



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.

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at <http://www.juniper.net/books>.

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 important new terms. Identifies book names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos OS System Basics Configuration Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; interface names; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Enclose optional keywords or variables.	<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</i> <i>string2</i> <i>string3</i>)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Enclose a variable for which you can substitute one or more values.	community name members [community-ids]
Indentation and braces ({ })	Identify a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> In the Logical Interfaces box, select All Interfaces. To cancel the configuration, click Cancel.
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web selections.	In the configuration editor hierarchy, select Protocols>Ospf .

Documentation Feedback

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

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

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/> .
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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](#)
- [Overview of Broadband Gateway as GGSN or P-GW on page 9](#)
- [Understanding Mobile User Types on page 10](#)

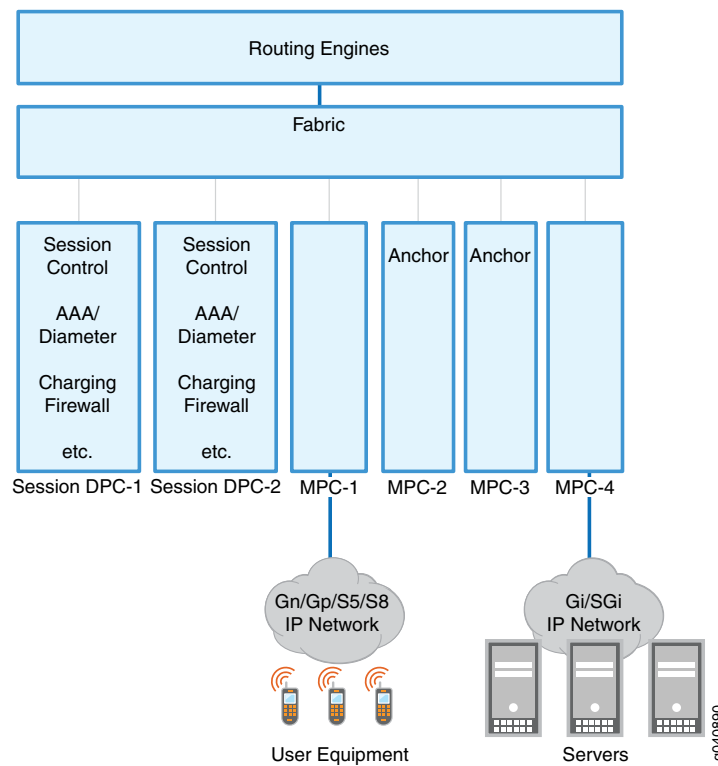
Overview of Broadband Gateway System Architecture

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 9](#)

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

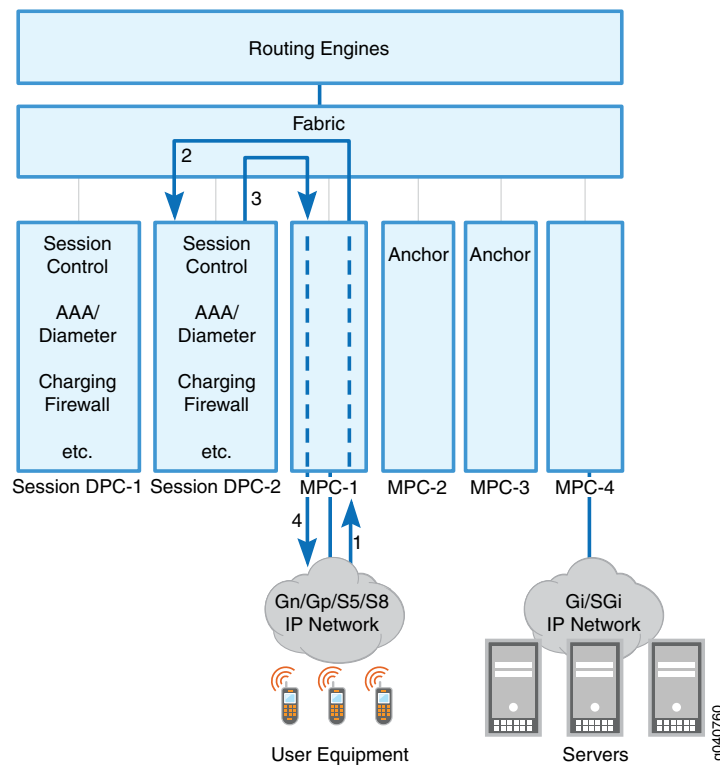


Figure 2 on page 5 shows the four steps that GTP-C signaling packets take through the broadband gateway:

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.

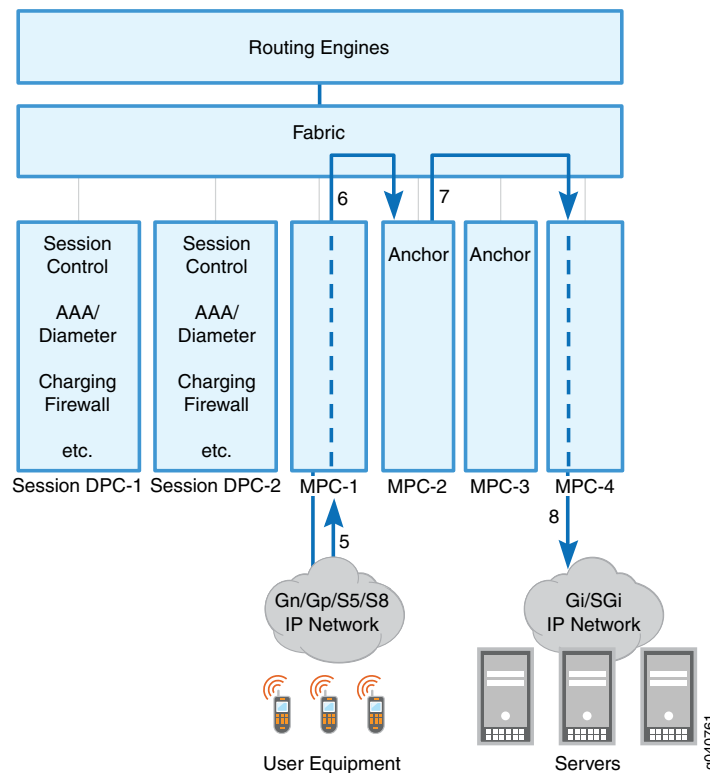
Related Documentation

- [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 9](#)

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.

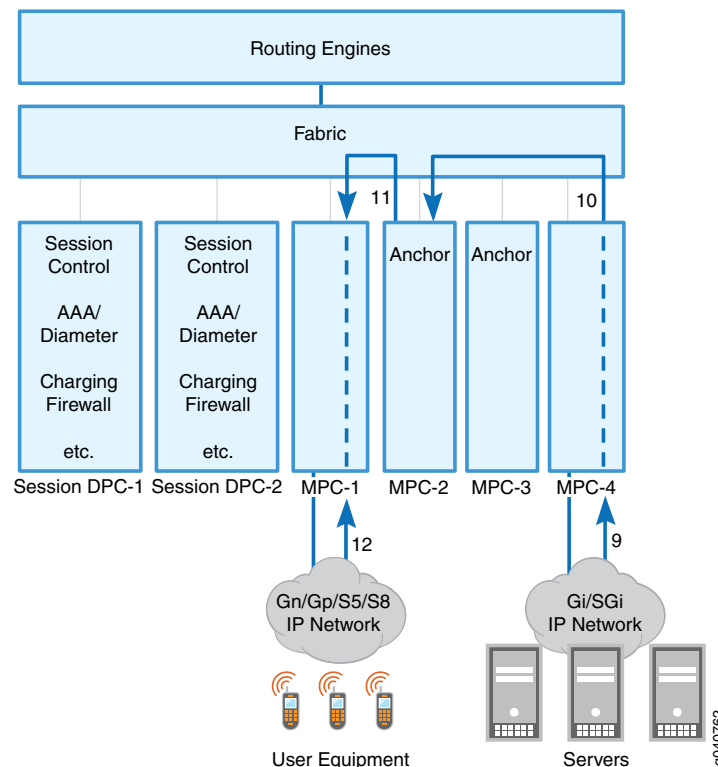
**Related
Documentation**

- [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 9](#)

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 9](#)

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 13](#)

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 13](#)
- [Configuring Broadband Gateway Local Policies Application on page 15](#)

PART 2

Configuration

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CHAPTER 2

Configuration Tasks

- [Configuring Broadband Gateway Home PLMNs and Gateways on page 13](#)
- [Configuring Broadband Gateway Call Rate Statistics on page 14](#)
- [Configuring Broadband Gateway Local Policies Application on page 15](#)
- [Verifying the Gateway Configuration on page 16](#)

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 10](#)
- [Configuring Broadband Gateway Local Policies Application on page 15](#)
- [Overview of Broadband Gateway System Architecture on page 3](#)
- [Configuring General Gateway Trace Options on page 52](#)
- [Configuring Mobile Options Trace Options on page 54](#)
- [Configuring Resource Manager Trace Options on page 49](#)

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 13](#)
- [Configuring General Gateway Trace Options on page 52](#)
- [Configuring Mobile Options Trace Options on page 54](#)

- [Configuring Resource Manager Trace Options on page 49](#)

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 10](#)
- [Overview of Broadband Gateway System Architecture on page 3](#)

- [Configuring General Gateway Trace Options on page 52](#)
- [Configuring Mobile Options Trace Options on page 54](#)
- [Configuring Resource Manager Trace Options on page 49](#)

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 13](#)
- [Configuring Broadband Gateway Local Policies Application on page 15](#)
- [Configuring Broadband Gateway Call Rate Statistics on page 14](#)

CHAPTER 3

Configuration Statements

- [\[edit unified-edge mobile-options\] Hierarchy Level on page 17](#)
- [\[edit unified-edge resource-management\] Hierarchy Level on page 17](#)

[\[edit unified-edge mobile-options\] 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	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] Hierarchy Level• show unified-edge ggsn-pgw call-rate statistics on page 63• show unified-edge sgw call-rate statistics on page 80

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.



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 26

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 49](#)
- [resource-management \(MobileNext Broadband Gateway\) on page 31](#)

dl-bandwidth-pool (Local Policies)

Syntax	<code>dl-bandwidth-pool <i>pool-name</i>;</code>
Hierarchy Level	[edit unified-edge local-policies <i>name</i>]
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 26

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 TrafficExample: Configuring the MobileNext Broadband Gateway Chassis

ggsn-pgw

Syntax	<code>ggsn-pgw gateway-name { ... }</code>
Hierarchy Level	[edit unified-edge gateways]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	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. The remaining statements are explained separately.
Options	gateway-name —Name of the gateway. Range: Up to 63 characters
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 Configuring Broadband Gateway Home PLMNs and Gateways on page 13

history (Call-Rate Statistics)

Syntax	<code>history history;</code>
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 number of past intervals for which the call-rate statistics are stored by the broadband gateway.
Options	history —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 18 show unified-edge ggsn-pgw call-rate statistics on page 63 show unified-edge sgw call-rate statistics on page 80

home-plmn

Syntax `home-plmn {
 mcc [mcc] {
 mnc [mnc];
 }
 }`

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

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

Description Configure the operator's home public land mobile networks (HPLMNs) that the broadband gateway and its access point names (APNs) recognize. The HPLMN consists of the mobile country code (MCC) and its corresponding mobile network codes (MNCs).



NOTE: Configuring the `home-plmn` statement is optional for the Serving Gateway (S-GW). In order to select the charging profile for a subscriber, 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 for selecting the charging profile.

The remaining statements are explained separately.

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

Related Documentation

- [Configuring Broadband Gateway Home PLMNs and Gateways on page 13](#)
- [ggsn-pgw on page 23](#)
- [Configuring an S-GW on a Broadband Gateway](#)



interval (Call-Rate Statistics)

Syntax	<code>interval <i>interval</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 interval for which the call-rate statistics are calculated by the broadband gateway.
Options	<i>interval</i> —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	<ul style="list-style-type: none"> • call-rate-statistics on page 18 • show unified-edge ggsn-pgw call-rate statistics on page 63 • show unified-edge sgw call-rate statistics on page 80



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

mcc

Syntax	<code>mcc [mcc] { mnc [mnc]; }</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> home-plmn], [edit unified-edge gateways sgw <i>gateway-name</i> home-plmn]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> home-plmn] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Configure the mobile country codes (MCCs) for the operator's home public land mobile networks (HPLMNs) that the broadband gateway and its access point names (APNs) recognize. For each MCC, you can configure a list of mobile network codes (MNCs).
	 <p>NOTE: This is a mandatory configuration for the gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW).</p>
	The remaining statement is explained separately.
Options	<i>mcc</i> —Mobile country code.
	Syntax: The MCC must be three digits long and can contain numbers from 0 through 9.
	 <p>NOTE: The MCC/MNC combination 00101 is reserved for test networks.</p>
	To configure multiple MCCs, include the <i>mcc</i> statement 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	<ul style="list-style-type: none"> • Configuring Broadband Gateway Home PLMNs and Gateways on page 13 • home-plmn on page 24 • Configuring an S-GW on a Broadband Gateway


mnc

Syntax	<code>mnc [mnc];</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> home-plmn mcc], [edit unified-edge gateways sgw <i>gateway-name</i> home-plmn mcc]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> home-plmn mcc] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Configure the mobile network codes (MNCs) belonging to the mobile country codes (MCCs) for the operator's home public land mobile networks (HPLMNs) that the broadband gateway and its access point names (APNs) recognize.
<div>  <p>NOTE: This is a mandatory configuration for the gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW).</p> </div>	
Options	<p>mnc—Mobile network code.</p> <p>Syntax: The MNC must be at least two digits long and a maximum of three digits long. It can contain numbers from 0 through 9.</p>
<div>  <p>NOTE: The MCC/MNC combination 00101 is reserved for test networks.</p> </div>	
To configure multiple MNCs, include the mnc statement multiple times.	
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Broadband Gateway Home PLMNs and Gateways on page 13 • mcc on page 27 • Configuring an S-GW on a Broadband Gateway

mobile-options

Syntax	<pre>mobile-options { 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]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W.
Description	<p>Specify the tracing options for the mobility daemon.</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] Hierarchy Level Configuring Mobile Options Trace Options on page 54

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.
<div>  <p>NOTE:</p> <ul style="list-style-type: none"> 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. </div>	
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 Example: Configuring the MobileNext Broadband Gateway Chassis forwarding-packages on page 22

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 49](#)

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> 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.</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 26

roamer-classifier-profile (Local Policies)

Syntax	<code>roamer-classifier-profile <i>profile-name</i>;</code>
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.
<div>  <p>NOTE: The classifier policy profile must be previously configured on the broadband gateway at the [edit unified-edge cos-cac classifier-profiles] 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 classifier-profiles local-policies (QoS) on page 26

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 49](#)
- [resource-management \(MobileNext Broadband Gateway\) on page 31](#)

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 /var/log 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	<ul style="list-style-type: none">• Configuring Mobile Options Trace Options on page 54• mobile-options on page 29

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] Hierarchy Level
 - [Configuring General Gateway Trace Options on page 52](#)
 - Configuring S-GW Traceoptions

traceoptions (Resource Management Client)

Syntax `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 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 20](#)
 - [Configuring Resource Manager Trace Options on page 49](#)

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	<ul style="list-style-type: none"> • Configuring Resource Manager Trace Options on page 49 • server (Resource Management) on page 34

ul-bandwidth-pool (Local Policies)


Syntax	ul-bandwidth-pool <i>pool-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 bandwidth pool for limiting the downlink bandwidth usage at the gateway or at the APN level.
Options	<i>pool-name</i> —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	<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 26

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 26

PART 3

Administration

- [Monitoring on page 49](#)
- [Operational Commands on page 57](#)

CHAPTER 4

Monitoring

- [Configuring Resource Manager Trace Options on page 49](#)
- [Configuring General Gateway Trace Options on page 52](#)
- [Configuring Mobile Options Trace Options on page 54](#)

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 49](#) 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.
info-manager	Trace information management code.
init	Trace events related to data path daemon initialization.

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

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 50](#) 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 50](#) describes the levels you can include.

Table 5: Trace Levels

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

Table 5: Trace Levels (*continued*)

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 13](#)
- [Configuring Broadband Gateway Local Policies Application on page 15](#)

- [Configuring General Gateway Trace Options on page 52](#)
- [Configuring Mobile Options Trace Options on page 54](#)

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 6 on page 52](#) 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 6: General Gateway Trace Flags

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

[Table 7 on page 52](#) describes the levels you can include.

Table 7: Trace Levels

Level	Description
all	Match all levels.

Table 7: 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 13](#)

- [Configuring Broadband Gateway Local Policies Application on page 15](#)
- [Configuring Mobile Options Trace Options on page 54](#)
- [Configuring Resource Manager Trace Options on page 49](#)

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 and levels.

[Table 8 on page 54](#) 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 8: Mobile Options Trace Flags

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

[Table 9 on page 54](#) describes the levels you can include.

Table 9: Trace Levels

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

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. Configure the tracing level.

```
[edit unified-edge mobile-options traceoptions]
```

```
user@host# set level error
```

6. 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 13](#)
- [Configuring Broadband Gateway Local Policies Application on page 15](#)
- [Configuring General Gateway Trace Options on page 52](#)
- [Configuring Resource Manager Trace Options on page 49](#)

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 67
List of Sample Output	clear unified-edge ggsn-pgw statistics gateway pgw on page 58
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 60](#)

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

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 62 show unified-edge gateways detail on page 62
Output Fields	Table 10 on page 61 lists the output fields for the show unified-edge gateways command. Output fields are listed in the approximate order in which they appear.

Table 10: 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	none —Display the call-rate statistics for all GGSNs or P-GWs. gateway gateway-name —(Optional) Display the call-rate statistics for the specified GGSN or P-GW. 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.)
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> call-rate-statistics on page 18
List of Sample Output	show unified-edge ggsn-pgw call-rate statistics on page 64 show unified-edge ggsn-pgw call-rate statistics history on page 64
Output Fields	Table 11 on page 63 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 11: 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	The following control plane information is displayed: <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 11: 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 user@host> show unified-edge ggsn-pgw call-rate statistics
ggsn-pgw call-rate PGW
statistics 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 user@host> show unified-edge ggsn-pgw call-rate statistics history
ggsn-pgw call-rate Record 1 (Call-rate statistics for the past 5 min):
statistics history 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 61 • show unified-edge ggsn-pgw system interfaces
List of Sample Output	show unified-edge ggsn-pgw resource-manager clients on page 66
Output Fields	Table 12 on page 65 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 12: 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 user@host> show unified-edge ggsn-pgw resource-manager clients
ggsn-pgw Client State Redundancy role Client type Gateway
resource-manager pfe-0/0/0 In-Service Primary PFE PGW
clients 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	<pre>show unified-edge ggsn-pgw statistics <apn apn> <gateway gateway> <gtpv1-arp gtpv1-arp> <gtpv2-priority-level gtpv2-priority-level> <qci qci></pre>
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	<p>apn <i>apn</i>—(Optional) Display the statistics for the specified APN on one or more GGSNs or P-GWs.</p> <p>gateway <i>gateway</i>—(Optional) Display the statistics for the specified GGSN or P-GW.</p> <p>gtpv1-arp <i>gtpv1-arp</i>—(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.</p> <p>gtpv2-priority-level <i>gtpv2-priority-level</i>—(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.</p> <p>qci <i>qci</i>—(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.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear unified-edge ggsn-pgw statistics on page 58 • show unified-edge ggsn-pgw statistics traffic-class
List of Sample Output	show unified-edge ggsn-pgw statistics on page 69
Output Fields	Table 13 on page 67 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 13: show unified-edge ggsn-pgw statistics Output Fields

Field Name	Field Description
Gateway	Name of the GGSN or P-GW.
Control Plane Statistics	

Table 13: show unified-edge ggsn-pgw statistics Output Fields (*continued*)

Field Name	Field Description
Session establishment attempts	Number of attempted session establishments.
Successful session establishments	Number of successful session establishments.
MS/peer initiated session deactivations	Number of attempted deactivations initiated by the mobile station (MS) or GPRS tunneling protocol (GTP) peer.
Successful MS/peer initiated deactivations	Number of deactivations initiated by the MS or GTP peer that were successful.
Gateway initiated session deactivations	Number of attempted deactivations initiated by the broadband gateway.
Successful gateway initiated deactivations	Number of deactivations initiated by the broadband gateway that were successful.
Data Plane Global statistics	
Source address violation packets	Number of packets with an incorrect source address.
Source address violation bytes	Number of octets 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
Data Plane GTP Statistics (Gn/S5/S8)	
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.

Table 13: show unified-edge ggsn-pgw statistics Output Fields (*continued*)

Field Name	Field Description
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
Control plane statistics:
  Session establishment attempts:      187501
  Successful session establishments:    187501
  MS/peer initiated session deactivations: 46878
  Successful MS/peer initiated deactivations: 46878
  Gateway initiated session deactivations: 0
  Successful gateway initiated deactivations: 0
Data plane global statistics:
  Source address violation packets:      0
  Source address violation bytes:        0
  Non-existent TEID/TID packets:        0
  GTP length error packets:             0
  Non-existent UE address packets:      0
Data plane GTP statistics (Gn/S5/S8):
  Input packets:                        2999505
  Input bytes:                          2111435520
  Output packets:                       221199
  Output bytes:                         14156736
  Discarded packets:                    0
Data plane GTP statistics (Gi):
  Input packets:                        221199
  Input bytes:                          14156736
  Output packets:                       2999505
  Output bytes:                         2111435520
  Discarded packets:                    0

```

show unified-edge ggsn-pgw status

Syntax `show unified-edge ggsn-pgw status`
 `<apn-name apn-name>`
 `<brief | detail>`
 `<fpc-slot fpc-slot>`
 `<gateway gateway>`
 `<gtpv1-arp gtpv1-arp>`
 `<gtpv2-priority-level gtpv2-priority-level>`
 `<pic-slot pic-slot>`
 `<pdn-type>`
 `<qci qci>`
 `<rat-type (eutan | gan | geran | hspa | others | utran | wlan)>`
 `<traffic-class (background | conversational | interactive | streaming)>`

Release Information Command introduced in Junos OS Mobility Release 11.2W. **extensive** and **pdn-type** 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 (*eutran | gan | geran | hspa | others | utran | wlan*)—(Optional) Display the status information for the specified Radio Access Technology (RAT).

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 72](#)
[show unified-edge ggsn-pgw status detail on page 72](#)
[show unified-edge ggsn-pgw status detail on page 73](#)
[show unified-edge ggsn-pgw status extensive on page 73](#)
[show unified-edge ggsn-pgw status pdn-type detail on page 73](#)

Output Fields

[Table 14 on page 71](#) 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 14: 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
PIC SLOT	PIC slot number of the FPC for which the status information is displayed.	detail
State	State of the services or session PIC on the GGSN or P-GW: <ul style="list-style-type: none"> • Standalone • Active—PIC is an active member. • Backup—PIC is a backup. 	detail
Type	Indicates whether the PIC is a session PIC or a services PIC.	detail
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.	
Active Sessions	Number of active sessions.	All levels none

Table 14: show unified-edge ggsn-pgw status Output Fields (*continued*)

Field Name	Field Description	Level of Output
Active Bearers	Number of active bearers or Packet Data Protocol (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
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

Sample Output

```

show unified-edge ggsn-pgw status user@host> show unified-edge ggsn-pgw status
Gateway: PGW
Active Subscribers           :           3
Active Subscribers (with services) :           0
Active Sessions              :           3
Active Bearers               :           3
CPU Load (%)                 :           0
Memory Load (%)              :          55

show unified-edge ggsn-pgw status detail user@host> show unified-edge ggsn-pgw status detail
Gateway: PGW
FPC SLOT: 4    PIC SLOT: 0
State          : Standalone
Type           : Session-PIC
Active Subscribers :           3
Active Sessions  :           3
Active Bearers   :           3
CPU Load (%)    :           0
Memory Load (%) :          55
FPC SLOT: 4    PIC SLOT: 1
State          : Standalone
Type           : Session-PIC
Active Subscribers :           0
Active Sessions  :           0
Active Bearers   :           0

```

```

CPU Load (%)           : 0
Memory Load (%)        : 55

```

```

show unified-edge ggsn-pgw status detail user@host> show unified-edge ggsn-pgw status detail
Gateway: PGW
FPC SLOT: 4    PIC SLOT: 0
State          : Standalone
Type           : Session-PIC
Active Subscribers : 3
Active Sessions  : 3
Active Bearers   : 3
CPU Load (%)    : 0
Memory Load (%) : 55
FPC SLOT: 4    PIC SLOT: 1
State          : Standalone
Type           : Session-PIC
Active Subscribers : 0
Active Sessions  : 0
Active Bearers   : 0
CPU Load (%)    : 0
Memory Load (%) : 55

```

```

show unified-edge ggsn-pgw status extensive user@host> show unified-edge ggsn-pgw status extensive
Gateway: PGW
FPC SLOT: 1    PIC SLOT: 0
State          : Active
Type           : Service-PIC
Active Subscribers : 0
Active Sessions  : 0
CPU Load (%)    : 0
Memory Load (%) : 22
Connections to Session PICs :
ms-2/0

FPC SLOT: 2    PIC SLOT: 0
State          : Active
Type           : Session-PIC
Active Subscribers : 0
Active Sessions  : 0
Active Bearers   : 0
CPU Load (%)    : 0
Memory Load (%) : 29

```

```

show unified-edge ggsn-pgw status pdn-type detail user@host> show unified-edge ggsn-pgw status pdn-type detail
Gateway: PGW
FPC SLOT: 4    PIC SLOT: 0
State          : Standalone
Type           : Session-PIC
IPv4 Active Sessions : 3
IPv6 Active Sessions : 0
IPv4-v6 Active Sessions : 0
FPC SLOT: 4    PIC SLOT: 1
State          : Standalone
Type           : Session-PIC

```

IPv4 Active Sessions	:	0
IPv6 Active Sessions	:	0
IPv4-v6 Active Sessions	:	0

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 76
Output Fields	Table 15 on page 75 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 15: 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 15: 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	show unified-edge sgw status session-state brief on page 78 show unified-edge sgw status session-state detail on page 79
Output Fields	Table 16 on page 77 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 16: 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 16: 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 user@host> show unified-edge sgw session-state detail
status session-state Gateway: SGW
detail               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 18
List of Sample Output	show unified-edge sgw call-rate statistics on page 81 show unified-edge sgw call-rate statistics history on page 81
Output Fields	Table 17 on page 80 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 17: 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 17: 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 61 • show unified-edge sgw system interfaces
List of Sample Output	show unified-edge sgw resource-manager clients on page 83
Output Fields	Table 18 on page 82 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 18: 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
user@host> 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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