

MobileNext Broadband Gateway

GPRS Tunneling Protocol (GTP) for Serving Gateway



Published: 2012-04-11

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MobileNext Broadband Gateway GPRS Tunneling Protocol (GTP) for Serving Gateway

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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</i> <i>string2</i> <i>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 <i>address</i> ; 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 .

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

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- 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/>

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- 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 13](#)

CHAPTER 1

GTP Overview

- [Configuring General GTP Service on the S-GW on page 3](#)
- [GTP Versions and GPRS Interfaces Overview on page 6](#)
- [GPRS Tunneling Protocol \(GTP\) Overview on page 8](#)
- [Restart Counters Overview on page 9](#)
- [Understanding CSID Signaling on page 9](#)
- [Configuring GTP Services Overview on page 10](#)

Configuring General GTP Service on the S-GW

The following configuration specifies the general parameters for the GPRS Tunneling Protocol (GTP) for a Serving Gateway (S-GW) configured on the MobileNext Broadband Gateway. GTP includes control (GTP-C) version 2 and GTP, user (GTP-U) payloads inside UDP datagrams. Parameters configured at the more specific hierarchy level override those configured at a more general hierarchy level.

You can configure many of the same parameters for GTP-C (**control**) and GTP-U (**data**) payloads as at the GTP (**gtp**) hierarchy level. When configured as separate control or data parameters, these values override the values configured at the **gtp** hierarchy level.

You can configure the following parameters at multiple GTP hierarchy levels:

- **echo-interval**
- **echo-n3-requests**
- **echo-t3-response**
- **interface**
- **n3-requests** (except data level)
- **path-management**
- **t3-response** (except data level)

To configure GTP services for a broadband gateway configured as an S-GW called MBG2:

1. Configure the maximum number of GTP peers for which statistics are stored in the GTP history.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
user@host# set peer-history 100
```



NOTE: You can set the peers for which statistics are stored from 1 to 1000. There is no default value.

2. Configure an interface to use for GTP packets. If the interface has more than one IP address, specify which address to use.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
[edit unified-edge mobile gateways sgw MBG2 gtp data]
user@host# set interface lo0.2 v4-address 10.10.10.2
```

3. (Optional) Disable or enable path management.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
[edit unified-edge mobile gateways sgw MBG2 gtp data]
user@host# set path-management disable
```



NOTE: Control path management is enabled by default for the GTP control plane (GTP-C), but disabled by default for the GTP user plane (GTP-U).

4. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a remote control peer.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
user@host# set n3-requests 6
```



NOTE: This parameter cannot be set for data (GTP-U).

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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
user@host# set t3-response 8
```



NOTE: This parameter cannot be set for data (GTP-U).

6. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a remote control peer.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
[edit unified-edge mobile gateways sgw MBG2 gtp data]
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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
[edit unified-edge mobile gateways sgw MBG2 gtp data]
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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
[edit unified-edge mobile gateways sgw MBG2 gtp data]
user@host# set echo-interval 65
```

9. To configure parameters for GTP-U data packets:

- a. Specify the error indication interval.

```
[edit unified-edge mobile gateways sgw MBG2 gtp data]
user@host# set error-indication-interval 5
```



NOTE: You can set the error indication interval from 1 to 20 seconds. The default value is 1 second.

- b. (Optional) Enable the indirect tunnel feature.

```
[edit unified-edge mobile gateways sgw MBG2 gtp data]
user@host# set indirect-tunnel
```



NOTE: The indirect tunnel feature is enabled by default.

10. To configure parameters for GTP-C control packets:

- a. (Optional) Disable the GTP response cache.

```
[edit unified-edge mobile gateways sgw MBG2 gtp control]
user@host# set no-response-cache
```



NOTE: The GTP response cache is enabled by default.

- b. (Optional) Specify a response cache timeout value for cached GTP response packets.

```
[edit unified-edge mobile gateways sgw MBG2 gtp control]
user@host# set response-cache-timeout 10
```



NOTE: You can set the response cache timer from 5 to 20 seconds.

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

```
[edit unified-edge mobile gateways sgw MBG2 gtp 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 sgw MBG2 gtp control]  
user@host# set dscp-code-point 010110
```

- e. Enable or disable the downlink data notification delay synchronization across service PICs.

```
[edit unified-edge mobile gateways sgw MBG2 gtp control]  
user@host# set ddn-delay-sync
```



NOTE: By default, downlink data notification delay synchronization is enabled.

- f. Specify a time-to-live (TTL) value to be used in the GTP-C packets.

```
[edit unified-edge mobile gateways sgw MBG2 gtp control]  
user@host# set ttl-value ?
```



NOTE: By default, the TTL value is 255. You can set any value from 1 to 255.

Related Documentation

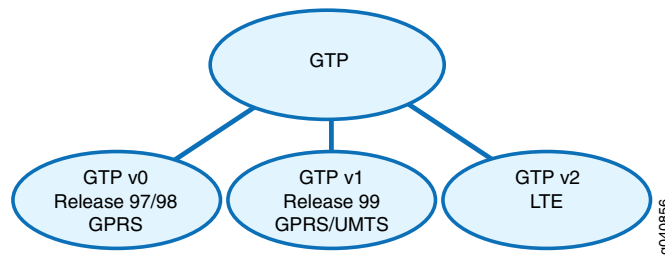
- [GPRS Tunneling Protocol \(GTP\) Overview on page 8](#)
- [Configuring GTP Services on the S4 Interface on page 37](#)
- [Configuring GTP-C Services on the S11 Interface on page 32](#)
- [Configuring GTP-U Services on the S12 Interface on page 34](#)
- [Configuring GTP Services on the S1-U Interface on page 35](#)
- [Example: Configuring GTP for the S-GW When Interfaces Are in different VRFs on page 55](#)

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 7](#) shows the GTP versions that the broadband gateway supports.

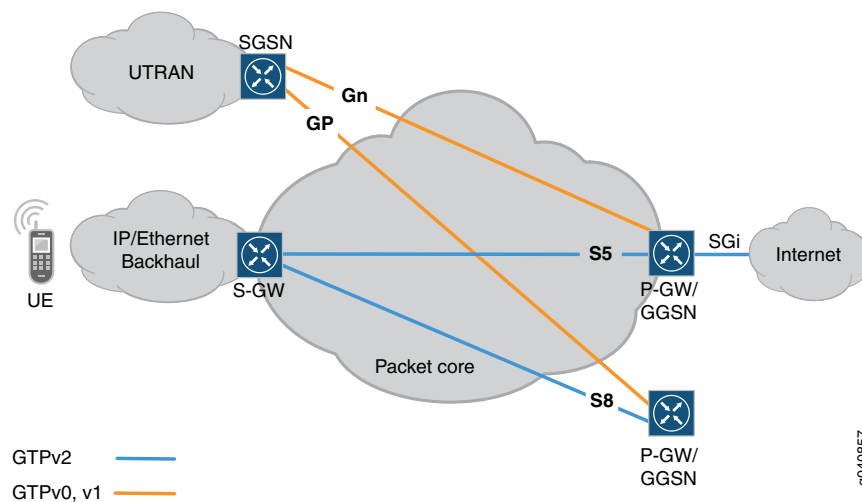
Figure 1: GTP Versions Supported on a MobileNext Broadband Gateway



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 7 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 8](#)
- [GTP Tunnel Management Overview on page 17](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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 10](#)
- [GTP Path Management Overview on page 13](#)
- [GTP Tunnel Management Overview on page 17](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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 10](#)
- [GTP Path Management Overview on page 13](#)
- [GTP Tunnel Management Overview on page 17](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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 8](#)
- [GTP Path Management Overview on page 13](#)
- [GTP Tunnel Management Overview on page 17](#)
- [Understanding Tunnel Endpoint Identifiers on page 21](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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 10](#)
- [Configuring GTP Services at Different Levels on a Broadband Gateway on page 10](#)
- [GTP Services Default Settings on page 11](#)
- [GTP Version Support on page 12](#)

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 13](#).

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 17](#).

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 8](#)
- [GTP Path Management Overview on page 13](#)
- [GTP Tunnel Management Overview on page 17](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

CHAPTER 2

Path and Tunnel Management Overview

- [GTP Path Management Overview on page 13](#)
- [Understanding Path Management on page 15](#)
- [GTP Tunnel Management Overview on page 17](#)
- [Understanding Tunnel Management on page 18](#)
- [Restart Counters Overview on page 20](#)
- [Understanding Tunnel Endpoint Identifiers on page 21](#)

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 13](#)
- [GTP Version Support for Echo Requests and Echo Responses on page 14](#)

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 10](#)
- [GTP Tunnel Management Overview on page 17](#)
- [Understanding Tunnel Endpoint Identifiers on page 21](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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.

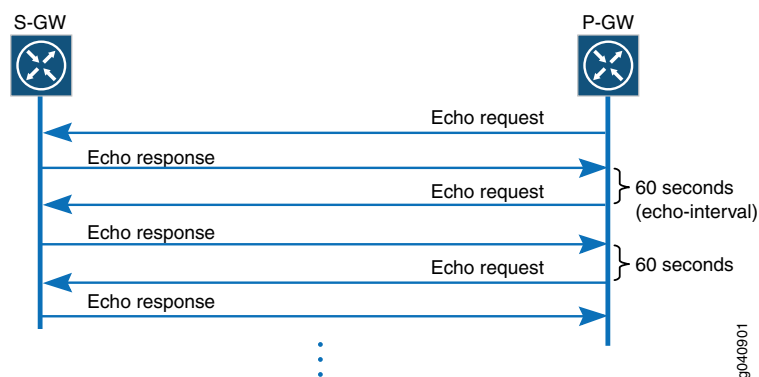
This topic includes the following sections:

- [Successful Echo-Request Sequence for Path Management on page 15](#)
- [Failed Echo Request Sequence for Path Management on page 16](#)

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 15](#) 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 15](#):

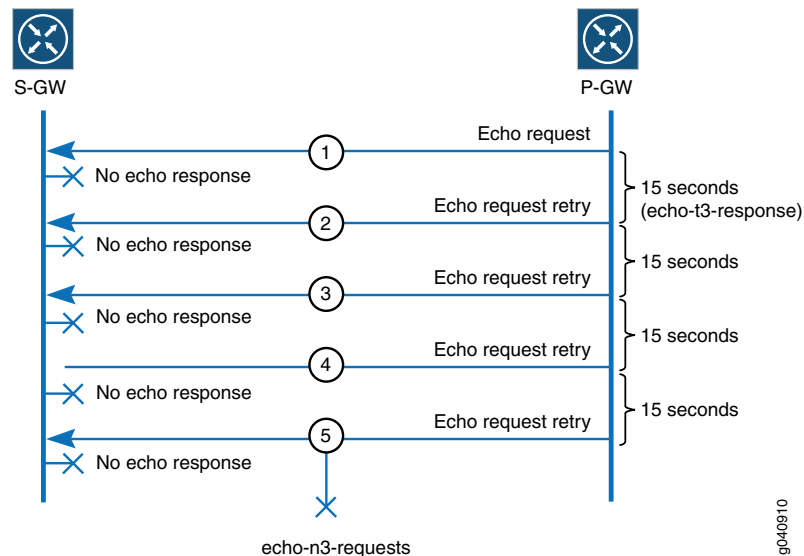
1. An echo request is sent, and the P-GW receives an echo response within the specified **echo-t3-response** time.
2. The P-GW waits for the configured echo-interval (or default echo-interval of 60 seconds) before sending another echo request, and the P-GW receives an echo response within the specified **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 16](#) 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 16](#):

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 10](#)
 - [GTP Path Management Overview on page 13](#)
 - [GTP Tunnel Management Overview on page 17](#)
 - [Understanding Tunnel Endpoint Identifiers on page 21](#)
 - [Configuring General GTP Service on the S-GW on page 3](#)

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 17](#)
- [Default Tunnel Management Configuration on page 17](#)
- [GTP Version Support for Tunnel Management Requests and Responses on page 17](#)

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 10](#)
- [GTP Path Management Overview on page 13](#)
- [Understanding Tunnel Endpoint Identifiers on page 21](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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 18](#)
- [Successful Update/Delete Request Sequence for Tunnel Management on page 19](#)
- [Failed Update/Delete Request Sequence for Tunnel Management on page 19](#)

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 18](#) 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



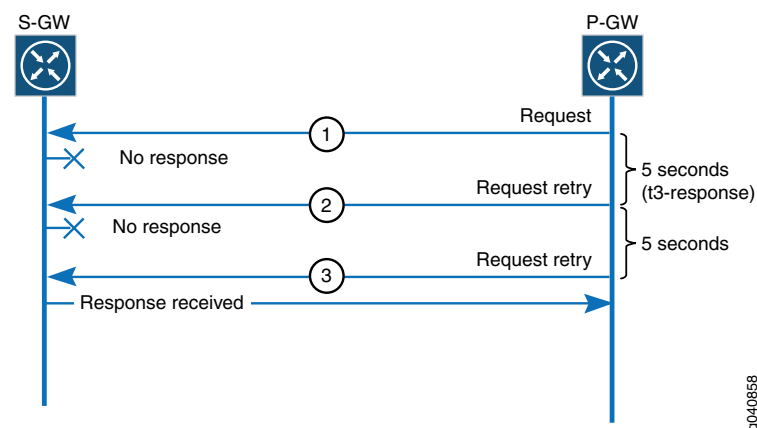
The following steps describe the tunnel management Create request sequence in [Figure 5 on page 18](#):

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 19](#) 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



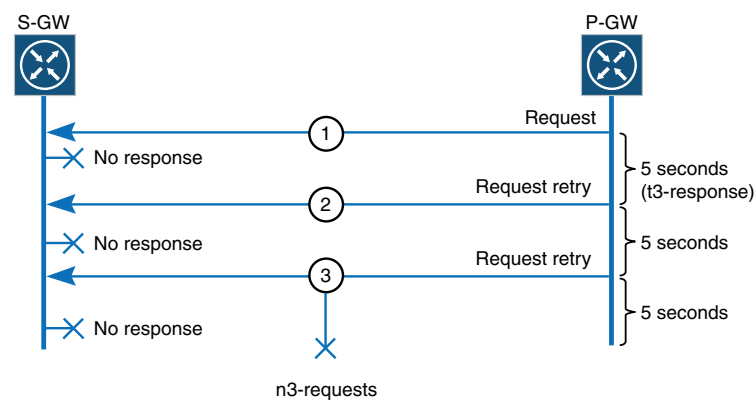
The following steps describe the tunnel management Update or Delete request sequence in [Figure 6 on page 19](#):

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 20](#) 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 20](#):

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 10](#)
- [GTP Path Management Overview on page 13](#)
- [GTP Tunnel Management Overview on page 17](#)
- [Understanding Tunnel Endpoint Identifiers on page 21](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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

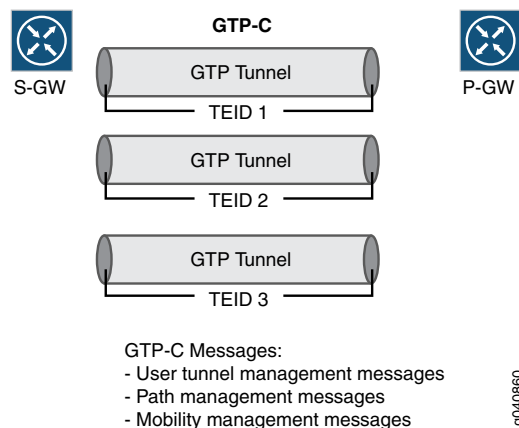
- [Configuring GTP Services Overview on page 10](#)
- [GTP Path Management Overview on page 13](#)
- [GTP Tunnel Management Overview on page 17](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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 21 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 21. 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 10](#)
- [GTP Path Management Overview on page 13](#)
- [GTP Tunnel Management Overview on page 17](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

PART 2

Configuration

- [Configuration Tasks on page 25](#)
- [Configuration Example on page 55](#)
- [Configuration Statements on page 61](#)

CHAPTER 3

Configuration Tasks

- [Configuring a Loopback Interface for Transport of GTP Packets on page 25](#)
- [Configuring General GTP Service on the S-GW on page 26](#)
- [Configuring GTP Services on the Control Plane on page 29](#)
- [Configuring GTP Services on the Data Plane on page 31](#)
- [Configuring GTP-C Services on the S11 Interface on page 32](#)
- [Configuring GTP-U Services on the S12 Interface on page 34](#)
- [Configuring GTP Services on the S1-U Interface on page 35](#)
- [Configuring GTP Services on the S4 Interface on page 37](#)
- [Configuring GTP Services on the S5 Interface on page 39](#)
- [Configuring GTP Services on the S8 Interface on page 41](#)
- [Configuring GTP Services on the S-GW When the S4 and S5 Interfaces Are in the Same VRF on page 42](#)
- [Configuring GTP Services on the S-GW When Interfaces are in Different VRFs on page 44](#)
- [Configuring GTP Services When the S5 and S8 Interfaces Are in Different VRFs on page 45](#)
- [Configuring GTP Services When the S5 and S8 Interfaces Are in the Same VRF on page 47](#)
- [Configuring GTP Services When 3GPP Interfaces Are in Different VRFs on page 48](#)
- [Configuring GTP Services on a GGSN Broadband Gateway on page 50](#)
- [Configuring GTP Services on a Peer Group on page 51](#)
- [Disabling Path Management on a Broadband Gateway or Peer Group on page 53](#)

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](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

Configuring General GTP Service on the S-GW

The following configuration specifies the general parameters for the GPRS Tunneling Protocol (GTP) for a Serving Gateway (S-GW) configured on the MobileNext Broadband Gateway. GTP includes control (GTP-C) version 2 and GTP, user (GTP-U) payloads inside UDP datagrams. Parameters configured at the more specific hierarchy level override those configured at a more general hierarchy level.

You can configure many of the same parameters for GTP-C (**control**) and GTP-U (**data**) payloads as at the GTP (**gtp**) hierarchy level. When configured as separate control or data parameters, these values override the values configured at the **gtp** hierarchy level.

You can configure the following parameters at multiple GTP hierarchy levels:

- **echo-interval**
- **echo-n3-requests**
- **echo-t3-response**
- **interface**
- **n3-requests** (except data level)
- **path-management**
- **t3-response** (except data level)

To configure GTP services for a broadband gateway configured as an S-GW called MBG2:

1. Configure the maximum number of GTP peers for which statistics are stored in the GTP history.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]  
user@host# set peer-history 100
```




NOTE: You can set the peers for which statistics are stored from 1 to 1000. There is no default value.

2. Configure an interface to use for GTP packets. If the interface has more than one IP address, specify which address to use.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
[edit unified-edge mobile gateways sgw MBG2 gtp data]
user@host# set interface lo0.2 v4-address 10.10.10.2
```

3. (Optional) Disable or enable path management.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
[edit unified-edge mobile gateways sgw MBG2 gtp data]
user@host# set path-management disable
```



NOTE: Control path management is enabled by default for the GTP control plane (GTP-C), but disabled by default for the GTP user plane (GTP-U).

4. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to a remote control peer.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
user@host# set n3-requests 6
```



NOTE: This parameter cannot be set for data (GTP-U).

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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
user@host# set t3-response 8
```



NOTE: This parameter cannot be set for data (GTP-U).

6. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to a remote control peer.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
[edit unified-edge mobile gateways sgw MBG2 gtp data]
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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
[edit unified-edge mobile gateways sgw MBG2 gtp data]
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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp control]
[edit unified-edge mobile gateways sgw MBG2 gtp data]
user@host# set echo-interval 65
```

9. To configure parameters for GTP-U data packets:

- a. Specify the error indication interval.

```
[edit unified-edge mobile gateways sgw MBG2 gtp data]
user@host# set error-indication-interval 5
```



NOTE: You can set the error indication interval from 1 to 20 seconds. The default value is 1 second.

- b. (Optional) Enable the indirect tunnel feature.

```
[edit unified-edge mobile gateways sgw MBG2 gtp data]
user@host# set indirect-tunnel
```



NOTE: The indirect tunnel feature is enabled by default.

10. To configure parameters for GTP-C control packets:

- a. (Optional) Disable the GTP response cache.

```
[edit unified-edge mobile gateways sgw MBG2 gtp control]
user@host# set no-response-cache
```



NOTE: The GTP response cache is enabled by default.

- b. (Optional) Specify a response cache timeout value for cached GTP response packets.

```
[edit unified-edge mobile gateways sgw MBG2 gtp control]
user@host# set response-cache-timeout 10
```



NOTE: You can set the response cache timer from 5 to 20 seconds.

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

```
[edit unified-edge mobile gateways sgw MBG2 gtp 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 sgw MBG2 gtp control]
user@host# set dscp-code-point 010110
```

- e. Enable or disable the downlink data notification delay synchronization across service PICs.

```
[edit unified-edge mobile gateways sgw MBG2 gtp control]
user@host# set ddn-delay-sync
```



NOTE: By default, downlink data notification delay synchronization is enabled.

- f. Specify a time-to-live (TTL) value to be used in the GTP-C packets.

```
[edit unified-edge mobile gateways sgw MBG2 gtp control]
user@host# set ttl-value 1
```



NOTE: By default, the TTL value is 255. You can set any value from 1 to 255.

Related Documentation

- [GPRS Tunneling Protocol \(GTP\) Overview on page 8](#)
- [Configuring GTP Services on the S4 Interface on page 37](#)
- [Configuring GTP-C Services on the S11 Interface on page 32](#)
- [Configuring GTP-U Services on the S12 Interface on page 34](#)
- [Configuring GTP Services on the S1-U Interface on page 35](#)
- [Example: Configuring GTP for the S-GW When Interfaces Are in different VRFs on page 55](#)

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 25](#)
- [Configuring GTP Services on the Data Plane on page 31](#)
- [Configuring GTP Services on a Broadband Gateway](#)
- [Configuring GTP Services Overview on page 10](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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 21](#)
 - [Configuring a Loopback Interface for Transport of GTP Packets on page 25](#)
 - [Configuring GTP Services on the Control Plane on page 29](#)
 - [Configuring GTP Services on a Broadband Gateway](#)
 - [Configuring GTP Services Overview on page 10](#)
 - [Configuring General GTP Service on the S-GW on page 3](#)

Configuring GTP-C Services on the S11 Interface

The following configuration specifies the parameters for a 3GPP S11 interface on the MobileNext Broadband Gateway. The S11 interface is between the Serving Gateway (S-GW) and the Mobility Management Entity (MME). The S11 interface processes GPRS tunneling protocol, control (GTP-C) version 2 payloads inside UDP datagrams.

You can configure many of the same parameters for the GTP (**gtp**) hierarchy level and the S11 (**s11**) interface hierarchy level. When configured as separate GTP or interface parameters, the values at the S11 (**s11**) hierarchy level override the values configured at the GTP (**gtp**) hierarchy level.

You can configure the following parameters at the GTP and S11 hierarchy levels:

- **echo-interval**
- **echo-n3-requests**
- **echo-t3-response**
- **interface**
- **n3-requests**
- **path-management**
- **t3-response**

To configure GTP-Cv2 services on an S11 interface for a broadband gateway configured as a S-GW named MBG2:

1. Configure an IPv4 address on a loopback interface to specify the transport addresses on which GTP-Cv2 packets on the S11 interface are received.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s11]
user@host# set interface lo0.2 v4-address 10.10.10.1
```

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

```
[edit unified-edge mobile gateways sgw MBG2 gtp s11]
user@host# set dscp-code-point 010110
```

3. Specify a time-to-live (TTL) value to be used in the GTP-C packets.

```
[edit unified-edge mobile gateways sgw MBG2 gtp s11]
```

```
user@host# set ttl-value 7
```



NOTE: By default, the TTL value is 255. You can set any value from 1 to 255.

4. Optionally, disable or enable path management.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s11]
user@host# set path-management disable
```



NOTE: Path management is enabled by default.

5. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to an MME.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s11]
user@host# set n3-requests 6
```

6. 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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s11]
user@host# set t3-response 8
```

7. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to an MME.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s11]
user@host# set echo-n3-requests 6
```

8. 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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s11]
user@host# set echo-t3-response 4
```

9. 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 MME.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s11]
user@host# set echo-interval 65
```

Related Documentation

- [GPRS Tunneling Protocol \(GTP\) Overview on page 8](#)
- [Configuring General GTP Service on the S-GW on page 3](#)
- [Configuring GTP Services on the S4 Interface on page 37](#)

- [Configuring GTP-U Services on the S12 Interface on page 34](#)
- [Configuring GTP Services on the S1-U Interface on page 35](#)
- [Example: Configuring GTP for the S-GW When Interfaces Are in different VRFs on page 55](#)

Configuring GTP-U Services on the S12 Interface

The following configuration specifies the parameters for a 3GPP S12 interface on the MobileNext Broadband Gateway. The S12 interface is between the Serving Gateway (S-GW) and a 3G mobile radio network, specifically, the Radio Network Controller (RNC). The S12 interface processes GPRS tunneling protocol, user (GTP-U) payloads inside UDP datagrams.

You can configure many of the same parameters for the GTP (**gtp**) hierarchy level and the S12 (**s12**) interface hierarchy level. When configured as separate GTP or interface parameters, the values at the S12 (**s12**) hierarchy level override the values configured at the GTP (**gtp**) hierarchy level.

You can configure the following parameters at the GTP and S12 hierarchy levels:

- **echo-interval**
- **echo-n3-requests**
- **echo-t3-response**
- **interface**
- **path-management**

To configure GTP-U services on an S12 interface for a broadband gateway configured as an S-GW named MBG2:

1. Configure an IPv4 address on a loopback interface to specify the transport addresses on which GTP-U packets on the S12 interface are received.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s12]
user@host# set interface lo0.2 v4-address 10.10.10.2
```

2. (Optional) Enable path management.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s12]
user@host# set path-management enable
```



NOTE: Path management on the S12 interface is disabled by default.

3. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to an RNC.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
```



```
[edit unified-edge mobile gateways sgw MBG2 gtp s12]
user@host# set echo-n3-requests 6
```

4. 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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s12]
user@host# set echo-t3-response 4
```

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

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s12]
user@host# set echo-interval 65
```

Related Documentation

- [GPRS Tunneling Protocol \(GTP\) Overview on page 8](#)
- [Configuring General GTP Service on the S-GW on page 3](#)
- [Configuring GTP Services on the S4 Interface on page 37](#)
- [Configuring GTP-C Services on the S11 Interface on page 32](#)
- [Configuring GTP Services on the S1-U Interface on page 35](#)
- [Example: Configuring GTP for the S-GW When Interfaces Are in different VRFs on page 55](#)

Configuring GTP Services on the S1-U Interface

The following configuration specifies the parameters for a 3GPP S1-U interface on the MobileNext Broadband Gateway. The S1-U interface is between the Serving Gateway (S-GW) and a mobile radio network, specifically, the enhanced Node B (eNodeB). The S1-U interface processes GPRS tunneling protocol, user (GTP-U) payloads inside UDP datagrams.

You can configure many of the same parameters for the GTP (**gtp**) hierarchy level and the S1-U (**s1u**) interface hierarchy level. When configured as separate GTP or interface parameters, the values at the S1-U (**s1u**) hierarchy level override the values configured at the GTP (**gtp**) hierarchy level.

You can configure the following parameters at the GTP and S1-U hierarchy levels:

- **echo-interval**
- **echo-n3-requests**
- **echo-t3-response**
- **interface**
- **path-management**

To configure GTP-U services on an S1-U interface for a broadband gateway configured as an S-GW named MBG2:

1. Configure an IPv4 or IPv6 address on a loopback interface to specify the transport addresses on which GTP-U packets on the S1-U interface are received.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp slu]
user@host# set interface lo0.2 v4-address 10.10.10.2
```

2. (Optional) Enable path management.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp slu]
user@host# set path-management enable
```



NOTE: Path management on the S1-U interface is disabled by default.

3. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to an eNodeB.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp slu]
user@host# set echo-n3-requests 6
```

4. 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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp slu]
user@host# set echo-t3-response 4
```

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

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp slu]
user@host# set echo-interval 65
```

Related Documentation

- [GPRS Tunneling Protocol \(GTP\) Overview on page 8](#)
- [Configuring General GTP Service on the S-GW on page 3](#)
- [Configuring GTP Services on the S4 Interface on page 37](#)
- [Configuring GTP-C Services on the S11 Interface on page 32](#)
- [Configuring GTP-U Services on the S12 Interface on page 34](#)
- [Example: Configuring GTP for the S-GW When Interfaces Are in different VRFs on page 55](#)

Configuring GTP Services on the S4 Interface

The following configuration specifies the parameters for a 3GPP S4 interface on the MobileNext Broadband Gateway. The S4 interface is between the Serving Gateway (S-GW) and a Serving GPRS Support Node (SGSN). The S4 interface processes GPRS tunneling protocol, control (GTP-C) version 2 and GTP, user (GTP-U) payloads inside UDP datagrams.

You can configure many of the same parameters for GTP-C (control) and GTP-U (data) payloads on the S4 interface. When configured as separate interface, control, or data parameters, these values override the values configured at the GTP (**gtp**) hierarchy level. Parameters at the control or data level override those set at the S4 (**s4**) hierarchy level.

You can configure the following parameters at multiple GTP hierarchy levels:

- **echo-interval**
- **echo-n3-requests**
- **echo-t3-response**
- **interface**
- **n3-requests** (all levels except S4 data)
- **path-management**
- **t3-response** (all levels except S4 data)

To configure GTP services on an S4 interface for a broadband gateway configured as an S-GW called MBG2:

1. Configure an interface to use for GTP packets. If the interface has more than one IP address, you can specify which address to use.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s4]
[edit unified-edge mobile gateways sgw MBG2 gtp s4 control]
[edit unified-edge mobile gateways sgw MBG2 gtp s4 data]
user@host# set interface lo0.2 v4-address 10.10.10.2
```

2. (Optional) Disable or enable path management.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s4]
[edit unified-edge mobile gateways sgw MBG2 gtp s4 control]
[edit unified-edge mobile gateways sgw MBG2 gtp s4 data]
user@host# set path-management disable
```



NOTE: Path management is enabled by default.

3. For tunnel management, configure the maximum number of times that the gateway will attempt to send signaling-request messages to an SGSN.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
```

```
[edit unified-edge mobile gateways sgw MBG2 gtp s4]
[edit unified-edge mobile gateways sgw MBG2 gtp s4 control]
user@host# set n3-requests 6
```



NOTE: This parameter cannot be set for S4 data (GTP-U).

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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s4]
[edit unified-edge mobile gateways sgw MBG2 gtp s4 control]
user@host# set t3-response 8
```



NOTE: This parameter cannot be set for S4 data (GTP-U).

5. For path management, configure the maximum number of times that the gateway will attempt to send an echo-request message to an SGSN.

```
[edit unified-edge mobile gateways sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s4]
[edit unified-edge mobile gateways sgw MBG2 gtp s4 control]
[edit unified-edge mobile gateways sgw MBG2 gtp s4 data]
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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s4]
[edit unified-edge mobile gateways sgw MBG2 gtp s4 control]
[edit unified-edge mobile gateways sgw MBG2 gtp s4 data]
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 sgw MBG2 gtp]
[edit unified-edge mobile gateways sgw MBG2 gtp s4]
[edit unified-edge mobile gateways sgw MBG2 gtp s4 control]
[edit unified-edge mobile gateways sgw MBG2 gtp s4 data]
user@host# set echo-interval 65
```

8. To configure parameters for GTP control packets for the S4 interface:

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

```
[edit unified-edge mobile gateways sgw MBG2 gtp s4 control]
user@host# set forwarding-class assured-forwarding
```

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

```
[edit unified-edge mobile gateways sgw MBG2 gtp s4 control]
user@host# set dscp-code-point 010110
```

- Related Documentation**
- [GPRS Tunneling Protocol \(GTP\) Overview on page 8](#)
 - [Configuring General GTP Service on the S-GW on page 3](#)
 - [Configuring GTP-C Services on the S11 Interface on page 32](#)
 - [Configuring GTP-U Services on the S12 Interface on page 34](#)
 - [Example: Configuring GTP for the S-GW When Interfaces Are in different VRFs on page 55](#)

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 25](#)
- [Configuring GTP Services on the S8 Interface on page 41](#)
- [Configuring GTP Services on the Data Plane on page 31](#)
- [Configuring GTP Services on the Control Plane on page 29](#)
- [Configuring GTP Services on a Broadband Gateway](#)
- [Configuring GTP Services Overview on page 10](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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 25](#)
- [Configuring GTP Services on the S5 Interface on page 39](#)
- [Configuring GTP Services on the Data Plane on page 31](#)
- [Configuring GTP Services on the Control Plane on page 29](#)
- [Configuring GTP Services on a Broadband Gateway](#)
- [Configuring GTP Services Overview on page 10](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

Configuring GTP Services on the S-GW When the S4 and S5 Interfaces Are in the Same VRF

To configure GTP services on a MobileNext Broadband Gateway configured as a Service Gateway (S-GW) when the S4 (between Serving GPRS Support Node [SGSN] and S-GW) and S5 (between S-GW and Packet Data Network Gateway [P-GW]) interfaces are the same virtual routing and forwarding (VRF) routing instances, you specify a single loopback interface IP address for the S4 and S5 interfaces.

To configure GTP services for a MobileNext Broadband Gateway configured as a S-GW when the S4 and S5 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 sgw SGW--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.

```
[edit unified-edge mobile gateways sgw SGW--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 sgw SGW--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.

```
[edit unified-edge mobile gateways sgw SGW--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 sgw SGW--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 sgw SGW--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 S4 interface are received

```
[edit unified-edge mobile gateways sgw SGW--vrf-green gtp s4]
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 S5 interface are received

```
[edit unified-edge mobile gateways sgw SGW--vrf-green gtp s5]
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 sgw SGW-vrf-green gtp traceoptions]
user@host# set file gtp_log
```

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

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

Related Documentation

- [Configuring General GTP Service on the S-GW on page 3](#)
- [Configuring GTP Services on the S4 Interface on page 37](#)
- [Configuring GTP Services on the S5 Interface on page 39](#)
- [Configuring GTP Services on the S-GW When the S4 and S5 Interfaces Are in the Same VRF on page 42](#)
- [GPRS Tunneling Protocol \(GTP\) Overview on page 8](#)

Configuring GTP Services on the S-GW When Interfaces are in Different VRFs

To configure GTP services on a MobileNext Broadband Gateway configured as a S-GW when the S4 (between Serving GPRS Support Node [SGSN] and S-GW) and S5 (between S-GW and Packet Data Network Gateway [P-GW]) interfaces are in different virtual routing and forwarding (VRF) routing instances, you specify a different loopback interface but same IP address for each interface.

To configure GTP services for a broadband gateway configured as a S-GW when the S4 and S5 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 sgw SGW-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.

```
[edit unified-edge mobile gateways sgw SGW-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 sgw SGW-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 sgw SGW-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 sgw SGW-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 sgw SGW-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 S4 interface are received.

```
[edit unified-edge mobile gateways sgw SGW-1 gtp s4]
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 S5 interface are received.

```
[edit unified-edge mobile gateways sgw SGW-1 gtp s5]
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 sgw SGW-1 gtp traceoptions]
user@host# set file gtp_log
```

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

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

Related Documentation

- [Configuring General GTP Service on the S-GW on page 3](#)
- [Configuring GTP Services on the S4 Interface on page 37](#)
- [Configuring GTP Services on the S5 Interface on page 39](#)
- [Configuring General GTP Service on the S-GW on page 3](#)
- [Configuring GTP Trace Options on page 105](#)
- [Configuring S-GW GTP Traceoptions on page 107](#)
- [GPRS Tunneling Protocol \(GTP\) Overview on page 8](#)

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 25](#)
- [Configuring GTP Services on the Data Plane on page 31](#)

- [Configuring GTP Services on the Control Plane on page 29](#)
- [Configuring GTP Services on a Broadband Gateway](#)
- [Configuring GTP Services Overview on page 10](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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 25](#)
- [Configuring GTP Services on the Data Plane on page 31](#)
- [Configuring GTP Services on the Control Plane on page 29](#)
- [Configuring GTP Services on a Broadband Gateway](#)
- [Configuring GTP Services Overview on page 10](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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 25](#)
- [Configuring GTP Services on the Data Plane on page 31](#)
- [Configuring GTP Services on the Control Plane on page 29](#)
- [Configuring GTP Services on a Broadband Gateway](#)
- [Configuring GTP Services Overview on page 10](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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
```


- 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
```

- 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
```

- 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
```

- 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
```

- 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 25](#)
- [Configuring GTP Services Overview on page 10](#)
- [Configuring GTP Services on the Data Plane on page 31](#)
- [Configuring GTP Services on the Control Plane on page 29](#)
- [Configuring GTP Services on a Broadband Gateway](#)
- [Configuring GTP Services When 3GPP Interfaces Are in Different VRFs on page 48](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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:

- Specify a name for the peer group.

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

- 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 25](#)
- [Configuring GTP Services on the Data Plane on page 31](#)
- [Configuring GTP Services on the Control Plane on page 29](#)
- [Configuring GTP Services on a Broadband Gateway](#)
- [Configuring GTP Services Overview on page 10](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

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 13](#)
- [Configuring GTP Services Overview on page 10](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

CHAPTER 4

Configuration Example

- [Example: Configuring GTP for the S-GW When Interfaces Are in different VRFs on page 55](#)

Example: Configuring GTP for the S-GW When Interfaces Are in different VRFs

This example describes how to configure the MobileNext Broadband Gateway Serving Gateway (S-GW) GTP interfaces when the interfaces are in different virtual routing and forwarding (VRF) routing instances. The emphasis is on GTP configuration, and does not include many other parameters a full S-GW configuration requires.

- [Requirements on page 55](#)
- [Overview on page 55](#)
- [Configuration on page 56](#)

Requirements

This example uses the following hardware and software components:

- Junos OS Release 11.4W
- Juniper Networks MobileNext Broadband Gateway

Overview

This example describes how to configure the broadband gateway GTP interfaces when the interfaces are in different VRF routing instances. The VRFs are used to support the following configuration:

- The S11 and S5 control interfaces are in the same VRF.
- The S1-U, S12, S4, and S5 data interfaces are in the same VRF, but this VRF is not the same as the control interfaces.

Table 3: Components of the Broadband Gateway

Property	Settings	Description
Loopback addresses	lo0 unit 111 address 192.168.111.1/32	Identifies the device for communications.
	lo0 unit 112 address 192.168.112.1/32	

Table 3: Components of the Broadband Gateway (*continued*)

Property	Settings	Description
Interface family	family inet	The logical units belong to family inet.
S11/S5 control connectivity	VRF11-Control lo0.111	VRF for S11/S5 interfaces for control
S1-U/S12/S4/S5 data connectivity	VRF12-Data lo0.122	VRF for S1-U/S12/S4 interfaces for data

Configuration

- [Configuring the Interfaces on page 56](#)
- [Enabling the Routing Instances for the VRF on page 57](#)
- [Configuring GTP Interfaces on page 58](#)

Configuring the Interfaces

CLI Quick Configuration

To quickly configure this example, copy the following commands and paste them into the router terminal window:

```
[edit]
set chassis redundancy graceful-switchover
set system commit synchronize
load merge /etc/config/mobility-defaults.conf
set chassis fpc 1 pic 0 apply-groups mobility
set chassis fpc 1 pic 1 apply-groups mobility
set chassis fpc 3 pic 0 apply-groups mobility
set chassis fpc 3 pic 1 apply-groups mobility
set chassis fpc 0 forwarding-packages mobility sgw
set chassis fpc 5 forwarding-packages mobilitysgw
set interfaces lo0 unit 111 family inet address 192.168.111.1/32
set interfaces lo0 unit 112 family inet address 192.168.112.1/32
```

Step-by-Step Procedure

To configure the chassis:

1. Enable graceful restart for Routing Engine redundancy.


```
[edit]
user@pe1# set chassis redundancy graceful-switchover
```
2. Load and merge the default configuration file for the **mobility** group.


```
[edit]
user@pe1# load merge /etc/config/mobility-defaults.conf
```
3. Configure the **mobility** group on the session DPCs.


```
[edit]
user@pe1# set chassis fpc 1 pic 0 apply-groups mobility
user@pe1# set chassis fpc 1 pic 1 apply-groups mobility
user@pe1# set chassis fpc 3 pic 0 apply-groups mobility
```

```
user@pe1# set chassis fpc 3 pic 1 apply-groups mobility
```



NOTE: You must include every services PIC configured with the `jservices-mobile` package at the `[edit unified-edge gateways sgw gateway-name system anchor-spics]` hierarchy level on the broadband gateway. If you do not include the services PIC as an anchor interface, then the services PIC will not be used by the broadband gateway.

4. Configure the interface DPC or MPC at the FPC level.

```
[edit]
user@pe1# set chassis fpc 0 forwarding-packages mobility sgw
user@pe1# set chassis fpc 5 forwarding-packages mobility sgw
```



NOTE: You must include every Packet Forwarding Engine configured with the `sgw` forwarding package at the `[edit unified-edge gateways sgw gateway-name system anchor-pfes]` hierarchy level on the broadband gateway. If you do not specify the Packet Forwarding Engine as an anchor interface, then the Packet Forwarding Engine will not be used by the broadband gateway.

5. Configure loopback interfaces.

```
[edit]
user@pe1# set interfaces lo0 unit 111 family inet address 192.168.111.1/32
user@pe1# set interfaces lo0 unit 112 family inet address 192.168.112.1/32
```

Enabling the Routing Instances for the VRF

CLI Quick Configuration

To quickly configure this example, copy the following commands and paste them into the router terminal window:

```
[edit]
set routing-instances VRF11-Control instance-type vrf
set routing-instances VRF11-Control interface lo0.111
set routing-instances VRF11-Control route-distinguisher 192.168.111.1:111
set routing-instances VRF11-Control vrf-target target:1:111
set routing-instances VRF11-Control vrf-table-label
set routing-instances VRF12-Data instance-type vrf
set routing-instances VRF12-Data interface lo0.112
set routing-instances VRF12-Data route-distinguisher 192.168.112.1:112
set routing-instances VRF12-Data vrf-target target:1:112
set routing-instances VRF12-Data vrf-table-label
```

Step-by-Step Procedure To configure the routing instance for the VRF used:



BEST PRACTICE: For GTP traffic, use the `vrf-table-label` option when configuring the routing instances.

1. Configure the VRF routing instances for GTP traffic.

```
[edit]
user@pe1# set routing-instances VRF11-Control instance-type vrf
user@pe1# set routing-instances VRF11-Control interface lo0.111
user@pe1# set routing-instances VRF11-Control route-distinguisher 192.168.111.1:111
user@pe1# set routing-instances VRF11-Control vrf-target target:1:111
user@pe1# set routing-instances VRF11-Control vrf-table-label
user@pe1# set routing-instances VRF12-Data instance-type vrf
user@pe1# set routing-instances VRF12-Data interface lo0.112
user@pe1# set routing-instances VRF12-Data route-distinguisher 192.168.112.1:112
user@pe1# set routing-instances VRF12-Data vrf-target target:1:112
user@pe1# set routing-instances VRF12-Data vrf-table-label
```

Configuring GTP Interfaces

CLI Quick Configuration To quickly configure this example, copy the following commands and paste them into the router terminal window:

```
[edit]
set unified-edge gateways sgw MBG1 gtp s11 interface lo0.111
set unified-edge gateways sgw MBG1 gtp s5 control interface lo0.111
set unified-edge gateways sgw MBG1 gtp s1u interface lo0.112
set unified-edge gateways sgw MBG1 gtp s12 interface lo0.112
set unified-edge gateways sgw MBG1 gtp s4 data interface lo0.112
set unified-edge gateways sgw MBG1 gtp s5 data interface lo0.112
```

Step-by-Step Procedure To configure GTP interfaces:

1. Configure the GTP interfaces for the broadband gateway called MBG1.

```
[edit]
user@pe1# edit unified-edge gateways sgw MBG1 gtp
```

2. Specify the appropriate loopback interface associated with the VRF routing instance for the S11 and S5 control interfaces and S1-U, S12, S4, and S5 data interfaces.

```
[edit unified-edge gateways sgw MBG1 gtp]
user@pe1# set s5 control interface lo0.111
user@pe1# set s11 interface lo0.111
user@pe1# set s1u interface lo0.112
user@pe1# set s12 interface lo0.112
user@pe1# set s4 data interface lo0.112
user@pe1# set s5 data interface lo0.112
```

Related Documentation

- [Configuring General GTP Service on the S-GW on page 3](#)

- [Configuring GTP Trace Options on page 105](#)
- [GPRS Tunneling Protocol \(GTP\) Overview on page 8](#)

CHAPTER 5

Configuration Statements

- [\[edit unified-edge gateways\] Hierarchy Level on page 61](#)

[\[edit unified-edge gateways\] 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>t 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 10 • gtp (GGSN or P-GW) • gtp (S-GW) on page 76

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 10 • gn • gp • s4 on page 92 • s5 on page 94

- [s8 on page 96](#)

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	[edit unified-edge gateways <i>ggsn-pgw name gtp</i>], [edit unified-edge gateways <i>sgw name gtp</i>]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways <i>sgw gateway-name gtp</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.
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	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 10• gtp (GGSN or P-GW)• gtp (S-GW) on page 76

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 10 • gn • gp • s4 on page 92 • s5 on page 94 • s8 on page 96

ddn-delay-sync

Syntax	<code>ddn-delay-sync (disable enable);</code>
Hierarchy Level	[edit unified-edge gateways <i>sgw gateway-name</i> gtp control]
Release Information	Statement introduced in Junos OS Mobility Release 11.4W.
Description	Specify whether the synchronizing of the Downlink Data Notification (DDN) delay value with the other services PICs on the Serving Gateway should be disabled or enabled. DDN delay value synchronization is enabled by default.
Options	disable —Disable DDN delay value synchronization. enable —Enable DDN delay value synchronization.
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-GW on page 3• control (GTP) on page 62

dscp-code-point (GTP)

Syntax	<code>dscp-code-point <i>value</i>;</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 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]</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 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	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. 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 10 • control (GTP) on page 62

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 13](#)
- [gtp \(GGSN or P-GW\)](#)
- [gtp \(S-GW\) on page 76](#)

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 10](#)
- gtp (GGSN or P-GW)
- [gtp \(S-GW\) on page 76](#)

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 *response interval*—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

- [Configuring GTP Services Overview on page 10](#)
- gtp (GGSN or P-GW)
- [gtp \(S-GW\) on page 76](#)

error-indication-interval

Syntax	error-indication-interval <i>seconds</i> ;
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>name</i> gtp data], [edit unified-edge gateways ggsn-pgw <i>name</i> gtp s8 data], [edit unified-edge gateways sgw <i>name</i> gtp data], [edit unified-edge gateways sgw <i>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 10• gtp (GGSN or P-GW)• gtp (S-GW) on page 76

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 62 • control (GTP Gn, Gp, S4, S5, and S8 Interfaces) on page 63 • s11 on page 89

gtp (S-GW)

```
Syntax gtp {
    control {
        ddn-delay-sync (disable | enable);
        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;
        ttl-value ttl-value;
    }
    data {
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        error-indication-interval seconds;
        indirect-tunnel (disable | enable);
        interface {
            interface-name;
            v4-address v4-address;
        }
        num-gtpu-end-markers num-gtpu-end-markers;
        path-management (disable | enable);
    }
    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);
    peer-history number;
    s11 {
        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;
ttl-value ttl-value;
}
s12 {
  echo-interval interval;
  echo-n3-requests requests;
  echo-t3-response response-interval;
  interface {
    interface-name;
    v4-address v4-address;
  }
  path-management (disable | enable);
}
s1u {
  echo-interval interval;
  echo-n3-requests requests;
  echo-t3-response response-interval;
  interface {
    interface-name;
    v4-address v4-address;
  }
  path-management (disable | enable);
}
s4 {
  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;
    ttl-value ttl-value;
  }
  data {
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    interface {
      interface-name;
      v4-address v4-address;
    }
    path-management (disable | enable);
  }
  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;
}
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);
        t3-response response-interval;
        ttl-value ttl-value;
    }
    data {
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        interface {
            interface-name;
            v4-address v4-address;
        }
        path-management (disable | enable);
    }
    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);
    }

```

```

    t3-response response-interval;
    ttl-value ttl-value;
}
data {
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    interface {
        interface-name;
        v4-address v4-address;
    }
    path-management (disable | enable);
}
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 sgw *gateway-name*]

Release Information Statement introduced in Junos OS Mobility Release 11.4W.

Description Configure the parameters related to the GPRS tunneling protocol (GTP) on the Serving Gateway (S-GW). GTP is used to tunnel GTP packets through 3G and 4G networks. Only GTP Version 2 is supported on the S-GW.

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 sgw <gateway-name>] Hierarchy Level
- [Configuring General GTP Service on the S-GW on page 3](#)

indirect-tunnel

Syntax	<code>indirect-tunnel (disable enable);</code>
Hierarchy Level	[edit unified-edge gateways <i>sgw gateway-name</i> gtp data]
Release Information	Statement introduced in Junos OS Mobility Release 11.4W.
Description	<p>Specify whether support for indirect tunnel forwarding should be disabled or enabled. Indirect tunnel forwarding is enabled by default.</p> <p>To ensure minimal packet loss, network elements must switch the packet forwarding path from source eNodeB to target eNodeB, or, in inter-RAT scenarios, between eNodeB to Serving GPRS Support Node (SGSN) or Radio Network Controller (RNC), or SGSN to eNodeB.</p> <p>If a direct path is available, then the packets are routed directly between the network elements. If a direct path between the network elements is not available, then the packets are routed indirectly from the source eNodeB, RNC, or SGSN to the target eNodeB, RNC, or SGSN via the Serving Gateway (S-GW), or the source and target S-GWs (in the case of S-GW relocation). Indirect tunnels might be set up in the S-GW that is not hosting subscriber sessions.</p>
Options	<p>disable—Disable support for indirect tunnel forwarding.</p> <p>enable—Enable support for indirect tunnel forwarding.</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 on page 3• gtp (S-GW) on page 76

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 10](#)
- [gtp \(GGSN or P-GW\)](#)
- [gtp \(S-GW\) on page 76](#)

n3-requests

Syntax	<code>n3-requests <i>requests</i>;</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 s11], [edit unified-edge gateways sgw <i>name</i> gtp s4 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],</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 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><i>requests</i>—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 10 • gtp (GGSN or P-GW) • gtp (S-GW) on page 76

no-response-cache

Syntax	<code>no-response-cache;</code>
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-GW on page 3• <code>gtp</code> (GGSN or P-GW)• gtp (S-GW) on page 76• response-cache-timeout on page 88

num-gtpu-end-markers

Syntax	<code>num-gtpu-end-markers <i>num-gtpu-end-markers</i>;</code>
Hierarchy Level	[edit unified-edge gateways <i>sgw gateway-name</i> gtp data]
Release Information	Statement introduced in Junos OS Mobility Release 11.4W.
Description	Configure the number of GPRS tunneling protocol, user plane (GTP-U) end marker packets to be sent in case of handovers towards the previous access tunnel for the bearer.
Options	<i>num-gtpu-end-markers</i> —Number of GTP-U end marker packets. Range: 1 through 10. Default: 1
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-GW on page 3• gtp (S-GW) on page 76

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.</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] • [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 • [Configuring GTP Services Overview on page 10](#)
• gtp (GGSN or P-GW)
• [gtp \(S-GW\) on page 76](#)

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 10• gtp (GGSN or P-GW)• gtp (S-GW) on page 76

response-cache-timeout

Syntax	<code>response-cache-timeout <i>interval-in-seconds</i>;</code>
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	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> NOTE: This configuration is invalid if the <code>no-response-cache</code> statement is configured.</div>	
Options	<i>timeout-in-seconds</i> —Timeout, in seconds, for the GTP response cache. Range: 5 through 20 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 General GTP Service on the S-GW on page 3• gtp (GGSN or P-GW)• gtp (S-GW) on page 76• no-response-cache on page 84

s11

Syntax

```
s11 {
  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;
  ttl-value ttl-value;
}
```

Hierarchy Level [edit unified-edge gateways sgw *gateway-name* gtp]

Release Information Statement introduced in Junos OS Mobility Release 11.4W.

Description Configure the 3GPP control parameters applicable to the 3GPP s11 interface. The s11 interface is used by the serving gateway and the Mobile Management Entity (MME) to exchange GTP-C control packets with each other.

The values configured here override the common control configuration configured at the [edit unified-edge gateways sgw *gateway-name* gtp] hierarchy level. The parameters configured here are applicable to all GTP peers that use the interface.

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-C Services on the S11 Interface on page 32](#)
- [gtp \(S-GW\) on page 76](#)

s12

Syntax s12 {
 [echo-interval](#) *interval*;
 [echo-n3-requests](#) *requests*;
 [echo-t3-response](#) *response-interval*;
 interface {
 interface-name;
 v4-address *v4-address*;
 }
 [path-management](#) (disable | enable);
 }

Hierarchy Level [edit unified-edge gateways *sgw gateway-name* gtp]

Release Information Statement introduced in Junos OS Mobility Release 11.4W.

Description Configure the 3GPP data parameters applicable to the 3GPP s12 interface. The s12 interface is used by the serving gateway and the Radio Network Controller (RNC) to exchange GTP user plane (GTP-U) data packets with each other.

The values configured here override the common data configuration configured at the [edit unified-edge gateways *sgw gateway-name* gtp] hierarchy level. The parameters configured here are applicable to all GTP peers that use the interface.

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-U Services on the S12 Interface on page 34](#)
- [gtp \(S-GW\) on page 76](#)

s1u

Syntax	<pre>s1u { echo-interval <i>interval</i>; echo-n3-requests <i>requests</i>; echo-t3-response <i>response-interval</i>; interface { <i>interface-name</i>; v4-address <i>v4-address</i>; } path-management (disable enable); }</pre>
Hierarchy Level	[edit unified-edge gateways <i>sgw gateway-name</i> gtp]
Release Information	Statement introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the 3GPP data parameters applicable to the 3GPP s1u interface. The s1u interface is used by the serving gateway and the eNodeB to exchange GTP user plane (GTP-U) data packets with each other.</p> <p>The values configured here override the common data configuration configured at the [edit unified-edge gateways <i>sgw gateway-name</i> gtp] hierarchy level. The parameters configured here are applicable to all GTP peers that use the interface.</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 on the S1-U Interface on page 35 • gtp (S-GW) on page 76

s4

```

Syntax  s4 {
    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;
        ttl-value ttl-value;
    }
    data {
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        interface {
            interface-name;
            v4-address v4-address;
        }
        path-management (disable | enable);
    }
    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 *sgw gateway-name* gtp]

Release Information Statement introduced in Junos OS Mobility Release 11.4W.

Description Configure the 3GPP control and data parameters applicable to the 3GPP S4 interface. The S4 interface is used by the serving gateway and the S4 Serving GPRS Support Nodes (SGSNs).

The values configured here override the common control and data configuration configured at the [edit unified-edge gateways *sgw gateway-name* gtp] hierarchy level. The parameters configured here are applicable to all GTP peers that use the interface.

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 on the S4 Interface on page 37• gtp (S-GW) on page 76

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 10
	• gtp (GGSN or P-GW)
	• gtp (S-GW) on page 76

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	• Configuring GTP Services Overview on page 10
	• gtp (GGSN or P-GW)
	• gtp (S-GW) on page 76

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	<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] • [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	<p>seconds—Time that the gateway waits before resending a signaling request message.</p> <p>Range: 1 through 30 seconds</p> <p>Default: 5 seconds</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 10 • gtp (GGSN or P-GW) • gtp (S-GW) on page 76

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	trace and unified-edge—To view this statement in the configuration.
Level	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 10• gtp (GGSN or P-GW)• gtp (S-GW) on page 76
------------------------------	---

ttn-value (S-GW GTP-C)

Syntax	ttn-value <i>ttn-value</i> ;
Hierarchy Level	[edit unified-edge gateways sgw <i>gateway-name</i> gtp control], [edit unified-edge gateways sgw <i>gateway-name</i> gtp s4 control], [edit unified-edge gateways sgw <i>gateway-name</i> gtp s5 control], [edit unified-edge gateways sgw <i>gateway-name</i> gtp s8 control], [edit unified-edge gateways sgw <i>gateway-name</i> gtp s11]
Release Information	Statement introduced in Junos OS Mobility Release 11.4W.
Description	Configure the time-to-live (TTL) value used on outgoing GPRS tunneling protocol, control plane (GTP-C) packets. When the TTL count in the GTP-C packet reaches zero, the packet is discarded.
Options	ttn-value —TTL value Range: 1 through 255 Default: 255
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-GW on page 3 • control (GTP) on page 62

PART 3

Administration

- [Monitoring on page 105](#)
- [Operational Commands on page 111](#)

CHAPTER 6

Monitoring

- [Configuring GTP Trace Options on page 105](#)
- [Configuring S-GW GTP Traceoptions on page 107](#)

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 4 on page 105](#) describes the flags that you can include.

Table 4: 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 5 on page 106](#) describes the levels you can include.

Table 5: 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 10](#)
- [Configuring General GTP Service on the S-GW on page 3](#)

Configuring S-GW GTP Traceoptions

GPRS tunneling protocol (GTP) tracing operations record detailed messages about the operation of Serving Gateway (S-GW) GTP services on the MobileNext Broadband Gateway. You can trace various types of S-GW GTP operations such as errors, warnings, configuration events, and other information. You can specify which trace operations are logged by including specific tracing flags and levels.

[Table 6 on page 107](#) describes the flags relating to the S-GW GTP that you can include at the `[edit unified-edge gateways sgw gateway-name gtp traceoptions flag]` hierarchy level.

Table 6: S-GW GTP Trace Flags

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

[Table 7 on page 107](#) describes the levels you can include.

Table 7: S-GW GTP Trace Levels

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

Table 7: S-GW GTP Trace Levels (*continued*)

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 sgw MBG2 gtp]
user@host# edit traceoptions
```



NOTE: You can use the `no-remote-trace` statement at this level to disable remote tracing capabilities.

2. Configure the filename for the trace file.

```
[edit unified-edge gateways sgw MBG2 gtp traceoptions]
user@host# set file datapath-log
```

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

```
[edit unified-edge gateways sgw MBG2 gtp traceoptions]
user@host# set file size 100m
```



NOTE: When a trace file (for example, `sgw-gtp-log`) reaches its maximum size, it is renamed `sgw-gtp-log.0`, then `sgw-gtp-log.1`, and so on, until the maximum number of trace files is reached. The oldest archived file is then overwritten.

4. Configure the tracing flag.

```
[edit unified-edge gateways sgw MBG2 gtp traceoptions]
user@host# set flag all
```



NOTE: You should use care when tracing all operations on a gateway. This can have a performance impact.

5. Configure the tracing level.

```
[edit unified-edge gateways sgw MBG2 gtp traceoptions]
user@host# set level error
```

6. View the trace file.

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

Related Documentation

- [Configuring General GTP Service on the S-GW on page 3](#)
- [Configuring GTP Trace Options on page 105](#)

- [GPRS Tunneling Protocol \(GTP\) Overview on page 8](#)
- Configuring S-GW Traceoptions
- Configuring S-GW Data Path Traceoptions
- Configuring S-GW Charging Traceoptions
- Configuring S-GW Local Persistent Storage Traceoptions

CHAPTER 7

Operational Commands

clear unified-edge sgw gtp peer statistics

Syntax	clear unified-edge sgw gtp peer statistics remote-address <i>remote-address</i> <fpc-slot <i>fpc-slot</i>> <gateway <i>gateway</i>> <local-address <i>local-address</i>> <pic-slot <i>pic-slot</i>> <routing-instance <i>routing-instance</i>>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Clear the statistics for the specified GPRS tunneling protocol (GTP) peer on one or more Serving Gateways (S-GWs). If an S-GW is not specified, then the statistics are cleared for the specified peer on all the S-GWs.
Options	remote-address <i>remote-address</i> —Clear the statistics for the GTP peer with the specified remote address. fpc-slot <i>fpc-slot</i> —(Optional) Clear the statistics for the specified Flexible PIC Concentrator (FPC) slot number. gateway <i>gateway</i> —(Optional) Clear the statistics for peer on the specified S-GW. local-address <i>local-address</i> —(Optional) Clear the statistics for the peer with the specified local IP address. pic-slot <i>pic-slot</i> —(Optional) Clear the statistics for the specified PIC slot number. You must first specify an FPC slot number before specifying the PIC slot number. routing-instance <i>routing-instance</i> —(Optional) Clear the statistics for the peer on the specified routing instance.
Required Privilege Level	clear, unified-edge
Related Documentation	<ul style="list-style-type: none">• show unified-edge sgw gtp peer statistics on page 120
List of Sample Output	clear unified-edge sgw gtp peer statistics remote-address 122.2.2.2 on page 112
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear unified-edge sgw gtp peer statistics remote-address 122.2.2.2	user@host> clear unified-edge sgw gtp peer statistics remote-address 122.2.2.2 Cleared GTP Peer statistics
--	---

clear unified-edge sgw gtp statistics

Syntax	<code>clear unified-edge sgw 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	Command introduced in Junos OS Mobility Release 11.4W.
Description	Clear the global GPRS tunneling protocol (GTP) statistics for the specified Serving Gateway (S-GW).
Options	<p>gateway <i>gateway</i>—Clear the GTP statistics for the specified S-GW.</p> <p>fpc-slot <i>fpc-slot</i>—(Optional) Clear the GTP statistics for the specified Flexible PIC Concentrator (FPC) slot number.</p> <p>pic-slot <i>pic-slot</i>—(Optional) Clear the GTP statistics for the specified PIC slot number. You must first specify an FPC slot number before specifying the PIC slot number.</p>
Required Privilege Level	clear, unified-edge
Related Documentation	<ul style="list-style-type: none"> • show unified-edge sgw gtp statistics on page 125
List of Sample Output	clear unified-edge sgw gtp statistics gateway SGW on page 113
Output Fields	No message is displayed on successful execution of this command; otherwise an error message is displayed.

Sample Output

```
clear unified-edge sgw      user@host> clear unified-edge sgw gtp statistics gateway SGW
gtp statistics gateway
SGW
```

show unified-edge sgw gtp peer

Syntax `show unified-edge sgw gtp peer`
 `<detail>`
 `<fpc-slot fpc-slot>`
 `<gateway gateway>`
 `<history>`
 `<local-address local-address>`
 `<pic-slot pic-slot>`
 `<remote-address remote-address>`
 `<routing-instance routing-instance>`
 `<s11>`
 `<s12>`
 `<s1u>`
 `<s4>`
 `<s5>`
 `<s8>`

Release Information Command introduced in Junos OS Mobility Release 11.4W.

Description Display the information about GTP peers for one or more Serving Gateways (S-GWs). If a gateway is not specified, then the information for all S-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.

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 S-GW.

pic-slot pic-slot—(Optional) Display the GTP peer information 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 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.

s11—Display the information about GTP peers on the s11 interface.

s12—Display the information about GTP peers on the s12 interface.

s1u—Display the information about GTP peers on the s1u interface.

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 sgw gtp peer statistics on page 112](#)
- [show unified-edge sgw gtp peer count on page 119](#)
- [show unified-edge sgw gtp peer statistics on page 120](#)

List of Sample Output

[show unified-edge sgw gtp peer on page 117](#)
[show unified-edge sgw gtp peer detail on page 117](#)

Output Fields

[Table 8 on page 115](#) lists the output fields for the **show unified-edge sgw gtp peer** command. Output fields are listed in the approximate order in which they appear.

Table 8: show unified-edge sgw gtp peer Output Fields

Field Name	Field Description	Level of Output
Gateway	Name of the S-GW for which the GTP peer information is displayed.	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 S-GW.	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 S11, S4, and so on.	detail
GTP Version	GTP version number.	detail
RCM Registration Done	This parameter is used internally by the S-GW.	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 S-GW 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 8: show unified-edge sgw 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 S-GW waits before sending an echo request message (for path management) to its control peer (MME, S4-SGSN, or P-GW).	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 Path State	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 S-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 8: show unified-edge sgw 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	Downlink data notification delay received from the MME.	detail
Is CSID Supported	Indicates whether the connection set identifier (CSID) is supported by peer or not.	detail

Sample Output

```

show unified-edge sgw gtp peer  user@host> show unified-edge sgw gtp peer
Gateway: SGW
Remote IP Address      Local IP Address      Routing Instance
-----
136.6.6.2              200.6.88.2           default
10.10.1.2              200.6.88.2           default
200.6.88.1             200.6.88.2           default

```

```

show unified-edge sgw gtp peer detail  user@host> show unified-edge sgw gtp peer detail
Gateway: SGW
Peer Detail:
-----
Remote IP Address      : 136.6.6.2
Local IP Address       : 200.6.88.2
Local IP Address       : 17.1.1.2
Routing Instance       : default
Interface Type         : S1U
GTP Version            : 1
RCM Registration Done  : yes
Restart Counter Valid  : no
Restart Counter Value  : 0
Sent Restart Counter Value : 29
Control Path N3 Request : 5
Control Path T3 Timer  : 25
Control Path Echo N3 Request : 3
Control Path Echo T3 Timer : 15
Control Path Echo Interval : 65
Control Path Management Enabled : yes
Control Path State     : not-tracked
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               : 5
Data Path Echo T3 Timer                 : 15
Data Path Echo Interval                 : 70
Data Path Management Enabled            : yes
Data Path State                         : down
GTP-C using Short Sequence Number       : no
Downlink Data Notification Delay Interval : 0
CSID Supported                          : no
```

```
[...output truncated...]
```

show unified-edge sgw gtp peer count

Syntax	show unified-edge sgw 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 Serving Gateways (S-GWs).
Options	This command has no options.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show unified-edge sgw gtp peer on page 114
List of Sample Output	show unified-edge sgw gtp peer count on page 119
Output Fields	Table 9 on page 119 lists the output fields for the show unified-edge sgw gtp peer count command. Output fields are listed in the approximate order in which they appear.

Table 9: show unified-edge sgw gtp peer Output Fields

Field Name	Field Description
Interface Name	Name of the interface (S1u, S11, S12, S4, S5, S8, and All) for which the GTP peer count is displayed.
Peer Count	The number of peers corresponding to the interface name (S1u, S11, S12, S4, S5, S8, and All) is displayed.

Sample Output

```

show unified-edge sgw gtp peer count
user@host> show unified-edge sgw gtp peer count
Gateway: SGW
Interface Name      Peer Count
-----
S1u Interface       1
S11 Interface       1
S12 Interface       0
S4 Interface        0
S5 Interface        1
S8 Interface        0
All Interfaces      3

```

show unified-edge sgw gtp peer statistics

Syntax	<code>show unified-edge sgw gtp peer statistics remote-address <i>remote-address</i></code> <code><detail></code> <code><fpc-slot <i>fpc-slot</i>></code> <code><gateway <i>gateway</i>></code> <code><local-address <i>local-address</i>></code> <code><pic-slot <i>pic-slot</i>></code> <code><routing-instance <i>routing-instance</i>></code>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Display the GTP peer statistics for one or more Serving Gateways (S-GWs). If a gateway is not specified, then the statistics for all the S-GWs is displayed.
Options	<p><code>remote-address <i>remote-address</i></code>—Display the GTP peer statistics for the peer with the specified remote address.</p> <p><code>detail</code>—(Optional) Display detailed statistics about GTP peers.</p> <p><code>fpc-slot <i>fpc-slot</i></code>—(Optional) Display the GTP peer statistics for the specified FPC slot number.</p> <p><code>gateway <i>gateway-name</i></code>—(Optional) Display the GTP peer statistics for the specified gateway.</p> <p><code>local-address <i>local-address</i></code>—(Optional) Display the GTP peer statistics for the local address of the specified peer on the S-GW.</p> <p><code>pic-slot <i>pic-slot</i></code>—(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.</p> <p><code>routing-instance <i>routing-instance</i></code>—(Optional) Display the GTP peer statistics for the peer on the specified routing instance.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• clear unified-edge sgw gtp peer statistics on page 112• show unified-edge sgw gtp peer on page 114• show unified-edge sgw gtp statistics on page 125
List of Sample Output	show unified-edge sgw gtp peer statistics remote-address 136.6.6.2 on page 121 show unified-edge sgw gtp peer statistics remote-address 136.6.6.2 detail on page 122
Output Fields	See the output fields for the <code>show unified-edge sgw gtp statistics</code> command.

Sample Output

```

show unified-edge sgw user@host> show unified-edge sgw gtp peer statistics remote-address 136.6.6.2
gtp peer statistics Gateway: SGW
remote-address 136.6.6.2
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 2 Statistics:
-----
Protocol Error : 0
Unsupported Messages Received : 0

-----

```

Message Type	Received	Transmitted
Total number of messages	25	25
Total number of bytes	325	1025
Redirect messages	0	0
S11 piggyback messages	0	0
S4 piggyback messages	0	0
S5 piggyback messages	0	0
Echo Request	0	25
Echo Response	25	0
Version Not Supported	0	0
Create session request	0	0
Create session response	0	0
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

```

show unified-edge sgw user@host> show unified-edge sgw gtp peer statistics remote-address 136.6.6.2 detail
gtp peer statistics Gateway: SGW
remote-address Global Packet Statistics
136.6.6.2 detail

```

```

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 2 Statistics:

```

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

```

Message Type	Received	Transmitted

Total number of messages	26	26
Total number of bytes	338	1066
Redirect messages	0	0
S11 piggyback messages	0	0
S4 piggyback messages	0	0
S5 piggyback messages	0	0
Echo Request	0	26
Echo Response	26	0
Version Not Supported	0	0
Create session request	0	0
Create session response	0	0
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	0
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

show unified-edge sgw gtp statistics

Syntax `show unified-edge sgw gtp statistics`
 `<detail>`
 `<fpc-slot fpc-slot>`
 `<gateway gateway>`
 `<pic-slot pic-slot>`
 `<s11>`
 `<s12>`
 `<s1u>`
 `<s4>`
 `<s5>`
 `<s8>`
 `<v1>`
 `<v2>`

Release Information Command introduced in Junos OS Mobility Release 11.4W.

Description Display the global GTP statistics for one or more Serving Gateways (S-GWs). If a gateway is not specified, then statistics for all S-GWs are displayed.

Options **none**—Display the GTP statistics in brief.

detail—(Optional) Display the GTP statistics with the GTP cause statistics included.

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

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

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.

s11—Display the GTP statistics for only the s11 interface.

s12—Display the GTP statistics for only the s12 interface.

s1u—Display the GTP statistics for only the s1u interface.

s5—Display the GTP statistics for only the s5 interface.

s8—Display the GTP statistics for only the s8 interface.

v1—(Optional) Display GTP version 1 statistics.

v2—(Optional) Display GTP version 2 statistics.

Required Privilege Level view

Related Documentation • [clear unified-edge sgw gtp statistics on page 113](#)
 • [show unified-edge sgw gtp peer statistics on page 120](#)

List of Sample Output [show unified-edge sgw gtp statistics on page 127](#)
[show unified-edge sgw gtp statistics detail on page 129](#)

Output Fields [Table 10 on page 126](#) 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 10: show unified-edge sgw gtp statistics Output Fields

Field Name	Field Description	Level of Output
Gateway	Name of the S-GW.	All levels
Global Packet Statistics		
Received Packets Dropped	Total number of packets received by the S-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 incorrect length in the IP or UDP header.	All levels
Unknown Messages Received	Number of GTP messages received that are not recognized by the S-GW.	All levels
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 Error Indication .	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

Table 10: show unified-edge sgw gtp statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 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
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, S11 piggyback messages or Create session response .	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 Missing or unknown APN .	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 sgw gtp statistics  user@host> show unified-edge sgw gtp statistics
                                     Gateway: SGW

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

```

Message Type	Received	Transmitted
End Marker	0	0
Echo Request	0	0
Echo Response	0	0
Error Indication	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	923	924
Total number of bytes	9191	13225
Redirect messages	0	0
S11 piggyback messages	0	0
S4 piggyback messages	0	0
S5 piggyback messages	0	0
Echo Request	907	0
Echo Response	0	907
Version Not Supported	0	0
Create session request	3	3
Create session response	3	3
Modify bearer request	3	0
Modify bearer response	0	3
Delete session request	6	5
Delete session response	1	3
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

```
show unified-edge sgw gtp statistics detail
user@host> show unified-edge sgw gtp statistics detail
Gateway: SGW
```

```
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 1 Statistics:

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

Message Type	Received	Transmitted
End Marker	0	0
Echo Request	0	0
Echo Response	0	0
Error Indication	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	925	926
Total number of bytes	9209	13251
Redirect messages	0	0
S11 piggyback messages	0	0
S4 piggyback messages	0	0
S5 piggyback messages	0	0
Echo Request	909	0
Echo Response	0	909
Version Not Supported	0	0
Create session request	3	3
Create session response	3	3
Modify bearer request	3	0
Modify bearer response	0	3
Delete session request	6	5
Delete session response	1	3
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
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	4	9
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

Troubleshooting

- [Gathering Troubleshooting Information on page 135](#)

CHAPTER 8

Gathering Troubleshooting Information

- [Configuring S-GW GTP Traceoptions on page 135](#)

Configuring S-GW GTP Traceoptions

GPRS tunneling protocol (GTP) tracing operations record detailed messages about the operation of Serving Gateway (S-GW) GTP services on the MobileNext Broadband Gateway. You can trace various types of S-GW GTP operations such as errors, warnings, configuration events, and other information. You can specify which trace operations are logged by including specific tracing flags and levels.

[Table 6 on page 107](#) describes the flags relating to the S-GW GTP that you can include at the `[edit unified-edge gateways sgw gateway-name gtp traceoptions flag]` hierarchy level.

Table 11: S-GW GTP Trace Flags

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

Table 7 on page 107 describes the levels you can include.

Table 12: S-GW GTP 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 sgw MBG2 gtp]
user@host# edit traceoptions
```



NOTE: You can use the `no-remote-trace` statement at this level to disable remote tracing capabilities.

2. Configure the filename for the trace file.

```
[edit unified-edge gateways sgw MBG2 gtp traceoptions]
user@host# set file datapath-log
```

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

```
[edit unified-edge gateways sgw MBG2 gtp traceoptions]
user@host# set file size 100m
```



NOTE: When a trace file (for example, `sgw-gtp-log`) reaches its maximum size, it is renamed `sgw-gtp-log.0`, then `sgw-gtp-log.1`, and so on, until the maximum number of trace files is reached. The oldest archived file is then overwritten.

4. Configure the tracing flag.

```
[edit unified-edge gateways sgw MBG2 gtp traceoptions]
user@host# set flag all
```



NOTE: You should use care when tracing all operations on a gateway. This can have a performance impact.

5. Configure the tracing level.

```
[edit unified-edge gateways sgw MBG2 gtp traceoptions]  
user@host# set level error
```

6. View the trace file.

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

**Related
Documentation**

- [Configuring General GTP Service on the S-GW on page 3](#)
- [Configuring GTP Trace Options on page 105](#)
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