], [edit unified-edge gateways sgw name gtp control], [edit unified-edge gateways sgw name gtp data], [edit unified-edge gateways sgw name gtp s11], [edit unified-edge gateways sgw name gtp s12], [edit unified-edge gateways sgw name gtp s1u], [edit unified-edge gateways sgw name gtp s4], [edit unified-edge gateways sgw name gtp s4 control], [edit unified-edge gateways sgw name gtp s4 data], [edit unified-edge gateways sgw name gtp s5], [edit unified-edge gateways sgw name gtp s5 control], [edit unified-edge gateways sgw name gtp s5 data], [edit unified-edge gateways sgw name gtp s8], [edit unified-edge gateways sgw name gtp s8 control], [edit unified-edge gateways sgw name gtp s8 data]</pre>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the following hierarchy levels introduced in Junos OS Mobility Release 11.4W:</p> <ul style="list-style-type: none"> • [edit unified-edge gateways sgw name gtp] • [edit unified-edge gateways sgw name gtp control] • [edit unified-edge gateways sgw name gtp data] • [edit unified-edge gateways sgw name gtp s11] • [edit unified-edge gateways sgw name gtp s12] • [edit unified-edge gateways sgw name gtp s1u] • [edit unified-edge gateways sgw name gtp s4] • [edit unified-edge gateways sgw name gtp s4 control]

- [edit unified-edge gateways *sgw name* gtp s4 data]
- [edit unified-edge gateways *sgw name* gtp s5]
- [edit unified-edge gateways *sgw name* gtp s5 control]
- [edit unified-edge gateways *sgw name* gtp s5 data]
- [edit unified-edge gateways *sgw name* gtp s8]
- [edit unified-edge gateways *sgw name* gtp s8 control]
- [edit unified-edge gateways *sgw name* gtp s8 data]

Description Specify the loopback interface and IPv4 address on which the GTP packets are received. To enable GTP services, you must configure at least one loopback interface and IPv4 address for the Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW) or for the Serving Gateway (S-GW), as applicable.

For the GGSN or P-GW, you can optionally configure the loopback interface and IP address at the Gn, Gp, S5, or S8 interface levels or their corresponding control and data planes, or at the gateway level or their corresponding control and data planes.

For the S-GW, you can optionally configure the loopback interface and IP address at the S11, S12, or S1u interface levels, or the S4, S5, or S8 interface levels, or their corresponding control and data planes, or at the gateway level or their corresponding control and data planes. However, you must at least configure the **interface** statement:

- At the [edit unified-edge gateways *sgw name* gtp] hierarchy level or the [edit unified-edge gateways *sgw name* gtp control] and [edit unified-edge gateways *sgw name* gtp data] hierarchy levels, or
- If it is not configured at the top of the GTP hierarchy level, you must configure the statement for either:
 - The S11, S1u, and one of the S5 or S8 interfaces, or
 - The S4, and one of the S5 or S8 interfaces.

Options *interface-name*—Name of the interface used in the gateway.

v4-address v4-address—IP address (IPv4) on which the GTP packets are received.

Required Privilege Level unified-edge—To view this statement in the configuration.
unified-edge-control—To add this statement to the configuration.

Related Documentation

- [Configuring GTP Services Overview on page 7](#)
- [gtp \(GGSN or P-GW\) on page 62](#)
- gtp (S-GW)

n3-requests

Syntax	<code>n3-requests <i>requests</i>;</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp control],</p> <p>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp gn control],</p> <p>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp gp control],</p> <p>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5 control],</p> <p>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8 control],</p> <p>[edit unified-edge gateways sgw <i>name</i> gtp control],</p> <p>[edit unified-edge gateways sgw <i>name</i> gtp s11],</p> <p>[edit unified-edge gateways sgw <i>name</i> gtp s4 control],</p> <p>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5 control],</p> <p>[edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8 control],</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the following hierarchy levels introduced in Junos OS Mobility Release 11.4W:</p> <ul style="list-style-type: none"> • [edit unified-edge gateways sgw <i>name</i> gtp control] • [edit unified-edge gateways sgw <i>name</i> gtp s5 control] • [edit unified-edge gateways sgw <i>name</i> gtp s8 control]
Description	For tunnel management, configure the maximum number of times that the broadband gateway attempts to send a signaling request message to a control. The gateway waits for the time specified in the t3-timeout statement before resending a signaling request message when a response to the request has not been received.
Options	<p>requests—Maximum number of times that the gateway attempts to send a signaling request message.</p> <p>Range: 1 through 5</p> <p>Default: 3</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring GTP Services Overview on page 7 • gtp (GGSN or P-GW) on page 62 • gtp (S-GW)

no-response-cache

Syntax	no-response-cache;
Hierarchy Level	[edit unified-edge gateways <i>ggsn-pgw gateway-name</i> gtp control], [edit unified-edge gateways <i>sgw gateway-name</i> gtp control]
Release Information	Statement introduced in Junos OS Mobility Release 11.4W.
Description	Specify that the GPRS Tunneling Protocol (GTP) response cache is disabled. The response cache stores the GTP responses (sent for request messages) for the duration configured, or the default, if the time is not configured, using the response-cache-timeout statement. If this cache is disabled, then the response messages are not stored.
Default	If you do not configure this statement, then the GTP response cache is enabled by default.
Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">Configuring General GTP Service on the S-GWgtp (GGSN or P-GW) on page 62gtp (S-GW)response-cache-timeout on page 75

path-management

Syntax	path-management (disable enable);
Hierarchy Level	<pre> [edit unified-edge gateways ggsn-pgw <i>name</i> gtp], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp data], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp gn], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp gn control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp gn data], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp gp], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp gp control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp gp data], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp peer-group <i>name</i>], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5 control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5 data], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8 control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8 data], [edit unified-edge gateways sgw <i>name</i> gtp], [edit unified-edge gateways sgw <i>name</i> gtp control], [edit unified-edge gateways sgw <i>name</i> gtp data], [edit unified-edge gateways sgw <i>name</i> gtp s11], [edit unified-edge gateways sgw <i>name</i> gtp s12], [edit unified-edge gateways sgw <i>name</i> gtp s1u], [edit unified-edge gateways sgw <i>name</i> gtp s4], [edit unified-edge gateways sgw <i>name</i> gtp s4 control], [edit unified-edge gateways sgw <i>name</i> gtp s4 data], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5 control], [edit unified-edge gateways sgw <i>name</i> gtp s5 data], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8 control], [edit unified-edge gateways sgw <i>name</i> gtp s8 data] </pre>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W. Support at the following hierarchy levels introduced in Junos OS Mobility Release 11.4W:</p> <ul style="list-style-type: none"> • [edit unified-edge gateways sgw <i>name</i> gtp] • [edit unified-edge gateways sgw <i>name</i> gtp control] • [edit unified-edge gateways sgw <i>name</i> gtp data] • [edit unified-edge gateways sgw <i>name</i> gtp s11] • [edit unified-edge gateways sgw <i>name</i> gtp s12] • [edit unified-edge gateways sgw <i>name</i> gtp s1u] • [edit unified-edge gateways sgw <i>name</i> gtp s4] • [edit unified-edge gateways sgw <i>name</i> gtp s4 control] • [edit unified-edge gateways sgw <i>name</i> gtp s4 data]

- `[edit unified-edge gateways sgw name gtp s5]`
- `[edit unified-edge gateways sgw name gtp s5 control]`
- `[edit unified-edge gateways sgw name gtp s5 data]`
- `[edit unified-edge gateways sgw name gtp s8]`
- `[edit unified-edge gateways sgw name gtp s8 control]`
- `[edit unified-edge gateways sgw name gtp s8 data]`

Description	Enable or disable path management. When path management is disabled, the broadband gateway does not send echo request messages to its peer. By default, path management is enabled only on the control plane for the broadband gateway.
Options	disable —Disable path management. enable —Enable path management.
Required Privilege Level	unified-edge —To view this statement in the configuration. unified-edge-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• gtp (GGSN or P-GW) on page 62• gtp (S-GW)

peer (GTP)

Syntax	<pre>peer { [ip-addr-prefix]; }</pre>
Hierarchy Level	<code>[edit unified-edge gateways ggsn-pgw name gtp peer-group peer-group]</code>
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	Specify the IP address of the peer in the peer group. The IP address specified must also include the network prefix. To specify multiple peers, include the peer statement multiple times.
Options	ip-addr-prefix —IP address of the peer, including the network prefix; for example, 22.1.1.10/16.
Required Privilege Level	unified-edge —To view this statement in the configuration. unified-edge-control —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• peer-group (GTP) on page 73


peer-group (GTP)

Syntax	<pre> peer-group <i>name</i> { control { support-16-bit-sequence; } echo-interval <i>interval</i>; echo-n3-requests <i>requests</i>; echo-t3-response <i>response-interval</i>; n3-requests <i>requests</i>; path-management (disable enable); peer { [<i>ip-addr-prefix</i>]; } routing-instance <i>routing-identifier</i>; t3-response <i>response-interval</i>; </pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>name</i> gtp]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	Configure a group of 3GPP GTP peers to share common signaling and data parameters. This configuration overrides the common or interface-specific configuration for the peers in the group.
Options	<p><i>name</i>—Name of the peer group.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring GTP Services Overview on page 7 • gtp (GGSN or P-GW) on page 62

peer-history (GTP)

Syntax	<code>peer-history <i>number</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>name</i> gtp], [edit unified-edge gateways sgw <i>name</i> gtp]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>name</i> gtp] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Configure the maximum number of peers (that are no longer present on the broadband gateway) for which the broadband gateway stores the statistics collected.
Options	<i>number</i> —Maximum number of peers for which statistics are stored. Range: 1 through 1000
Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• gtp (GGSN or P-GW) on page 62• gtp (S-GW)

response-cache-timeout

Syntax	<code>response-cache-timeout <i>interval-in-seconds</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> gtp control], [edit unified-edge gateways sgw <i>gateway-name</i> gtp control]
Release Information	Statement introduced in Junos OS Mobility Release 11.4W.
Description	Configure the timeout for the GPRS Tunneling Protocol (GTP) response cache. This timeout indicates the duration for which the GTP response messages (sent for request messages) should be stored in the response cache.
<div>  <p>NOTE: This configuration is invalid if the <code>no-response-cache</code> statement is configured.</p> </div>	
Options	<p><i>timeout-in-seconds</i>—Timeout, in seconds, for the GTP response cache.</p> <p>Range: 5 through 20 seconds</p> <p>Default: 15 seconds</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring General GTP Service on the S-GW gtp (GGSN or P-GW) on page 62 gtp (S-GW) no-response-cache on page 70

routing-instance (GTP)

Syntax	<code>routing-instance <i>routing-identifier</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>name</i> gtp peer-group <i>name</i>]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	Configure the routing instance or the VPN routing and forwarding (VRF) instance for the peer group.
Options	<i>routing-identifier</i> —Identifier for the routing instance.
Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• peer-group (GTP) on page 73

s5

```

Syntax  s5 {
        control {
            dscp-code-point value;
            echo-interval interval;
            echo-n3-requests requests;
            echo-t3-response response-interval;
            forwarding-class class-name;
            interface {
                interface-name;
                v4-address v4-address;
            }
            n3-requests requests;
            path-management (disable | enable);
            support-16-bit-sequence; #P-GW only
            t3-response response-interval;
            ttl-value ttl-value; #S-GW only
        }
        data {
            echo-interval interval;
            echo-n3-requests requests;
            echo-t3-response response-interval;
            interface {
                interface-name;
                v4-address v4-address;
            }
            n3-requests requests; #P-GW only
            path-management (disable | enable);
            t3-response response-interval; #P-GW only
        }
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        interface {
            interface-name;
            v4-address v4-address;
        }
        n3-requests requests;
        path-management (disable | enable);
        t3-response response-interval;
    }

```

Hierarchy Level [edit unified-edge gateways *ggsn-pgw name gtp*],
[edit unified-edge gateways *sgw name gtp*],

Release Information Statement introduced in Junos OS Mobility Release 11.2W.
Support at the [edit unified-edge gateways *sgw name gtp*] hierarchy level introduced in Junos OS Mobility Release 11.4W.

Description Configure the path and tunnel management parameters for the 3GPP S5 interface. This configuration overrides the parameters configured at a higher level in the hierarchy and applies to all GTP peers that connect to the S5 interface. You can also configure

parameters only for GTP control packets or GTP user plane packets—these parameters override the parameters at the higher hierarchy levels.

The remaining statements are explained separately.

Required Privilege Level	unified-edge—To view this statement in the configuration.
	unified-edge-control—To add this statement to the configuration.
Related Documentation	• Configuring GTP Services Overview on page 7
	• gtp (GGSN or P-GW) on page 62
	• gtp (S-GW)

s8

```

Syntax  s8 {
        control {
            dscp-code-point value;
            echo-interval interval;
            echo-n3-requests requests;
            echo-t3-response response-interval;
            forwarding-class class-name;
            interface {
                interface-name;
                v4-address v4-address;
            }
            n3-requests requests;
            path-management (disable | enable);
            support-16-bit-sequence; #P-GW only
            t3-response response-interval;
            ttl-value ttl-value; #S-GW only
        }
        data {
            echo-interval interval;
            echo-n3-requests requests;
            echo-t3-response response-interval;
            interface {
                interface-name;
                v4-address v4-address;
            }
            n3-requests requests; #P-GW only
            path-management (disable | enable);
            t3-response response-interval; #P-GW only
        }
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        interface {
            interface-name;
            v4-address v4-address;
        }
        n3-requests requests;
        path-management (disable | enable);
        t3-response response-interval;
    }

```

Hierarchy Level [edit unified-edge gateways *ggsn-pgw name gtp*],
[edit unified-edge gateways *sgw name gtp*]

Release Information Statement introduced in Junos OS Mobility Release 11.2W.
Support at the [edit unified-edge gateways *sgw name gtp*] hierarchy level introduced in Junos OS Mobility Release 11.4W.

Description Configure the path and tunnel management parameters for the 3GPP S8 interface. This configuration overrides the parameters configured at a higher level in the hierarchy and applies to all GTP peers that connect to the S8 interface. You can also configure

parameters only for GTP control packets or GTP user plane packets—these parameters override the parameters at the higher hierarchy levels.

The remaining statements are explained separately.

Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• gtp (GGSN or P-GW) on page 62• gtp (S-GW)

support-16-bit-sequence

Syntax	support-16-bit-sequence;
Hierarchy Level	[edit unified-edge gateways ggsn-pgw name gtp peer-group name control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5 control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8 control]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	Enable support for 16-bit sequence numbers for interoperation with older gateways that support a GTP version with a 16-bit sequence number length. Support for 16-bit sequence numbers is disabled by default.
Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring GTP Services Overview on page 7• gtp (GGSN or P-GW) on page 62

t3-response

Syntax	t3 response <i>response-interval</i> ;
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>name</i> gtp control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp gn control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp gp control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s5 control], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8 control], [edit unified-edge gateways sgw <i>name</i> gtp control], [edit unified-edge gateways sgw <i>name</i> gtp s11], [edit unified-edge gateways sgw <i>name</i> gtp s4 control], [edit unified-edge gateways sgw <i>name</i> gtp s5 control], [edit unified-edge gateways sgw <i>name</i> gtp s8 control]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the following hierarchy levels introduced in Junos OS Mobility Release 11.4W: <ul style="list-style-type: none"> • [edit unified-edge gateways sgw <i>name</i> gtp] • [edit unified-edge gateways sgw <i>name</i> gtp control] • [edit unified-edge gateways sgw <i>name</i> gtp s11] • [edit unified-edge gateways sgw <i>name</i> gtp s4 control] • [edit unified-edge gateways sgw <i>name</i> gtp s5 control] • [edit unified-edge gateways sgw <i>name</i> gtp s8 control]
Description	Configure the response timeout for GTP signaling request messages. The response timeout is how long the gateway waits before resending a signaling request message when the response to a request has not been received.
Options	<i>seconds</i> —Time that the gateway waits before resending a signaling request message. Range: 1 through 30 seconds Default: 5 seconds
Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring GTP Services Overview on page 7 • gtp (GGSN or P-GW) on page 62 • gtp (S-GW)

traceoptions (GTP)

Syntax	<pre>traceoptions { file <i>filename</i> { files <i>files</i>; (no-world-readable world-readable); size <i>size</i>; } flag { <i>flag</i>; } level <i>level</i>; no-remote-trace; }</pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>name</i> gtp], [edit unified-edge gateways sgw <i>name</i> gtp]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>name</i> gtp] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Configure GTP tracing options. You can specify which trace operations are logged by including specific tracing flags and levels.
Options	<p>file <i>filename</i>—Name of the file that receives the output of the tracing operation. All files are placed in the <code>/var/log</code> directory.</p> <p>files <i>files</i>— (Optional) Maximum number of trace files. When a trace file named trace-file reaches its maximum size, it is renamed trace-file.0, then trace-file.1, and so on, until the maximum number of trace files is reached. Then, the oldest trace file is overwritten.</p> <p>If you specify a maximum number of files, you must also specify a maximum file size with the size option and a filename.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>flag</p> <ul style="list-style-type: none">• flag—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can use one of the following flags:<ul style="list-style-type: none">• all—Trace everything.• config—Trace configuration-related information.• debug—Trace debug information.• decode—Trace decoding of received packets.• encode—Trace encoding of transmitted packets.

- **error**—Trace internal and external errors.
- **events**—Trace all internal and external events.
- **packet-io**—Trace transmitted and received packets.
- **peer**—Trace GTP peer-related events.
- **tracker**—Trace GTP tracker-related events.
- **warning**—Trace warnings.

level *level*—(Optional) Level of tracing to perform. You can specify any of the following levels:

- **all**—Match all levels.
- **error**—Match error conditions.
- **info**—Match informational messages.
- **notice**—Match conditions that should be handled specially
- **verbose**—Match verbose messages.
- **warning**—Match warning messages.

no-remote-trace—(Optional) Disable remote tracing.

no-world-readable—(Optional) Restrict access to the originator of the trace operation only.

size *size*—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you must also specify a maximum number of trace files with the **files** option and filename.

Syntax: **xk** to specify KB, **xm** to specify MB, or **xg** to specify GB

Range: 10 KB through 1 GB

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

Required Privilege Level	trace and unified-edge—To view this statement in the configuration. trace-control and unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring GTP Services Overview on page 7 • gtp (GGSN or P-GW) on page 62 • gtp (S-GW)

PART 3

Administration

- [Monitoring on page 87](#)
- [Operational Commands on page 89](#)

CHAPTER 5

Monitoring

- [Configuring GTP Trace Options on page 87](#)

Configuring GTP Trace Options

GTP tracing operations record detailed messages about the operation of GTP services on the Broadband Gateway, such as the various types of GTP packets sent and received, GTP peer-related events, GTP tracker-related events, configuration information, and debug information. You can specify which trace operations are logged by including specific tracing flags and levels.

[Table 3 on page 87](#) describes the flags that you can include.

Table 3: Trace Flags

Flag	Description
all	Trace everything.
config	Trace configuration-related information.
debug	Trace debug information.
decode	Trace decoding of received packets.
encode	Trace encoding of transmitted packets.
events	Trace all internal and external events.
packet-io	Trace transmitted and received packets.
peer	Trace decoding of received packets.
tracker	Trace GTP peer-related events.
warning	Trace warnings.

[Table 4 on page 88](#) describes the levels you can include.

Table 4: Trace Levels

Level	Description
all	Match all levels.
error	Match error conditions.
info	Match informational messages.
notice	Match conditions that should be specially handled.
verbose	Match verbose messages.
warning	Match warning messages.

To configure tracing options for GTP operations:

1. Specify that you want to configure tracing options for GTP operations.

```
[edit unified-edge gateways ggsn-pgw pgw-1 gtp]
user@host# edit traceoptions
```

2. Configure the filename for the trace file.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp trace-options]
user@host# set file gtp-log
```

3. (Optional) Configure the maximum size of each trace file.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp trace-options]
user@host# set file size 100m
```

4. Configure tracing flags.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp s5 trace-options]
user@host# set flag all
```

5. Configure the tracing level.

```
[edit unified-edge mobile gateways ggsn-pgw pgw-1 gtp s5 trace-options]
user@host# set level error
```

6. View the trace file.

```
user@host# file show /var/log/gtp-log
```

Related Documentation

- [Configuring GTP Services Overview on page 7](#)
- [Configuring General GTP Service on the S-GW](#)

CHAPTER 6

Operational Commands

clear unified-edge ggsn-pgw gtp peer statistics

Syntax	<code>clear unified-edge ggsn-pgw gtp peer statistics gateway gateway remote-address remote-address</code> <code><fpc-slot fpc-slot></code> <code><gtp-all></code> <code><gtp-v0></code> <code><gtp-v1></code> <code><gtp-v2></code> <code><local-address local-address></code> <code><pic-slot pic-slot></code> <code><routing-instance routing-instance></code>
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	Clear the statistics for the GTP peer on the specified gateway GPRS support node (GGSN) or a Packet Data Network Gateway (P-GW).
Options	<p>gateway gateway—Clear the statistics for the specified gateway.</p> <p>remote-address remote-address—Clear the statistics for the peer with the specified remote address.</p> <p>fpc-slot fpc-slot—(Optional) Clear the statistics for the peer on the specified FPC slot.</p> <p>gtp-all—(Optional) Clear the statistics for GTP versions 0, 1, and 2.</p> <p>gtp-v0—(Optional) Clear the GTP version 0 statistics.</p> <p>gtp-v1—(Optional) Clear the GTP version 1 statistics.</p> <p>gtp-v2—(Optional) Clear the GTP version 2 statistics.</p> <p>local-address local-address—(Optional) Clear the statistics for the peer with the specified local IP address.</p> <p>pic-slot slot—(Optional) Clear the statistics for the peer on the specified PIC slot. You must specify an FPC slot number before specifying a PIC slot number.</p> <p>routing-instance routing-instance—(Optional) Clear the statistics for the peer on the specified routing instance.</p>
Required Privilege Level	clear, unified-edge
Related Documentation	<ul style="list-style-type: none">• show unified-edge ggsn-pgw gtp peer statistics on page 99
List of Sample Output	clear unified-edge ggsn-pgw gtp peer statistics gateway PGW remote-address 122.2.2.2 on page 91
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

```
clear unified-edge user@host> clear unified-edge ggsn-pgw gtp peer statistics gateway PGW remote-address
ggsn-pgw gtp peer 122.2.2.2
statistics gateway Cleared GTP peer statistics
PGW remote-address
122.2.2.2
```

clear unified-edge ggsn-pgw gtp statistics

Syntax	<code>clear unified-edge ggsn-pgw gtp statistics gateway <i>gateway</i></code> <code><fpc-slot <i>fpc-slot</i>></code> <code><pic-slot <i>pic-slot</i>></code>
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	Clear the global GTP statistics for the specified gateway GPRS support node (GGSN) or a Packet Data Network Gateway (P-GW).
Options	<p>gateway <i>gateway</i>—Clear the statistics for the specified gateway.</p> <p>fpc-slot <i>fpc-slot</i>—(Optional) Clear the statistics for the specified FPC slot.</p> <p>pic-slot <i>slot</i>—(Optional) Clear the statistics for the peer on the specified PIC slot. You must specify an FPC slot number before specifying a PIC slot number.</p>
Required Privilege Level	clear, unified-edge
Related Documentation	<ul style="list-style-type: none">• show unified-edge ggsn-pgw gtp statistics on page 107
List of Sample Output	clear unified-edge ggsn-pgw gtp statistics gateway PGW on page 92
Output Fields	No message is displayed on successful execution of this command; otherwise an error message is displayed.

Sample Output

<code>clear unified-edge ggsn-pgw gtp statistics gateway PGW</code>	<code>user@host> clear unified-edge ggsn-pgw gtp statistics gateway PGW</code>
---	---

show unified-edge ggsn-pgw gtp peer

Syntax `show unified-edge ggsn-pgw gtp peer`
`<detail>`
`<fpc-slot fpc-slot>`
`<gateway gateway>`
`<gn>`
`<gp>`
`<history>`
`<local-address local-address>`
`<pic-slot pic-slot>`
`<remote-address remote-address>`
`<routing-instance name>`
`<s5>`
`<s8>`

Release Information Statement introduced in Junos OS Mobility Release 11.2W.
gn, **gp**, **s5**, and **s8** attributes introduced in Junos OS Mobility Release 11.4W.

Description Display the information about GTP peers for one or more Gateway GPRS Support Nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then the information for all GGSNs and P-GWs is displayed.

Options **none**—Display the GTP peer information in brief.

detail—(Optional) Display detailed information about GTP peers.

fpc-slot fpc-slot—(Optional) Display the GTP peer information for the specified FPC slot number.

gateway gateway-name—(Optional) Display the GTP peer information for the specified gateway.

gn—Display the information about GTP peers on the gn interface.

gp—Display the information about GTP peers on the gp interface.

history—(Optional) Display the GTP peer information for peers that are no longer present on the gateway.

local-address local-address—(Optional) Display the GTP peer information for the local address of the specified peer on the gateway.

pic-slot pic-slot—(Optional) Display the GTP peer for the specified PIC slot number. You must first specify an FPC slot number before specifying the PIC slot number.

remote-address remote-address—(Optional) Display the GTP peer information for the peer with the specified remote address.

routing-instance routing-instance—(Optional) Display the GTP peer information for the peer on the specified routing instance name.



NOTE: If you specify the routing instance, you must also specify the remote address of the peer.

s5—Display the information about GTP peers on the s5 interface.

s8—Display the information about GTP peers on the s8 interface.

Required Privilege Level

view

Related Documentation

- [clear unified-edge ggsn-pgw gtp peer statistics on page 90](#)
- [show unified-edge ggsn-pgw gtp peer count on page 98](#)
- [show unified-edge ggsn-pgw gtp peer statistics on page 99](#)

List of Sample Output

[show unified-edge ggsn-pgw gtp peer on page 96](#)
[show unified-edge ggsn-pgw gtp peer detail on page 96](#)

Output Fields

[Table 5 on page 94](#) lists the output fields for the **show unified-edge ggsn-pgw gtp peer** command. Output fields are listed in the approximate order in which they appear.

Table 5: show unified-edge ggsn-pgw gtp peer Output Fields

Field Name	Field Description	Level of Output
Gateway	Name of the GGSN or P-GW.	All levels
Remote IP Address	Remote IP address of the GTP peer.	All levels
Local IP Address	Local IP address of the GTP peer on the gateway.	All levels
Routing Instance	Name of the routing instance on which the GTP peer is located.	All levels
Interface Type	Type of 3GPP interface; for example S5, S8, and so on.	detail
GTP Version	GTP version number.	detail
RCM Registration Done	This parameter is used internally by the gateway.	detail
Restart Counter Valid	Indicates whether the restart counter of the peer is valid or not.	detail
Restart Counter Value	Current restart count of the peer.	detail
Sent Restart Counter Value	Restart counter value of the gateway that was sent to the peer.	detail
Control Path N3 Request	Maximum number of times that the S-GW attempts to send a signaling request message to a control peer.	detail

Table 5: show unified-edge ggsn-pgw gtp peer Output Fields (*continued*)

Field Name	Field Description	Level of Output
Control Path T3 Timer	Response timeout for GTP signaling request messages to a control peer.	detail
Control Path Echo N3 Request	Maximum number of retries of GTP echo request messages (for path management) to a control peer.	detail
Control Path Echo T3 Timer	Response timeout for GTP echo request messages (for path management) to a control peer.	detail
Control Path Echo Interval	Number of seconds that the GGSN or P-GW waits before sending an echo request message (for path management) to its control peer.	detail
Control Path Management Enabled	Indicates whether path management is enabled or not for the control plane.	detail
Control Path State	Path state of the GTP control plane: <ul style="list-style-type: none"> • Up—Indicates that echo requests are being transmitted and responses are being received, which means that the peer is alive. • Down—Indicates that echo requests are being transmitted but responses are not being received, which means that the peer is detected to be dead. • Not tracked—Indicates that path management is disabled, which means that echo requests are not sent to the peer. 	detail
Control Min Response Time in usec	Minimum response time, in microseconds, for GTP-C messages.	detail
Control Max Response Time in usec	Maximum response time, in microseconds, for GTP-C messages.	detail
Control Avg Response Time in usec	Average response time, in microseconds, for GTP-C messages.	detail
Data Path Echo N3 Request	Maximum number of retries of GTP echo request messages (for path management) to a data peer.	detail
Data Path Echo T3 Timer	Response timeout for GTP echo request messages (for path management) to a data peer.	detail
Data Path Echo Interval	Number of seconds that the GGSN or P-GW waits before sending an echo request message (for path management) to its data peer.	detail
Data Path Management Enabled	Indicates whether path management is enabled or not for the data plane.	detail

Table 5: show unified-edge ggsn-pgw gtp peer Output Fields (*continued*)

Field Name	Field Description	Level of Output
Data Path State	Path state of the GTP user plane: <ul style="list-style-type: none"> • Up—Indicates that echo requests are being transmitted and responses are being received, which means that the peer is alive. • Down—Indicates that echo requests are being transmitted but responses are not being received, which means that the peer is detected to be dead. • Not tracked—Indicates that path management is disabled, which means that echo requests are not sent to the peer. 	detail
GTP-C using Short Sequence Number	Indicates whether the peer is using the 16-bit sequence number length.	detail
Downlink Data Notification Delay Interval	This field is not relevant for the GGSN or P-GW.	detail
CSID Supported	Indicates whether the connection set identifier (CSID) is supported by the peer or not.	detail

Sample Output

```

show unified-edge ggsn-pgw gtp peer user@host> show unified-edge ggsn-pgw gtp peer
Gateway: PGW
Remote IP Address      Local IP Address      Routing Instance
-----
17.1.1.1               17.1.1.2             default

```

```

show unified-edge ggsn-pgw gtp peer detail user@host> show unified-edge ggsn-pgw gtp peer detail
Gateway: PGW
Peer Detail:
-----
Remote IP Address      : 17.1.1.1
Local IP Address       : 17.1.1.2
Routing Instance       : default
Interface Type         : S5
GTP Version            : 2
RCM Registration Done  : yes
Restart Counter Valid  : yes
Restart Counter Value  : 65
Sent Restart Counter Value : 65
Control Path N3 Request : 3
Control Path T3 Timer  : 5
Control Path Echo N3 Request : 8
Control Path Echo T3 Timer : 15
Control Path Echo Interval : 60
Control Path Management Enabled : yes
Control Path State     : up
Control Min Response Time in usec : 0
Control Max Response Time in usec : 0
Control Avg Response Time in usec : 0
Data Path Echo N3 Request : 8

```

```
Data Path Echo T3 Timer           : 15
Data Path Echo Interval          : 60
Data Path Management Enabled      : no
Data Path State                   : not-tracked
GTP-C using Short Sequence Number : no
Downlink Data Notification Delay Interval : 0
CSID Supported                    : yes
```

show unified-edge ggsn-pgw gtp peer count

Syntax	show unified-edge ggsn-pgw gtp peer count
Release Information	Statement introduced in Junos OS Mobility Release 11.4W.
Description	Display the number of GTP peers on each interface and the total number of GTP peers for one or more Gateway GPRS Support Nodes (GGSNs) or Packet Data Network Gateways (P-GWs).
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show unified-edge ggsn-pgw gtp peer on page 93
List of Sample Output	show unified-edge ggsn-pgw gtp peer count on page 98
Output Fields	Table 6 on page 98 lists the output fields for the show unified-edge ggsn-pgw gtp peer count command. Output fields are listed in the approximate order in which they appear.

Table 6: show unified-edge ggsn-pgw gtp peer Output Fields

Field Name	Field Description
Interface Name	Name of the interface (Gn, Gp, S5, S8, and All) for which the GTP peer count is displayed.
Peer Count	The number of peers corresponding to the interface name (Gn, Gp, S5, S8, and All) is displayed.

Sample Output

```

show unified-edge user@host> show unified-edge ggsn-pgw gtp peer count
ggsn-pgw gtp peer Gateway: PGW
count              Interface Name      Peer Count
-----
Gn Interface       0
Gp Interface       0
S5 Interface       1
S8 Interface       0
All Interfaces     1

```


show unified-edge ggsn-pgw gtp peer statistics

Syntax	<pre>show unified-edge ggsn-pgw gtp peer statistics remote-address <i>remote-address</i> <detail> <fpc-slot <i>fpc-slot</i>> <gateway <i>gateway</i>> <gtp-all> <gtp-v0> <gtp-v1> <gtp-v2> <history> <local-address <i>local-address</i>> <pic-slot <i>pic-slot</i>> <routing-instance <i>routing-instance</i>></pre>
Release Information	<p>Command introduced in Junos OS Mobility Release 11.2W.</p> <p>gateway option introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Display the GTP peer statistics for one or more gateway GPRS support nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then the status for all GGSNs and P-GWs is displayed.</p>
Options	<p>remote-address <i>remote-address</i>—Display the GTP peer statistics for the peer with the specified remote address.</p> <p>detail—(Optional) Display detailed statistics about GTP peers.</p> <p>fpc-slot <i>fpc-slot</i>—(Optional) Display the GTP peer statistics for the specified FPC slot number.</p> <p>gateway <i>gateway-name</i>—(Optional) Display the GTP peer statistics for the specified gateway.</p> <p>gtp-all—(Optional) Display the statistics for GTP versions 0, 1, and 2.</p> <p>gtp-v0—(Optional) Display the GTP version 0 statistics.</p> <p>gtp-v1—(Optional) Display the GTP version 1 statistics.</p> <p>gtp-v2—(Optional) Display the GTP version 2 statistics.</p> <p>history—(Optional) Display the GTP peer statistics for peers which are no longer present on the gateway.</p> <p>local-address <i>local-address</i>—(Optional) Display the GTP peer statistics for the local address of the specified peer on the S-GW.</p> <p>pic-slot <i>pic-slot</i>—(Optional) Display the GTP peer statistics for the specified PIC slot number. You must first specify an FPC slot number before specifying the PIC slot number.</p> <p>routing-instance <i>routing-instance</i>—(Optional) Display the GTP peer statistics for the peer on the specified routing instance.</p>

Required Privilege Level view

- Related Documentation**
- [clear unified-edge ggsn-pgw gtp peer statistics on page 90](#)
 - [show unified-edge ggsn-pgw gtp peer on page 93](#)
 - [show unified-edge ggsn-pgw gtp statistics on page 107](#)

List of Sample Output [show unified-edge ggsn-pgw gtp peer statistics remote-address 17.1.1.1 on page 100](#)
[show unified-edge ggsn-pgw gtp peer statistics remote-address 17.1.1.1 detail on page 102](#)

Output Fields See the output fields for the [show unified-edge ggsn-pgw gtp statistics](#) command.

Sample Output

```
show unified-edge ggsn-pgw gtp peer statistics remote-address 17.1.1.1
user@host> show unified-edge ggsn-pgw gtp peer statistics remote-address 17.1.1.1
Gateway: PGW2

Global Packet Statistics
  Received Packets Dropped      : 0
  Packet Allocation Fail       : 0
  Packet Send Fail             : 0
  IP Version Error Received    : 0
  IP Protocol Error Received   : 0
  GTP Port Error Received     : 0
  GTP Unknown Version Received : 0
  Packet Length Error Received : 0
  Unknown Messages Received    : 0

GTP Version 0 Statistics:
-----
  Protocol Error                : 0
  Unsupported Messages Received : 0
  T3 Response Timer Expires     : 0

  Message Type                  Received      Transmitted
  -----
  Total number of messages      0             0
  Total number of bytes         0             0
  Redirect messages             0             0
  Echo Request                  0             0
  Echo Response                 0             0
  Version Not Supported         0             0
  Create PDP Context Request    0             0
  Create PDP Context Response   0             0
  Update PDP Context Request    0             0
  Update PDP Context Response   0             0
  Delete PDP Context Request    0             0
  Delete PDP Context Response   0             0

GTP Version 1 Statistics:
-----
  Protocol Error                : 0
  Unsupported Messages Received : 0
  T3 Response Timer Expires     : 0
```

Message Type	Received	Transmitted
-----	-----	-----
Total number of messages	0	0
Total number of bytes	0	0
Redirect messages	0	0
Echo Request	0	0
Echo Response	0	0
Version Not Supported	0	0
Create PDP Context Request	0	0
Create PDP Context Response	0	0
Update PDP Context Request	0	0
Update PDP Context Response	0	0
Delete PDP Context Request	0	0
Delete PDP Context Response	0	0

GTP Version 2 Statistics:

Protocol Error	: 0
Unsupported Messages Received	: 0
T3 Response Timer Expires	: 0

Message Type	Received	Transmitted
-----	-----	-----
Total number of messages	6	6
Total number of bytes	266	162
Redirect messages	0	0
S11 piggyback messages	0	0
S4 piggyback messages	0	0
S5 piggyback messages	0	0
Echo Request	5	0
Echo Response	0	5
Version Not Supported	0	0
Create session request	1	0
Create session response	0	1
Modify bearer request	0	0
Modify bearer response	0	0
Delete session request	0	0
Delete session response	0	0
Create bearer request	0	0
Create bearer response	0	0
Update bearer request	0	0
Update bearer response	0	0
Delete bearer request	0	0
Delete bearer response	0	0
Delete PDN connection set request	0	0
Delete PDN connection set response	0	0
Update PDN connection set request	0	0
Update PDN connection set response	0	0
Modify bearer command	0	0
Modify bearer failure indication	0	0
Delete bearer command	0	0
Delete bearer failure indication	0	0
Bearer resource command	0	0
Bearer resource failure indication	0	0
Change notification request	0	0
Change notification response	0	0
Release Access Bearer request	0	
0		
Release Access Bearer response	0	
0		

Suspend Notification	0	0
Suspend Acknowledge	0	0
Resume Notification	0	0
Resume Acknowledge	0	0
Create Indirect Data Forward Tunnel Request	0	0
Create Indirect Data Forward Tunnel Response	0	0
Delete Indirect Data Forward Tunnel Request	0	0
Delete Indirect Data Forward Tunnel Response	0	0
Downlink Data Notification	0	0
Downlink Data Notification ack	0	0
Downlink Data Notification fail	0	0
Stop paging indication	0	0

Error Indication Statistics:

Version	Received	Transmitted

GTPv0	0	0
GTPv1	0	0

```

show unified-edge user@host> show unified-edge ggsn-pgw gtp peer statistics remote-address 17.1.1.1 detail
ggsn-pgw gtp peer Gateway: PGW2
statistics
remote-address 17.1.1.1
detail

```

```

Global Packet Statistics
Received Packets Dropped      : 0
Packet Allocation Fail        : 0
Packet Send Fail              : 0
IP Version Error Received     : 0
IP Protocol Error Received    : 0
GTP Port Error Received       : 0
GTP Unknown Version Received  : 0
Packet Length Error Received  : 0
Unknown Messages Received     : 0

```

GTP Version 0 Statistics:

```

-----
Protocol Error                  : 0
Unsupported Messages Received  : 0
T3 Response Timer Expires      : 0

```

Message Type	Received	Transmitted

Total number of messages	0	0
Total number of bytes	0	0
Redirect messages	0	0
Echo Request	0	0
Echo Response	0	0
Version Not Supported	0	0
Create PDP Context Request	0	0
Create PDP Context Response	0	0
Update PDP Context Request	0	0
Update PDP Context Response	0	0
Delete PDP Context Request	0	0
Delete PDP Context Response	0	0

Cause Code	Received	Transmitted

Request Accepted	0	0

Non Existent	0	0
Invalid Message Format	0	0
IMSI Not Known	0	0
MS is GPRS Detached	0	0
MS is not GPRS Response	0	0
MS Refuses	0	0
Version Not Supported	0	0
No Resource Available	0	0
Service Not Supported	0	0
Mandatory IE Incorrect	0	0
Mandatory IE Missing	0	0
Optional IE Incorrect	0	0
System Failure	0	0
Roaming Restriction	0	0
P-TMSI Signature Mismatch	0	0
GPRS Connection Suspended	0	0
Authentication Failure	0	0
User Authentication Failed	0	0

GTP Version 1 Statistics:

Protocol Error	: 0
Unsupported Messages Received	: 0
T3 Response Timer Expires	: 0

Message Type	Received	Transmitted

Total number of messages	0	0
Total number of bytes	0	0
Redirect messages	0	0
Echo Request	0	0
Echo Response	0	0
Version Not Supported	0	0
Create PDP Context Request	0	0
Create PDP Context Response	0	0
Update PDP Context Request	0	0
Update PDP Context Response	0	0
Delete PDP Context Request	0	0
Delete PDP Context Response	0	0

Cause Code	Received	Transmitted

Request Accepted	0	0
Non Existent	0	0
Invalid Message Format	0	0
IMSI Not Known	0	0
MS is GPRS Detached	0	0
MS is not GPRS Response	0	0
MS Refuses	0	0
Version Not Supported	0	0
No Resource Available	0	0
Service Not Supported	0	0
Mandatory IE Incorrect	0	0
Mandatory IE Missing	0	0
Optional IE Incorrect	0	0
System Failure	0	0
Roaming Restriction	0	0
P-TMSI Signature Mismatch	0	0
GPRS Connection Suspended	0	0

Authentication Failure	0	0
User Authentication Failed	0	0
Context not found	0	0
All dynamic PDP addresses are occupied	0	0
No memory is available	0	0
Relocation failure	0	0
Unknown mandatory extension header	0	0
Semantic error in the TFT operation	0	0
Syntactic error in the TFT operation	0	0
Semantic errors in packet filter(s)	0	0
Syntactic errors in packet filter(s)	0	0
Missing or unknown APN	0	0
Unknown PDP address or PDP type	0	0
PDP context without TFT already activated	0	0

GTP Version 2 Statistics:

Protocol Error	: 0
Unsupported Messages Received	: 0
T3 Response Timer Expires	: 0

Message Type	Received	Transmitted

Total number of messages	7	7
Total number of bytes	279	175
Redirect messages	0	0
S11 piggyback messages	0	0
S4 piggyback messages	0	0
S5 piggyback messages	0	0
Echo Request	6	0
Echo Response	0	6
Version Not Supported	0	0
Create session request	1	0
Create session response	0	1
Modify bearer request	0	0
Modify bearer response	0	0
Delete session request	0	0
Delete session response	0	0
Create bearer request	0	0
Create bearer response	0	0
Update bearer request	0	0
Update bearer response	0	0
Delete bearer request	0	0
Delete bearer response	0	0
Delete PDN connection set request	0	0
Delete PDN connection set response	0	0
Update PDN connection set request	0	0
Update PDN connection set response	0	0
Modify bearer command	0	0
Modify bearer failure indication	0	0
Delete bearer command	0	0
Delete bearer failure indication	0	0
Bearer resource command	0	0
Bearer resource failure indication	0	0
Change notification request	0	0
Change notification response	0	0
Release Access Bearer request	0	
0		
Release Access Bearer response	0	
0		

Suspend Notification	0	0
Suspend Acknowledge	0	0
Resume Notification	0	0
Resume Acknowledge	0	0
Create Indirect Data Forward Tunnel Request	0	0
Create Indirect Data Forward Tunnel Response	0	0
Delete Indirect Data Forward Tunnel Request	0	0
Delete Indirect Data Forward Tunnel Response	0	0
Downlink Data Notification	0	0
Downlink Data Notification ack	0	0
Downlink Data Notification fail	0	0
Stop paging indication	0	0

Cause Code	Received	Transmitted

Request accepted	0	1
Request accepted partially	0	0
New PDN type due to network preference	0	0
New PDN type due to single address bearer only	0	0
Local Detach	0	0
Complete Detach	0	0
RAT changed from 3GPP to Non 3GPP	0	0
ISR Deactivated	0	0
Error Indication from RNC Enodeb	0	0
Context Not Found	0	0
Invalid Message Format	0	0
Version not supported by next peer	0	0
Invalid length	0	0
Service not supported	0	0
Mandatory IE incorrect	0	0
Mandatory IE missing	0	0
Optional IE incorrect	0	0
System failure	0	0
No resources available	0	0
Semantic error in the TFT operation	0	0
Syntactic error in the TFT operation	0	0
Semantic errors in packet filter(s)	0	0
Syntactic errors in packet filter(s)	0	0
Missing or unknown APN	0	0
Unexpected repeated IE	0	0
GRE key not found	0	0
Reallocation failure	0	0
Denied in RAT	0	0
Preferred PDN type not supported	0	0
All dynamic addresses are occupied	0	0
UE context without TFT already activated	0	0
Protocol type not supported	0	0
UE not responding	0	0
UE refuses	0	0
Service denied	0	0
Unable to page UE	0	0
No memory available	0	0
User authentication failed	0	0
APN access denied - no subscription	0	0
Request rejected	0	0
P-TMSI Signature Mismatch	0	0
IMSI Not Known	0	0
Semantic Error in the TAD Operation	0	0
Syntactic Error in the TAD Operation	0	0
Reserved Message Value Received	0	0

Rmt Peer Not Responding	0	0
Collision with Network Initiated Request	0	0
Unable to Page UE due to Suspension	0	0
Conditional IE Missing	0	0
APN Restriction Type Incompatible	0	0
Invalid Total len	0	0
Data Forwarding Not Supported	0	0
Invalid Reply from Rmt Peer	0	0
Invalid Peer	0	0
Unknown	0	0

Error Indication Statistics:

Version	Received	Transmitted

GTPv0	0	0
GTPv1	0	0

show unified-edge ggsn-pgw gtp statistics

Syntax	<pre>show unified-edge ggsn-pgw gtp statistics <detail> <fpc-slot fpc-slot> <gateway gateway> <gn> <gp> <pic-slot pic-slot> <s5> <s8> <v0> <v1> <v2></pre>
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. gn , gp , s5 , and s8 attributes introduced in Junos OS Mobility Release 11.4W.
Description	Display the global GTP statistics for one or more gateway GPRS support nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then the status for all GGSNs and P-GWs is displayed.
Options	<p>none—Display the statistics for GTP versions 0, 1, and 2, in brief.</p> <p>detail—(Optional) Display the GTP statistics with the GTP cause statistics included.</p> <p>fpc-slot fpc-slot—(Optional) Display the GTP statistics for the specified FPC slot number.</p> <p>gateway gateway-name—(Optional) Display the GTP statistics for the specified gateway.</p> <p>gn—Display the GTP statistics for only the gn interface.</p> <p>gp—Display the GTP statistics for only the gp interface.</p> <p>pic-slot pic-slot—(Optional) Display the GTP statistics for the specified PIC slot number. You must first specify an FPC slot number before specifying the PIC slot number.</p> <p>s5—Display the GTP statistics for only the s5 interface.</p> <p>s8—Display the GTP statistics for only the s8 interface.</p> <p>v0—(Optional) Display GTP version 0 statistics.</p> <p>v1—(Optional) Display GTP version 1 statistics.</p> <p>v2—(Optional) Display GTP version 2 statistics.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear unified-edge ggsn-pgw gtp statistics on page 92 • show unified-edge ggsn-pgw gtp peer statistics on page 99

List of Sample Output [show unified-edge ggsn-pgw gtp statistics on page 110](#)
[show unified-edge ggsn-pgw gtp statistics detail on page 112](#)

Output Fields [Table 7 on page 108](#) lists the output fields for the **show unified-edge sgw gtp statistics** command. Output fields are listed in the approximate order in which they appear.

Table 7: show unified-edge sgw gtp statistics Output Fields

Field Name	Field Description	Level of Output
Gateway	Name of the GGSN or P-GW.	All levels
Global Packet Statistics		
Received Packets Dropped	Total number of packets received by the GGSN or P-GW that were dropped.	All levels
Packet Allocation Fail	Number of times that packet allocation failed.	All levels
Packet Send Fail	Number of times that packet sending failed.	All levels
IP Version Error Received	Number of packets with an unsupported IP version.	All levels
IP Protocol Error Received	Number of non-UDP IP packets received.	All levels
GTP Port Error Received	Number of packets received on a unknown GTP port number.	All levels
GTP Unknown Version Received	Number of GTP packets with an incorrect GTP version.	All levels
Packet Length Error Received	Number of GTP packets with an incorrect length in the IP or UDP header.	All levels
Unknown Messages Received	Number of GTP messages received that are not recognized by the gateway.	All levels
GTP Version 0 Statistics		
Protocol Error	Number of messages received that had a protocol error. This counter is incremented if a message with an invalid or unknown GTP message type is received.	All levels
Unsupported Messages Received	Number of unsupported messages received. This counter is incremented if the message is invalid for the interface on which the message is received.	All levels
T3 Response Timer Expires	Number of messages for which the T3 response timer elapsed.	All levels
Message Type	Type of the GTP message; for example, Echo Request or Create PDP Context Request .	All levels
Received	Number of GTP messages received corresponding to the message type.	All levels

Table 7: show unified-edge sgw gtp statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
Transmitted	Number of GTP messages transmitted corresponding to the message type.	All levels
Cause Code	GTP cause codes; for example, Request accepted or Invalid Message Format .	detail
Received	Number of GTP messages received corresponding to the GTP cause code.	detail
Transmitted	Number of GTP messages transmitted corresponding to the GTP cause code.	detail
GTP Version 1 Statistics		
Protocol Error	Number of messages received that had a protocol error. This counter is incremented if a message with an invalid or unknown GTP message type is received.	All levels
Unsupported Messages Received	Number of unsupported messages received. This counter is incremented if the message is invalid for the interface on which the message is received.	All levels
T3 Response Timer Expires	Number of messages for which the T3 response timer elapsed.	All levels
Message Type	Type of the GTP message; for example, Echo Request or Create PDP Context Request .	All levels
Received	Number of GTP messages received corresponding to the message type.	All levels
Transmitted	Number of GTP messages transmitted corresponding to the message type.	All levels
Cause Code	GTP cause codes; for example, Request accepted or Invalid Message Format .	detail
Received	Number of GTP messages received corresponding to the GTP cause code.	detail
Transmitted	Number of GTP messages transmitted corresponding to the GTP cause code.	detail
GTP Version 2 Statistics		
Protocol Error	Number of messages received that had a protocol error. This counter is incremented if a message with an invalid or unknown GTP message type is received.	All levels
Unsupported Messages Received	Number of unsupported messages received. This counter is incremented if the message is invalid for the interface on which the message is received.	All levels

Table 7: show unified-edge sgw gtp statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
T3 Response Timer Expires	Number of messages for which the T3 response timer elapsed.	All levels
Message Type	Type of the GTP message; for example, Echo Request or Create PDP Context Request .	All levels
Received	Number of GTP messages received corresponding to the message type.	All levels
Transmitted	Number of GTP messages transmitted corresponding to the message type.	All levels
Cause Code	GTP cause codes; for example, Request accepted or Invalid Message Format .	detail
Received	Number of GTP messages received corresponding to the GTP cause code.	detail
Transmitted	Number of GTP messages transmitted corresponding to the GTP cause code.	detail

Sample Output

```
show unified-edge ggsn-pgw gtp statistics
user@host> show unified-edge ggsn-pgw gtp statistics
Gateway: PGW
```

```
Global Packet Statistics
Received Packets Dropped      : 0
Packet Allocation Fail       : 0
Packet Send Fail             : 0
IP Version Error Received    : 0
IP Protocol Error Received   : 0
GTP Port Error Received      : 0
GTP Unknown Version Received : 0
Packet Length Error Received : 0
Unknown Messages Received    : 0
```

GTP Version 0 Statistics:

```
-----
Protocol Error                : 0
Unsupported Messages Received : 0
T3 Response Timer Expires     : 0
```

Message Type	Received	Transmitted

Total number of messages	0	0
Total number of bytes	0	0
Redirect messages	0	0
Echo Request	0	0
Echo Response	0	0
Version Not Supported	0	0
Create PDP Context Request	0	0
Create PDP Context Response	0	0

Update PDP Context Request	0	0
Update PDP Context Response	0	0
Delete PDP Context Request	0	0
Delete PDP Context Response	0	0
Error Indication Messages	0	0

GTP Version 1 Statistics:

```
-----
Protocol Error                : 0
Unsupported Messages Received : 0
T3 Response Timer Expires    : 128
```

Message Type	Received	Transmitted
Total number of messages	247	378
Total number of bytes	1122	10384
Redirect messages	0	0
Echo Request	180	196
Echo Response	67	180
Version Not Supported	0	0
Create PDP Context Request	0	0
Create PDP Context Response	0	0
Update PDP Context Request	0	0
Update PDP Context Response	0	0
Delete PDP Context Request	0	0
Delete PDP Context Response	0	0
Error Indication Messages	0	0

GTP Version 2 Statistics:

```
-----
Protocol Error                : 0
Unsupported Messages Received : 5
T3 Response Timer Expires    : 0
```

Message Type	Received	Transmitted
Total number of messages	366	366
Total number of bytes	5103	10487
Redirect messages	0	0
S11 piggyback messages	0	0
S4 piggyback messages	0	0
S5 piggyback messages	0	0
Echo Request	187	145
Echo Response	145	187
Version Not Supported	0	0
Create session request	6	3
Create session response	3	6
Modify bearer request	5	0
Modify bearer response	0	5
Delete session request	4	2
Delete session response	2	4
Create bearer request	0	0
Create bearer response	0	0
Update bearer request	0	0
Update bearer response	0	0
Delete bearer request	0	0
Delete bearer response	0	0
Delete PDN connection set request	0	0
Delete PDN connection set response	0	0

Update PDN connection set request	0	0
Update PDN connection set response	0	0
Modify bearer command	0	0
Modify bearer failure indication	0	0
Delete bearer command	0	0
Delete bearer failure indication	0	0
Bearer resource command	0	0
Bearer resource failure indication	0	0
Change notification request	0	0
Change notification response	0	0
Release Access Bearer request	0	0
Release Access Bearer response	0	0
Suspend Notification	0	0
Suspend Acknowledge	0	0
Resume Notification	0	0
Resume Acknowledge	0	0
Create Indirect Data Forward Tunnel Request	12	0
Create Indirect Data Forward Tunnel Response	0	12
Delete Indirect Data Forward Tunnel Request	2	0
Delete Indirect Data Forward Tunnel Response	0	2
Downlink Data Notification	0	0
Downlink Data Notification ack	0	0
Downlink Data Notification fail	0	0
Stop paging indication	0	0

```
show unified-edge ggsn-pgw gtp statistics detail
user@host> show unified-edge ggsn-pgw gtp statistics detail
Gateway: PGW2
```

```
Global Packet Statistics
Received Packets Dropped      : 0
Packet Allocation Fail       : 0
Packet Send Fail             : 0
IP Version Error Received    : 0
IP Protocol Error Received   : 0
GTP Port Error Received     : 0
GTP Unknown Version Received : 0
Packet Length Error Received : 0
Unknown Messages Received    : 0
```

GTP Version 0 Statistics:

```
-----
Protocol Error                : 0
Unsupported Messages Received : 0
T3 Response Timer Expires     : 0
```

Message Type	Received	Transmitted

Total number of messages	0	0
Total number of bytes	0	0
Redirect messages	0	0
Echo Request	0	0
Echo Response	0	0
Version Not Supported	0	0
Create PDP Context Request	0	0
Create PDP Context Response	0	0
Update PDP Context Request	0	0
Update PDP Context Response	0	0
Delete PDP Context Request	0	0

Delete PDP Context Response	0	0
Error Indication Messages	0	0

Cause Code	Received	Transmitted
Request Accepted	0	0
Non Existent	0	0
Invalid Message Format	0	0
IMSI Not Known	0	0
MS is GPRS Detached	0	0
MS is not GPRS Response	0	0
MS Refuses	0	0
Version Not Supported	0	0
No Resource Available	0	0
Service Not Supported	0	0
Mandatory IE Incorrect	0	0
Mandatory IE Missing	0	0
Optional IE Incorrect	0	0
System Failure	0	0
Roaming Restriction	0	0
P-TMSI Signature Mismatch	0	0
GPRS Connection Suspended	0	0
Authentication Failure	0	0
User Authentication Failed	0	0

GTP Version 1 Statistics:

Protocol Error	: 0
Unsupported Messages Received	: 0
T3 Response Timer Expires	: 0

Message Type	Received	Transmitted
Total number of messages	0	0
Total number of bytes	0	0
Redirect messages	0	0
Echo Request	0	0
Echo Response	0	0
Version Not Supported	0	0
Create PDP Context Request	0	0
Create PDP Context Response	0	0
Update PDP Context Request	0	0
Update PDP Context Response	0	0
Delete PDP Context Request	0	0
Delete PDP Context Response	0	0
Error Indication Messages	0	0

Cause Code	Received	Transmitted
Request Accepted	0	0
Non Existent	0	0
Invalid Message Format	0	0
IMSI Not Known	0	0
MS is GPRS Detached	0	0
MS is not GPRS Response	0	0
MS Refuses	0	0
Version Not Supported	0	0
No Resource Available	0	0

Service Not Supported	0	0
Mandatory IE Incorrect	0	0
Mandatory IE Missing	0	0
Optional IE Incorrect	0	0
System Failure	0	0
Roaming Restriction	0	0
P-TMSI Signature Mismatch	0	0
GPRS Connection Suspended	0	0
Authentication Failure	0	0
User Authentication Failed	0	0
Context not found	0	0
All dynamic PDP addresses are occupied	0	0
No memory is available	0	0
Relocation failure	0	0
Unknown mandatory extension header	0	0
Semantic error in the TFT operation	0	0
Syntactic error in the TFT operation	0	0
Semantic errors in packet filter(s)	0	0
Syntactic errors in packet filter(s)	0	0
Missing or unknown APN	0	0
Unknown PDP address or PDP type	0	0
PDP context without TFT already activated	0	0

GTP Version 2 Statistics:

Protocol Error	: 0
Unsupported Messages Received	: 0
T3 Response Timer Expires	: 0

Message Type	Received	Transmitted

Total number of messages	16	16
Total number of bytes	332	292
Redirect messages	0	0
S11 piggyback messages	0	0
S4 piggyback messages	0	0
S5 piggyback messages	0	0
Echo Request	15	0
Echo Response	0	15
Version Not Supported	0	0
Create session request	1	0
Create session response	0	1
Modify bearer request	0	0
Modify bearer response	0	0
Delete session request	0	0
Delete session response	0	0
Create bearer request	0	0
Create bearer response	0	0
Update bearer request	0	0
Update bearer response	0	0
Delete bearer request	0	0
Delete bearer response	0	0
Delete PDN connection set request	0	0
Delete PDN connection set response	0	0
Update PDN connection set request	0	0
Update PDN connection set response	0	0
Modify bearer command	0	0
Modify bearer failure indication	0	0
Delete bearer command	0	0
Delete bearer failure indication	0	0

Bearer resource command	0	0
Bearer resource failure indication	0	0
Change notification request	0	0
Change notification response	0	0
Release Access Bearer request	0	0
Release Access Bearer response	0	0
Suspend Notification	0	0
Suspend Acknowledge	0	0
Resume Notification	0	0
Resume Acknowledge	0	0
Create Indirect Data Forward Tunnel Request	0	0
Create Indirect Data Forward Tunnel Response	0	0
Delete Indirect Data Forward Tunnel Request	0	0
Delete Indirect Data Forward Tunnel Response	0	0
Downlink Data Notification	0	0
Downlink Data Notification ack	0	0
Downlink Data Notification fail	0	0
Stop paging indication	0	0

Cause Code	Received	Transmitted

Request accepted	0	1
Request accepted partially	0	0
New PDN type due to network preference	0	0
New PDN type due to single address bearer only	0	0
Local Detach	0	0
Complete Detach	0	0
RAT changed from 3GPP to Non 3GPP	0	0
ISR Deactivated	0	0
Error Indication from RNC Enodeb	0	0
Context Not Found	0	0
Invalid Message Format	0	0
Version not supported by next peer	0	0
Invalid length	0	0
Service not supported	0	0
Mandatory IE incorrect	0	0
Mandatory IE missing	0	0
Optional IE incorrect	0	0
System failure	0	0
No resources available	0	0
Semantic error in the TFT operation	0	0
Syntactic error in the TFT operation	0	0
Semantic errors in packet filter(s)	0	0
Syntactic errors in packet filter(s)	0	0
Missing or unknown APN	0	0
Unexpected repeated IE	0	0
GRE key not found	0	0
Reallocation failure	0	0
Denied in RAT	0	0
Preferred PDN type not supported	0	0
All dynamic addresses are occupied	0	0
UE context without TFT already activated	0	0
Protocol type not supported	0	0
UE not responding	0	0
UE refuses	0	0
Service denied	0	0
Unable to page UE	0	0
No memory available	0	0
User authentication failed	0	0
APN access denied - no subscription	0	0

Request rejected	0	0
P-TMSI Signature Mismatch	0	0
IMSI Not Known	0	0
Semantic Error in the TAD Operation	0	0
Syntactic Error in the TAD Operation	0	0
Reserved Message Value Received	0	0
Remote Peer Not Responding	0	0
Collision with Network Initiated Request	0	0
Unable to Page UE due to Suspension	0	0
Conditional IE Missing	0	0
APN Restriction Type Incompatible	0	0
Invalid Total len	0	0
Data Forwarding Not Supported	0	0
Invalid Reply from Remote Peer	0	0
Invalid Peer	0	0
Unknown	0	0

PART 4

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