

MobileNext Broadband Gateway

System Architecture



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MobileNext Broadband Gateway System Architecture

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Documentation and Release Notes

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

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

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Supported Platforms

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

- MX240 Routers
- MX960 Routers
- MX480 Routers

Documentation Conventions

Table 1 on page x 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 x 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: <code>user@host> configure</code>
Fixed-width text like this	Represents output that appears on the terminal screen.	<code>user@host> show chassis alarms</code> <code>No alarms currently active</code>
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces or emphasizes 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] <code>root@# set system domain-name domain-name</code>
Text like this	Represents names of configuration statements, commands, files, and directories; 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.	<code>stub <default-metric metric>;</code>

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

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

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

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

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract,

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

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

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- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://www.juniper.net/alerts/>
- Join and participate in the Juniper Networks Community Forum: <http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

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

Opening a Case with JTAC

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

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

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

PART 1

Overview

- [System Architecture Overview on page 3](#)

CHAPTER 1

System Architecture Overview

- [Overview of Broadband Gateway System Architecture on page 3](#)
- [Overview of Broadband Gateway System Control Packet Flow on page 5](#)
- [Overview of Broadband Gateway Uplink Payload Packet Flow on page 6](#)
- [Overview of Broadband Gateway Downlink Payload Packet Flow on page 8](#)
- [Understanding the Broadband Gateway Software Data Path on page 9](#)
- [Overview of Broadband Gateway as GGSN or P-GW on page 10](#)
- [Understanding Mobile User Types on page 11](#)

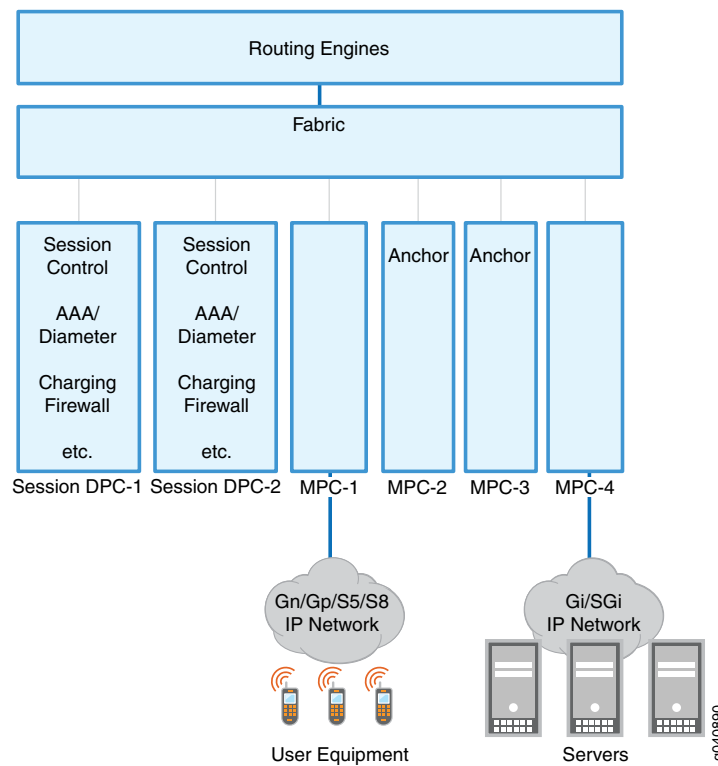
Overview of Broadband Gateway System Architecture

The distinctive architecture of the MobileNext Broadband Gateway allows the functions of the gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW) in 2G, 3G, and 4G architectures to combine with a typical provider edge (PE) router. Service chaining helps with scaling and lets the broadband gateway process mobile traffic without involving the Routing Engine.

[Figure 1 on page 4](#) shows the main hardware components of the broadband gateway. This is a typical configuration: minimally, one session Dense Port Concentrator (DPC) is required and one interface DPC or Modular Port Concentrator (MPC). This configuration shows a more typical configuration for redundancy and other routing functions:

- **Routing Engines**—These components exercise overall control of the chassis.
- **Fabric**—The heart of the chassis, the fabric allows all of the boards to communicate.
- **Session DPCs**—Also often called Service DPCs, these boards do not have external interfaces, but instead provide services for packets flowing through the system. Some session DPCs are designated *anchor* DPCs for control plane purposes.
- **Interface DPCs or MPCs**—These boards have external interfaces and can face packet networks or the mobile network. Some of these MPCs are designated anchor MPCs for user (bearer) data flows. All interfaces can use a single IP address.

Figure 1: The Broadband Gateway System Architecture



An *anchor* session DPC is where mobile control plane functions occur for a particular subscriber. The anchor interface DPC or MPC is where the processing for a specific GPRS tunneling protocol (GTP) tunnel identifier range occurs.

A key feature of the broadband gateway architecture is that many services can be integrated into the system. It is important to note that these services can be performed in a single pass through the device. This simplifies deployment scenarios and reduces requirements for space, latency, power, cooling, and so on. Because everything is all in one system, there are no interoperability issues and the same network management system can be used.

The broadband gateway can support 2G, 3G, and 4G subscribers at the same time, features fully redundant hardware and resilient software, and can scale bearer and control planes separately.

An overall resource manager watches operations concerning the resource management clients (the board in the chassis slots) and server (the active Routing Engine) on the broadband gateway.



NOTE: You do not configure the resource manager for the broadband gateway. The process runs automatically.

Related Documentation

- [Overview of Broadband Gateway System Control Packet Flow on page 5](#)
- [Overview of Broadband Gateway Uplink Payload Packet Flow on page 6](#)
- [Overview of Broadband Gateway Downlink Payload Packet Flow on page 8](#)
- [Overview of Broadband Gateway as GGSN or P-GW on page 10](#)

Overview of Broadband Gateway System Control Packet Flow

The MobileNext Broadband Gateway uses session Dense Port Concentrators (DPCs) to handle all GPRS tunneling protocol, control (GTP-C) signaling requests from the user equipment and the GTP responses. New GTP sessions are anchored on a selected session DPC, and all control plane functions are handled by the same session DPC. In this example, the mobile and packet network interfaces are all housed in Modular Port Concentrators (MPCs).

Figure 2: Broadband Gateway GTP Signaling Packet Flow

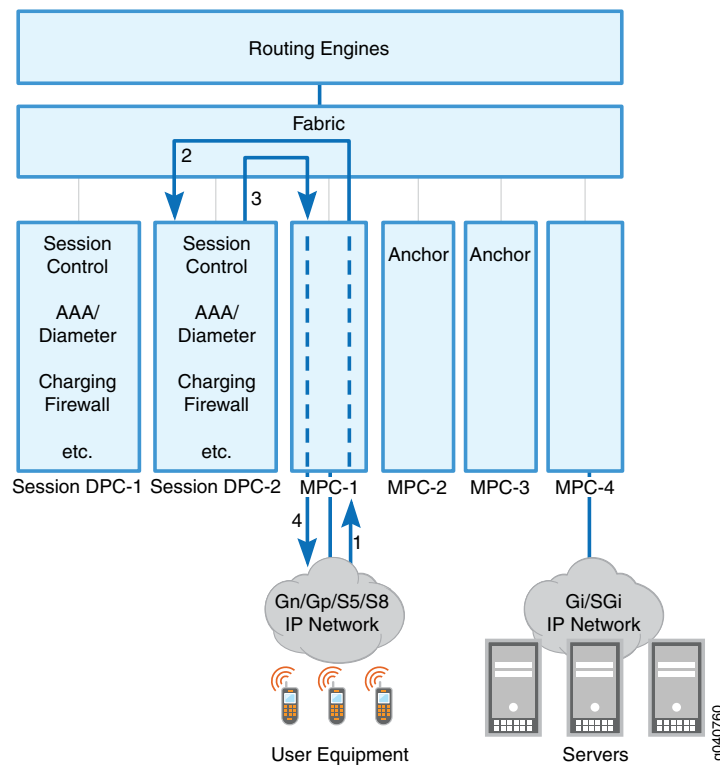


Figure 2 on page 5 shows the four steps that GTP-C signaling packets take through the broadband gateway:

1. An attached user equipment device activates a session and sends a Create Session request GTP-C signaling packet to a mobile interface on the broadband gateway.
2. The Gn/Gp or S5/S8 interface MPC parses the GTP-C packet based on the outer IP address and selects a session DPC for the new session. The MPC then sends the GTP-C signaling packet through the fabric to a session DPC that will anchor the session

for control purposes. The session DPC performs the admission control, authentication, authorization, and accounting (AAA), Dynamic Host Configuration Protocol (DHCP) and charging operations required.

3. If the session is accepted, the session DPC sends a create session reply GTP-C signaling packet to the interface MPC that received the GTP message.
4. The Gn/Gp or S5/S8 interface MPC sends the GTP-C response back to the user equipment.

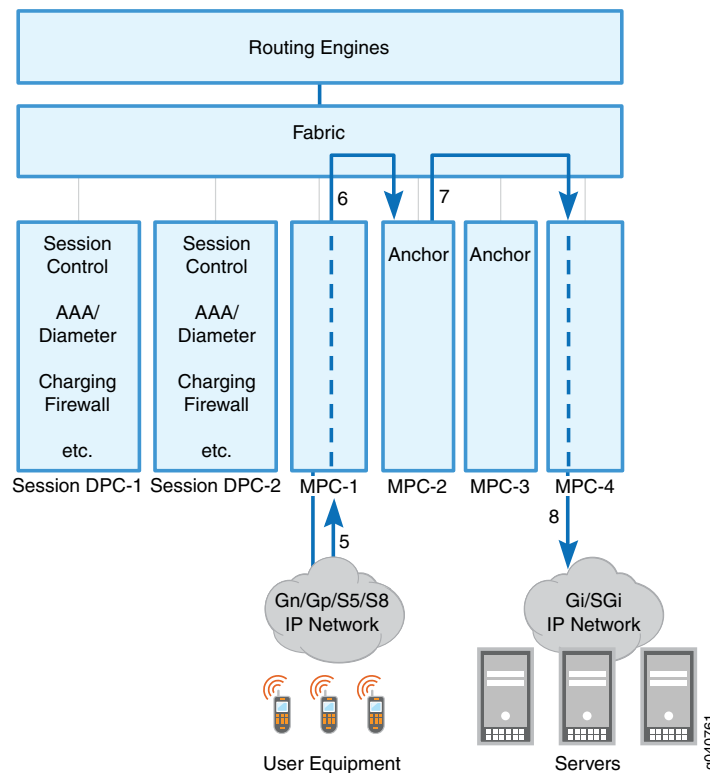
Related Documentation

- [Overview of Broadband Gateway System Architecture on page 3](#)
- [Overview of Broadband Gateway Uplink Payload Packet Flow on page 6](#)
- [Overview of Broadband Gateway Downlink Payload Packet Flow on page 8](#)
- [Overview of Broadband Gateway as GGSN or P-GW on page 10](#)

Overview of Broadband Gateway Uplink Payload Packet Flow

The MobileNext Broadband Gateway uses interface Modular Port Concentrators (MPCs) or Dense Port Concentrators (DPCs) to handle all uplink user payload packet flow requests from user equipment. All user traffic flows through the anchor interface MPC or DPC. In this example, the mobile and packet network interfaces are all housed in MPCs.

Figure 3: Broadband Gateway Uplink User Packet Flow



After the GPRS tunneling protocol control (GTP-C) packets establish a session, [Figure 3 on page 6](#) shows the next four steps that the uplink user payload GTP user plane (GTP-U) packets take through the broadband gateway:

5. An attached user equipment device sends an uplink payload GTP-U packet to a mobile interface on the broadband gateway.
6. The interface MPC sends the GTP-U packet to the interface MPC chosen during the control phase to anchor the user session data flow. The anchor MPC performs all subscriber-specific access control, policing, statistic gathering, and other parameters set for the subscriber based on the inner IP address in the GTP-U packet.
7. The anchor interface MPC sends the user packet to the uplink MPC that leads to the correct IP packet network.
8. The uplink interface MPC sends the user payload packet to the IP network on the Gi or SGi interface.

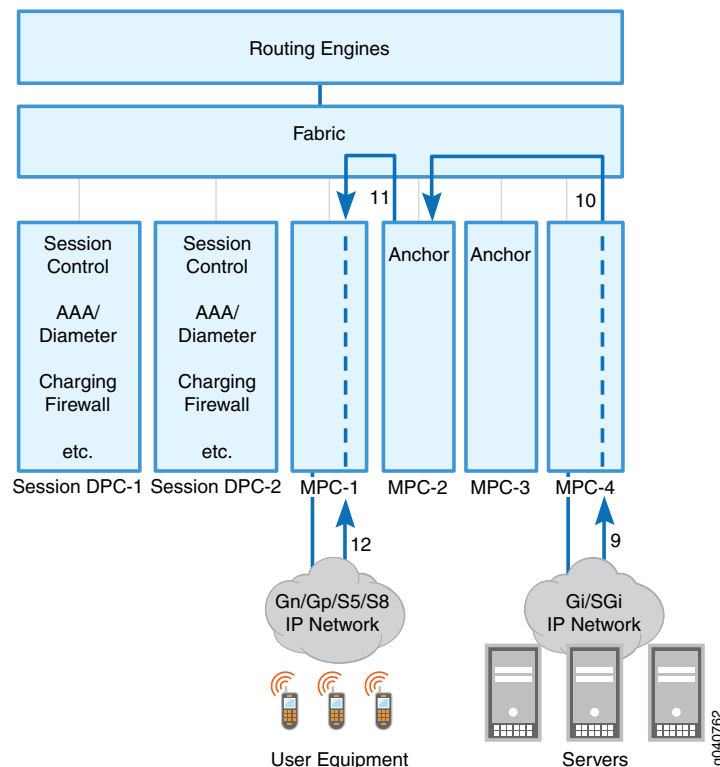
**Related
Documentation**

- [Overview of Broadband Gateway System Architecture on page 3](#)
- [Overview of Broadband Gateway System Control Packet Flow on page 5](#)
- [Overview of Broadband Gateway Downlink Payload Packet Flow on page 8](#)
- [Overview of Broadband Gateway as GGSN or P-GW on page 10](#)

Overview of Broadband Gateway Downlink Payload Packet Flow

The MobileNext Broadband Gateway uses interface Modular Port Concentrators (MPCs) or Dense Port Concentrators (DPCs) to handle all downlink user payload packets flows requests from an IP network back to the user equipment. All user traffic flows through the anchor interface MPC or DPC. In this example, the mobile and packet network interfaces are all housed in MPCs.

Figure 4: Broadband Gateway Downlink User Packet Flow



After the GPRS tunneling protocol, control (GTP-C) packets establish a session, and packets flow uplink to the broadband gateway, [Figure 4 on page 8](#) shows the last four steps that the downlink user payload GTP user plane (GTP-U) packets take through the broadband gateway:

9. The IP network sends a downlink data packet to a mobile Gi or SGi interface on the broadband gateway.
10. The interface MPC sends the downlink packet to the interface MPC chosen during the control phase to anchor the user session data flow. The anchor MPC performs all subscriber-specific access control, policing, statistic gathering, and other parameters set for the subscriber.

11. The anchor interface MPC sends the encapsulated GTP-U packet to the downlink interface that leads to the correct user device.

12. The downlink interface MPC sends the GTP-U user payload packet to the user device.

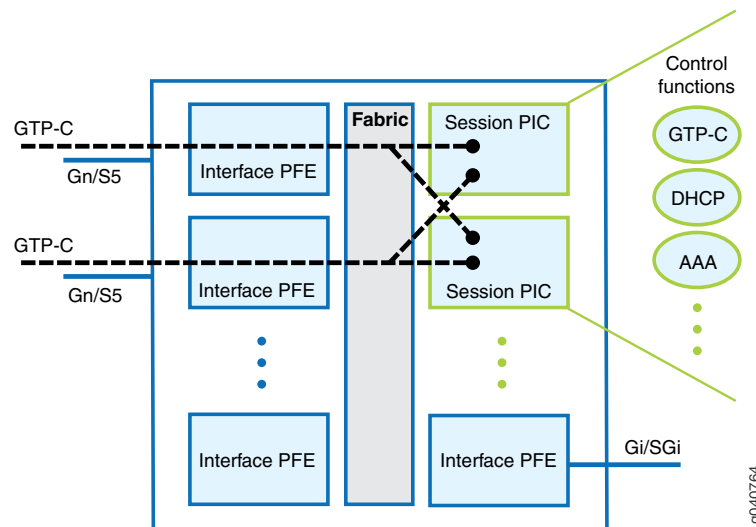
Related Documentation

- [Overview of Broadband Gateway System Architecture on page 3](#)
- [Overview of Broadband Gateway System Control Packet Flow on page 5](#)
- [Overview of Broadband Gateway Uplink Payload Packet Flow on page 6](#)
- [Overview of Broadband Gateway as GGSN or P-GW on page 10](#)

Understanding the Broadband Gateway Software Data Path

The MobileNext Broadband Gateway processes GPRS tunneling protocol (GTP) and IP packets as they make their way from an input interface to an output interface, upstream from mobile device to IP network or downstream from IP network to mobile device. Usually, the packet processing is handled at the “hardware” level, in the interface and anchor Packet Forwarding Engines. However, certain *data path* (sometimes called “exception”) packets follow a path through “software”, which means the Session PIC.

Figure 5: GTP-C Handling



As shown in [Figure 5 on page 9](#), control plane packets such as session creation requests arriving on a Gn or S5 (or S8) interface are sent to an anchor session Dense Port Concentrator (DPC) for processing. The session DPC load-balances and selects anchor interface DPCs or Modular Port Concentrators (MPCs) (housing the Packet Forwarding Engines) for the user session, and all subsequent data packets for that session flow through the anchor Packet Forwarding Engine. Mid-session control packets, such as those changing session parameters due to mobility, are still sent to the anchor session DPC and associated PICs. In general, upstream and downstream data flows are handled directly by the anchor Packet Forwarding Engine.

There are four exceptions to the general rule that user packets flow only through Packet Forwarding Engine hardware:

- Anchor Packet Forwarding Engine failovers (N:1)
- Reassembly of GTP-U and mobility control plane (for instance, authentication, authorization, and accounting [AAA]) fragments
- IPv6 router advertisements and router solicitation packet handling
- GTP-U error indication generation

Only software-based IP fragment reassembly and IPv6 router advertisements have parameters you can configure on the broadband gateway. (Anchor Packet Forwarding Engine configuration is part of the basic chassis configuration and aggregated Packet Forwarding Engines for failover are part of redundancy configuration).

**Related
Documentation**

- [Understanding GTP-U Error Data Path](#)
- [Configuring GGSN or P-GW Software Data Path Traceoptions on page 56](#)
- [Configuring S-GW Software Data Path Traceoptions on page 58](#)

Overview of Broadband Gateway as GGSN or P-GW

You can configure the MobileNext Broadband Gateway as either a 3G gateway GPRS support node (GGSN) or 4G Packet Data Network Gateway (P-GW). The GGSN or P-GW is the interconnection point between the public land mobile network (PLMN) and a particular Packet Data Network (PDN) such as the Internet or a corporate intranet.

In 3G networks, the GGSN maintains a one-to-many relationship with serving GPRS support nodes (SGSNs), which may be in either the home public land mobile network (HPLMN) or visited public land mobile network (VPLMN) for roaming subscribers. The SGSN and GGSN communicate with each other over Gn interface, which utilizes GPRS tunneling protocol, control plane (GTP-C) (version 0 and version 1) and GPRS tunneling protocol, user plane (GTP-U) for data traffic.

In 4G networks, the P-GW maintains a one-to-many relationship with Serving Gateway (S-GW), which can be in either the home PLMN or visiting PLMN for roaming subscribers. The S-GW and P-GW communicate with each other over the S5 interface for non-roaming subscribers and S8 interface for roaming subscribers. Both S5 and S8 interfaces make use of GTP-C (version 2) for control plane and GTP-U for data traffic.

The application framework for the broadband gateway is composed of a set of applications and protocols that interact with the external servers and provide the following configurable services for subscribers:

- Mobile subscriber authentication with RADIUS.
- Charging and accounting with GTP prime Charging Data Records (CDRs) generation and billing, or through RADIUS accounting.
- Policy enforcement using local configuration.

You configure the GGSN or P-GW for the broadband gateway as part of a *unified edge* configuration. The unified edge brings all mobile subscriber-related services under one structure. A unified edge gateway has its own set of parameters for AAA, charging, APNs, and so on.

- Related Documentation**
- [Overview of Broadband Gateway System Architecture on page 3](#)
 - [Configuring Broadband Gateway Home PLMNs and Gateways on page 15](#)

Understanding Mobile User Types

There are different types of users in a mobile network. These are distinguished by comparing the home public land mobile network (HPLMN) list configured on the gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW) and the PLMNs received from users in headers and control messages.

Based on a comparison of PLMNs, the mobile user falls into one of three categories:

- Home user—The subscriber, the GGSN or P-GW, and SSGN or S-GW are all in the same PLMN.
- Roaming user—The subscriber and GGSN or P-GW belong to the same PLMN, but the SSGN or S-GW are in a different PLMN.
- Visiting user—The subscriber and SGSN or S-GW belong to the same PLMN, but the GGSN or P-GW are in a different PLMN.

- Related Documentation**
- [Overview of Broadband Gateway System Architecture on page 3](#)
 - [Configuring Broadband Gateway Home PLMNs and Gateways on page 15](#)
 - [Configuring Broadband Gateway Local Policies Application on page 17](#)

PART 2

Configuration

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- [Configuration Statements on page 19](#)

CHAPTER 2

Configuration Tasks

- [Configuring Broadband Gateway Home PLMNs and Gateways on page 15](#)
- [Configuring Broadband Gateway Call Rate Statistics on page 16](#)
- [Configuring Broadband Gateway Local Policies Application on page 17](#)
- [Verifying the Gateway Configuration on page 18](#)

Configuring Broadband Gateway Home PLMNs and Gateways

The MobileNext Broadband Gateway establishes a context and framework for mobile operations under the unified edge. The basic mobile framework unit is the gateway, which can be used as either a 3G gateway GPRS support node (GGSN) or 4G Packet Data Network Gateway (P-GW). The gateway also has one or more home public land mobile networks (HPLMNs) associated with it.

Before you begin configuring HPLMNs and gateways on the broadband gateway, you should have done the following:

- Configured access to the MobileNext Broadband Gateway

To establish the mobile context, configure a gateway. You also configure a list of HPLMNs that this gateway and its access point names (APNs) recognize. The HPLMNs consist of the mobile country code (MCC) and mobile network code (MNC).



NOTE: At initial release, the broadband gateway supports only one gateway.

To configure the gateway and HPLMN list:

1. Configure a name for the gateway.

```
[edit unified-edge gateways ggsn-pgw ]  
user@host# set MGB1
```



NOTE: You can include dashes or underscores, but many special characters are not allowed in the gateway name.

2. Configure a list of HPLMNs for the gateway.

```
[edit unified-edge gateways ggsn-pgw MBG1]
user@host# set home-plmn mcc 001 mnc 01
```



NOTE: The MMC/MNC combination 00101 is reserved for test networks.

**Related
Documentation**

- [Understanding Mobile User Types on page 11](#)
- [Configuring Broadband Gateway Local Policies Application on page 17](#)
- [Overview of Broadband Gateway System Architecture on page 3](#)
- [Configuring General Gateway Trace Options on page 60](#)
- [Configuring Mobile Options Trace Options on page 62](#)
- [Configuring Resource Manager Trace Options on page 53](#)

Configuring Broadband Gateway Call Rate Statistics

The MobileNext Broadband Gateway records statistics about the rate of calls through the gateway. You can configure parameters relating to the recording of these statistics at the gateway level.

Before you begin configuring call rate statistics on the broadband gateway, you should have done the following:

- Configured a list of home public land mobile networks (HPLMNs) and a gateway on the MobileNext Broadband Gateway

To configure the option values for call rate statistics:

1. Configure the history interval value for collecting call rate statistics.

```
[edit unified-edge gateways ggsn-pgw MBG1 call-rate-statistics]
user@host# set history 10
```



NOTE: Enter a value from 1 through 20 intervals to keep call rate statistics.

2. Configure the interval for collecting call rate statistics.

```
[edit unified-edge gateways ggsn-pgw MBG1 call-rate-statistics]
user@host# set interval 5
```



NOTE: Enter a value in minutes from 5 through 120 minutes.

**Related
Documentation**

- [Configuring Broadband Gateway Home PLMNs and Gateways on page 15](#)
- [Configuring General Gateway Trace Options on page 60](#)
- [Configuring Mobile Options Trace Options on page 62](#)

- [Configuring Resource Manager Trace Options on page 53](#)

Configuring Broadband Gateway Local Policies Application

The MobileNext Broadband Gateway associates a number of locally configured policies with a configured gateway. These policies are used for connection admission control and service-related parameters.

Before you begin configuring local policies on the broadband gateway, you should have done the following:

- Configured access to the MobileNext Broadband Gateway

You configure the local policies at the **[edit unified-edge cos-cac]** hierarchy level and apply the profiles at the **[edit unified-edge local-policies *local-policies-name*]** hierarchy level. You can configure many policy profiles, but you can apply only one of each type at a time to the gateway as a whole.

To associate the gateway with local policy profiles:

1. Use a name for the local policies profile.

```
[edit unified-edge local-policies local-policy-profile-1]
```

2. Associate the gateway with a classifier profile by user type.

```
[edit unified-edge local-policies local-policy-profile-1
user@host# set classifier-profile home-classifier-profile-1
user@host# set roamer-classifier-profile roamer-classifier-profile-1
user@host# set visitor-classifier-profile visitor-classifier-profile-1
```

3. Associate the gateway with a class-of-service policy profiles by user type.

```
[edit unified-edge local-policies local-policy-profile-1
user@host# set policy-profile home-classifier-policy-profile-1
user@host# set roamer-policy-profile roamer-classifier-policy-profile-1
user@host# set visitor-policy-profile visitor-policy-profile-1
```

4. Associate the gateway with the resource threshold profile used to define admission control for managing system overload conditions.

```
[edit unified-edge local-policies local-policy-profile-1
user@host# set resource-threshold-profiles resource-threshold-profile-1
```

5. Associate the gateway with the downlink bandwidth pool.

```
[edit unified-edge local-policies local-policy-profile-1
user@host# set dl-bandwidth-pool bw-pool-downlink-1
```

6. Associate the gateway with the uplink bandwidth pool.

```
[edit unified-edge local-policies local-policy-profile-1
user@host# set ul-bandwidth-pool bw-pool-uplink-1
```

Related Documentation

- [Understanding Mobile User Types on page 11](#)
- [Overview of Broadband Gateway System Architecture on page 3](#)

- [Configuring General Gateway Trace Options on page 60](#)
- [Configuring Mobile Options Trace Options on page 62](#)
- [Configuring Resource Manager Trace Options on page 53](#)

Verifying the Gateway Configuration

Purpose Display information about the gateway configuration.

Action • To display information about the call rate and general statistics on the gateway:

```
user@host> show unified-edge ggsn-pgw call-rate statistics
user@host> show unified-edge ggsn-pgw statistics
```

• To clear information about the general statistics on the gateway:

```
user@host> clear unified-edge ggsn-pgw statistics
```

• To display information about the status of the gateway:

```
user@host> show unified-edge ggsn-pgw status
user@host> show unified-edge ggsn-pgw status preemption-list
```

• To clear information about the subscriber peers on the gateway:

```
user@host> clear unified-edge ggsn-pgw subscribers peer
```

• To display information about the resources on the gateway:

```
user@host> show unified-edge ggsn-pgw resource-manger clients
```

Related Documentation

- [Configuring Broadband Gateway Home PLMNs and Gateways on page 15](#)
- [Configuring Broadband Gateway Local Policies Application on page 17](#)
- [Configuring Broadband Gateway Call Rate Statistics on page 16](#)

CHAPTER 3

Configuration Statements

- [\[edit unified-edge mobile-options\] Hierarchy Level on page 19](#)
- [\[edit unified-edge resource-management\] Hierarchy Level on page 19](#)

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

```
unified-edge {  
  mobile-options {  
    traceoptions {  
      file filename {  
        files files;  
        match match;  
        (no-world-readable | world-readable);  
        size size;  
      }  
      flag {  
        flag;  
      }  
      no-remote-trace;  
    }  
  }  
}
```

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

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

```
unified-edge {  
  resource-management {  
    client {  
      traceoptions {  
        file filename {  
          files files;  
          match match;  
          (no-world-readable | world-readable);  
          size size;  
        }  
        flag {  
          flag;  
        }  
      }  
    }  
  }  
}
```

```
    }
    no-remote-trace;
  }
}
server {
  traceoptions {
    file filename {
      files files;
      match match;
      (no-world-readable | world-readable);
      size size;
    }
    flag {
      flag;
    }
    no-remote-trace;
  }
}
}
```


**Related
Documentation**

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

call-rate-statistics

Syntax	<pre>call-rate-statistics { history <i>history</i>; interval <i>interval</i>; }</pre>
Hierarchy Level	[edit unified-edge gateways <i>ggsn-pgw gateway-name</i>], [edit unified-edge gateways <i>sgw gateway-name</i>]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways <i>sgw gateway-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the parameters related to the broadband gateway's call-rate statistics. You can specify the number of past intervals for which the call-rate statistics are stored, and the interval for which the call-rate statistics are calculated.</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"> • [edit unified-edge gateways <i>ggsn-pgw <gateway-name></i>] Hierarchy Level • [edit unified-edge gateways <i>sgw <gateway-name></i>] Hierarchy Level • show unified-edge ggsn-pgw call-rate statistics on page 71 • show unified-edge sgw call-rate statistics on page 94

classifier-profile (Local Policies)

Syntax	<code>classifier-profile <i>profile-name</i>;</code>
Hierarchy Level	<code>[edit unified-edge local-policies <i>name</i>]</code>
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	Specify the classifier profile for home subscribers. A classifier profile defines the packet forwarding treatment for each bearer depending on its QoS Class Identifiers (QCI).
Options	<i>profile-name</i> —Name of the classifier profile.
<div><p>NOTE: The classifier policy profile must be previously configured on the broadband gateway at the <code>[edit unified-edge cos-cac classifier-profiles]</code> hierarchy level.</p></div>	
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 a Local PolicyConfiguring QoS on the Broadband Gateway Overviewclassifier-profileslocal-policies (QoS) on page 29

client (Resource Management)

```
Syntax  client {
          traceoptions {
            file filename {
              files files;
              match match;
              (no-world-readable | world-readable);
              size size;
            }
            flag {
              flag;
            }
            level level;
            no-remote-trace;
          }
        }
```

Hierarchy Level [edit unified-edge resource-management]

Description Define the tracing options for the resource management client (the session Dense Port Concentrators [DPCs] and interface DPCs and Modular Port Concentrators [MPCs]). Resource management tracing operations record detailed messages about the operation of resource management clients on the broadband gateway.

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

- [Configuring Resource Manager Trace Options on page 53](#)
- [resource-management \(MobileNext Broadband Gateway\) on page 32](#)

dl-bandwidth-pool (Local Policies)

Syntax	<code>dl-bandwidth-pool <i>pool-name</i>;</code>
Hierarchy Level	<code>[edit unified-edge local-policies <i>name</i>]</code>
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	Specify the bandwidth pool for limiting the downlink bandwidth usage at the gateway or at the APN level.
Options	<i>pool-name</i> —Name of the downlink bandwidth pool.



NOTE: The bandwidth pool must be previously configured on the broadband gateway at the `[edit unified-edge cos-cac gbr-bandwidth-pools]` hierarchy level.

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 a Local Policy• Configuring QoS on the Broadband Gateway Overview• gbr-bandwidth-pools (Class of Service)• local-policies (QoS) on page 29

forwarding-packages

Syntax	<pre>forwarding-packages { mobility { ggsn-pgw; sgw; } }</pre>
Hierarchy Level	[edit chassis fpc <i>fpc-slot</i> pfe <i>pfe-id</i>]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	<p>Configure the Packet Forwarding Engine so that it can be used to anchor mobile sessions. If this configuration is changed, then the FPC reboots.</p> <p>The forwarding-packages statement can be configured at the Packet Forwarding Engine level. Therefore, you can configure a subset of Packet Forwarding Engines in an FPC to be mobile anchors.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring Interface DPCs or MPCs for User Mobility Traffic

ggsn-pgw

Syntax	<code>ggsn-pgw <i>gateway-name</i> { ... }</code>
Hierarchy Level	[edit unified-edge gateways]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	<p>Specify the name to be used for the broadband gateway. The broadband gateway can be configured as a gateway GPRS support node (GGSN), as a Packet Data Network Gateway (P-GW), or as both a GGSN and a P-GW.</p> <p>The remaining statements are explained separately.</p>
Options	<p><i>gateway-name</i>—Name of the gateway.</p> <p>Range: Up to 63 characters</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"> [edit unified-edge gateways ggsn-pgw <gateway-name>] Hierarchy Level Configuring Broadband Gateway Home PLMNs and Gateways on page 15

history (Call-Rate Statistics)

Syntax	<code>history <i>history</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> call-rate-statistics], [edit unified-edge gateways sgw <i>gateway-name</i> call-rate-statistics]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> call-rate-statistics] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Configure the number of past intervals for which the call-rate statistics are stored by the broadband gateway.
Options	<i>history</i> —Number of past intervals for which the call-rate statistics are stored. Range: 1 through 20 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">• call-rate-statistics on page 21• show unified-edge ggsn-pgw call-rate statistics on page 71• show unified-edge sgw call-rate statistics on page 94

home-plmn

Syntax	home-plmn { [mcc <i>mcc</i> mnc <i>mnc</i>]; }
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i>]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Configure the operator's home public land mobile networks (HPLMNs) to which the broadband gateway belongs. The HPLMN consists of the mobile country code (MCC) and its corresponding mobile network codes (MNCs).



NOTE:

- For the broadband gateway configured as a Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW), we recommend that you configure the home-plmn statement even though it is not mandatory to do so. If the home-plmn statement is not configured for the GGSN or P-GW, then all subscribers will be classified as visitors.
- For the broadband gateway configured as a Serving Gateway (S-GW), configuring the home-plmn statement is optional. In order to determine the subscriber's roaming status, the S-GW uses the Serving Network PLMN provided as part of the Serving Network Information Element (IE) in the Create Session Request message. If the Serving Network IE is not available, then the S-GW uses the home PLMN configuration to determine the subscriber's roaming status.

Options **mcc *mcc* mnc *mnc***—Specify the MCC and the MNC (belonging to the MCC) for the home HPLMN.

Syntax:

- The MCC must be three digits long and can contain numbers from 0 through 9.
- The MNC must be at least two digits long and up to a maximum of three digits long. It can contain numbers from 0 through 9.



NOTE:

- The MCC/MNC combination 00101 is reserved for test networks.
- You can specify more than one MCC and MNC combination by including the `set mcc mcc mnc mnc` command multiple times.

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 Broadband Gateway Home PLMNs and Gateways on page 15](#)
- Configuring an S-GW on a Broadband Gateway
- [ggsn-pgw on page 25](#)
- `sgw`

interval (Call-Rate Statistics)

Syntax `interval interval;`

Hierarchy Level [edit unified-edge gateways `ggsn-pgw gateway-name` call-rate-statistics],
[edit unified-edge gateways `sgw gateway-name` call-rate-statistics]

Release Information Statement introduced in Junos OS Mobility Release 11.2W.
Support at the [edit unified-edge gateways `sgw gateway-name` call-rate-statistics] hierarchy level introduced in Junos OS Mobility Release 11.4W.

Description Configure the interval for which the call-rate statistics are calculated by the broadband gateway.

Options *interval*—Interval, in minutes, for which the call-rate statistics are calculated.
Range: 5 through 120 minutes
Default: 60 minutes

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

Related Documentation

- [call-rate-statistics on page 21](#)
- [show unified-edge ggsn-pgw call-rate statistics on page 71](#)
- [show unified-edge sgw call-rate statistics on page 94](#)

local-policies (QoS)

Syntax	<pre> local-policies { policy-name { cos-policy-profile name; classifier-profile name; description description; dl-bandwidth-pool name; resource-threshold-profile name; roamer-classifier-profile name; roamer-cos-policy-profile name; ul-bandwidth-pool name; visitor-classifier-profile name; visitor-cos-policy-profile name; } } </pre>
Hierarchy Level	[edit unified-edge]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	<p>Configure the local policy, which defines the quality of service (QoS) to be applied at the gateway level or at the access point name (APN) level for the broadband gateway. A local policy applied at the APN level takes priority over a local policy applied at the gateway level. A local policy defines traffic by classes and specifies the different levels of throughput and packet loss when congestion occurs.</p> <p>The remaining statements are explained separately.</p>
Options	<p>policy-name—Name of the local policy.</p> <p>Range: Up to 64 characters</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"> [edit unified-edge local-policies] Hierarchy Level Configuring QoS on the Broadband Gateway Overview

mobile-options

Syntax

```
mobile-options {  
  traceoptions {  
    file filename {  
      files files;  
      match match;  
      (no-world-readable | world-readable);  
      size size;  
    }  
    flag {  
      flag;  
    }  
    no-remote-trace;  
  }  
}
```

Hierarchy Level [edit unified-edge]

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

Description Specify the tracing options for the mobility daemon.

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] Hierarchy Level
- [Configuring Mobile Options Trace Options on page 62](#)

mobility

Syntax	<pre>mobility { ggsn-pgw; sgw; }</pre>
Hierarchy Level	[edit chassis fpc <i>fpc-slot</i> pfe <i>pfe-id</i> forwarding-packages]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. sgw statement introduced in Junos OS Mobility Release 11.4W.
Description	Specify the forwarding package that the Packet Forwarding Engines associated with mobility must use.



NOTE:

- You must include every Packet Forwarding Engine configured with the **ggsn-pgw** forwarding package at the [edit unified-edge gateways **ggsn-pgw 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.
- 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.

Options	<p>ggsn-pgw—Configure the router as a gateway GPRS support node (GGSN) or as a Packet Data Network Gateway (P-GW).</p> <p>sgw—Configure the router as a Serving Gateway (S-GW).</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Interface DPCs or MPCs for User Mobility Traffic • forwarding-packages on page 25

resource-management (MobileNext Broadband Gateway)

```

Syntax  resource-management {
        client {
            traceoptions {
                file filename {
                    files files;
                    match match;
                    (no-world-readable | world-readable);
                    size size;
                }
                flag {
                    flag;
                }
                level level;
                no-remote-trace;
            }
        }
        server {
            traceoptions {
                file filename {
                    files files;
                    match match;
                    (no-world-readable | world-readable);
                    size size;
                }
                flag {
                    flag;
                }
                level level;
                no-remote-trace;
            }
        }
    }

```

Hierarchy Level [edit unified-edge]

Description Define the resource management tracing options. Resource management tracing operations record detailed messages about the operation of resource management clients and server on the broadband gateway.


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] Hierarchy Level
- [Configuring Resource Manager Trace Options on page 53](#)

resource-threshold-profile (Local Policies)

Syntax	<code>resource-threshold-profile <i>profile-name</i>;</code>
Hierarchy Level	<code>[edit unified-edge local-policies <i>name</i>]</code>
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	Specify the resource threshold profile for the local policy. The resource threshold profile specifies the limit for the bearer load, CPU load, or memory load.
Options	<i>profile-name</i> —Name of the resource threshold profile.
<div>  <p>NOTE: The resource threshold profile must be previously configured on the broadband gateway at the <code>[edit unified-edge cos-cac resource-threshold-profiles]</code> hierarchy level.</p> </div>	
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 a Local Policy Configuring QoS on the Broadband Gateway Overview resource-threshold-profiles (QoS) local-policies (QoS) on page 29

roamer-classifier-profile (Local Policies)

Syntax	roamer-classifier-profile <i>profile-name</i> ;
Hierarchy Level	[edit unified-edge local-policies <i>name</i>]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	Specify the classifier profile for roaming subscribers. A classifier profile defines the packet forwarding treatment for each bearer depending on its QoS Class Identifiers (QCI).
Options	<i>profile-name</i> —Name of the roamer classifier profile.



NOTE: The classifier policy profile must be previously configured on the broadband gateway at the [edit unified-edge cos-cac classifier-profiles] hierarchy level.

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 a Local Policy• Configuring QoS on the Broadband Gateway Overview• classifier-profiles• local-policies (QoS) on page 29

server (Resource Management)

```
Syntax  server {
        traceoptions {
            file filename {
                files files;
                match match;
                (no-world-readable | world-readable);
                size size;
            }
            flag {
                flag;
            }
            level level;
            no-remote-trace;
        }
    }
```

Hierarchy Level [edit unified-edge resource-management]

Description Define the tracing options for the resource management server (the active Routing Engine). Resource management tracing operations record detailed messages about the operation of the resource management server on the broadband gateway.

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

- [Configuring Resource Manager Trace Options on page 53](#)
- [resource-management \(MobileNext Broadband Gateway\) on page 32](#)

software-datapath

Syntax	<pre>software-datapath { traceoptions { file <i>filename</i> { files <i>files</i>; match <i>match</i>; size <i>size</i>; (no-world-readable world-readable); } flag { <i>flag</i>; } level <i>level</i>; no-remote-trace; } }</pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i>]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Specify the configuration for the software data path. The remaining statements are explained separately.
Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• [edit unified-edge gateways ggsn-pgw <gateway-name>] Hierarchy Level• [edit unified-edge gateways sgw <gateway-name>] Hierarchy Level• Configuring GGSN or P-GW Software Data Path Traceoptions on page 56

traceoptions (Data Path)

Syntax	<pre> traceoptions { file <i>filename</i> { files <i>files</i>; match <i>match</i>; size <i>size</i>; (no-world-readable world-readable); } flag { <i>flag</i>; } level <i>level</i>; no-remote-trace; } </pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> software-datapath], [edit unified-edge gateways sgw <i>gateway-name</i> software datapath]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> software-datapath] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Define tracing operations for software data path.
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"> <i>flag</i>—You can use one of the following flags: <ul style="list-style-type: none"> ager—Trace flow ageout-related events. all—Trace everything. buffering—Trace buffering. commands—Trace operational commands. configuration—Trace configuration commands. flow—Trace flow. init—Trace events related to the init datapath daemon.

- **ipv6-router-advertisement**—Trace IPv6 router advertisements.
- **memory**—Trace memory.
- **reassembly**—Trace reassembly.
- **redundancy**—Trace redundancy.

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.

match *match*—(Optional) Refine the output to include lines that contain the regular expression.

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 GGSN or P-GW Software Data Path Traceoptions on page 56• software-datapath on page 36
------------------------------	--

traceoptions (Mobile Options)

Syntax	<pre> traceoptions { file <i>filename</i> { files <i>files</i>; match <i>match</i>; (no-world-readable world-readable); size <i>size</i>; } flag { <i>flag</i>; } no-remote-trace; } </pre>
Hierarchy Level	[edit unified-edge mobile-options]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	<p>Define the tracing options for the mobility daemon.</p> <p>Tracing options record detailed messages about the operation of the mobility daemon. You can specify which trace operations are logged by including specific tracing flags and levels.</p>
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"> • <i>flag</i>—You can use one of the following flags: <ul style="list-style-type: none"> • all—Trace everything for the mobility daemon. • configuration—Trace configuration commands. • error—Trace events related to errors in the daemon. • init—Trace events related to the protocol initialization daemon. • protocol—Trace protocol processing events.

match *match*—(Optional) Refine the output to include lines that contain the regular expression.

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

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

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

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

Range: 10 KB through 1 GB

Default: 128 KB

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

Required Privilege Level	trace and unified-edge—To view this statement in the configuration.
	trace-control and unified-edge-control—To add this statement to the configuration.
Related Documentation	• Configuring Mobile Options Trace Options on page 62
	• mobile-options on page 30

traceoptions (Broadband Gateway)

Syntax	<pre> traceoptions { file <i>filename</i> { files <i>files</i>; match <i>match</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>gateway-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i>]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Define the tracing operations for the broadband gateway. 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"> • <i>flag</i>—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. • bulkjob—Trace events that are handled by bulk jobs in order to prevent system overload. • config—Trace configuration events. • cos-cac—Trace class of service (CoS) and call admission control (CAC) events.

- **ctxt**—Trace user equipment, Packet Data Network (PDN), or bearer context events.
- **fsm**—Trace mobile subscriber finite state machine (FSM) events.
- **gtpu**—Trace GPRS tunneling protocol, user plane (GTP-U) events.
- **ha**—Trace high availability events.
- **init**—Trace initialization events.
- **pfem**—Trace Packet Forwarding Engine Manager events.
- **stats**—Trace **stats** events. This flag is used internally by Juniper's engineers.
- **waitq**—Trace **waitq** events. This flag is used internally by Juniper's engineers.

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

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

match *match*—(Optional) Refine the output to include lines that contain the regular expression.

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**
- [edit unified-edge gateways ggsn-pgw <gateway-name>] Hierarchy Level
 - [edit unified-edge gateways sgw <gateway-name>] Hierarchy Level
 - [Configuring General Gateway Trace Options on page 60](#)
 - Configuring S-GW Traceoptions

tracoptions (Resource Management Client)

Syntax

```
tracoptions {  
    file filename {  
        files files;  
        match match;  
        (no-world-readable | world-readable);  
        size size;  
    }  
    flag {  
        flag;  
    }  
    level level;  
    no-remote-trace;  
}
```

Hierarchy Level [edit unified-edge resource-management client]

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

Description Define the tracing options for the resource management client (the session Dense Port Concentrators [DPCs] and interface DPCs and Modular Port Concentrators [MPCs]). Resource management tracing operations record detailed messages about the operation of resource management clients on the broadband gateway. You can specify which trace operations are logged by including specific tracing flags and levels.

Options **file *filename***—Name of the file that receives the output of the tracing operation. All files are placed in the **/var/log** directory.



NOTE: The FPC and PIC slot numbers are appended to the specified filename to obtain a unique filename for each DPC.

files *files*— (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.

If you specify a maximum number of files, you must also specify a maximum file size with the **size** option and a filename.

Range: 2 through 1000

Default: 3 files

flag

- ***flag***—You can use one of the following flags:



NOTE: Currently, only the **all** flag is supported. The other flags are not fully supported.

- **all**—Trace everything.
- **communication**—Trace Inter-Process Communication (IPC) code.
- **info-tables**—Trace information table code.
- **infra**—Trace finite state machine (FSM) and infra code.
- **memory**—Trace memory management code.
- **redundancy**—Trace graceful Routing Engine switchover (GRES) code.
- **resource-tables**—Trace resource table code.

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.

match *match*—(Optional) Refine the output to include lines that contain the regular expression.

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**
- [client \(Resource Management\) on page 23](#)
 - [Configuring Resource Manager Trace Options on page 53](#)

tracoptions (Resource Management Server)

Syntax

```
tracoptions {
    file filename {
        files files;
        match match;
        (no-world-readable | world-readable);
        size size;
    }
    flag {
        flag;
    }
    level level;
    no-remote-trace;
}
```

Hierarchy Level [edit unified-edge resource-management server]

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

Description Define the tracing options for the resource management server (the active Routing Engine). Resource management tracing operations record detailed messages about the operation of the resource management server on the broadband gateway. You can specify which trace operations are logged by including specific tracing flags and levels.

Options **file *filename***—Name of the file that receives the output of the tracing operation. All files are placed in the `/var/log` directory.



NOTE: The FPC and PIC slot numbers are appended to the specified filename to obtain a unique filename for each DPC.

files *files*— (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.

If you specify a maximum number of files, you must also specify a maximum file size with the **size** option and a filename.

Range: 2 through 1000

Default: 3 files

flag

- **flag**—You can use one of the following flags:



NOTE: Currently, only the all flag is supported. The other flags are not fully supported.

- **all**—Trace everything.
- **communication**—Trace infra code.
- **configuration**—Trace configuration code.
- **gres**—Trace graceful Routing Engine switchover (GRES) code.
- **info-manager**—Trace information management code.
- **init**—Trace events related to the Resource Management and Packet Steering Daemon(RMPD) initialization sequence of messages.
- **memory**—Trace memory management code.
- **packet-steering**—Trace packet-steering code.
- **resource-manager**—Trace resource management code.
- **signal**—Trace signal-handling code.
- **state**—Trace state-handling code.
- **timer**—Trace timer code.
- **ui**—Trace user interface code.

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.

match *match*—(Optional) Refine the output to include lines that contain the regular expression.

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

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

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

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

Range: 10 KB through 1 GB

Default: 128 KB

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

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

Related Documentation

- [Configuring Resource Manager Trace Options on page 53](#)
- [server \(Resource Management\) on page 35](#)

ul-bandwidth-pool (Local Policies)

Syntax `ul-bandwidth-pool pool-name ;`

Hierarchy Level [edit unified-edge local-policies *name*]

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

Description Specify the bandwidth pool for limiting the downlink bandwidth usage at the gateway or at the APN level.

Options *pool-name*—Name of the uplink bandwidth pool.




NOTE: The bandwidth pool must be previously configured on the broadband gateway at the [edit unified-edge cos-cac gbr-bandwidth-pools] hierarchy level.

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 a Local Policy](#)
- [Configuring QoS on the Broadband Gateway Overview](#)
- [gbr-bandwidth-pools \(Class of Service\)](#)
- [local-policies \(QoS\) on page 29](#)

visitor-classifier-profile (Local Policies)

Syntax	visitor-classifier-profile <i>profile-name</i> ;
Hierarchy Level	[edit unified-edge local-policies <i>name</i>]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	Specify the classifier profile for visiting subscribers. A classifier profile defines the packet forwarding treatment for each bearer depending on its QoS Class Identifiers (QCI).
Options	<i>profile-name</i> —Name of the visitor classifier profile.
<div> NOTE: The classifier policy profile must be previously configured on the broadband gateway at the [edit unified-edge cos-cac classifier-profiles] hierarchy level.</div>	
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 a Local Policy• Configuring QoS on the Broadband Gateway Overview• classifier-profiles• local-policies (QoS) on page 29

PART 3

Administration

- [Monitoring on page 53](#)
- [Operational Commands on page 65](#)

CHAPTER 4

Monitoring

- [Configuring Resource Manager Trace Options on page 53](#)
- [Configuring GGSN or P-GW Software Data Path Traceoptions on page 56](#)
- [Configuring S-GW Software Data Path Traceoptions on page 58](#)
- [Configuring General Gateway Trace Options on page 60](#)
- [Configuring Mobile Options Trace Options on page 62](#)

Configuring Resource Manager Trace Options

Resource management tracing operations record detailed messages about the operation of resource management clients and server on the MobileNext Broadband Gateway.



NOTE: You do not configure the resource manager for the broadband gateway. The process runs automatically.

Resource management trace options are divided into flags for the resource management *server* (the active Routing Engine) and the resource management *client* (the session Dense Port Concentrators [DPCs] and interface DPCs and Modular Port Concentrators [MPCs]). You can set server and client flags independently. You can specify which trace operations are logged by including specific tracing flags and levels.

[Table 3 on page 53](#) describes the flags relating to the resource management server that you can include at the **[edit unified-edge resource-management server traceoptions flag]** hierarchy level.

Table 3: Resource Management Server Trace Flags

Flag	Description
all	Trace everything.
communication	Trace Infra code.
config	Trace configuration code.
gres	Trace GRES code.

Table 3: Resource Management Server Trace Flags (*continued*)

info-manager	Trace information management code.
init	Trace events related to data path daemon initialization.
memory	Trace memory management code.
packet-steering	Trace packet-steering code.
resource-manager	Trace resource management code.
signal	Trace signal handling code.
state	Trace state handling code.
timer	Trace timer code.
ui	Trace user interface code.

Table 4 on page 54 describes the flags relating to the resource management client that you can include at the **[edit unified-edge resource-management client traceoptions flag]** hierarchy level.

Table 4: Resource Management Client Trace Flags

Flag	Description
all	Trace everything.
communication	Trace IPC code.
info-tables	Trace information table code.
infra	Trace FSM and Infra code.
memory	Trace memory management code.
redundancy	Trace GRES code.
resource-tables	Trace resource table code.

Table 5 on page 54 describes the levels you can include.

Table 5: Trace Levels

Level	Description
all	Match all levels.
error	Match error conditions.

Table 5: Trace Levels (*continued*)

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 resource management operations:

1. Specify that you want to configure tracing options for resource management client or server operations.

```
[edit unified-edge resource-management server]
[edit unified-edge resource-management client]
user@host# edit traceoptions
```

2. Configure the filename for the trace file.

```
[edit unified-edge resource-management server traceoptions]
[edit unified-edge resource-management client traceoptions]
user@host# set file rm-log
```

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

```
[edit unified-edge resource-management server traceoptions]
[edit unified-edge resource-management client traceoptions]
user@host# set file size 100m
```



NOTE: When a trace file (for example, `rm-log`) reaches its maximum size, it is renamed `rm-log.0`, then `rm-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 resource-management server traceoptions]
[edit unified-edge resource-management client traceoptions]
user@host# set flag all
```



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

5. Configure the tracing level.

```
[edit unified-edge resource-management server traceoptions]
[edit unified-edge resource-management client traceoptions]
user@host# set level error
```

6. View the trace file.

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

- Related Documentation**
- [Overview of Broadband Gateway System Architecture on page 3](#)
 - [Configuring Broadband Gateway Home PLMNs and Gateways on page 15](#)
 - [Configuring Broadband Gateway Local Policies Application on page 17](#)
 - [Configuring General Gateway Trace Options on page 60](#)
 - [Configuring Mobile Options Trace Options on page 62](#)

Configuring GGSN or P-GW Software Data Path Traceoptions

Data path tracing operations record detailed messages about the operation of services such as packet reassembly or IPv6 router advertisements on the MobileNext Broadband Gateway. You can trace various types of data path operations such as configuration events, memory usage, the age of a packet flow, configuration information, and other information. You can specify which trace operations are logged by including specific tracing flags and levels.

[Table 6 on page 56](#) describes the flags relating to the data path that you can include at the `[edit unified-edge gateways ggsn-pgw gateway-name software-datapath traceoptions flag]` hierarchy level.

Table 6: Trace Flags

Flag	Description
<code>ager</code>	Trace flow ager.
<code>all</code>	Trace everything.
<code>commands</code>	Trace operational commands.
<code>configuration</code>	Trace configuration events.
<code>flow</code>	Trace flow.
<code>init</code>	Trace events related to data path daemon initialization.
<code>ipv6-router-advertisement</code>	Trace IPv6 router advertisement.
<code>memory</code>	Trace memory.
<code>reassembly</code>	Trace reassembly.
<code>redundancy</code>	Trace redundancy.

[Table 7 on page 56](#) describes the levels you can include.

Table 7: Trace Levels

Level	Description
-------	-------------

Table 7: Trace Levels (*continued*)

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 data path operations:

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

```
[edit unified-edge gateways ggsn-pgw MBG1 software-datapath]
user@host# edit traceoptions
```

2. Configure the filename for the trace file.

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 software-datapath traceoptions]
user@host# set file datapath-log
```

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

```
[edit unified-edge mobile gateways ggsn-pgw MBG1 software-datapath traceoptions]
user@host# set file size 100m
```



NOTE: When a trace file (for example, data-path-log) reaches its maximum size, it is renamed data-path-log.0, then data-path-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 mobile gateways ggsn-pgw MBG1 software-datapath 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 mobile gateways ggsn-pgw MBG1 software-datapath traceoptions]
user@host# set level error
```

6. View the trace file.

```
user@host# file show /var/log/data-path-log
```

- Related Documentation**
- [Understanding the Broadband Gateway Software Data Path on page 9](#)
 - [Configuring S-GW Software Data Path Traceoptions on page 58](#)

Configuring S-GW Software Data Path Traceoptions

Data path tracing operations record detailed messages about the operation of Serving Gateway (S-GW) services on the MobileNext Broadband Gateway. You can trace various types of data path operations such as packet reassembly, IPv6 router advertisements, memory usage, configuration events, and other information. You can specify which trace operations are logged by including specific tracing flags and levels.

[Table 8 on page 58](#) describes the flags relating to the data path that you can include at the `[edit unified-edge gateways sgw gateway-name software-datapath traceoptions flag]` hierarchy level.

Table 8: S-GW Data Path Trace Flags

Flag	Description
ager	Trace flow ager.
all	Trace everything.
commands	Trace operational commands.
configuration	Trace configuration events.
flow	Trace flow.
init	Trace events related to data path daemon initialization.
ipv6-router-advertisement	Trace IPv6 router advertisement.
memory	Trace memory.
reassembly	Trace reassembly.
redundancy	Trace redundancy.

[Table 9 on page 58](#) describes the levels you can include.

Table 9: S-GW Datapath Trace Levels

Level	Description
all	Match all levels.
error	Match error conditions.
info	Match informational messages.

Table 9: S-GW Datapath Trace Levels (*continued*)

notice	Match conditions that should be specially handled.
verbose	Match verbose messages.
warning	Match warning messages.

To configure tracing options for data path operations:

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

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

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

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



NOTE: When a trace file (for example, `data-path-log`) reaches its maximum size, it is renamed `data-path-log.0`, then `data-path-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 mobile gateways sgw MBG2 software-datapath 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 mobile gateways sgw MBG2 software-datapath traceoptions]
user@host# set level error
```

6. View the trace file.

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

- Related Documentation**
- [Understanding the Broadband Gateway Software Data Path on page 9](#)
 - [Configuring GGSN or P-GW Software Data Path Traceoptions on page 56](#)
 - [Configuring S-GW Traceoptions](#)

Configuring General Gateway Trace Options

General gateway tracing operations record detailed messages about the operation of configured gateways on the MobileNext Broadband Gateway.

General gateway trace options are related to overall gateway operation. You can specify which trace operations are logged by including specific tracing flags and levels.

[Table 10 on page 60](#) describes the flags relating to the mobile unified edge that you can include at the `[edit unified-edge gateways ggsn-pgw gateway-name traceoptions flag]` hierarchy level.

Table 10: General Gateway Trace Flags

Flag	Description
<code>all</code>	Trace everything.
<code>bulkjob</code>	Trace resources.
<code>config</code>	Trace configuration events.
<code>cos-cac</code>	Trace CoS and CAC events.
<code>ctext</code>	Trace user equipment, PDN, or bearer context events.
<code>fsm</code>	Trace FSM events.
<code>gtpu</code>	Trace GTP-U events.
<code>ha</code>	Trace high availability events.
<code>init</code>	Trace events related to protocol daemon initialization.
<code>pfem</code>	Trace PFE manager events.
<code>stats</code>	Trace stats events.
<code>waitq</code>	Trace waitq events.

[Table 11 on page 60](#) describes the levels you can include.

Table 11: Trace Levels

Level	Description
<code>all</code>	Match all levels.

Table 11: Trace Levels (*continued*)

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 general gateway events:

1. Specify that you want to configure tracing options for general gateway events.

```
[edit unified-edge gateways ggsn-pgw gateway-name ]
user@host# edit traceoptions
```

2. Configure the filename for the trace file.

```
[edit unified-edge gateways ggsn-pgw gateway-name traceoptions]
user@host# set file general-gw-log
```

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

```
[edit unified-edge gateways ggsn-pgw gateway-name traceoptions]
user@host# set file size 100m
```



NOTE: When a trace file (for example, *gateway-log*) reaches its maximum size, it is renamed *gateway-log.0*, then *gateway-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 ggsn-pgw gateway-name traceoptions]
user@host# set flag all
```



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

5. Configure the tracing level.

```
[edit unified-edge gateways ggsn-pgw gateway-name traceoptions]
user@host# set level error
```

6. View the trace file.

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

Related Documentation

- [Overview of Broadband Gateway System Architecture on page 3](#)
- [Configuring Broadband Gateway Home PLMNs and Gateways on page 15](#)

- [Configuring Broadband Gateway Local Policies Application on page 17](#)
- [Configuring Mobile Options Trace Options on page 62](#)
- [Configuring Resource Manager Trace Options on page 53](#)

Configuring Mobile Options Trace Options

Mobile options tracing operations record detailed messages about the operation of unified edge options on the MobileNext Broadband Gateway. Mobile options trace options are related to the processor daemon operation. You can specify which trace operations are logged by including specific tracing flags.

[Table 12 on page 62](#) describes the flags relating to the mobile unified edge that you can include at the **[edit unified-edge mobile-options traceoptions flag]** hierarchy level.

Table 12: Mobile Options Trace Flags

Flag	Description
all	Trace everything.
configuration	Trace configuration events.
error	Trace events related to catastrophic errors in the daemon.
init	Trace events related to protocol daemon initialization.
protocol	Trace protocol processing events.

To configure tracing options for mobile options:

1. Specify that you want to configure tracing options for mobile options.

```
[edit unified-edge mobile-options]
user@host# edit traceoptions
```

2. Configure the filename for the trace file.

```
[edit unified-edge mobile-options traceoptions]
user@host# set file mobile-options-log
```

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

```
[edit unified-edge mobile-options traceoptions]
user@host# set file size 100m
```



NOTE: When a trace file (for example, mobile-log) reaches its maximum size, it is renamed mobile-log.0, then mobile-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 mobile-options traceoptions]  
user@host# set flag all
```



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

5. View the trace file.

```
user@host# file show /var/log/mobile-options-log
```

**Related
Documentation**

- [Overview of Broadband Gateway System Architecture on page 3](#)
- [Configuring Broadband Gateway Home PLMNs and Gateways on page 15](#)
- [Configuring Broadband Gateway Local Policies Application on page 17](#)
- [Configuring General Gateway Trace Options on page 60](#)
- [Configuring Resource Manager Trace Options on page 53](#)

CHAPTER 5

Operational Commands

clear unified-edge ggsn-pgw statistics

Syntax	<code>clear unified-edge ggsn-pgw statistics gateway <i>gateway</i></code> <code><apn <i>apn</i>></code>
Release Information	Command introduced in Junos OS Mobility Release 11.2W.
Description	Clear the statistics for the specified gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW).
Options	gateway <i>gateway</i> —Clear the statistics for the specified GGSN or P-GW. apn <i>apn</i> —(Optional) Clear the statistics for the specified access point name (APN).
Required Privilege Level	clear, unified-edge
Related Documentation	<ul style="list-style-type: none">• show unified-edge ggsn-pgw statistics on page 75
List of Sample Output	clear unified-edge ggsn-pgw statistics gateway pgw on page 66
Output Fields	No message is displayed on successful execution of this command; otherwise an error message is displayed.

Sample Output

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

clear unified-edge ggsn-pgw subscribers

Syntax	<pre>clear unified-edge ggsn-pgw subscribers gateway <i>gateway</i> <ams-interface-name <i>ams-interface-name</i>> <apfe-interface-name <i>apfe-interface-name</i>> <apn <i>apn</i>> <imsi <i>imsi</i>> <ms-interface-name <i>ms-interface-name</i>> <msisdn <i>msisdn</i>> <pfe-interface-name <i>pfe-interface-name</i>> <routing-instance <i>routing-instance</i>> <v4-addr <i>v4-addr</i>> <v6-addr <i>v6-addr</i>></pre>
Release Information	Command introduced in Junos OS Mobility Release 11.2W. ams-interface-name , apfe-interface-name , ms-interface-name , and pfe-interface-name options introduced in Junos OS Mobility Release 11.4W.
Description	Clear the subscribers on the specified gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW).
Options	<p>gateway <i>gateway</i>—Clear the subscribers for the GGSN or P-GW.</p> <p>ams-interface-name <i>ams-interface-name</i>—Clear the subscribers on the specified aggregated multiservices interface name.</p> <p>apfe-interface-name <i>apfe-interface-name</i>—Clear the subscribers on the specified aggregated Packet Forwarding Engine interface name.</p> <p>apn <i>apn</i>—(Optional) Clear the subscribers for the specified APN.</p> <p>imsi <i>imsi</i>—(Optional) Clear the subscriber matching the specified International Mobile Subscriber Identity (IMSI).</p> <p>ms-interface-name <i>ms-interface-name</i>—Clear the subscribers on the specified multiservices interface name.</p> <p>msisdn <i>msisdn</i>—(Optional) Clear the subscriber matching the specified Mobile Station ISDN (MSISDN) number.</p> <p>pfe-interface-name <i>pfe-interface-name</i>—Clear the subscribers on the specified Packet Forwarding Engine interface name.</p> <p>routing-instance <i>routing-instance</i>—(Optional) Clear the subscriber information for the specified routing instance.</p> <p>v4-addr <i>v4-addr</i>—(Optional) Clear the subscriber information for the specified IPv4 address of the subscriber's user equipment (UE).</p> <p>v6-addr <i>v6-addr</i>—(Optional) Clear the subscriber information for the specified IPv6 address of the subscriber's user equipment.</p>

Required Privilege Level clear, unified-edge

Related Documentation

- clear unified-edge ggsn-pgw subscribers charging
- clear unified-edge ggsn-pgw subscribers peer
- show unified-edge ggsn-pgw subscribers

List of Sample Output [clear unified-edge ggsn-pgw subscribers gateway pgw on page 68](#)

Output Fields No message is displayed on successful execution of this command; otherwise an error message is displayed.

Sample Output

clear unified-edge
ggsn-pgw subscribers
gateway pgw

```
user@host> clear unified-edge ggsn-pgw subscribers gateway pgw
```


show unified-edge gateways

Syntax	show unified-edge gateways <brief detail>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Display information about all gateways configured on the chassis.
Options	none —(Same as brief) Display information about the configured gateways in brief. brief detail —(Optional) Display the specified level of output.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show unified-edge ggsn-pgw system interfaces show unified-edge sgw system interfaces
List of Sample Output	show unified-edge gateways brief on page 70 show unified-edge gateways detail on page 70
Output Fields	Table 13 on page 69 lists the output fields for the show unified-edge gateways command. Output fields are listed in the approximate order in which they appear.

Table 13: show unified-edge gateways Field Descriptions

Field Name	Field Description	Level of Output
Gateway name	Name of the gateway.	All levels
Gateway type	Type of gateway: <ul style="list-style-type: none"> ggsn-pgw—Gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW). sgw—Serving Gateway (S-GW). 	All levels
Gateway ID	Internal ID of the gateway.	All levels
Gateway uplink mif interface	Mobile interface, on the gateway, used for uplink packets.	detail
Gateway downlink mif interface	Mobile interface, on the gateway, used for downlink packets.	detail
Gateway pfe interfaces	Packet Forwarding Engine interfaces (pfe-) or aggregated Packet Forwarding Engine interfaces (apfe-) configured on the gateway.	detail
Gateway session pic interfaces	Multiservices interfaces (ms-) or aggregated multiservices interfaces (ams-) configured on the gateway.	detail

Sample Output

show unified-edge gateways brief

```
user@host> show unified-edge gateways brief
```

```
Total number of configured gateways: 2
```

```
Gateway name: PGW  
Gateway type: ggsn-pgw  
Gateway id: 1
```

```
Gateway name: SGW  
Gateway type: sgw  
Gateway id: 2
```

show unified-edge gateways detail

```
user@host> show unified-edge gateways detail
```

```
Total number of configured gateways: 2
```

```
Gateway name: PGW  
Gateway type: ggsn-pgw  
Gateway id: 1  
Gateway uplink mif interface: mif.64001  
Gateway downlink mif interface: ---  
Gateway pfe interfaces:
```

```
pfe-5/0/0
```

```
Gateway session-pic interfaces:  
ms-3/0/0
```

```
Gateway name: SGW  
Gateway type: sgw  
Gateway id: 2  
Gateway uplink mif interface: mif.64003  
Gateway downlink mif interface: mif.64004  
Gateway pfe interfaces:
```

```
pfe-0/0/0
```

```
Gateway session-pic interfaces:  
ms-1/0/0
```

show unified-edge ggsn-pgw call-rate statistics

Syntax	<code>show unified-edge ggsn-pgw call-rate statistics</code> <code><gateway gateway-name></code> <code><history></code>
Release Information	Command introduced in Junos OS Mobility Release 11.2W. <code>gateway</code> option introduced in Junos OS Mobility Release 11.4W.
Description	Display the call-rate statistics for one or more gateway GPRS support nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then information for all GGSNs and P-GWs is displayed.
Options	<p>none—Display the call-rate statistics for all GGSNs or P-GWs.</p> <p>gateway gateway-name—(Optional) Display the call-rate statistics for the specified GGSN or P-GW.</p> <p>history—(Optional) Display the call-rate statistics for a specified number of past intervals. (The number of past intervals is configured using the <code>set call-rate-statistics history</code> statement at the <code>[edit unified-edge gateways ggsn-pgw gateway-name]</code> hierarchy level.)</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> call-rate-statistics on page 21
List of Sample Output	show unified-edge ggsn-pgw call-rate statistics on page 72 show unified-edge ggsn-pgw call-rate statistics history on page 72
Output Fields	Table 14 on page 71 lists the output fields for the <code>show unified-edge ggsn-pgw call-rate statistics</code> command. Output fields are listed in the approximate order in which they appear.

Table 14: show unified-edge ggsn-pgw call-rate statistics Output Fields

Field Name	Field Description
Gateway	Name of the GGSN or P-GW.
Record	Record number for the interval in which the call-rate statistics are collected, starting from the newest record (1) to the oldest.
Call-rate interval	Interval, in minutes, for which the call-rate statistics are calculated.
Control Plane	<p>The following control plane information is displayed:</p> <ul style="list-style-type: none"> Activations—Number of activations during the call-rate interval. Deactivations—Number of deactivations during the call-rate interval.

Table 14: show unified-edge ggsn-pgw call-rate statistics Output Fields (*continued*)

Field Name	Field Description
Data Plane (Gn)	<p>The following data plane (Gn interface) information is displayed:</p> <ul style="list-style-type: none"> • Input packets—Number of data packets received during the call-rate interval. • Output packets—Number of data packets transmitted during the call-rate interval. • Input bytes—Number of data bytes received during the call-rate interval. • Output bytes—Number of data bytes transmitted during the call-rate interval.
Statistics collection time	Date and time when the call-rate statistics for the record are computed.

Sample Output

show unified-edge ggsn-pgw call-rate statistics

```
user@host> show unified-edge ggsn-pgw call-rate statistics
PGW
Record 1 (Call-rate statistics for the past 5 min):
Control Plane:
    Activations:    24
    Deactivations:  0
Data Plane(Gn):
    Input Packets:  100
    Output packets: 0
    Input bytes:    12800
    Output bytes:   0
Statistics collection time: 2012-03-02 03:13:26 PST (00:00:05 ago)
```

show unified-edge ggsn-pgw call-rate statistics history

```
user@host> show unified-edge ggsn-pgw call-rate statistics history
Record 1 (Call-rate statistics for the past 5 min):
Control Plane:
    Activations:    10
    Deactivations:  0
Data Plane(Gn):
    Input Packets:  600
    Output packets: 600
    Input bytes:    556800
    Output bytes:   556800
Statistics collection time: 2011-05-19 02:33:05 PDT (00:01:19 ago)

Record 2 (Call-rate statistics for the past 5 min):
Control Plane:
    Activations:     9
    Deactivations:  19
Data Plane(Gn):
    Input Packets:   774
    Output packets:  774
    Input bytes:    20212
    Output bytes:   20212
Statistics collection time: 2011-05-19 02:23:05 PDT (00:06:19 ago)
```

show unified-edge ggsn-pgw resource-manager clients

Syntax	show unified-edge ggsn-pgw resource-manager clients <gateway gateway>
Release Information	Command introduced in Junos OS Mobility Release 11.2W. gateway option introduced in Junos OS Mobility Release 11.4W.
Description	Display information about the resource management clients (the session Dense Port Concentrators [DPCs] and interface DPCs and Modular Port Concentrators [MPCs]) on one or more gateway GPRS support nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then information for all GGSNs and P-GWs is displayed.
Options	none —Display information for one or more GGSNs or P-GWs. gateway gateway-name —(Optional) Display information for the specified gateway.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show unified-edge gateways on page 69 • show unified-edge ggsn-pgw system interfaces
List of Sample Output	show unified-edge ggsn-pgw resource-manager clients on page 74
Output Fields	Table 15 on page 73 lists the output fields for the show unified-edge gateways ggsn-pgw resource-manager clients command. Output fields are listed in the approximate order in which they appear.

Table 15: show unified-edge gateways ggsn-pgw resource-manager clients Output Fields

Field Name	Field Description
Client	Name of the resource manager client slot identified by the FPC and PIC slot numbers; for example, pfe-1/2/0 or ms/7/0/0 .
State	Resource manager client state. In-Service means that the client can handle session creation requests.
Role	Role of the resource manager client slot: <ul style="list-style-type: none"> • Primary—The resource manager client is a primary member. • Secondary—The resource manager client is a secondary or backup member.
Client type	Type of resource manager client: <ul style="list-style-type: none"> • PFE—Packet Forwarding Engine client used for anchoring subscribers in the gateway. • Session PIC—Session PIC client used for the mobile control plane in the gateway • Service PIC—services PIC used for anchoring services-related subscriber sessions in the gateway
Gateway	Name of the gateway to which the resource manager client belongs.

Sample Output

```
show unified-edge  
ggsn-pgw  
resource-manager  
clients
```

```
user@host> show unified-edge ggsn-pgw resource-manager clients
```

Client	State	Redundancy	role	Client type	Gateway
pfe-0/0/0	In-Service	Primary		PFE	PGW
pfe-0/1/0	In-Service	Primary		PFE	PGW
pfe-0/2/0	In-Service	Primary		PFE	PGW
pfe-0/3/0	In-Service	Primary		PFE	PGW
ms-2/0/0	In-Service	Primary		Service-PIC	PGW
ms-2/1/0	In-Service	Secondary		Service-PIC	PGW
ms-3/0/0	In-Service	Primary		Service-PIC	PGW
ms-3/1/0	In-Service	Primary		Service-PIC	PGW
ms-5/0/0	In-Service	Primary		Session-PIC	PGW
ms-5/1/0	In-Service	Secondary		Session-PIC	PGW

show unified-edge ggsn-pgw statistics

Syntax show unified-edge ggsn-pgw statistics
 <apn *apn*>
 <gateway *gateway*>
 <gtpv1-arp *gtpv1-arp*>
 <gtpv2-priority-level *gtpv2-priority-level*>
 <qci *qci*>

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

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

Options **apn *apn***—(Optional) Display the statistics for the specified APN on one or more GGSNs or P-GWs.



NOTE: The output of the `show unified-edge ggsn-pgw statistics` command with the `apn` option is the same as the output of the `show unified-edge ggsn-pgw apn statistics` command. Refer to the output fields of the `show unified-edge ggsn-pgw apn statistics` command.

gateway *gateway*—(Optional) Display the statistics for the specified GGSN or P-GW.

gtpv1-arp *gtpv1-arp*—(Optional) Display the statistics for the specified GTPv1 allocation and retention priority (ARP) on one or more gateways. You can specify an ARP value of 1 through 3.

gtpv2-priority-level *gtpv2-priority-level*—(Optional) Display the statistics for the specified GTPv2 priority level on one or more gateways. You can specify a priority level of 1 through 15.

qci *qci*—(Optional) Display the statistics for the specified QoS Class Identifier (QCI) on one or more gateways. You can specify a QCI of 1 through 9.

Required Privilege Level view

Related Documentation

- [clear unified-edge ggsn-pgw statistics on page 66](#)
- `show unified-edge ggsn-pgw apn statistics`
- `show unified-edge ggsn-pgw statistics traffic-class`

List of Sample Output [show unified-edge ggsn-pgw statistics on page 80](#)

Output Fields [Table 16 on page 76](#) lists the output fields for the `show unified-edge ggsn-pgw statistics` command. Output fields are listed in the approximate order in which they appear.

Table 16: show unified-edge ggsn-pgw statistics Output Fields

Field Name	Field Description
Gateway	Name of the GGSN or P-GW.
Control Plane GTP Statistics	
Session establishment attempts	Number of session establishments attempted and number of successful session establishments (Success).
MS/peer initiated modification attempts	Number of session modifications attempted by the mobile station (MS) and number of successful modifications (Success).
Gateway initiated modification attempts	Number of session modifications attempted by the broadband gateway and number of successful modifications (Success).
MS/peer initiated session deactivations	Number of attempted deactivations initiated by the mobile station , Mobility Management Entity (MME), or Serving Gateway (S-GW) and number of successful deactivations (Success).
Gateway initiated session deactivations	Number of attempted deactivations initiated by the broadband gateway and number of successful deactivations (Success).
Dedicated Bearer Statistics	
MS/peer initiated activation attempts	Number of attempted bearer activations initiated by the mobile station, MME, or S-GW and number of successful activations (Success).
Network initiated activation attempts	Number of attempted bearer activations initiated by the network (policy and charging rules function [PCRF] or the broadband gateway) and number of successful activations (Success).
MS/peer initiated modification attempts	Number of attempted bearer modifications initiated by the mobile station, MME, or S-GW and number of successful modifications (Success).
Network initiated modification attempts	Number of attempted bearer modifications initiated by the network (policy and charging rules function [PCRF] or the broadband gateway) and number of successful modifications (Success).
MS/peer initiated deactivations	Number of deactivations initiated by the mobile station, MME, or S-GW.
Network initiated deactivations	Number of deactivations initiated by the network (policy and charging rules function [PCRF] or the broadband gateway).

Table 16: show unified-edge ggsn-pgw statistics Output Fields (*continued*)

Field Name	Field Description
Gateway initiated deactivations	<p>Number of deactivations initiated by the broadband gateway. This counter increments when one of the following conditions is applicable:</p> <ul style="list-style-type: none"> When the clear unified-edge ggsn-pgw subscribers is executed and the subscriber has a dedicated bearer. When the clear unified-edge ggsn-pgw subscribers bearer ebi ebi is executed.
Handover Statistics	
Inter-RAT Handover attempts	Number of inter-RAT handovers attempted and number of handovers that were successful (Success).
Intra-RAT Handover attempts	Number of intra-RAT handovers attempted and number of handovers that were successful (Success).
Offline Charging Statistics	
CDRs Allocated	Total number of Charging Data Records (CDRs) opened.
Partial CDRs Allocated	Total number of partial CDRs opened.
CDRs Closed	Total number of CDRs closed.
Containers Closed	Total number of containers closed.
DCCA-Gy statistics (Diameter Credit Control Application [DCCA] Gy statistics)	
Session establishments attempts	Number of Diameter session establishments attempted and number of sessions established (Success).
Session reauthorization attempts	Number of session reauthorizations attempted with the OCS and number of successful reauthorizations (Success).
Online authorization timeouts	Number of online authorizations that timed out.
MS/Peer initiated session deactivations	Number of Diameter session deactivations initiated by the mobile station , MME, or S-GW.
OCS initiated session deactivations	Number of Diameter session deactivations initiated by the OCS.

Table 16: show unified-edge ggsn-pgw statistics Output Fields (*continued*)

Field Name	Field Description
Gateway initiated session deactivations	Number of Diameter session deactivations initiated by the broadband gateway.
PCC Gx Statistics	
Session establishment attempts	Number of IP CAN session establishments attempted and number of successful session establishments (Success).
MS/Peer initiated modification attempts	Number of IP CAN session modifications attempted by the mobile station, MME, or S-GW and number of successful session modifications (Success).
PCRF initiated modification attempts	Number of IP CAN session modifications initiated by the PCRF and number of sessions established (Success).
MS/Peer initiated session deactivations	Number of session deactivations initiated by the mobile station, MME, or S-GW.
PCRF initiated session deactivations	Number of session deactivations initiated by the PCRF.
Gateway initiated session deactivations	Number of session deactivations initiated by the broadband gateway.
Data Plane Global statistics	
Source address violation packets	Number of packets with an incorrect source address.
Non-existent TEID/TID packets	Total number of packets received with nonexistent tunnel endpoint identifiers (TEIDs) or tunnel identifiers (TIDs).
GTP length error packets	Number of GTP packets with an incorrect length in the IP or UDP header.
Non-existent UE address packets	Number of packets received by the broadband gateway for which the IP address (IPv4 or IPv6) did not match the IP address of existing subscribers on the gateway.
Mobile-to-mobile packets	Number of packets received by the broadband gateway for another mobile device.
Data Plane GTP Statistics (Gn/S5/S8)	

Table 16: show unified-edge ggsn-pgw statistics Output Fields (*continued*)

Field Name	Field Description
Input packets	Number of incoming GTP data packets on the Gn, Gp, S5, and S8 interfaces.
Input bytes	Number of octets of incoming GTP data packets on the Gn, Gp, S5, and S8 interfaces.
Output packets	Number of outgoing GTP data packets on the Gn, Gp, S5, and S8 interfaces.
Output bytes	Number of octets of outgoing GTP data packets on the Gn, Gp, S5, and S8 interfaces.
Discarded packets	Number of discarded GTP data packets on the Gn, Gp, S5, and S8 interfaces.
Data Plane GTP statistics (Gi)	
Input packets	Number of incoming GTP data packets on the Gi interface.
Input bytes	Number of octets of incoming GTP data packets on the Gi interface.
Output packets	Number of outgoing GTP data packets on the Gi interface.
Output bytes	Number of octets of outgoing GTP data packets on the Gi interface.
Discarded packets	Number of discarded GTP data packets on the Gi interface.

Sample Output

show unified-edge
ggsn-pgw statistics

```
user@host> show unified-edge ggsn-pgw statistics
Gateway: gw1
Control Plane GTP Statistics:
  Session establishment attempts:      300      Success: 300
  MS/peer initiated modification attempts: 0      Success: 0
  Gateway initiated modification attempts: 0      Success: 0
  MS/peer initiated session deactivations: 0      Success: 0
  Gateway initiated session deactivations: 0      Success: 0
Dedicated Bearer Statistics:
  MS-peer initiated activation attempts: 0      Success: 0
  Network initiated activation attempts: 300      Success: 300
  MS-peer initiated modification attempts: 0      Success: 0
  Network initiated modification attempts: 0      Success: 0
  MS-peer initiated deactivations:      0
  Network initiated deactivations:      0
  Gateway initiated deactivations:      0
Handover Statistics:
  Inter-RAT Handover attempts:          0      Success: 0
  Intra-RAT Handover attempts:          0      Success: 0
Offline Charging Statistics:
  CDRs allocated:                       300
  Partial CDRs allocated:                0
  CDRs closed:                          0
  Containers closed:                     0
DCCA-Gy Statistics:
  Session establishments attempts:        300      Success : 300
  Session reauthorization attempts:      10600     Success : 0
  Online authorization timeouts:         0
  Ms/Peer initiated session deactivations: 0
  OCS initiated session deactivations:   0
  Gateway initiated session deactivations: 0
PCC Gx statistics:
  Session establishment attempts:        300      Success: 300
  MS/peer initiated modification attempts: 0      Success: 0
  PCRF initiated modification attempts:   0      Success: 0
  MS/peer initiated session deactivations: 0
  PCRF initiated session deactivations:   0
  Gateway initiated session deactivations: 0
Data plane global statistics:
  Source address violation packets:       0
  Non-existent TEID/TID packets:         0
  GTP length error packets:              0
  Non-existent UE address packets:       0
  Mobile-to-mobile packets:              0
Data plane GTP statistics (Gn/S5/S8):
  Input   packets:      0
  Input   bytes:        0
  Output  packets:      0
  Output  bytes:        0
  Discarded packets:    0
Data plane GTP statistics (Gi):
  Input   packets:      0
  Input   bytes:        0
  Output  packets:      0
  Output  bytes:        0
  Discarded packets:    0
```

show unified-edge ggsn-pgw status

Syntax show unified-edge ggsn-pgw status
 <apn-name *apn-name*>
 <brief | detail | extensive>
 <fpc-slot *fpc-slot*>
 <gateway *gateway*>
 <gtpv1-arp *gtpv1-arp*>
 <gtpv2-priority-level *gtpv2-priority-level*>
 <pdn-type>
 <pic-slot *pic-slot*>
 <qci *qci*>
 <rat-type>
 <roaming-status>
 <traffic-class (background | conversational | interactive | streaming)>

Release Information Command introduced in Junos OS Mobility Release 11.2W. **extensive** **pdn-type**, and **roaming-status** options introduced in Junos OS Mobility Release 11.4W.

Description Display the status information, such as the number of subscribers, active sessions, and so on, for one or more gateway GPRS support nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then status information for all GGSNs and P-GWs is displayed.

Options **none**—(Same as brief) Display the status information in brief.

apn-name *apn-name*—(Optional) Display the status information for the specified access point name (APN).

brief | detail | extensive—(Optional) Display the specified level of output.

fpc-slot *fpc-slot*—(Optional) Display the status information for the specified FPC slot number.

gateway *gateway*—(Optional) Display the status information for the specified GGSN or P-GW.

gtpv1-arp *gtpv1-arp*—(Optional) Display the status information for the GTPv1 Allocation and Retention Priority (ARP) value specified. You can specify a GTPv1 ARP value of 1 through 3.

gtpv2-priority-level *gtpv2-priority-level*—(Optional) Display the status information for the GTPv2 priority specified. You can specify a priority of 1 through 15.

pdn-type—(Optional) Display the number of active sessions according to the type of Packet Data Network (PDN): IPv4, IPv6, and both IPv4 and IPv6.

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

qci qci—(Optional) Display the status information for the specified QoS Class Identifier (QCI). You can specify a QCI of 1 through 9.

rat-type—(Optional) Display the number of active subscribers, sessions, and bearers for each Radio Access Technology (RAT) type.

roaming-status—(Optional) Display the subscriber sessions based on the roaming status (home, roamer, or visitor).

traffic-class (background | conversational | interactive | streaming)—(Optional) Display the status information for the specified traffic class.

Required Privilege Level view

Related Documentation

- [show unified-edge ggsn-pgw status gtp-peer](#)
- [show unified-edge ggsn-pgw status preemption-list](#)
- [show unified-edge ggsn-pgw status session-state](#)

List of Sample Output

[show unified-edge ggsn-pgw status on page 85](#)
[show unified-edge ggsn-pgw status detail on page 85](#)
[show unified-edge ggsn-pgw status extensive on page 86](#)
[show unified-edge ggsn-pgw status pdn-type detail on page 87](#)
[show unified-edge ggsn-pgw status rat-type detail on page 87](#)
[show unified-edge ggsn-pgw status roaming-status detail on page 87](#)

Output Fields [Table 17 on page 82](#) lists the output fields for the **show unified-edge ggsn-pgw status** command. Output fields are listed in the approximate order in which they appear.

Table 17: show unified-edge ggsn-pgw status Output Fields

Field Name	Field Description	Level of Output
Gateway	Name of the GGSN or P-GW.	All levels none
FPC SLOT	FPC slot number of the interface for which the status information is displayed.	detail extensive
PIC SLOT	PIC slot number of the FPC for which the status information is displayed.	detail extensive
Role	Role of the Packet Forwarding Engine, services PIC, or session PIC on the GGSN or P-GW: <ul style="list-style-type: none"> • Standalone • Primary—Primary member. • Secondary—Secondary member. 	detail extensive

Table 17: show unified-edge ggsn-pgw status Output Fields (*continued*)

Field Name	Field Description	Level of Output
Type	Indicates whether the PIC is a Packet Forwarding Engine, a session PIC or a services PIC.	detail extensive
Active Subscribers	Number of active subscribers.	All levels none
Active Subscribers (with services)	Number of active subscribers who are using subscriber-aware services and who are anchored on a services PIC.	All levels none
Active Sessions	Number of active sessions.	All levels none
Active Sessions (with services)	Number of active sessions for subscribers who are using subscriber-aware services and who are anchored on a services PIC.	All levels none
Active Bearers	Number of active bearers or Packet Data Protocol (PDP) contexts.	All levels none
Active GBR Bearers	Number of active guaranteed bit rate (GBR) bearers or PDP contexts.	All levels none
Active Non-GBR Bearers	Number of active non-GBR bearers or PDP contexts.	All levels none
Active Prepaid bearers	Number of active prepaid bearers or PDP contexts.	All levels none
Active Postpaid bearers	Number of active postpaid bearers or PDP contexts.	All levels none
CPU Load (%)	Percentage of the CPU load.	All levels none
Memory Load (%)	Percentage of the memory load.	All levels none
Connections to Session PICs	Connections between the services PIC and the session PICs. This field is displayed only when the services PIC has a connection to one or more session PICs.	extensive

Table 17: show unified-edge ggsn-pgw status Output Fields (*continued*)

Field Name	Field Description	Level of Output
IPv4 Active Sessions	Number of active IPv4 sessions.	pdn-type
IPv6 Active Sessions	Number of active IPv6 sessions.	pdn-type
IPv4-v6 Active Sessions	Number of active IPv4-IPv6 sessions.	pdn-type
Home	Number of active sessions belonging to home subscribers.	roaming-status
Roamer	Number of active sessions belonging to roaming subscribers.	roaming-status
Visitor	Number of active sessions belonging to visiting subscribers.	roaming-status

Sample Output

**show unified-edge
ggsn-pgw status**

user@host> show unified-edge ggsn-pgw status

Gateway: PGW

Mobile gateway status:

Active Subscribers	:	2
Active Subscribers (with services)	:	2
Active Sessions	:	2
Active Sessions (with services)	:	2
Active Bearers	:	2
Active GBR Bearers	:	0
Active Non-GBR Bearers	:	2
Active Prepaid bearers	:	0
Active Postpaid bearers	:	2
CPU Load (%)	:	0
Memory Load (%)	:	29

**show unified-edge
ggsn-pgw status detail**

user@host> show unified-edge ggsn-pgw status detail

Gateway: PGW

FPC SLOT: 3 PIC SLOT: 0

Role	:	Primary
Type	:	Service-PIC
Active Subscribers (with services)	:	5000
Active Sessions (with services)	:	5000
CPU Load (%)	:	0
Memory Load (%)	:	14

FPC SLOT: 3 PIC SLOT: 1

Role	:	Secondary
Type	:	Session-PIC
Active Subscribers	:	9077
Active Sessions	:	9077
Active Bearers	:	9077
Active GBR Bearers	:	0
Active Non-GBR Bearers	:	9077
Active prepaid Bearers	:	0
Active postpaid Bearers	:	0
CPU Load (%)	:	0
Memory Load (%)	:	30

FPC SLOT: 5 PIC SLOT: 0

Role	:	Primary
Type	:	Session-PIC
Active Subscribers	:	9077
Active Sessions	:	9077
Active Bearers	:	9077
Active GBR Bearers	:	0
Active Non-GBR Bearers	:	9077
Active prepaid Bearers	:	0
Active postpaid Bearers	:	0
CPU Load (%)	:	0
Memory Load (%)	:	30

FPC SLOT: 0 PIC SLOT: 0

Role	:	Standalone
Type	:	PFE
Active Sessions	:	0
Active Bearers	:	0

```

CPU Load (%)           : 0
Memory Load (%)        : 0

FPC SLOT: 0   PIC SLOT: 2
Role           : Standalone
Type           : PFE
Active Sessions : 0
Active Bearers  : 0
CPU Load (%)   : 0
Memory Load (%) : 0

```

show unified-edge ggsn-pgw status extensive

```

user@host> show unified-edge ggsn-pgw status extensive
Gateway: PGW

```

```

FPC SLOT: 3   PIC SLOT: 1
Role           : Secondary
Type           : Session-PIC
Active Subscribers : 3687
Active Sessions   : 3687
Active Bearers     : 3687
Active GBR Bearers : 0
Active Non-GBR Bearers : 3687
Active Prepaid Bearers : 0
Active Postpaid Bearers : 0
CPU Load (%)      : 0
Memory Load (%)   : 34

FPC SLOT: 5   PIC SLOT: 0
Role           : Primary
Type           : Session-PIC
Active Subscribers : 3687
Active Sessions   : 3687
Active Bearers     : 3687
Active GBR Bearers : 0
Active Non-GBR Bearers : 3687
Active Prepaid Bearers : 0
Active Postpaid Bearers : 0
CPU Load (%)      : 0
Memory Load (%)   : 34

FPC SLOT: 5   PIC SLOT: 1
Role           : Secondary
Type           : Service-PIC
Active Subscribers (with services) : 3687
Active Sessions (with services)   : 3687
CPU Load (%)                      : 0
Memory Load (%)                   : 19
Connections to Session PICs       :
                                   ms-5/0

FPC SLOT: 0   PIC SLOT: 0
Role           : Standalone
Type           : PFE
Active Sessions : 0
Active Bearers  : 0
CPU Load (%)   : 0
Memory Load (%) : 0

FPC SLOT: 0   PIC SLOT: 2
Role           : Standalone

```

Type	:	PFE
Active Sessions	:	0
Active Bearers	:	0
CPU Load (%)	:	0
Memory Load (%)	:	0

show unified-edge ggsn-pgw status pdn-type detail

```
user@host> show unified-edge ggsn-pgw status pdn-type detail
Gateway: PGW
```

FPC SLOT: 3		PIC SLOT: 1	
State	:	Backup	
Type	:	Session-PIC	
IPv4 Active Sessions	:	2	
IPv6 Active Sessions	:	0	
IPv4-v6 Active Sessions	:	0	
FPC SLOT: 5		PIC SLOT: 0	
State	:	Active	
Type	:	Session-PIC	
IPv4 Active Sessions	:	2	
IPv6 Active Sessions	:	0	
IPv4-v6 Active Sessions	:	0	

show unified-edge ggsn-pgw status rat-type detail

```
user@host> show unified-edge ggsn-pgw status rat-type detail
Gateway: PGW
```

```
RAT type list:
FPC SLOT: 4    PIC SLOT: 0
OTHER  Active  Subscribers  :      0
        Active  Sessions    :      0
        Active  Bearers     :      0
UTRAN   Active  Subscribers  :      0
        Active  Sessions    :      0
        Active  Bearers     :      0
GERAN   Active  Subscribers  :      0
        Active  Sessions    :      0
        Active  Bearers     :      0
WLAN    Active  Subscribers  :      0
        Active  Sessions    :      0
        Active  Bearers     :      0
GAN     Active  Subscribers  :      0
        Active  Sessions    :      0
        Active  Bearers     :      0
HSPA    Active  Subscribers  :      0
        Active  Sessions    :      0
        Active  Bearers     :      0
EUTRAN  Active  Subscribers  :      1
        Active  Sessions    :      1
        Active  Bearers     :      1
```

show unified-edge ggsn-pgw status roaming-status detail

```
user@host> show unified-edge ggsn-pgw status roaming-status detail
Gateway: PGW
```

FPC SLOT: 3		PIC SLOT: 1	
State	:	Backup	
Type	:	Session-PIC	

Home	:	0
Roamer	:	0
Visitor	:	2
FPC SLOT: 5 PIC SLOT: 0		
State	:	Active
Type	:	Session-PIC
Home	:	0
Roamer	:	0
Visitor	:	2

show unified-edge sgw status gtp-peer

Syntax	show unified-edge sgw status gtp-peer 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>name</i>>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Displays the count of the bearer distribution across multiple Packet Forwarding Engines for the specified GTP peer on one or more Serving Gateways (S-GWs). If an S-GW is not specified, then information for all S-GWs is displayed.
Options	<p>remote-address <i>remote-address</i>—Display the information for the GTP peer with the specified remote address.</p> <p>fpc-slot <i>fpc-slot</i>—(Optional) Display the information for the specified FPC slot number pertaining to the session PIC.</p> <p>gateway <i>gateway</i>—(Optional) Display the information for the specified S-GW.</p> <p>local-address <i>local-address</i>—(Optional) Display the information for the local address of the specified peer on the gateway.</p> <p>pic-slot <i>pic-slot</i>—(Optional) Display the information for the specified PIC slot number. You must first specify an FPC slot number before specifying the PIC slot number.</p> <p>routing-instance <i>routing-instance</i>—(Optional) Display the information for the peer on the specified routing instance ID.</p>
Required Privilege Level	unified-edge, view
Related Documentation	<ul style="list-style-type: none"> show unified-edge sgw status
List of Sample Output	show unified-edge sgw status gtp-peer remote-address 2.2.2.1 on page 90
Output Fields	Table 18 on page 89 lists the output fields for the show unified-edge sgw status gtp-peer command. Output fields are listed in the approximate order in which they appear.

Table 18: show unified-edge sgw status gtp-peer Output Fields

Field Name	Field Description
Gateway	Name of the S-GW.
FPC-slot/PIC-slot	FPC and PIC slot numbers of the aggregated Packet Forwarding Engine interface for which the information is displayed.

Table 18: show unified-edge sgw status gtp-peer Output Fields (*continued*)

Field Name	Field Description
Number of bearers	Number of bearers on the corresponding FCP and PIC slot.

Sample Output

```
show unified-edge sgw status gtp-peer remote-address 2.2.2.1
user@host> show unified-edge sgw status gtp-peer remote-address 2.2.2.1
Gateway: S`GW
FPC-slot/PIC-slot      Number of bearers
-----
0/0                      1
0/1                      0
```

show unified-edge sgw status session-state

Syntax	<pre>show unified-edge sgw status session-state <brief detail> <fpc-slot fpc-slot> <gateway gateway> <pic-slot pic-slot></pre>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Display the session state information of subscribers anchored on one or more Serving Gateways (S-GWs). If a gateway name is not specified, then the session state information for all the S-GWs is displayed.
Options	<p>none—(Same as brief) Display the session state information in brief.</p> <p>brief detail —(Optional) Display the specified level of output.</p> <p>fpc-slot fpc-slot pic-slot pic-slot—(Optional) Display the session state information for the PIC in the specified FPC and PIC slot numbers.</p> <p>gateway gateway—(Optional) Display the session state information for the specified gateway name.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show unified-edge sgw status
List of Sample Output	<p>show unified-edge sgw status session-state brief on page 93</p> <p>show unified-edge sgw status session-state detail on page 93</p>
Output Fields	Table 19 on page 91 lists the output fields for the show unified-edge sgw status session-state command. Output fields are listed in the approximate order in which they appear.

Table 19: show unified-edge sgw status session-state Output Fields

Field Name	Field Description	Level of Output
Gateway	Name of the S-GW.	All levels none
FPC Slot	FPC slot number of the interface for which the session state information is displayed.	detail
PIC Slot	PIC slot number of the FPC for which the session state information is displayed.	detail

Table 19: show unified-edge sgw status session-state Output Fields (*continued*)

Field Name	Field Description	Level of Output
Initial	Number of sessions being initialized.	All levels none
Default bearer setup wait	Number of sessions waiting for the default bearer to be set up.	All levels none
Sync wait	Number of sessions waiting for the synchronization to the backup services PIC.	All levels none
Established	Number of sessions established.	All levels none
Cleaning up	Number of sessions being cleaned up.	All levels none
Idle mode	Number of sessions in idle mode.	All levels none
Suspended	Number of suspended sessions.	All levels none
PFE wait	Number of sessions waiting for a response from the Packet Forwarding Engine.	All levels none
PGW wait	Number of sessions waiting for a response from the Packet Data Network Gateway (P-GW) during handovers.	All levels none
MME wait	Number of sessions waiting for a request from the Mobility Management Entity (MME) during handovers.	All levels none

Sample Output

```
show unified-edge sgw status session-state brief
user@host> show unified-edge sgw status session-state brief
Gateway: SGW
Initial : 0
Default bearer setup wait : 0
Sync wait : 0
Established : 1
Cleaning up : 0
Idle mode : 0
Suspended : 0
PFE wait : 0
PGW wait : 0
MME wait : 0
```

```
show unified-edge sgw status session-state detail
user@host> show unified-edge sgw session-state detail
Gateway: SGW
Mobile gateway status of fpc slot: 5 pic slot: 0
Initial : 0
Default bearer setup wait : 0
Sync wait : 0
Established : 1
Cleaning up : 0
Idle mode : 0
Suspended : 0
PFE wait : 0
PGW wait : 0
MME wait : 0

Mobile gateway status of fpc slot: 5 pic slot: 1
Initial : 0
Default bearer setup wait : 0
Sync wait : 0
Established : 1
Cleaning up : 0
Idle mode : 0
Suspended : 0
PFE wait : 0
PGW wait : 0
MME wait : 0
```

show unified-edge sgw call-rate statistics

Syntax	show unified-edge sgw call-rate statistics <gateway gateway-name> <history>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Display the call-rate statistics for one or more Serving Gateways (S-GWs). If a gateway is not specified, then information for all S-GWs is displayed.
Options	<p>none—Display the call-rate statistics for all S-GWs.</p> <p>gateway gateway-name—(Optional) Display the call-rate statistics for the specified gateway.</p> <p>history—(Optional) Display the call-rate statistics for a specified number of past intervals. (The number of past intervals is configured using the set call-rate-statistics history statement at the [edit unified-edge gateways sgw gateway-name] hierarchy level.)</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • call-rate-statistics on page 21
List of Sample Output	show unified-edge sgw call-rate statistics on page 95 show unified-edge sgw call-rate statistics history on page 95
Output Fields	Table 20 on page 94 lists the output fields for the show unified-edge sgw call-rate statistics command. Output fields are listed in the approximate order in which they appear.

Table 20: show unified-edge sgw call-rate statistics Output Fields

Field Name	Field Description
Gateway	Name of the S-GW.
Record	Record number for the interval in which the call-rate statistics are collected, starting from the newest record (1) to the oldest.
Call-rate interval	Interval, in minutes, for which the call-rate statistics are calculated.
Control Plane	<p>The following control plane information is displayed:</p> <ul style="list-style-type: none"> • Activations—Number of activations during the call-rate interval. • Deactivations—Number of deactivations during the call-rate interval.

Table 20: show unified-edge sgw call-rate statistics Output Fields (*continued*)

Field Name	Field Description
Data Plane (Gn)	<p>The following data plane (Gn interface) information is displayed:</p> <ul style="list-style-type: none"> • Input packets—Number of data packets received during the call-rate interval. • Output packets—Number of data packets transmitted during the call-rate interval. • Input bytes—Number of data bytes received during the call-rate interval. • Output bytes—Number of data bytes transmitted during the call-rate interval.
Statistics collection time	Date and time when the call-rate statistics for the record are computed.

Sample Output

show unified-edge sgw call-rate statistics

```

user@host> show unified-edge sgw call-rate statistics
Gateway: SGW
Record 1 (Call-rate statistics for the past 10 min):
Control Plane:
    Activations:    1
    Deactivations: 0
Data Plane(Gn):
    Input Packets:  0
    Output packets: 2
    Input bytes:    0
    Output bytes:   584
Statistics collection time: 2011-12-09 21:08:30 PST (00:00:49 ago)

```

show unified-edge sgw call-rate statistics history

```

user@host> show unified-edge sgw call-rate statistics history
Gateway: SGW
Record 1 (Call-rate statistics for the past 10 min):
Control Plane:
    Activations:    1
    Deactivations: 0
Data Plane(Gn):
    Input Packets:  0
    Output packets: 2
    Input bytes:    0
    Output bytes:   584
Statistics collection time: 2011-12-09 21:08:30 PST (00:01:17 ago)

```

show unified-edge sgw resource-manager clients

Syntax	show unified-edge sgw resource-manager clients <gateway gateway>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Display information about the resource management clients (the session Dense Port Concentrators [DPCs] and interface DPCs and Modular Port Concentrators [MPCs]) on one or more configured Serving Gateways (S-GWs). If a gateway is not specified, then information for all configured S-GWs is displayed.
Options	gateway gateway —(Optional) Display resource management information for the specified gateway.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show unified-edge gateways on page 69 • show unified-edge sgw system interfaces
List of Sample Output	show unified-edge sgw resource-manager clients on page 97
Output Fields	Table 21 on page 96 lists the output fields for the show unified-edge sgw resource-manager clients command. Output fields are listed in the approximate order in which they appear.

Table 21: show unified-edge sgw resource-manager clients Output Fields

Field Name	Field Description
Client	Name of the resource manager client slot identified by the FPC and PIC slot numbers; for example, pfe-1/2/0 or ms/7/0/0 .
State	Resource manager client state. In-Service means that the client can handle session creation requests.
Redundancy Role	Redundancy role of the resource manager client slot: <ul style="list-style-type: none"> • Primary—The resource manager client is a primary member. • Secondary—The resource manager client is a secondary or backup member.
Client type	Type of resource manager client: <ul style="list-style-type: none"> • PFE—Packet Forwarding Engine client used for anchoring subscribers in the gateway. • Session PIC—Session PIC client used for the mobile control plane in the gateway
Gateway	Name of the gateway to which the resource manager client belongs.

Sample Output

```
show unified-edge sgw resource-manager clients
```

Client	State	Redundancy	role	Client type	Gateway
pfe-0/0/0	In-Service	Secondary		PFE	SGW
pfe-1/0/0	In-Service	Primary		PFE	SGW
ms-5/0/0	In-Service	Primary		Session-PIC	SGW
ms-5/1/0	In-Service	Secondary		Session-PIC	SGW

PART 4

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