

MobileNext Broadband Gateway

Charging for Serving Gateway



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Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net

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MobileNext Broadband Gateway Charging for Serving Gateway

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About the Documentation

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- Supported Platforms on page xi
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- Documentation Feedback on page xiii
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Documentation and Release Notes

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

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

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Supported Platforms

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

- MX240 Routers
- MX960 Routers
- MX480 Routers

Documentation Conventions

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

Table 1: Notice Icons

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

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

Table 2: Text and Syntax Conventions

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

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

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

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

Opening a Case with JTAC

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

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

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

PART 1

Overview

- [Charging Overview on page 3](#)

CHAPTER 1

Charging Overview

- [Charging Overview on page 3](#)
- [Offline Charging Overview on page 5](#)
- [Charging Data Records on page 7](#)
- [Charging Profiles on page 11](#)

Charging Overview

Charging is an umbrella term that often covers not only charging, but also the rating and billing of services. Together, charging, rating and billing combine to assure that service providers are compensated by their customers or subscribers for the delivery of services.

More specifically, charging is used to describe the metering of services that are not free or are bundled in other ways with basic service features (such as handoffs). The opposite of a charge is a credit. Together, in the process called rating, charges and credits are applied to a subscriber's account to determine the periodic amount due to the service provider. If charges exceed credits, the subscriber's account is billed for a certain amount. Monthly telephony billing statements used to have a section called "other charges and credits" where these items were detailed, usually by date.

Charges can be determined by a number of different criteria, alone or in combination:

- Time (duration), often variable by time of day or distance between endpoints
- Pre-paid credits, which are consumed by users and often have a quota that can be exhausted
- Artificial units, which have no basis in reality, such as the old "message units" for telephony services

Charging rates can be set by contract or by public documents (called "tariffs") approved by a regulating entity. Tariffs and contract terms can vary by time of day, day of the week, or other intervals.

Service charges can be flat-rate or metered based on the various criteria outlined above. Flat-rate services are popular with customers (especially those on tight budgets), predictable, simple to maintain from an accounting perspective (few disputes arise over flat-rate services), and easy to bill. On the other hand, flat-rate services can deprive the

service provider of additional revenues during periods of high usage and can result in forced expenses on the part of the subscriber during periods of low usage.

Metered services are popular with customers when services are inexpensive compared to other items in a budget, unpredictable, difficult to maintain from an accounting perspective (many disputes arise over metered services), and more complex to bill. However, in contrast to flat-rate services, metered services provide additional revenues when resource use is high (due to a suddenly popular service), spreading the financial burden among customers based on actual usage.

The accrued amount of subscriber charges can be conveyed to the subscriber in real time as they occur, periodically (monthly bills were a common feature in telephony), or on request. The use of one main method need not preclude the others.

Charging in Mobile Networks

In the mobile network, it is important to have detailed and accurate monitoring of service usage on the MobileNext Broadband Gateway so that proper charging information can be generated for millions of customers. In the Third-Generation Partnership Project (3GPP), there are three distinct aspects to the process that translates service use into a bill for services. These aspects are charging, rating, and billing. Charging gathers statistics about service usage for each customer. Rating is the process of determining how much each service costs each particular customer, based on the services contracted or tariffed. Billing is the process of actually generating the customer's invoice for services.

The MobileNext Broadband Gateway is the anchor of the data call and contains most of the subscriber context information. The broadband gateway is responsible for collecting charging information related to the external data network usage and to network resource usage on the Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW), including the amount of data categorized by quality of service (QoS), the user protocols, and the usage of the packet data protocol address. Packet data volume in both the uplink (from the Gn-to-Gi interface) and downlink (from the Gi-to-Gn interface) directions is counted separately.

Long Term Evolution (LTE) mobile networks define two different types of charging systems: Offline Charging Systems (OFCS) and Online Charging Systems (OCS). Offline charging is usually used for post-paid services for which the subscriber receives a bill (typically monthly). Online charging is well suited for pre-paid services. Online charging can affect a session in real time. For example, a session can be terminated if the subscriber runs out of credit. Offline charging cannot affect subscribers in real time. Typically, a service provider will provision both offline and online charging for subscribers.

Charging with Data Records (Offline Charging)

In offline charging, a charging trigger monitors the subscriber's use of services and resources and generates charging events that describe the system charge activities. A charging data function, which can be integrated with the gateway device, processes charging events and collects these as Charging Data Records (CDRs). The CDRs are written to files or transferred to the OFCS charging gateway over the Ga interface using the GPRS Tunneling Protocol (GTP) prime (GTPP) protocol. The billing domain determines the cost of the resources used and invoices the subscriber.

If the user is roaming, the billing domain and charging gateway are in the subscriber's home network, while the charging data function is in the same network as the Serving Gateway (S-GW) and Packet Data Network Gateway (P-GW). The visited network also uses the roaming CDRs to invoice the home network for the roaming subscriber's use of visited resources (a process called settlement).

Charging in Real Time (Online Charging)

In online charging, a charging trigger in the P-GW sends a credit request to the online charging function over the Gy interface to see if a session can begin. A rating function determines the subscriber's balance and replies with a credit authorization (which usually also specifies how long the session can last or how much data can be transferred). The charging trigger monitors the session and use of resources. If the allocation nears its limit, another credit request is sent for additional resources. When the session is over, the charging trigger notifies the OCS with regard to any remaining credit to return to the subscriber.

If the user is roaming, the OCS is always in the subscriber's home network. As in offline charging, the visited network uses the roaming CDRs to invoice the home network for the roaming subscriber's use of visited resources (settlement).

Related Documentation

- [Offline Charging Overview on page 5](#)
- [Online Charging Overview](#)
- [Configuring GTP Prime for Charging on page 21](#)
- [Configuring Persistent Storage on page 23](#)
- [Charging Data Records on page 7](#)
- [Charging Profiles on page 11](#)
- [Example: Configuring Online Charging](#)

Offline Charging Overview

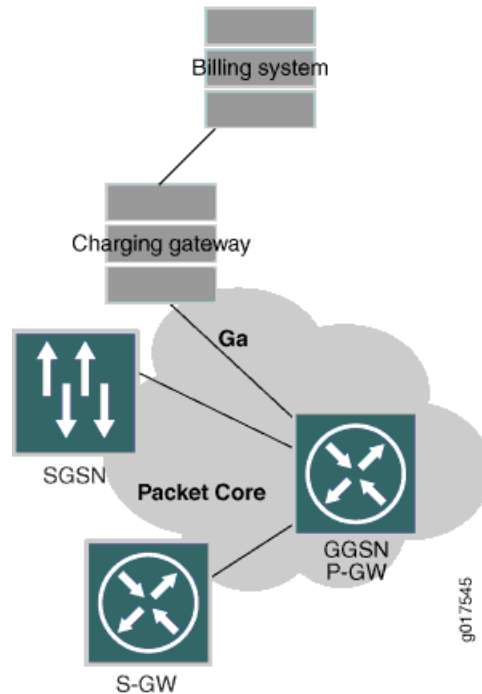
The MobileNext Broadband Gateway supports offline charging, which is commonly used in a postpaid environment. The broadband gateway provides mobile operators with an intelligent charging service that has flexible provisioning and accurate resource usage record collection for their mobile subscribers. The broadband gateway gathers Charging Data Records (CDRs) and delivers them to the charging gateway function (CGF) over the Ga interface using the GTP Prime protocol. The billing function is distributed across all modules of the broadband gateway, which performs these tasks for billing:

- Accurate CDR creation and closure
- Partial record generation
- ASN.1 or 3GPP formatting of CDRs prior to transfer to CGF or local storage
- Support of GTP Prime protocol stack to transfer CDRs to the CGF
- Support of primary, secondary, and tertiary CGF for redundancy of each charging profile

Charging information collection does not affect real-time operations and is transferred over the Ga interface using the GTP Prime protocol. The network element generates the CDR for each subscriber and reports it periodically to the charging gateway. The charging gateway then optionally reformats and transfers the collected CDRs to the operator's billing system for billing purposes.

Figure 1 on page 6 shows the components in a sample charging topology.

Figure 1: Simple Charging Topology



The provisioning of the charging services follows this process:

1. Configure the CGF or local storage.
2. Create the transport profile and associate the primary, secondary, and tertiary CGF.
3. (Optional) Configure the CDR and trigger profiles.
4. Create a charging profile with a profile ID and the associated transport, CDR, and trigger profiles. The profile ID is used to match against the charging characteristic information element sent in the GTP create request or the RADIUS profile ID attribute-value pairs (AVPs) from the RADIUS authentication response.
5. In the access point name (APN) configuration, configure the charging profile selection order as static to select locally configured charging profiles.

The binding of the charging services, as well as the charging information collection, follows this process:

1. The broadband gateway starts to establish a bearer when the broadband gateway receives the request from the mobile subscriber to create a packet data protocol (PDP) context.
2. For each new bearer created in the broadband gateway, the configured charging profile selection order algorithm is applied and a charging profile is associated with the bearer.
3. The broadband gateway generates a container or CDR for every trigger or signaling event that the operator wants reported for this subscriber.
4. When the mobile subscriber terminates the session, the final network usage is reported to the CGF by the broadband gateway.

**Related
Documentation**

- [Charging Overview on page 3](#)
- [Online Charging Overview](#)
- [Configuring GTP Prime for Charging on page 21](#)
- [Configuring Persistent Storage on page 23](#)
- [Charging Data Records on page 7](#)
- [Charging Profiles on page 11](#)
- [Example: Configuring Online Charging](#)

Charging Data Records

The MobileNext Broadband Gateway gathers charging information in Charging Data Records (CDRs). The broadband gateway supports different charging format versions.

The broadband gateway generates CDRs that contain the following types of information to charge a mobile station user or subscriber for accessing data from access point name (APN) networks:

- Data volume—Amount of data sent to and received from the APN networks.
- Duration of packet data protocol (PDP) context—Length of PDP context or call.
- Quality-of-service (QoS) classes—Priority at which requested data is transported.
- Roaming—Charges imposed for subscriber roaming among SGSNs belonging to a mobile operator or between different mobile operators.
- Tariff—Charges imposed based on the time of day.

CDRs can be delivered by the following methods:

- CDRs are transferred directly to a charging gateway server using the GTP Prime protocol.

The GTP Prime protocol supports UDP or TCP as the transport protocol, and IPv4 addresses. You must configure the charging gateways as GTP Prime peers. The peers can be configured for use by transport profiles as primary, secondary, or tertiary servers.

The broadband gateway supports sending the following messages:

- **Node Alive Response**—Response to a Node Alive Request received from the charging gateway function (CGF). The Node Alive Request message is used to indicate that a node in the network has started its service.
- **Echo Request and Echo Response**—The Echo Request message detects the path status between the CGF and the broadband gateway and should not be sent more than once every 60 seconds using UDP as the transport protocol.
- **Redirect Request**—CGF can send Redirect Request messages to the broadband gateway to advise that received CDR traffic is to be redirected to another CGF or that the next node in the chain (such as a mediation device or billing computer) has lost its connection to the CGF. When the request is to redirect to another CGF, the transport profile switches to the recommended CGF only if it is configured as a peer in the transport profile; otherwise, it switches to the next highest-priority peer in the transport profile.
- **CDRs are logged to the local persistent storage and eventually retrieved by a charging gateway using the File Transfer Protocol (FTP).** In broadband gateways configured with a backup Routing Engine, a mirror directory of CDRs is available.

Local persistent storage stores the CDRs in the form of files on the Routing Engine. When the transport profile is configured to use local persistent storage for CDRs, the session DPC sends the CDRs to the Routing Engine as temporary log files. When the triggers (such as file age, file size, or CDR count) acting on the temporary log files are reached, the temporary log file is closed and moved to the final log directory where it is available for transfer by the operator. By default, the configured user or root user is authorized to access the files. However, you can configure the log files to be readable by all users.

The final CDR log files are stored in the `/opt/mobility/charging/ggsn/final_log` directory in the filename format ***NodeID_-PIC_-transport-profile-id_-RC.date_-time[.PI].cdr***, where:

- ***NodeID***—Name of the host that generated the file.
- ***PIC***—The PIC number generating the CDR.
- ***transport-profile-id***—The number of the transport profile generating the CDR.
- ***RC***—Running count or sequence number, starting with the value of 1.
- ***date***—Date when the CDR file was closed in the format *YYYYMMDD*, where *YYYY* is the year, *MM* is the month (01-12), and *DD* is the day (01-31).
- ***time***—Time when the CDR file was closed in the format *HHMMshhmm*, where *HH* is the local time hour of day (00-23), *MM* is the local time minute of the hour (00-59), *s* is the sign of local time differential from UTC (+ or -), *hh* is the local time differential hour (00-23), and *mm* is the local time differential minute (00-59).

- *PI*—(Optional) Private information that is explicitly configured.
- *cdr*—File extension is always *cdr*.

For example, a final CDR log file could be named
magnet-PGW-1-3_-_155970.20120612_-_0950-0700.asn.cdr.

The charging gateway consolidates charges for a particular PDP context from the broadband gateway. Each CDR is marked with a charging ID that identifies the mobile station user and the particular PDP session. This charging ID correlates information generated by the broadband gateway. Each CDR also includes a Local Record Sequence Number (LRSN) that is allocated sequentially and is unique for each CDR on the same session DPC. The LRSN is the IP address of the broadband gateway and the node ID. The charging gateway uses the LRSN to identify missing records. The billing gateway uses the charging ID and the LRSN to identify CDRs. The billing gateway server generates the information used in the bill that is sent to the subscriber.

Information Collection and CDR Generation

Upon establishment of a PDP context, the broadband gateway opens a first partial CDR if it is configured to generate CDRs for the PDP context. The broadband gateway generates this CDR in Abstract Syntax Notation 1 (ASN.1) format. This format provides a common syntax for data transmitted between different communication systems.

This partial CDR contains static and dynamic information. The static information includes details such as the type of record (in this case, a CDR) and the international mobile station identifier (IMSI) of the subscriber. Additional information included in the CDR is based on the dynamic usage of an APN network by the subscriber. To collect dynamic usage information, the broadband gateway monitors the uplink and downlink bearer traffic associated with a PDP context.

A container holds the incremental statistics for the bearer. Each CDR has the containers that belong to the same bearer. Depending on the event, a container can be added to the CDR. You can configure the maximum number of containers for the CDR. Upon reaching this limit, the CDR is closed and sent to the CGF. The broadband gateway adds a container to the partial CDR each time one of the following chargeable events occurs:

- The QoS changes.
- The tariff changes.
- Other charging conditions are satisfied.

For example, if the QoS changes, a container is added. If the tariff changes, another container is added. If the QoS changes again, another container is added and so on until the maximum number of containers is reached.

The broadband gateway adds a container to the partial CDR and closes the CDR when one of the following chargeable events occurs:

- The PDP context terminates.
- The time limits are exceeded.

- The volume limits are exceeded.

The broadband gateway closes a partial CDR and opens a subsequent partial CDR if one of the following occurs:

- The configured number of containers for the container limit attribute is reached.
- A configurable data volume limit for the first partial CDR is reached. Each container has a data volume count associated with the chargeable event. Initially, the first partial CDR contains one container with 0 bytes of data volume.
- A configurable time limit for the first partial CDR is reached.
- The maximum of five SGSN or S-GW changes is reached. A container can include a list of up to five changes.

A very active broadband gateway has to generate a large number of CDRs. Many CDRs contain a lot of information that is not necessary for a given PDP context or is known to the charging gateway by other means. To minimize the size of the generated CDR packets, the charging configuration contains a variety of CDR attributes that can be excluded from CDRs if the information is not necessary.

After a PDP context terminates, a broadband gateway adds a container to the current partial CDR, closes it, and delivers it to a charging gateway using the configured CDR delivery method.

CDR Delivery

CDR delivery to a charging gateway is based on the transport profile configuration. You can configure primary, secondary, and tertiary external charging gateways or local persistent storage in the transport profile. You must configure either the external charging gateways or local persistent storage, or both.

To support high throughput, the distributed control plane modules on the broadband gateway independently send CDRs to the charging gateway through their own UDP/TCP communication path. However, connectivity to the charging gateway is fate-shared. Thus, when one control plane reports loss of connectivity, all control planes switch to the next charging gateway in the peer order. This behavior also applies to GTP Prime echo failure, node alive, and redirect messages. The redirect message can contain the recommended charging gateway to switch to, but the transport profile switches to this charging gateway only if it is configured in the transport profile. Otherwise, it is redirected to the next higher-priority charging gateway in the peer order.

If the broadband gateway loses connectivity to all the charging gateways or the charging gateway is too slow, each control plane has a staging area to temporarily prevent the loss of CDRs. To prevent CDR and charging container record loss, all records are backed up to the backup control plane if redundancy is configured.

Related Documentation

- [Charging Overview on page 3](#)
- [Offline Charging Overview on page 5](#)
- [Online Charging Overview](#)

- [Configuring Offline Charging on page 15](#)
- [Configuring Transport Profiles for Offline Charging on page 27](#)
- Example: Configuring Online Charging

Charging Profiles

The broadband gateway associates a charging profile with a mobile subscriber when a bearer is established. The charging profile specifies the charging behavior to apply based on the subscriber's charging characteristics. The charging behavior includes the charging mechanism, charging information sets, and charging transport behavior. The charging behavior depends on the charging type (for example, charging gateway or RADIUS server) and the associated charging profile.

Charging profiles can reference these profiles, which define the charging behavior:

- CDR profile—Defines the attributes in each CDR transmitted to the charging gateway.
You can enable the generation of reduced partial CDRs and configure the exclusion of information elements from the CDR.
- Transport profile—Defines how to transfer the CDR to the charging gateway.
You can specify information about the CDRs, including CDR format and aggregation limit, being transferred to the charging gateways. You can specify the order of the charging gateways.
- Trigger profile—Defines the effective charging events that trigger CDR creation and container addition or closure.

You can specify triggers, including:

- Time limits—Maximum age of collected charging data before a subsequent CDR is generated.
- Volume limits—Maximum amount of collected charging data before a subsequent CDR is generated.
- Tariff activation times—Time windows in which tariffs change for charging purposes. If the services provided by an APN network have different time windows and tariffs, you can configure the broadband gateway to update CDRs when the tariffs change.
- Container limits—Maximum number of containers in each CDR before a subsequent CDR is generated.
- Bearer changes—Bearer information changes to ignore for charging data updates. Charging updates are not triggered by changes to this information.

Charging Profile Selection Process

The MobileNext Broadband Gateway has a highly flexible charging profile selection algorithm that enables the operator to choose the appropriate charging configuration

for each subscriber. Provisioning is done for each APN, where the operator can specify the profile selection order for the charging profile.

You can specify that the charging profile be selected from the following sources in the preferred order:

- Subscriber type (static)—Use the configured charging profile for the type of subscriber (home, roamer, or visitor). If the charging profile for the type of subscriber is not configured for the APN, then the default profile is used if configured.
- SGSN or Serving Gateway (serving)—Use the charging profile sent by the SGSN or Serving Gateway.
- RADIUS server (radius)—Use the charging profile provided by the RADIUS server.

If the charging profile cannot be selected from the first source in the profile selection order, then the algorithm will try the next source. If no charging profile can be selected from any source, then charging is disabled for the subscriber.

**Related
Documentation**

- [Charging Overview on page 3](#)
- [Configuring Offline Charging on page 15](#)
- [Configuring Charging Profiles on page 35](#)
- [Configuring Transport Profiles for Offline Charging on page 27](#)
- [Configuring Charging Trigger Events for Offline Charging on page 30](#)
- [Configuring CDR Attributes on page 32](#)
- [Configuring Charging Profiles for APNs on page 37](#)
- [Example: Configuring Online Charging](#)

PART 2

Configuration

- [Configuration Overview on page 15](#)
- [Configuration Tasks for Charging on page 17](#)
- [Configuration Statements on page 39](#)

CHAPTER 2

Configuration Overview

- [Configuring Offline Charging on page 15](#)

Configuring Offline Charging

You can configure the charging function on the MobileNext Broadband Gateway. The broadband gateway supports the configuration of offline charging. Offline charging can be configured to send Charging Data Records (CDRs) to charging gateways, to store CDRs on local physical storage, or both.

To configure the broadband gateway for offline charging:

- Configure the GPRS tunneling protocol (GTP) Prime properties for transmitting the CDR to the external charging gateway.

You must perform this task if you are using an external charging gateway. You can also configure the local persistent storage options to store CDRs on the Routing Engine.

- Configure the local persistent storage options on the Routing Engine for the CDRs.

You must perform this task if you want to configure offline charging and do not configure an external charging gateway.

- Configure the transport profile, which specifies information about the CDRs being transferred to the specified charging gateways, including the CDR format and aggregation limit.
- (Optional) Configure the trigger profile, which specifies the charging events that trigger the creation of the CDR or the addition or closure of the container.
- (Optional) Configure the CDR profile, which specifies the attributes in each transmitted CDR.
- Configure the charging profile, which specifies the charging behavior to apply based on profiles included in the charging profile. The included profiles must be defined.
- Configure the charging profiles for the access point names (APNs).
- Configure tracing for charging operations.

Related Documentation

- [Configuring GTP Prime for Transferring CDRs on page 21](#)
- [Configuring Persistent Storage on page 23](#)

- [Configuring Transport Profiles for Offline Charging on page 27](#)
- [Configuring Charging Trigger Events for Offline Charging on page 30](#)
- [Configuring CDR Attributes on page 32](#)
- [Configuring Charging Profiles on page 35](#)
- [Configuring Charging Profiles for APNs on page 37](#)
- [Tracing Charging Operations on page 189](#)
- [Charging Data Records on page 7](#)

CHAPTER 3

Configuration Tasks for Charging

- [Configuring S-GW-Specific Charging Parameters on page 17](#)
- [Configuring S-GW Global Charging Profiles and Selection Order on page 19](#)
- [Configuring GTP Prime for Charging on page 21](#)
- [Configuring Persistent Storage on page 23](#)
- [Configuring the Solid State Disk for Persistent Storage on page 25](#)
- [Configuring Transport Profiles for Offline Charging on page 27](#)
- [Configuring Charging Trigger Events for Offline Charging on page 30](#)
- [Configuring CDR Attributes on page 32](#)
- [Configuring Charging Profiles on page 35](#)
- [Configuring Charging Profiles for APNs on page 37](#)

Configuring S-GW-Specific Charging Parameters

The MobileNext Broadband Gateway Serving Gateway (S-GW) uses three charging statements unique to the S-GW. This topic shows how to configure the charging statements that are unique to the S-GW.

Before you begin configuring S-GW charging parameters on the broadband gateway, you should have done the following:

- Configured the chassis of the MobileNext Broadband Gateway
- Configured the interfaces used by the MobileNext Broadband Gateway

To establish the charging parameters unique to the S-GW, you can exclude certain trigger events and specific charging detail record (CDR) information. The use of all three statements is optional.

To configure the S-GW charging parameters trigger profile exclusion:

1. (Option) Configure the S-GW charging trigger profile change exclusion.

```
[edit unified-edge gateways sgw MBG-SGW1 charging trigger-profiles TP1 offline  
exclude-attributes]  
user@host# set sgsn-mme-change
```



NOTE: When this statement is configured, a change in Serving GPRS Support Node (SGSN) or S-GW does not generate a charging data update.

2. (Option) Exclude the P-GW address used in the CDR attribute.

```
[edit unified-edge gateways sgw MBG-SGW1 charging cdr-profiles CDR1
exclude-attributes]
user@host# set pgw-address-used
```



NOTE: When this statement is configured, the P-GW IP address is not included in the CDR.

3. (Option) Exclude the S-GW change from the CDR attribute.

```
[edit unified-edge gateways sgw MBG-SGW1 charging cdr-profiles CDR1
exclude-attributes]
user@host# set sgw-change
```



NOTE: When this statement is configured, the S-GW change attribute is not included in the CDR.

4. Configure the CDR release.

```
[edit unified-edge gateways sgw MBG-SGW1 charging transport-profiles
MBG-SGW1-T-Profile offline charging-gateways]
user@host# set cdr-release r8
```



NOTE: By default, the S-GW supports Release 8. You must include this statement to change the supported release.

Related Documentation

- [Configuring Offline Charging on page 15](#)
- [Configuring S-GW Global Charging Profiles and Selection Order on page 19](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)
- [Configuring S-GW Local Persistent Storage Traceoptions on page 191](#)
- [Configuring GTP Prime for Transferring CDRs on page 21](#)
- [Configuring Persistent Storage on page 23](#)
- [Configuring Transport Profiles for Offline Charging on page 27](#)
- [Configuring Charging Trigger Events for Offline Charging on page 30](#)
- [Configuring CDR Attributes on page 32](#)
- [Configuring Charging Profiles on page 35](#)
- [Configuring Charging Profiles for APNs on page 37](#)

- [Tracing Charging Operations on page 189](#)
- [Charging Data Records on page 7](#)

Configuring S-GW Global Charging Profiles and Selection Order

The MobileNext Broadband Gateway Serving Gateway (S-GW) uses five global profiles for charging. This topic describes the profiles and shows how to configure the profile statements unique to the S-GW.

Before you begin configuring a S-GW CAC parameters on the broadband gateway, you should have done the following:

- Configured the chassis of the MobileNext Broadband Gateway
- Configured the interfaces used by the MobileNext Broadband Gateway
- Configured the charging profiles used by the MobileNext broadband Gateway

Global charging profile configuration is a mandatory configuration to enable charging on the S-GW. Configuring the **profile-selection-order** statement is mandatory when the **global-profile** statement is configured. The S-GW determines the type of subscriber by comparing the mobile country code (MCC) and the mobile network code (MNC) values in the Create Session Request message from the subscriber's user equipment (UE) with the corresponding values configured for the home public land mobile network (HPLMN) for the S-GW. Depending on whether a subscriber is a home subscriber, a visitor, or a roamer, the **home-profile**, **visitor-profile**, or **roamer-profile** is applied. If the applicable profile is not configured, then the **default-profile**, if configured, is applied. If the **default-profile** is not configured, then no charging is applied to the subscriber session.



NOTE: The profiles must already be configured on the broadband gateway before you reference them in the profile statements.

The default profile is applied if other profiles are absent. If the **profile-selection-order** configuration is **static**, and if the corresponding charging profile applicable to the type of subscriber (home, visitor, or roamer) has not been specified, then the default profile is applied.

The home profile is applied to home users based on the PLMN configuration. If the **profile-selection-order** configuration is **static**, and this is a home user, then the home profile is applied.

The roamer profile is applied to roaming users based on the PLMN configuration. If the **profile-selection-order** configuration is **static**, and this is a roaming user, then the roaming profile is applied.

The visitor profile is applied to visiting users based on the PLMN configuration. If the **profile-selection-order** configuration is **static**, and this is a visiting user, then the visiting profile is applied.

The profile selection order determines the order that the methods used to select a charging profile are applied. You can specify up to three profile selection methods: **static**, **serving**, or **pgw-cg-addr**. If the first choice is not available, then the next choice is considered, and so on.



NOTE: If no charging profile can be selected for the user, then the subscriber is not charged for the session.

Consider a configured profile selection order of **static**, **serving**, and **pgw-cg-addr**. Because **static** is the first choice, the global charging profiles specified are used. If the global charging profiles are not configured, then the next choice (**serving**) is considered. If the Serving GPRS Support Node (SGSN) or S-GW does not provide a charging profile identifier in the charging characteristics information element (IE) within the GPRS tunneling protocol (GTP) Create Session message, then the next choice (**pgw-cg-addr**) is considered. With the **pgw-cg-addr** option, the global charging profile is selected based on the IP address of the charging gateway (CG) for the P-GW.

To configure the S-GW global charging profiles and selection order:

1. Configure the S-GW default global charging profile.

```
[edit unified-edge gateways sgw MBG-SGW1 charging global-profile]
user@host# set default-profile MBG-SGW1-default
```

2. Configure the S-GW home user global charging profile.

```
[edit unified-edge gateways sgw MBG-SGW1 charging global-profile]
user@host# set home-profile MBG-SGW1-home
```

3. Configure the S-GW roaming user global charging profile.

```
[edit unified-edge gateways sgw MBG-SGW1 charging global-profile]
user@host# set roamer-profile MBG-SGW1-roaming
```

4. Configure the S-GW visiting user global charging profile.

```
[edit unified-edge gateways sgw MBG-SGW1 charging global-profile]
user@host# set visitor-profile MBG-SGW1-visiting
```

5. Configure the S-GW global charging profile selection order.

```
[edit unified-edge gateways sgw MBG-SGW1 charging global-profile]
user@host# set profile-selection-order static serving pgw-cg-addr
```

Related Documentation

- [Configuring Offline Charging on page 15](#)
- [Configuring S-GW-Specific Charging Parameters on page 17](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)
- [Configuring S-GW Local Persistent Storage Traceoptions on page 191](#)
- [Configuring GTP Prime for Transferring CDRs on page 21](#)
- [Configuring Persistent Storage on page 23](#)
- [Configuring Transport Profiles for Offline Charging on page 27](#)

- [Configuring Charging Trigger Events for Offline Charging on page 30](#)
- [Configuring CDR Attributes on page 32](#)
- [Configuring Charging Profiles on page 35](#)
- [Configuring Charging Profiles for APNs on page 37](#)
- [Tracing Charging Operations on page 189](#)
- [Charging Data Records on page 7](#)

Configuring GTP Prime for Charging

To configure GPRS tunneling protocol (GTP) Prime to transfer Charging Data Records (CDRs), perform these tasks:

- [Configuring GTP Prime for Transferring CDRs on page 21](#)
- [Configuring GTP Prime Peers on page 22](#)

Configuring GTP Prime for Transferring CDRs

CDRs are transferred to a charging gateway using GTP Prime or logged to a Routing Engine hard disk and eventually retrieved by a charging gateway using FTP.

To configure global GTP Prime options to transfer CDRs:

1. Specify that you want to configure GTP Prime properties for the gateway called MBG1.

```
[edit]
user@host# edit unified-edge gateways ggsn-pgw MBG1 charging gtp
```

2. Specify the destination port number of the charging gateway function (CGF) server.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging gtp]
user@host# set destination-port port-number
```

3. Specify the source interface from which GTP Prime packets will be sent.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging gtp]
user@host# set source-interface interface-name <ipv4-address>
```

4. Specify the transport protocol.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging gtp]
user@host# set transport-protocol (udp | tcp)
```

5. Specify the GTP Prime version.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging gtp]
user@host# set version (v0 | v1 | v2)
```

6. Specify the GTP Prime header type.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging gtp]
user@host# set header-type (long | short)
```

7. Specify that path management is disabled. This option cannot be used with the echo request interval.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging gtp]  
user@host# set no-path-management
```

- Specify the GTP Prime echo request interval for path management.

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

- Specify the number of retries of GTP Prime messages upon timeout.

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

- Specify the response timeout value for the GTP Prime request message.

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

- Specify the time to wait before declaring a CGF as down.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging gtp]  
user@host# set down-detect-time seconds
```

- Specify the time after which to retry the connection to the CGF server.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging gtp]  
user@host# set reconnect-time seconds
```

- Specify the maximum number of Data Record Transfer (DRT) messages awaiting an acknowledgment.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging gtp]  
user@host# set pending-queue-size queue-size
```

Configuring GTP Prime Peers

CDRs are transferred to a charging gateway using GTP Prime. The charging gateway is the GTP Prime peer. The charging gateway peer inherits the global GTP Prime values. You configure the GTP Prime peer only if you want to override any of the global GTP Prime values.

To configure the GTP Prime peer to transfer CDRs:

- Specify the name of the CGF peer for which you are configuring GTP Prime properties. Use this peer name to configure the peer order in the transport profile.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging gtp]  
user@host# edit peer peer-name
```

- Specify the destination IPv4 address of the CGF peer.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging gtp peer peer-name]  
user@host# set destination-ipv4-address ip-address
```

- (Optional) Specify any of the global GTP Prime options that you want to override for this charging gateway.

Related Documentation

- [Configuring Offline Charging on page 15](#)
- [Configuring Transport Profiles for Offline Charging on page 27](#)

- [Offline Charging Overview on page 5](#)

Configuring Persistent Storage

You can store Charging Data Records (CDRs) locally on the Routing Engine hard disk. You must configure the persistent storage order in the transport profile before CDRs can be stored locally on the Routing Engine.

To configure local persistent storage for the CDRs, perform these tasks:

- [Configuring Local Persistent Storage on page 23](#)
- [Tracing Persistent Storage Operations on page 24](#)

Configuring Local Persistent Storage

To configure local persistent storage of the file containing the CDRs:

1. Specify that you want to configure local persistent storage.

```
[edit]
user@host# edit unified-edge gateways ggsn-pgw MBG1 charging
local-persistent-storage-options
```

2. Specify the file age, in minutes.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options]
user@host# set file-age value
```

3. Specify the file size, in MB.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options]
user@host# set file-size value
```

4. Specify the number of CDRs for each file.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options]
user@host# set cdrs-per-file value
```

5. Specify that CDR log files are not replicated to the standby Routing Engine.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options]
user@host# set disable-replication
```

6. Specify the user authorized to access the files.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options]
user@host# set user-name username
```

7. Specify that CDR log files can be accessed for reading by all users.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options]
user@host# set world-readable
```

8. Specify the private extension for the filename.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options]
user@host# set file-name-private-extension string
```

9. Specify whether the CDR file is shared across all nodes for a charging group or is unique to a charging group in each node.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options]
user@host# set file-creation-policy (unique-file | shared-file)
```

10. Configure the CDR file format as 3GPP 32 297 format or raw ASN.1 format.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options]
user@host# set file-format (3gpp | raw-asn)
```

11. Configure the disk policy for when the disk runs out of space. Specify the percentage and notification for the watermark levels. Notification can be to generate an SNMP alarm, a syslog, or both.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options]
user@host# set disk-space-policy watermark-level-1 (percentage) (syslog | snmp |
alarm)
user@host# set disk-space-policy watermark-level-2 (percentage) (syslog | snmp |
alarm)
user@host# set disk-space-policy watermark-level-3 (percentage) (syslog | snmp |
alarm)
```

Tracing Persistent Storage Operations

To configure tracing operations for local persistent storage:

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

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options]
user@host# edit traceoptions
```

2. (Optional) Configure the name for the file used for the trace output.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options
traceoptions]
user@host# set file filename
```

3. (Optional) Configure flags to filter the operations to be logged.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options
traceoptions]
user@host# set flag flag
```

By default, only important events are logged. You can specify which trace operations are logged by including specific tracing flags. The following table describes the flags that you can include.

Flag	Description
all	Trace all operations
connection	Trace connection establishment between the Routing Engine and all session DPCs for CDR file backup
file-operations	Trace file operations (open, write, close)
general	Trace miscellaneous operations

Flag	Description
journaling	Trace file journaling operations
mirror	Trace mirroring operations

4. (Optional) Configure the level of tracing.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging local-persistent-storage-options
traceoptions]
user@host# set level (all | critical | error | info | notice | verbose | warning)
```

Related Documentation

- [Configuring the Solid State Disk for Persistent Storage on page 25](#)
- [Configuring Offline Charging on page 15](#)
- [Configuring Transport Profiles for Offline Charging on page 27](#)
- [Offline Charging Overview on page 5](#)
- [Configuring S-GW-Specific Charging Parameters on page 17](#)
- [Configuring S-GW Global Charging Profiles and Selection Order on page 19](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)

Configuring the Solid State Disk for Persistent Storage

You can use the Solid State Disk (SSD) on the Routing Engine for local persistent storage. You must configure the SSD (part number SSD-CDR-S) before Charging Data Records (CDRs) can be stored locally on the Routing Engine.



NOTE: If you do not want to format the existing content on the SSD, you must specify the **no-format** option when preparing the SSD.

To use the SSD for local persistent storage of CDRs, perform these tasks:

- [Initializing the Solid State Disk for Persistent Storage on page 25](#)
- [Ejecting the Solid State Disk on page 26](#)
- [Installing the Solid State Disk on page 26](#)

Initializing the Solid State Disk for Persistent Storage

If the SSD on the Routing Engine is not plugged in before you start storing CDRs locally on the Routing Engine, you must initialize the SSD.

To initialize the SSD for local persistent storage when it has not been installed in the Routing Engine:

1. Power down the Routing Engine by pressing the Online/Offline button or entering the **shutdown -h now** command.
2. Install the SSD. For information about installing the SSD, see “Replacing an SSD Drive on an RE-A-1800 or RE-S-1800” in the Hardware Guide for your MX Series router.
3. Boot the Routing Engine.
4. Prepare the SSD to store CDRs.

```
user@host> request system storage unified-edge media prepare
```



NOTE: If you do not want to format the existing content on the SSD, you must specify the **no-format** option.

5. Enable the SSD to start storing CDRs.

```
user@host> request system storage unified-edge charging media start
```

Ejecting the Solid State Disk

To eject the SSD from the Routing Engine:

1. Disable the SSD to close all open files and stop storing CDRs.

```
user@host> request system storage unified-edge charging media stop
```

2. Prepare the SSD for removal from the Routing Engine.

```
user@host> request system storage unified-edge media eject
```

3. Remove the SSD from the Routing Engine. For information about removing the SSD, see “Replacing an SSD Drive on an RE-A-1800 or RE-S-1800” in the Hardware Guide for your MX Series router.

Installing the Solid State Disk

If the SSD on the Routing Engine is reinstalled on the Routing Engine after it was initialized, you must prepare the SSD to store CDRs.

To prepare the SSD for local persistent storage when it has been reinstalled on the Routing Engine:

1. Install the SSD. For information about installing the SSD, see “Replacing an SSD Drive on an RE-A-1800 or RE-S-1800” in the Hardware Guide for your MX Series router.
2. Prepare the SSD to store CDRs.

```
user@host> request system storage unified-edge media prepare
```



NOTE: If you do not want to format the existing content on the SSD, you must specify the **no-format** option.

3. Enable the SSD to start storing CDRs.

```
user@host> request system storage unified-edge charging media start
```

4. Reboot the Routing Engine.

Related Documentation

- [Configuring Persistent Storage on page 23](#)
- [request system storage unified-edge charging media start on page 153](#)
- [request system storage unified-edge charging media stop on page 154](#)
- [request system storage unified-edge media eject on page 155](#)
- [request system storage unified-edge media prepare on page 156](#)

Configuring Transport Profiles for Offline Charging

A transport profile provides information for transporting offline Charging Data Records (CDRs) and online messages. Offline CDRs are transported from the charging data function (CDF) to the charging gateways or to local persistent storage, and online messages are transported between the Gateway GPRS Support Node (GGSN) Packet Data Network Gateway (P-GW) and the Online Charging System (OCS). A transport profile can be associated with one or more charging profiles. You can configure a maximum of eight transport profiles.



NOTE: The following configuration steps are applicable at both the [edit unified-edge gateways ggsn-pgw *gateway-name* charging] and the [edit unified-edge gateways sgw *gateway-name* charging] hierarchy levels. However, for clarity, they are presented only at the [edit unified-edge gateways ggsn-pgw *gateway-name* charging] hierarchy level. Unless explicitly stated otherwise, the configuration steps can be used with exactly the same syntax under both hierarchy levels.

To configure transport profiles for offline charging:

1. Specify the name of the transport profile that you are configuring for the gateway called MBG1.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging]
user@host# edit transport-profiles profile-name
```

The transport profile name can contain letters, numbers, and hyphens (-) and can be up to 128 characters long.

2. Specify a description for the transport profile.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging transport-profiles profile-name]
user@host# set description string
```

3. Specify that you want to configure offline charging in the transport profile.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging transport-profiles profile-name]
user@host# edit offline
```

4. Configure the charging function name for offline charging, which is used to select the transport profile for offline charging.

If either the primary or secondary charging functions obtained from the policy and charging rules function (PCRF) match the one configured here, then the transport profile is selected. If the names provided by the PCRF do not match, then the transport profile is not selected and the default transport profile is used.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging transport-profiles
 transport-profile1 offline]
user@host# set charging-function-name function-name
```

5. Configure the transport parameters for offline CDRs.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging transport-profiles
 transport-profile1 offline]
user@host# edit charging-gateways
```

- a. Configure the order in which the charging gateways are selected. The charging gateway must be defined as a GTP Prime peer. The highest-priority peer is selected first as the active charging gateway. When the active charging gateway goes down, the next higher-priority peer is selected. If all the charging gateways are down and you have configured local persistent storage, then the CDRs are stored on the Routing Engine.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging transport-profiles
 transport-profile1 offline charging-gateways]
user@host# set peer-order peer charging-gateway-peer-name
```

- b. Specify the time that the CDF must wait before switching back to a higher-priority peer from a lower-priority peer that has become the active charging gateway.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging transport-profiles
 transport-profile1 offline charging-gateways]
user@host# set switch-back-time seconds
```

The range for the time that the CDF must wait before switching to a higher-priority peer is 0 through 300 seconds.

- c. Specify that the persistent storage order is local (on the Routing Engine). You must configure the persistent storage order before CDRs can be stored locally on the Routing Engine.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging transport-profiles
 transport-profile1 offline charging-gateways]
user@host# set persistent-storage-order local-storage
```

- d. Configure the CDR format version. The charging format implemented in the 3GPP Release 8 specifications (r8) is the default format version.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging transport-profiles
 transport-profile1 offline charging-gateways]
user@host# set cdr-release (r7 | r8 | r9 | r99)
```



NOTE: 3GPP release versions 7, 9, and 99 are only applicable to the GGSN and P-GW (not to the S-GW), while 3GPP release version 8 is applicable to the GGSN, P-GW, and S-GW.

- e. Specify the maximum number of CDRs that can be added to a Data Record Transfer (DRT) message before it is transmitted. A DRT message containing the CDRs is transmitted from the CDF to the charging gateway function (CGF) server, when the **cdr-aggregation-limit** or the **mtu** size is reached (whichever comes first).

```
[edit unified-edge gateways ggsn-pgw MBG1 charging transport-profiles
 transport-profile1 offline charging-gateways]
user@host# set cdr-aggregation-limit value
```

The range for the CDR aggregation limit is 1 through 16.

- f. Configure the maximum transmission unit (MTU), in bytes, of the DRT message.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging transport-profiles
 transport-profile1 offline charging-gateways]
user@host# set mtu value
```

The range for the MTU is 300 through 8000 bytes.

6. Specify the maximum number of containers to limit for each CDR.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging transport-profiles
 transport-profile1 offline]
user@host# set container-limit value
```

The range for the maximum number of containers for a CDR is 1 through 15.

7. Specify the number of SGSN or S-GW changes that can occur before the CDR is updated and closed.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging transport-profiles
 transport-profile1 offline]
user@host# set sgsn-sgw-change-limit value
```

The range for the maximum number of SGSN or S-GW changes that can occur is 1 through 5.



NOTE: This statement is not applicable to the Serving Gateway (S-GW).

Related Documentation

- [Charging Profiles on page 11](#)
- [Configuring Charging Profiles on page 35](#)
- [Configuring GTP Prime for Charging on page 21](#)
- [Configuring Offline Charging on page 15](#)
- [Configuring Persistent Storage on page 23](#)
- [Configuring S-GW-Specific Charging Parameters on page 17](#)
- [Configuring S-GW Global Charging Profiles and Selection Order on page 19](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)
- [offline \(Transport Profiles\) on page 100](#)
- [transport-profiles on page 129](#)

Configuring Charging Trigger Events for Offline Charging

A trigger profile defines the charging events that cause offline Charging Data Record (CDR) changes and attributes for online charging. For offline CDRs, a trigger profile determines the events that trigger the creation of a Charging Data Record (CDR), the addition of a container to a CDR, and the closure of a CDR. You can configure up to a maximum of 16 trigger profiles.



NOTE: The following configuration steps are applicable at both the [edit unified-edge gateways ggsn-pgw *gateway-name* charging] and the [edit unified-edge gateways sgw *gateway-name* charging] hierarchy levels. However, for clarity, they are presented only at the [edit unified-edge gateways ggsn-pgw *gateway-name* charging] hierarchy level. Unless explicitly stated otherwise, the configuration steps can be used with exactly the same syntax under both hierarchy levels.

To configure trigger profiles for offline charging:

1. Specify the name of the trigger profile that you are configuring for the gateway called MBG1.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging]
user@host# edit trigger-profiles profile-name
```

The trigger profile name can contain letters, numbers, and hyphens (-) and can be up to 128 characters long.

2. Specify a description for the trigger profile.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging trigger-profiles profile-name]
user@host# set description string
```

3. Configure the default charging method to be used for subscribers attached to the trigger profile. The broadband gateway uses the configured default charging method only when the policy and charging rules function (PCRF) or the static policy and charging enforcement function (PCEF) policy do not provide a charging method.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging trigger-profiles profile-name]
user@host# set charging-method (both | none | offline | online)
```

If you do not configure this statement, then offline charging is enabled by default.

4. Configure offline charging in the trigger profile.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging trigger-profiles profile-name]
user@host# edit offline
```

5. Specify a time limit for closing the CDR. A value of zero (0) disables this trigger.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging trigger-profiles profile-name
offline]
user@host# set time-limit seconds
```

The range for the activation of the time limit is 600 through 65,535 seconds.

6. Specify the PDP context or bearer information changes that do not trigger charging data updates. All of these changes trigger a container or CDR closure by default.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging trigger-profiles profile-name
  offline]
user@host# set exclude [bearer-information-change]
```

You can specify more than one trigger to exclude in a single line. For example, to exclude the PLMN change and QoS change (in a trigger profile called *trigger-profile-1*) from the CCR messages:

```
[edit unified-edge gateways ggsn-pgw MBG-PGW1 charging trigger-profiles
  trigger-profile-1 offline]
user@host# set exclude plmn-change qos-change
```

[Table 3 on page 31](#) describes the bearer information changes that can be ignored for charging data updates.

Table 3: Bearer Information Changes

Bearer Information Change	Description
dcca-events	Diameter Credit Control Application (DCCA) events NOTE: This trigger is applicable only to the Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW).
ms-timezone-change	Mobile Station (MS) time zone change
plmn-change	Public land mobile network (PLMN) change
qos-change	Quality-of-service (QoS) change
rat-change	Radio Access Technology (RAT) change
sgsn-mme-change	Serving GPRS Support Node (SGSN) or Mobility Management Entity (MME) change NOTE: This trigger is applicable only to the S-GW.
sgsn-sgw-change	SGSN or S-GW limit change NOTE: This trigger is applicable only to the GGSN or P-GW.
user-location-change	User location information change

7. Specify a volume limit trigger for bandwidth, in bytes.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging trigger-profiles profile-name
  offline]
user@host# set volume-limit value
```

The range for the volume limit is 1 through 4,294,967,295 bytes.

8. Specify the direction for the volume limit trigger. If you specify **both**, the volume limit applies to the combined amount of uplink and downlink traffic.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging trigger-profiles profile-name
offline]
user@host# set volume-limit direction (both | uplink)
```

9. Configure the list of times to update CDRs when the tariffs change within a day. These times can be specified in a minimum of 15-minute increments. Specify the tariff time changes in the format *hh:mm*, where *hh* is 00 through 23 (00 is midnight) and *mm* is 00 through 59. The specified time is local time. You can configure up to a maximum of 24 tariff time changes.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging trigger-profiles profile-name]
user@host# set tariff-time-list hh:mm
```

For example:

```
[edit unified-edge gateways ggsn-pgw MBG1 charging trigger-profiles profile-name
tariff-time-list]
user@host# set tariff-time-list 21:00
user@host# set tariff-time-list 07:00
```

Related Documentation

- [Charging Profiles on page 11](#)
- [Configuring Charging Profiles on page 35](#)
- [Configuring Offline Charging on page 15](#)
- [Configuring S-GW-Specific Charging Parameters on page 17](#)
- [Configuring S-GW Global Charging Profiles and Selection Order on page 19](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)
- [offline \(Trigger Profiles\) on page 101](#)
- [trigger-profiles \(GGSN or P-GW\)](#)
- [trigger-profiles \(Serving Gateway\) on page 134](#)

Configuring CDR Attributes

A Charging Data Record (CDR) profile defines the attributes in each CDR.

To configure CDR profiles:



NOTE: The following configuration steps are applicable at both the [edit unified-edge gateways ggsn-pgw *gateway-name* charging] and the [edit unified-edge gateways sgw *gateway-name* charging] hierarchy levels. However, for clarity, they are presented only at the [edit unified-edge gateways ggsn-pgw *gateway-name* charging] hierarchy level. Unless explicitly stated otherwise, the configuration steps can be used with exactly the same syntax under both hierarchy levels.

1. Specify the name of the CDR profile that you are configuring for the gateway called MBG1.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging]
user@host# edit cdr-profiles profile-name
```

The CDR profile name can contain letters, numbers, and hyphens (-) and can be up to 128 characters long.

2. Specify a description for the profile.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging cdr-profiles profile-name]
user@host# set description string
```

3. Enable reduced partial CDR (RPC) generation.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging cdr-profiles profile-name]
user@host# set enable-reduced-partial-cdrs
```

4. Set optional attributes to exclude from the CDR. You can specify the excluded attributes so that you can manage the size of the CDR. By default, all attributes are included in the CDR.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging cdr-profiles profile-name]
user@host# set exclude-attributes [attribute]
```

[Table 4 on page 33](#) describes the attributes that can be excluded from CDRs.

Table 4: Attribute Exclusions

Attribute	Information in CDRs
apn-ni	Access point name (APN) network identifier
apn-selection-mode	APN selection mode
cc-selection-mode	Charging characteristic selection mode
dynamic-address	Dynamic Packet Data Protocol (PDP) address indication
list-of-service-data	List of service data
list-of-traffic-volumes	List of traffic volumes

Table 4: Attribute Exclusions (*continued*)

Attribute	Information in CDRs
lrsn	Local record sequence number
ms-time-zone	Mobile station (MS) time zone
network-initiation	Network initiation flag
node-id	Node identifier
pdn-connection-id	Packet data network (PDN) connection ID
pdppdn-type	PDP or PDN type
pgw-plmn-identifier	P-GW public land mobile network (PLMN) identifier field
ps-furnish-info	PS Furnish Info (where PS stands for packet switched)
rat-type	Radio Access Technology (RAT) type
record-sequence-number	Record sequence number
served-imeisv	Served International Mobile Equipment Identity and Software Version Number (IMEISV)
served-msisdn	Served mobile station ISDN (MSISDN)
served-pdppdn-address	Served PDP context or IP-CAN bearer address
served-pdp-address-extension	Served PDP context or IP-CAN bearer address extension
serving-node-plmn-identifier	Serving node PLMN identifier field
start-time	Time when session established; added to first CDR
stop-time	Time when session terminated; added to last CDR
user-location-information	User location information

- Specify the format of the node identifier (ID) in the CDR. The node identifier indicates the node that generated the CDR.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging cdr-profiles profile-name]
user@host# set node-id hostname
```


**NOTE:**

- The node identifier can be configured as one of the following:
 - hostname—Hostname of the node that generated the CDR.
 - hostname-spic—Hostname of the node that generated the CDR and the ID of the services PIC on which the CDR was triggered, delimited by a colon (:).
 - ipaddress-spic—IP address of the node that generated the CDR and the ID of the services PIC on which the CDR was triggered, delimited by a colon (:).
- If you do not include the `node-id` statement, then the IP address of the node generating the CDR and the ID of the services PIC on which the CDR was triggered, with a colon (:) as a delimiter, are used as the node identifier.

6. Specify that the broadband gateway includes the requested access point name (APN) in the CDRs of subscribers attached to the CDR profile. Therefore, when the APN type is virtual, the broadband gateway includes the requested or virtual APN in the CDRs.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging cdr-profiles profile-name]
user@host# set report-requested-apn
```



NOTE: If you do not include the `report-requested-apn` statement, then, by default, the broadband gateway includes only the real APN in the CDR. (For virtual APNs, the real APN to which the virtual APN is mapped is included in the CDR.)

**Related
Documentation**

- [cdr-profiles on page 51](#)
- [Configuring Charging Profiles on page 35](#)
- [Configuring Offline Charging on page 15](#)
- [Charging Profiles on page 11](#)
- [Configuring S-GW-Specific Charging Parameters on page 17](#)
- [Configuring S-GW Global Charging Profiles and Selection Order on page 19](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)
- [Tracing Charging Operations on page 189](#)

Configuring Charging Profiles

A charging profile defines the charging behavior applied to a mobile subscriber. The charging profile includes a transport profile, a Charging Data Record (CDR) profile, one or more trigger profiles, and other default service-aware charging information.



NOTE: The following configuration steps are applicable at both the [edit unified-edge gateways ggsn-pgw *gateway-name* charging] and the [edit unified-edge gateways sgw *gateway-name* charging] hierarchy levels. However, for clarity, they are presented only at the [edit unified-edge gateways ggsn-pgw *gateway-name* charging] hierarchy level. Unless explicitly stated otherwise, the configuration steps can be used with exactly the same syntax under both hierarchy levels.

To configure charging profiles:

1. Specify the name of the charging profile that you are configuring for the gateway called MBG1.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging]
user@host# edit charging-profiles profile-name
```

The charging profile name can contain letters, numbers, and hyphens (-) and can be up to 128 characters long.

2. Specify a profile identifier that is matched against the GPRS tunneling protocol (GTP) charging characteristic or authentication, authorization, and accounting (AAA) charging profile number. The profile identifier must be specified and it must be a unique value across all charging profiles defined for a gateway.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging charging-profiles profile-name]
user@host# set profile-id profile-id
```

3. Specify the transport profile referenced by this charging profile. The transport profile must be specified and must be previously configured on the broadband gateway.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging charging-profiles profile-name]
user@host# set transport-profile profile-name
```

4. (Optional) Specify a description for the profile.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging charging-profiles profile-name]
user@host# set description string
```

5. (Optional) Specify the default rating group, which is used for charging service data containers. This configuration is not applicable for the S-GW.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging charging-profiles profile-name]
user@host# set default-rating-group integer
```

If no default rating group is specified, then **RG 0** is sent in the Credit Control Request (CCR) message.

6. (Optional) Specify the default service identifier for the service or the service component, which is used for charging service data containers. This configuration is not applicable for the S-GW.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging charging-profiles profile-name]
user@host# set default-service-id integer
```

If no default service identifier is specified, then **Service ID 0** is sent in the Credit Control Request (CCR) message.

- (Optional) Specify the CDR profile referenced by this charging profile. The CDR profile must be previously configured on the gateway.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging charging-profiles profile-name]
user@host# set cdr-profile profile-name
```

- (Optional) Specify one or more trigger profiles to be referenced by this charging profile. The trigger profiles must be previously configured on the gateway.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging charging-profiles profile-name]
user@host# set trigger-profile profile-name
```

- (Optional) Specify one or more rating group identifiers that should be associated with a trigger profile. The rating group is used to select the trigger profile to be associated with a charging profile. If the rating group identifier received by the broadband gateway matches the rating group identifier configured here, then the trigger profile with which the rating group identifier is associated is linked to the charging profile.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging charging-profiles profile-name
trigger-profile profile-name]
user@host# set rating-group [value]
```

Related Documentation

- [Configuring Offline Charging on page 15](#)
- [Configuring S-GW-Specific Charging Parameters on page 17](#)
- [Configuring S-GW Global Charging Profiles and Selection Order on page 19](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)
- [charging-profiles on page 62](#)
- [Charging Profiles on page 11](#)

Configuring Charging Profiles for APNs

You can configure charging profiles that apply to access point names (APNs) that are used for the default profile, home subscribers, roaming subscribers, and visiting subscribers.

To configure charging profiles for APNs:

- Specify that you want to configure charging profiles for a particular APN.

```
[edit]
user@host# edit unified-edge gateways ggsn-pgw MBG1 apn-services apns apn-name
charging
```

- Specify the name of the default charging profile. The charging profile must be defined.

```
[edit unified-edge gateways ggsn-pgw MBG1 apn-services apns apn-name charging]
user@host# set default-profile profile-name
```

- Specify the name of the charging profile for home subscribers roaming in other public land mobile networks (PLMNs). The charging profile must be defined.

```
[edit unified-edge gateways ggsn-pgw MBG1 apn-services apns apn-name charging]
user@host# set home-profile profile-name
```

4. Specify the name of the charging profile for roaming subscribers between PLMNs. The charging profile must be defined.

```
[edit unified-edge gateways ggsn-pgw MBG1 apn-services apns apn-name charging]
user@host# set roamer-profile profile-name
```

5. Specify the name of the charging profile for visiting subscribers from other PLMNs. The charging profile must be defined.

```
[edit unified-edge gateways ggsn-pgw MBG1 apn-services apns apn-name charging]
user@host# set visitor-profile profile-name
```

6. Specify the profile selection order. You can order the selections by the charging profile sent by the RADIUS server (radius), the charging profile sent by the SGSN or Serving Gateway (serving), or the locally configured charging profile (static).

```
[edit unified-edge gateways ggsn-pgw MBG1 apn-services apns apn-name charging]
user@host# set profile-selection-order [(serving | radius | static)]
```

**Related
Documentation**

- [Configuring Offline Charging on page 15](#)
- [Charging Profiles on page 11](#)
- [Configuring S-GW-Specific Charging Parameters on page 17](#)
- [Configuring S-GW Global Charging Profiles and Selection Order on page 19](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)

CHAPTER 4

Configuration Statements

- [\[edit unified-edge gateways sgw <gateway-name>\] Hierarchy Level on page 39](#)

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

```
sgw gateway-name {
  anchor-pfe-default-bearers-percentage default-bearers-percentage;
  anchor-pfe-guaranteed-bandwidth anchor-pfe-guaranteed-bandwidth;
  anchor-pfe-maximum-bearers maximum-bearers;
  call-rate-statistics {
    history history;
    interval interval;
  }
  charging {
    cdr-profiles profile-name {
      description string;
      enable-reduced-partial-cdrs;
      exclude-attributes {
        apn-ni;
        apn-selection-mode;
        cc-selection-mode;
        dynamic-address;
        list-of-service-data;
        list-of-traffic-volumes;
        lrsn;
        ms-time-zone;
        network-initiation;
        node-id;
        pdn-connection-id;
        pdppdn-type;
        pgw-address-used;
        pgw-plmn-identifier;
        ps-furnish-info;
        rat-type;
        record-sequence-number;
        served-imeisv;
        served-msisdn;
        served-pdppdn-address;
        served-pdp-address-extension;
        serving-node-plmn-identifier;
        sgw-change;
        start-time;
      }
    }
  }
}
```

```

    stop-time;
    user-location-information;
}
node-id (hostname | hostname-spic | ipaddress-spic);
report-requested-apn;
}
charging-profiles profile-name {
    cdr-profile profile-name;
    default-rating-group rg-num;
    default-service-id id-num;
    description string;
    profile-id id-num;
    service-mode maintenance;
    transport-profile profile-name;
    trigger-profile profile-name {
        rating-group [value];
    }
}
global-profile {
    default-profile default-profile;
    home-profile home-profile;
    profile-selection-order [profile-selection-method];
    roamer-profile roamer-profile;
    visitor-profile visitor-profile;
}
gtp {
    destination-port port-number;
    down-detect-time duration;
    echo-interval duration;
    header-type (long | short);
    n3-requests requests;
    no-path-management;
    pending-queue-size value;
    peer peer-name {
        destination-ipv4-address address;
        destination-port port-number;
        down-detect-time duration;
        echo-interval duration;
        header-type (long | short);
        n3-requests requests;
        no-path-management;
        pending-queue-size value;
        reconnect-time duration;
        source-interface interface-name [ipv4-address address];
        t3-response response-interval;
        transport-protocol (tcp | udp);
        version (v0 | v1 | v2);
    }
    reconnect-time duration;
    source-interface {
        interface-name;
        ipv4-address address;
    }
    t3-response response-interval;
    transport-protocol (tcp | udp);
    version (v0 | v1 | v2);
}

```

```

}
local-persistent-storage-options {
  cdrs-per-file value;
  disable-replication;
  disk-space-policy {
    watermark-level-1 {
      notification-level (both | snmp-alarm | syslog);
      percentage value;
    }
    watermark-level-2 {
      notification-level (both | snmp-alarm | syslog);
      percentage value;
    }
    watermark-level-3 {
      notification-level (both | snmp-alarm | syslog);
      percentage value;
    }
  }
}
file-age {
  age;
  disable;
}
file-creation-policy (shared-file | unique-file);
file-format (3gpp | raw-asn);
file-name-private-extension string;
file-size {
  size;
  disable;
}
traceoptions {
  file file-name <files number> <match regular-expression> <no-world-readable |
    world-readable> <size size>;
  flag flag;
  level (all | critical | error | info | notice | verbose | warning);
  no-remote-trace;
}
user-name string;
world-readable;
}
traceoptions {
  file {
    file-name;
    files number;
    size size
    (no-world-readable | world-readable);
  }
  flag flag;
  level (all | critical | error | info | notice | verbose | warning);
  no-remote-trace;
}
transport-profiles profile-name {
  description string;
  offline {
    charging-function-name function-name;{
    charging-gateways {
      cdr-aggregation-limit value;

```

```

    cdr-release (r7 | r8 | r9 | r99);
    mtu value;
    peer-order {
        [peer charging-gateway-peer-name];
    }
    persistent-storage-order {
        local-storage;
    }
    switch-back-time seconds;
}
container-limit value;
}
service-mode maintenance;
}
trigger-profiles profile-name {
    description string;
    offline {
        exclude {
            ms-timezone-change;
            plmn-change;
            qos-change;
            rat-change;
            sgsn-mme-change;
            user-location-change;
        }
        sgsn-mme-change-limit value;
        time-limit value;
        volume-limit {
            value;
            direction (both | uplink);
        }
    }
    tariff-time-list {
        tariff-time;
    }
}
}
gtp {
    control {
        ddn-delay-sync (disable | enable);
        dscp-code-point value;
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        forwarding-class class-name;
        interface {
            interface-name;
            v4-address v4-address;
        }
        n3-requests requests;
        no-response-cache;
        path-management (disable | enable);
        response-cache-timeout interval-in-seconds;
        t3-response response-interval;
        ttl-value ttl-value;
    }
}

```



```

data {
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    error-indication-interval seconds;
    indirect-tunnel (disable | enable);
    interface {
        interface-name;
        v4-address v4-address;
    }
    num-gtpu-end-markers num-gtpu-end-markers;
    path-management (disable | enable);
}
echo-interval interval;
echo-n3-requests requests;
echo-t3-response response-interval;
interface {
    interface-name;
    v4-address v4-address;
}
n3-requests requests;
path-management (disable | enable);
peer-history number;
s11 {
    dscp-code-point value;
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    forwarding-class class-name;
    interface {
        interface-name;
        v4-address v4-address;
    }
    n3-requests requests;
    path-management (disable | enable);
    t3-response response-interval;
    ttl-value ttl-value;
}
s12 {
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    interface {
        interface-name;
        v4-address v4-address;
    }
    path-management (disable | enable);
}
s1u {
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    interface {
        interface-name;
        v4-address v4-address;
    }
}

```

```
    path-management (disable | enable);
}
s4 {
  control {
    dscp-code-point value;
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    forwarding-class class-name;
    interface {
      interface-name;
      v4-address v4-address;
    }
    n3-requests requests;
    path-management (disable | enable);
    t3-response response-interval;
    ttl-value ttl-value;
  }
  data {
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    interface {
      interface-name;
      v4-address v4-address;
    }
    path-management (disable | enable);
  }
  echo-interval interval;
  echo-n3-requests requests;
  echo-t3-response response-interval;
  interface {
    interface-name;
    v4-address v4-address;
  }
  n3-requests requests;
  path-management (disable | enable);
  t3-response response-interval;
}
s5 {
  control {
    dscp-code-point value;
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    forwarding-class class-name;
    interface {
      interface-name;
      v4-address v4-address;
    }
    n3-requests requests;
    path-management (disable | enable);
    t3-response response-interval;
    ttl-value ttl-value;
  }
  data {
```

```

    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    interface {
        interface-name;
        v4-address v4-address;
    }
    path-management (disable | enable);
}
echo-interval interval;
echo-n3-requests requests;
echo-t3-response response-interval;
interface {
    interface-name;
    v4-address v4-address;
}
n3-requests requests;
path-management (disable | enable);
t3-response response-interval;
}
s8 {
    control {
        dscp-code-point value;
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        forwarding-class class-name;
        interface {
            interface-name;
            v4-address v4-address;
        }
        n3-requests requests;
        path-management (disable | enable);
        t3-response response-interval;
        ttl-value ttl-value;
    }
    data {
        echo-interval interval;
        echo-n3-requests requests;
        echo-t3-response response-interval;
        interface {
            interface-name;
            v4-address v4-address;
        }
        path-management (disable | enable);
    }
    echo-interval interval;
    echo-n3-requests requests;
    echo-t3-response response-interval;
    interface {
        interface-name;
        v4-address v4-address;
    }
    n3-requests requests;
    path-management (disable | enable);
    t3-response response-interval;
}

```

```
}
t3-response response-interval;
traceoptions {
  file filename {
    files files;
    (no-world-readable | world-readable);
    size size;
  }
  flag {
    flag;
  }
  level level;
  no-remote-trace;
}
}
home-plmn {
  [mcc mcc mnc mnc];
}
idle-mode-buffering {
  disable;
  expire-timer time-in-seconds;
}
inline-services {
  ip-reassembly {
    service-set {
      service-set-name;
    }
  }
}
}
ip-reassembly-profile {
  profile-name;
}
local-policy-profile local-policy-profile;
maximum-bearers maximum-bearers;
preemption {
  enable;
}
remote-delete-on-peer-fail;
service-mode
software-datapath {
  traceoptions {
    file filename {
      files files;
      match match;
      size size;
      (no-world-readable | world-readable);
    }
    flag {
      flag;
    }
    level level;
    no-remote-trace;
  }
}
}
system {
  pfes {
```

```
    [interface interface-name];  
  }  
  session-pics {  
    [interface interface-name];  
  }  
}  
traceoptions {  
  file filename {  
    files files;  
    match match;  
    (no-world-readable | world-readable);  
    size size;  
  }  
  flag {  
    flag;  
  }  
  level level;  
  no-remote-trace;  
}  
}
```


**Related
Documentation**

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

cdr-aggregation-limit

Syntax	<code>cdr-aggregation-limit value;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways], [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the maximum number of Charging Data Records (CDRs) that can be added to a Data Record Transfer (DRT) message before it is transmitted.</p> <p>A DRT message containing the CDRs is transmitted from the charging data function (CDF) to the charging gateway function (CGF) server, when the cdr-aggregation-limit or the mtu size is reached (whichever comes first). For efficient transmissions of DRT messages, you may want to set the cdr-aggregation-limit to the maximum value of 16.</p>
Options	<p>value—Number of CDRs that can be added to a DRT message.</p> <p>Range: 1 through 16</p> <p>Default: 5</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">• charging-gateways (Transport Profiles—Offline) on page 61• Configuring Transport Profiles for Offline Charging on page 27• Configuring Offline Charging on page 15

cdr-profile (Charging Profiles)

Syntax	<code>cdr-profile <i>profile-name</i>;</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Associate a previously configured Charging Data Record (CDR) profile with a charging profile.</p> <p>When a subscriber session is created, the subscriber is bound to a charging profile and the CDR profile configuration associated with this profile determines the information (fields) that is included in the CDRs, which are used for billing.</p> <p>Any modification to the existing configuration of this attribute must be done only when the charging profile with which it is associated is under active maintenance mode. Use one of the following commands, as applicable, to bring the charging profile under maintenance mode:</p> <ul style="list-style-type: none"> For the Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW)—<code>set unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i> service-mode maintenance</code> For the Serving Gateway (S-GW)—<code>set unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i> service-mode maintenance</code>
	<div>  <p>TIP: If the profile is not already defined, use the one of the following commands, as applicable, to define a new CDR profile:</p> <ul style="list-style-type: none"> GGSN or P-GW—<code>set unified-edge gateways ggsn-pgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i></code> S-GW—<code>set unified-edge gateways sgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i></code> </div>
Options	<i>profile-name</i> —Name of the CDR profile to be associated with the charging profile.
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"> cdr-profiles on page 51 charging-profiles on page 62

- [Charging Profiles on page 11](#)
- [Configuring Charging Profiles on page 35](#)

cdr-profiles

Syntax `cdr-profiles profile-name {
 description string;
 enable-reduced-partial-cdrs;
 exclude-attributes {
 apn-ni;
 apn-selection-mode;
 cc-selection-mode;
 dynamic-address;
 list-of-service-data;
 list-of-traffic-volumes;
 lrsn;
 ms-time-zone;
 network-initiation;
 node-id;
 pdn-connection-id;
 pdppdn-type;
 pgw-address-used; # S-GW only
 pgw-plmn-identifier;
 ps-furnish-info;
 rat-type;
 record-sequence-number;
 served-imeisv;
 served-msisdn;
 served-pdppdn-address;
 served-pdp-address-extension;
 serving-node-plmn-identifier;
 sgw-change; # S-GW only
 start-time;
 stop-time;
 user-location-information;
 }
 node-id (hostname | hostname-spic | ipaddress-spic);
 report-requested-apn;
 }`

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

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

Description Configure a Charging Data Record (CDR) profile. The configuration in the CDR profile determines the content or the information that is included in a CDR, which are used for billing.

By default, the Juniper Charging Service (J-CS) module adds all the required fields mandated by the Third-Generation Partnership Project (3GPP) standards to the CDR. However, you can exclude the provisional fields information from the CDR by configuring a CDR profile.

The broadband gateway supports a maximum of 255 CDR profiles.

Options *profile-name*—Name of the CDR profile.

Range: 1 through 128 bytes

The remaining statements are explained separately.

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

Related Documentation	<ul style="list-style-type: none">• charging (GGSN or P-GW)• charging (Serving Gateway) on page 55• Configuring CDR Attributes on page 32• Configuring Offline Charging on page 15
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cdr-release

Syntax	<code>cdr-release (r7 r8 r9 r99);</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways], [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways] hierarchy level introduced in Junos OS Mobility Release 11.4W. r9 attribute introduced in Junos OS Mobility Release 12.1W.
Description	The encoding of the Charging Data Record (CDR) is compliant with the 3GPP technical specification release version that is configured using the statement. The supported versions are 3GPP release versions 7, 8, and 99.




NOTE: 3GPP release versions 7, 9 and 99 are only applicable to the GGSN and P-GW (not to the S-GW), while 3GPP release version 8 is applicable to the GGSN, P-GW, and S-GW.

For 3GPP release version 7 CDRs, the decision on whether the CDR generated is a GGSN CDR (G-CDR) or an evolved G-CDR (eG-CDR) is based on whether a policy and charging enforcement function (PCEF) profile is configured for the access point name (APN) or the charging method for the trigger profile is configured as online.

Options	r7 —3GPP release version, 7. r8 —3GPP release version, 8. r9 —3GPP release version, 9. r99 —3GPP release version, 99. Default: r8
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"> • charging-gateways (Transport Profiles—Offline) on page 61 • Configuring Offline Charging on page 15 • Configuring Transport Profiles for Offline Charging on page 27

cdrs-per-file

Syntax	<code>cdrs-per-file value;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw gateway-name charging local-persistent-storage-options], [edit unified-edge gateways sgw gateway-name charging local-persistent-storage-options]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw gateway-name charging local-persistent-storage-options] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the maximum number of Charging Data Records (CDRs) that can be added to a file after which the temporary CDR log file is closed and moved to a final location within the same disk (<code>/opt/mobility/charging/ggsn/final_log</code>), from where it can be transferred using SSH FTP (SFTP). Files transferred from the final location should be deleted from the local Routing Engine disk after the transfer. Only authorized users can transfer and delete the files (after the transfer).</p> <p>However, any one of the following conditions must be met (whichever comes first) before the files are moved from the temporary location to the final location:</p> <ul style="list-style-type: none"> • Number of CDRs per file reaches the configured or default limit. • Size of the file reaches the configured or default limit. • Age of the file reaches the configured or default limit.
	<div>  <p>NOTE: The default limit is applicable only if you have not configured any value.</p> </div>
Options	<p>value—Maximum number of CDRs that can be added to a file after which it is closed and moved to a location within the Routing Engine disk, from where it can be transferred using SFTP.</p> <p>Range: 5000 through 1,000,000</p> <p>Default: 0, which indicates that there is no trigger for the CDR count per file.</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"> • local-persistent-storage-options on page 94 • Configuring Persistent Storage on page 23 • Configuring Offline Charging on page 15

charging (Serving Gateway)

```
Syntax  charging {
    cdr-profiles profile-name {
        description string;
        enable-reduced-partial-cdrs;
        exclude-attributes {
            apn-ni;
            apn-selection-mode;
            cc-selection-mode;
            dynamic-address;
            list-of-service-data;
            list-of-traffic-volumes;
            lrsn;
            ms-time-zone;
            network-initiation;
            node-id;
            pdn-connection-id;
            pdppdn-type;
            pgw-address-used;
            pgw-plmn-identifier;
            ps-furnish-info;
            rat-type;
            record-sequence-number;
            served-imeisv;
            served-msisdn;
            served-pdppdn-address;
            served-pdp-address-extension;
            serving-node-plmn-identifier;
            sgw-change;
            start-time;
            stop-time;
            user-location-information;
        }
        node-id (hostname | hostname-spic | ipaddress-spic);
        report-requested-apn;
    }
    charging-profiles profile-name {
        cdr-profile profile-name;
        default-rating-group rg-num;
        default-service-id id-num;
        description string;
        profile-id id-num;
        service-mode maintenance;
        transport-profile profile-name;
        trigger-profile profile-name {
            rating-group [value];
        }
    }
    global-profile {
        default-profile default-profile;
        home-profile home-profile;
        profile-selection-order [profile-selection-method];
        roamer-profile roamer-profile;
    }
}
```

```

    visitor-profile visitor-profile;
}
gtp {
    destination-port port-number;
    down-detect-time duration;
    echo-interval duration;
    header-type (long | short);
    n3-requests requests;
    no-path-management;
    pending-queue-size value;
    peer peer-name {
        destination-ipv4-address address;
        destination-port port-number;
        down-detect-time duration;
        echo-interval duration;
        header-type (long | short);
        n3-requests requests;
        no-path-management;
        pending-queue-size value;
        reconnect-time duration;
        source-interface interface-name [ipv4-address address];
        t3-response response-interval;
        transport-protocol (tcp | udp);
        version (v0 | v1 | v2);
    }
    reconnect-time duration;
    source-interface {
        interface-name;
        ipv4-address address;
    }
    t3-response response-interval;
    transport-protocol (tcp | udp);
    version (v0 | v1 | v2);
}
local-persistent-storage-options {
    cdrs-per-file value;
    disable-replication;
    disk-space-policy {
        watermark-level-1 {
            notification-level (both | snmp-alarm | syslog);
            percentage value;
        }
        watermark-level-2 {
            notification-level (both | snmp-alarm | syslog);
            percentage value;
        }
        watermark-level-3 {
            notification-level (both | snmp-alarm | syslog);
            percentage value;
        }
    }
}
file-age {
    age;
    disable;
}
file-creation-policy (shared-file | unique-file);

```

```

file-format (3gpp | raw-asn);
file-name-private-extension string;
file-size {
    size;
    disable;
}
traceoptions {
    file file-name <files number> <match regular-expression> <no-world-readable |
    world-readable> <size size>;
    flag flag;
    level (all | critical | error | info | notice | verbose | warning);
    no-remote-trace;
}
user-name string;
world-readable;
}
traceoptions {
    file {
        file-name;
        files number;
        size size
        (no-world-readable | world-readable);
    }
    flag flag;
    level (all | critical | error | info | notice | verbose | warning);
    no-remote-trace;
}
transport-profiles profile-name {
    description string;
    offline {
        charging-function-name function-name;{
        charging-gateways {
            cdr-aggregation-limit value;
            cdr-release (r7 | r8 | r9 | r99);
            mtu value;
            peer-order {
                [peer charging-gateway-peer-name];
            }
            persistent-storage-order {
                local-storage;
            }
            switch-back-time seconds;
        }
        container-limit value;
    }
    service-mode maintenance;
}
trigger-profiles profile-name {
    description string;
    offline {
        exclude {
            ms-timezone-change;
            plmn-change;
            qos-change;
            rat-change;
            sgsn-mme-change;

```

```
        user-location-change;
    }
    sgsn-mme-change-limit value;
    time-limit value;
    volume-limit {
        value;
        direction (both | uplink);
    }
}
tariff-time-list {
    tariff-time;
}
}
```

Hierarchy Level	[edit unified-edge gateways sgw <i>gateway-name</i>]
Release Information	Statement introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the charging parameters for subscribers Serving Gateway (S-GW).</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">• Charging Overview on page 3• Charging Data Records on page 7• Charging Profiles on page 11• Configuring Offline Charging on page 15• Configuring S-GW-Specific Charging Parameters on page 17• Offline Charging Overview on page 5• [edit unified-edge gateways sgw <gateway-name>] Hierarchy Level on page 39

charging-function-name (Transport Profiles)

Syntax	<code>charging-function-name <i>function-name</i>;</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline],</p> <p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> online]</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline]</p>
Release Information	Statement introduced in Junos OS Mobility Release 12.1W.
Description	<p>Configure the charging function name, which is used to select the transport profile for offline and online charging. If either the primary or secondary charging functions obtained from the policy and charging rules function (PCRF) match the one configured here, then the transport profile is selected.</p> <p>The following conditions are applicable to the charging-function-name statement:</p> <ul style="list-style-type: none"> • The charging function name is a strings configured by the operator and is used as a matching criteria. • Configuring the charging function name is not mandatory for offline or online transport profiles. • The charging function names provided by the PCRF must match the one configured for the transport profile. If the names provided by the PCRF do not match, then the transport profile is not selected and the default transport profile is used. <p>For example, assume that you configure the charging function names for both offline and online, that is, you configure two charging function names. The transport profile is selected only if both names configured on the gateway match the corresponding ones provided by the PCRF.</p> <p>The charging function name is referred by the PCRF in the Credit Control Request (CCR) and Credit Control Acknowledgment (CCA) messages exchanged over the Gx interface.</p> <p>Offline Charging Data Records (CDRs) are transported from the charging data function (CDF) to the offline charging gateway based on the transport profile selected. Online charging messages are transported between the Packet Data Network Gateway (P-GW) and the Online Charging System (OCS) based on the transport profile selected.</p> <p>The remaining statements are explained separately.</p>
Default	If you do not include this statement, then the gateway uses the default transport profile.
Options	<p><i>function-name</i>—Name of the charging function name.</p> <p>Range: Up to 256 characters</p>

Required Privilege	unified-edge—To view this statement in the configuration.
Level	unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Transport Profiles for Offline Charging on page 27• Configuring Transport Profiles for Online Charging• offline (Transport Profiles) on page 100• online (Transport Profiles)

charging-gateways (Transport Profiles—Offline)

Syntax	<pre> charging-gateways { cdr-aggregation-limit value; cdr-release (r7 r8 r9 r99); mtu value; peer-order { [peer charging-gateway-peer-name]; } persistent-storage-order { local-storage; } switch-back-time seconds; } </pre>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure a group of GTP Prime peers, the local Routing Engine disk, or both for Charging Data Record (CDR) file storage. In addition, you can configure the following:</p> <ul style="list-style-type: none"> • The maximum number of CDRs that can be added to a Data Record Transfer (DRT) message. • The maximum transmission unit of a DRT message. • The generated CDRs to be compliant with a specific 3GPP release. • The duration that the charging data function (CDF) waits before transmitting the CDRs to a peer that has recently come up and that has the highest priority among all the peers, which are alive. <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Offline Charging on page 15 • Configuring Transport Profiles for Offline Charging on page 27 • offline (Transport Profiles) on page 100

charging-profiles

Syntax	<pre>charging-profiles <i>profile-name</i> { <i>cdr-profile profile-name</i>; <i>default-rating-group rg-num</i>; <i>default-service-id id-num</i>; <i>description string</i>; <i>profile-id id-num</i>; <i>service-mode maintenance</i>; <i>transport-profile profile-name</i>; <i>trigger-profile profile-name</i> { <i>rating-group [value]</i>; } }</pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging], [edit unified-edge gateways sgw <i>gateway-name</i> charging]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure a charging profile. The charging profile determines the overall charging configuration for a subscriber, such as the data collected in a Charging Data Record (CDR), the events that generate the CDR, where the CDR is stored, and so on for that subscriber.</p> <p>You can configure up to a maximum of 255 charging profiles.</p>
Options	<p><i>profile-name</i>—Name of the charging profile.</p> <p>Range: 1 through 128 bytes</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">charging (GGSN or P-GW)charging (Serving Gateway) on page 55Charging Profiles on page 11Configuring Charging Profiles on page 35

container-limit

Syntax	<code>container-limit <i>value</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline], [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline]
Release Information	Statement introduced in Junos OS Mobility Release 12.1W.
Description	Configure the maximum number of containers that can be added to a Charging Data Record (CDR). When the limit is reached, the CDR is closed.
Options	value —Maximum number of containers. Range: 1 through 15 Default: 5
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"> • offline (Transport Profiles) on page 100 • Configuring Transport Profiles for Offline Charging on page 27 • Configuring Offline Charging on page 15

default-profile

Syntax	<code>default-profile <i>default-profile</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> apn-services apns <i>name</i> charging], [edit unified-edge gateways sgw <i>gateway-name</i> charging global-profile]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging global-profile] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Specify the default profile. If the profile-selection-order configuration indicates static , and if the corresponding charging profile applicable to the type of subscriber (home, visitor, or roamer) has not been specified, then the default profile is applied.




NOTE: The charging profile must already be configured on the broadband gateway.


The broadband gateway determines the type of subscriber by using the mobile country code (MCC) and the mobile network code (MNC) values in the Create Session Request message from the subscriber's user equipment (UE) and compares these with the corresponding values configured for the home public land mobile network (HPLMN). Depending on whether a subscriber is a home subscriber, a visitor, or a roamer, the **home-profile**, **visited-profile**, or **roamer-profile** is applied. If the applicable profile is not configured, then the **default-profile**, if configured, is applied. If the **default-profile** is also not configured, then the subscriber session is created with no charging applied.

Options	<i>default-profile</i> —Name of the default profile.
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 Charging, Local Policy, and Policy and Charging Enforcement Function Profiles on a Broadband Gateway APN Configuring S-GW Global Charging Profiles and Selection Order on page 19 charging (APN) charging-profiles on page 62 global-profile (Serving Gateway) on page 90

default-rating-group

Syntax	<code>default-rating-group <i>rg-num</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-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> charging charging-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Specify a default rating group to be used for charging service data containers. The rating group represents a collection of services.
<div>  <p>NOTE: This configuration is not applicable for the Serving Gateway (S-GW).</p> </div>	
Options	<i>rg-num</i> —Default rating group to be used for charging.
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"> • charging-profiles on page 62 • Charging Profiles on page 11 • Configuring Charging Profiles on page 35

default-service-id

Syntax	default-service-id <i>id-num</i> ;
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-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> charging charging-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Specify the default service identifier to be used for charging service data containers. This ID is used to identify the service or the service component.
<div> NOTE: This configuration is not applicable for the Serving Gateway (S-GW).</div>	
Options	<i>id-num</i> —Default service identifier to be used for charging.
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">• charging-profiles on page 62• Charging Profiles on page 11• Configuring Charging Profiles on page 35

description (Charging-Related Profiles)

Syntax	<code>description <i>string</i>;</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i>],</p> <p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>],</p> <p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i>],</p> <p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i>], and [edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i>] hierarchy levels introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Enter a description for the Charging Data Record (CDR) profile, charging profile, transport profile, or trigger profile. The description can be used to indicate the purpose of the profile. For example, you might have a description to differentiate the default profile from other profiles, as follows: This is the default profile to be used when a subscriber cannot be categorized into any other profile.</p>
Options	<p><i>string</i>—Description of the profile.</p> <p>Range: Up to 255 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"> • cdr-profiles on page 51 • charging-profiles on page 62 • transport-profiles on page 129 • trigger-profiles (GGSN or P-GW) • trigger-profiles (Serving Gateway) on page 134

destination-ipv4-address (GTP Prime)

Syntax	<code>destination-ipv4-address <i>address</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-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> charging gtp peer <i>peer-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Configure the charging gateway function (CGF) server's (GTP Prime peer's) IPv4 address, to which the Charging Data Records (CDRs) are sent as GTP Prime messages from the charging gateway function (CGF). This is a mandatory configuration.
Options	<i>address</i> —IPv4 address of the CGF server.
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">• peer (GTP Prime) on page 102• Configuring GTP Prime Peers on page 22• Configuring GTP Prime for Charging on page 21

destination-port (GTP Prime)

Syntax	<code>destination-port <i>port-number</i>;</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp],</p> <p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp] and [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>] hierarchy levels introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the TCP or UDP port on which the charging gateway function (CGF) server listens to the GTP Prime messages sent from the charging data function (CDF).</p> <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</p>
Options	<p><i>port-number</i>—TCP or UDP port on which the CGF server listens to the GTP Prime messages sent from the CDF.</p> <p>Range: 1 through 65535</p> <p>Default: 3386</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"> • gtp on page 91 • peer (GTP Prime) on page 102 • Configuring GTP Prime Peers on page 22 • Configuring GTP Prime for Charging on page 21

direction (Trigger Profiles)

Syntax	<code>direction (both uplink);</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline volume-limit], [edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline volume-limit]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline volume-limit] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Specify whether the maximum volume of data transmitted includes the data transmitted in both the uplink and downlink directions, or only in the uplink direction.</p> <p>When the configured volume limit is reached, the CDR is updated with the transmitted uplink and downlink bytes and is closed.</p> <p>Any change to the existing configuration does not affect a previously established session. The updated configuration applies only to new sessions.</p>
Default	If you do not configure the direction statement, then the configured volume limit includes the total volume of data transmitted in both uplink and downlink directions.
Options	<p>both—The configured volume limit must include the total volume of data transmitted in both uplink and downlink directions.</p> <p>uplink—The configured volume limit must include the volume of data transmitted only in the uplink direction.</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">• volume-limit on page 138• Configuring Charging Trigger Events for Offline Charging on page 30• Configuring Offline Charging on page 15

disable-replication

Syntax	disable-replication;
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging local-persistent-storage-options], [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Specify that Charging Data Records (CDRs) stored on the Routing Engine disk should <i>not</i> be replicated to the standby Routing Engine. Typically, the CDRs stored on Routing Engine disk are replicated to the standby Routing Engine, as a backup. By default, replication is enabled.
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"> • local-persistent-storage-options on page 94 • Configuring Persistent Storage on page 23 • Configuring Offline Charging on page 15

disk-space-policy

Syntax	<pre>disk-space-policy { watermark-level-1 { notification-level (both snmp-alarm syslog); percentage <i>value</i>; } watermark-level-2 { notification-level (both snmp-alarm syslog); percentage <i>value</i>; } watermark-level-3 { notification-level (both snmp-alarm syslog); percentage <i>value</i>; } }</pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging local-persistent-storage-options], [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>When you use the Routing Engine disk to store Charging Data Records (CDRs), you may want to monitor and raise alerts if the disk space falls below a configured threshold level, which enables you to take appropriate measures to prevent the loss of CDR data.</p> <p>Use the statements within this hierarchy to configure the percentage of disk space you want to allocate for storage, and raise alerts when the limit is reached.</p> <p>You can configure up to a maximum of three threshold levels.</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">• local-persistent-storage-options on page 94• Configuring Persistent Storage on page 23• Configuring Offline Charging on page 15

down-detect-time (GTP Prime)

Syntax	<code>down-detect-time <i>duration</i>;</code>
Hierarchy Level	<code>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp],</code> <code>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>],</code> <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp],</code> <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>]</code>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp]</code> and <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>]</code> hierarchy levels introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the duration for which the charging data function (CDF) must wait for a response from the charging gateway function (CGF) server after the expiry of an $n3 * t3$ cycle, after which the server's status is marked Down. The CDF then sends the GTP Prime messages to the next configured CGF server in the corresponding transport profile.</p> <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</p>
Options	<p><i>duration</i>—Duration the CDF waits after the $n3 * t3$ cycle expiry before declaring a GTP Prime peer as Down. The CDF then sends the GTP Prime messages to the next configured GTP Prime peer in the corresponding transport profile.</p> <p>Range: 0 through 255 seconds</p> <p>Default: 10 seconds</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • gtp on page 91 • peer (GTP Prime) on page 102 • Configuring GTP Prime Peers on page 22 • Configuring GTP Prime for Charging on page 21 • Configuring Offline Charging on page 15


echo-interval (GTP Prime)

Syntax	<code>echo-interval <i>duration</i>;</code>
Hierarchy Level	<code>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp],</code> <code>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>],</code> <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp],</code> <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>]</code>
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp]</code> and <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>]</code> hierarchy levels introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the number of seconds that the charging data function (CDF) must wait before sending an echo request message to the charging gateway function (CGF) server.</p> <p>Echo messages are:</p> <ul style="list-style-type: none">• Sent only for UDP connections.• Not sent more than once in a minute. <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</p>
Options	<p><i>duration</i>—Number of seconds that the CDF waits before sending an echo request message to the CGF server.</p> <p>Range: 60 through 255 seconds</p> <p>Default: 60 seconds</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• gtp on page 91• peer (GTP Prime) on page 102• Configuring GTP Prime Peers on page 22• Configuring GTP Prime for Charging on page 21• Configuring Offline Charging on page 15

enable-reduced-partial-cdrs

Syntax	enable-reduced-partial-cdrs;
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging cdr-profiles <i>profile-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> charging cdr-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Enable the generation of reduced partial Charging Data Records (CDRs). Reduced Partial CDRs (RPCs) contain mandatory fields as well as information regarding changes in the session parameters relative to the previous CDR. For example, if the user equipment location has not changed, then this information is excluded from the RPC because this information has not changed from the previous CDR.
Default	If this statement is not configured, the generation of fully qualified partial CDRs (FQPCs) is supported. FQPCs contains all the mandatory and conditional fields, as well as those fields that the public land mobile network (PLMN) operator has provisioned to be included in the CDR.
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"> • cdr-profiles on page 51 • Configuring CDR Attributes on page 32 • Configuring Offline Charging on page 15

exclude (Trigger Profiles—Offline)

Syntax	<pre>exclude { dcca-events; # P-GW only ms-timezone-change; plmn-change; qos-change; rat-change; sgsn-mme-change; #S-GW only sgsn-sgw-change; #P-GW only user-location-change; }</pre>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline] hierarchy level and the sgsn-mme-change option introduced in Junos OS Mobility Release 11.4W.</p> <p>dcca-events option introduced in Junos OS Mobility Release 12.1W.</p>
Description	<p>Certain signal message updates to the packet data protocol (PDP) context or bearer trigger charging updates. However, using the statements in this hierarchy, you can choose not to record these updates in the Charging Data Record (CDR).</p> <p>For example, a quality-of-service (QoS) change results in a container being added to the CDR. However, the container is not added if you configure to ignore this change, using one of the following commands, as applicable:</p> <ul style="list-style-type: none"> set unified-edge gateways ggsn-pgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> exclude qos-change for the Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW). set unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> exclude qos-change for the Serving Gateway (S-GW).
Options	<p> NOTE: The following options are applicable to both GGSN or P-GW and S-GW CDRs unless otherwise specified.</p> <ul style="list-style-type: none"> dcca-events—(GGSN or P-GW only) If configured, excludes the generation of the offline container when Diameter Credit Control Application (DCCA) events occur. Examples of DCCA events include quota exhaustion, threshold being reached, and so on. ms-timezone-change—If configured, excludes charging data updates to the CDR when there is a change in the MS time zone. Otherwise, when an MS time zone change occurs, the CDR is updated with the charging information and is closed.

- **plmn-change**—If configured, excludes charging data updates to the CDR when there is a PLMN change. Otherwise, when a public land mobile network (PLMN) change occurs, the CDR is updated with the charging information and is closed.
- **qos-change**—If configured, excludes charging data updates to the CDR when there is a QoS change. Otherwise, a container is added to the CDR when there is a QoS change.
- **rat-change**—If configured, excludes charging data updates to the CDR when there is a Radio Access Technology (RAT) change. Otherwise, when a RAT change occurs, the CDR is updated with the charging information and is closed.
- **sgsn-mme-change**—(S-GW only) If configured, excludes charging data updates to the CDR when the SGSN or Mobility Management Entity (MME) changes reach the maximum configured limit (determined by the value set for the **sgsn-mme-change-limit** parameter). Otherwise, when the SGSN or MME changes reach the maximum configured limit, the CDR is updated and closed.
- **sgsn-sgw-change**—(GGSN or P-GW only) If configured, excludes charging data updates to the CDR when the SGSN or S-GW changes reach the maximum configuration limit (determined by the value set for the **sgsn-sgw-change-limit** parameter). Otherwise, when the SGSN or S-GW changes reach the maximum configured limit, the CDR is updated and closed.
- **user-location-change**—If configured, excludes charging data updates to the CDR when there is a change in user location. Otherwise, when a change in the user location information (such as E-UTRAN cell global identifier [ECGI], Tracking Area Identity [TAI], Routing Area Identity [RAI], Service Area Identity [SAI], Location Area Identity [LAI], or Cell Global Identity [CGI]) occurs, the open containers are closed and added to the CDR.

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

Related Documentation

- [offline \(Trigger Profiles\) on page 101](#)
- [Configuring Charging Trigger Events for Offline Charging on page 30](#)
- [Configuring Offline Charging on page 15](#)

exclude-attributes (CDR Profiles)

Syntax	<pre> exclude-attributes { apn-ni; apn-selection-mode; cc-selection-mode; dynamic-address; list-of-service-data; list-of-traffic-volumes; lrsn; ms-time-zone; network-initiation; node-id; pdn-connection-id; pdppdn-type; pgw-address-used; # S-GW only pgw-plmn-identifier; ps-furnish-info; rat-type; record-sequence-number; served-imeisv; served-msisdn; served-pdppdn-address; served-pdp-address-extension; serving-node-plmn-identifier; sgw-change; # S-GW only start-time; stop-time; user-location-information; } </pre>
Hierarchy Level	<p>[edit unified-edge gateways <i>ggsn-pgw gateway-name</i> charging cdr-profiles <i>profile-name</i>], [edit unified-edge gateways <i>sgw gateway-name</i> charging cdr-profiles <i>profile-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>pgw-address-used and sgw-change options and support for them at the [edit unified-edge gateways <i>sgw gateway-name</i> charging cdr-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p> <p>ps-furnish-info and served-pdp-address-extension options introduced in Junos OS Mobility Release 12.1W.</p>
Description	<p>Configure the optional attributes to be excluded from the Charging Data Record (CDR). By default, all informational elements are included in the CDR.</p>



CAUTION: Some of the attributes are added to the CDR irrespective of whether or not you have configured them to be excluded, if the corresponding triggering events are enabled. The **ms-time-zone**, **serving-node-plmn-identifier**, **rat-type**, and **user-location-information** attributes are added to the CDR, unless the corresponding **ms-timezone-change**, **plmn-change**, **rat-change**, and **user-location-change** triggering events are explicitly disabled using the statements under the following hierarchy levels:

- [edit unified-edge gateways ggsn-pgw *gateway-name* charging trigger-profiles *profile-name* offline exclude] hierarchy level for the Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW).
 - [edit unified-edge gateways sgw *gateway-name* charging trigger-profiles *profile-name* offline exclude] hierarchy level for the Serving Gateway (S-GW).
-

Options



NOTE: The following options are applicable to both the GGSN or P-GW and the S-GW CDRs unless otherwise specified.

- **apn-ni**—Exclude the Access Point Name Network Identifier (APN-NI) from the CDR. The APN-NI defines the external network to which the user wants to connect through the GGSN.
- **apn-selection-mode**—Exclude the APN selection mode from the CDR. The APN selection mode indicates the origin of the APN and whether the Home Location Register (HLR) or Home Subscriber Server (HSS) has verified the user's subscription. The possible values for this mode are:
 - Mobile Station—MS-provided APN, subscription not verified, which indicates that the mobile station (MS) provided the APN and that the HLR or HSS did not verify the user's subscription to the network.
 - Network—Network-provided APN, subscription not verified, which indicates that the network provided a default APN because the mobile station did not provide an APN, and that the HLR or HSS did not verify the user's subscription to the network.
 - Verified—MS or network-provided APN, subscription verified, which indicates that the mobile station or the network provided the APN and that the HLR or HSS verified the user's subscription to the network.
- **cc-selection-mode**—Exclude (from the CDR) the type of charging characteristic that the GGSN or P-GW applies to the CDR: Home, Visiting, Roaming, or SGSN/S-GW supplied.
- **dynamic-address**—Exclude from the CDR the packet data protocol (PDP) address that has been dynamically allocated for the specific PDP context.
- **list-of-service-data**—Exclude the list of service data from the CDR. This list includes one or more containers and each of the container includes a list of fields which records information about the volume of data transmitted in bytes in the uplink and downlink directions, quality-of-service (QoS) changes, and so on. For the complete list, refer to the 3GPP 32.298 v 8.7.0 technical specification.
- **list-of-traffic-volumes**—Exclude the list of traffic volumes from the CDR. This list includes one or more containers and each container includes a list of fields which records information about the volume of data transmitted, in bytes, in the uplink and downlink directions, the reason for closing the container, when the container is closed, and the location of the user equipment when this data transmission occurs.

This attribute is applicable for CDRs that are compliant with the 3GPP R7 and R99 release specifications, only.
- **lrsn**—Exclude the Local Record Sequence Number (LRSN) from the CDR. LRSN is a unique and sequential number generated by the network node (GGSN or P-GW) and is assigned to the CDRs for tracking any missing billing records.
- **ms-time-zone**—Exclude the mobile station time zone from the CDR.



NOTE:

- This attribute is added to the CDR, irrespective of whether or not you have configured it to be excluded, if the MS Timezone Change triggering event is enabled. You can disable this triggering event by including the `ms-timezone-change` statement at the `[edit unified-edge gateways ggsn-pgw gateway-name charging trigger-profiles profile-name offline exclude]` hierarchy level (for the GGSN or P-GW), or the `[edit unified-edge gateways sgw gateway-name charging trigger-profiles profile-name offline exclude]` hierarchy level (for the S-GW).
- This attribute is applicable only to CDRs that are compliant with the 3GPP R7, R8, and R9 release specifications.

- **network-initiation**—Exclude (from the CDR) the indication that the PDP context is network initiated.

This attribute is applicable only to CDRs that are compliant with the 3GPP R7 and R99 release specifications.

- **node-id**—Exclude (from the CDR) the ID of the network element node that generates the CDR.

On the MX Series router, the format of the node ID is `ggsn/pgw-ip-address:virtual-spic-id`.

- **pdn-connection-id**—Exclude the Packet Data Network (PDN) connection from the CDR. This ID uniquely identifies different records belonging to the same PDN connection. This field includes the charging ID of the first IP-CAN bearer activated within the PDN connection. Together with the P-GW address, it uniquely identifies the PDN connection.

This attribute is applicable only for CDRs that are compliant with the 3GPP R8 and R9 release specification.

- **pdppdn-type**—Exclude the PDP Type and PDN Type attributes from the CDR. Both PDP Type and PDN Type define the end-user protocol used between the external PDN and the mobile station.

This attribute is applicable only to CDRs that are compliant with the 3GPP R8 and R9 release specification.

- **pgw-address-used**—Exclude the P-GW address-used attribute from the CDR. This option is applicable only to the S-GW.

- **pgw-plmn-identifier**—Exclude the P-GW public land mobile network (PLMN) identifier (mobile country code and mobile network code) from the CDR.

This attribute is applicable only to CDRs that are compliant with the 3GPP R8, R9, and R99 release specifications.

- **ps-furnish-info**—Exclude the PS Furnish Info attribute (where PS stands for Packet Switched) from the CDR. This information is provided by the online charging system (OCS) in the PS Furnish Charging Information attribute-value pair (AVP).

- **rat-type**—Exclude the Radio Access Technology (RAT) type used by the mobile station (eUTRAN, GERAN, WLAN, GAN, HSPA Evolution, or evolved High Rate Packet Data [eHRPD]) from the CDR.



NOTE:

- This attribute is added to the CDR, irrespective of whether or not you have configured it to be excluded, if the RAT Change triggering event is enabled. You can disable this triggering event by including the `rat-change` statement at the `[edit unified-edge gateways ggsn-pgw gateway-name charging trigger-profiles profile-name offline exclude]` hierarchy level (for the GGSN or P-GW), or the `[edit unified-edge gateways sgw gateway-name charging trigger-profiles profile-name offline exclude]` hierarchy level (for the S-GW).
 - This information is applicable only for CDRs that are compliant with the 3GPP R7, R8, and R9 release specifications.
-
- **record-sequence-number**—Exclude the record sequence number from the CDR. The record sequence number is a sequential number assigned to each partial CDR of a particular PDP context or IP-CAN bearer. This number is not assigned if there is only one CDR generated during the lifetime of a subscriber.
 - **served-imeisv**—Exclude the International Mobile Station Equipment Identity and Software Version Number (IMEISV) attribute of the served mobile equipment (ME) from the CDR.
 - **served-msisdn**—Exclude the mobile station ISDN (MSISDN) number of the served equipment from the CDR.
 - **served-pdp-address-extension**—Exclude the served PDP context or IP-CAN bearer address extension attribute from the CDR. This attribute is used when the PDP Type is IPv4v6; it carries the IPv4 address.
 - **served-pdppdn-address**—Exclude the served PDP context or IP-CAN bearer address attribute from the CDR.

- **serving-node-plmn-identifier**—Exclude the serving node (SGSN or S-GW) PLMN identifier (mobile country code and mobile network code) from the CDR.



NOTE:

- This attribute is added to the CDR, irrespective of whether or not you have configured it to be excluded, if the PLMN Change triggering event is enabled. You can disable this triggering event by including the `plmn-change` statement at the [edit unified-edge gateways *ggsn-pgw gateway-name* charging trigger-profiles *profile-name* offline exclude] hierarchy level (for the GGSN or P-GW), or the [edit unified-edge gateways *sgw gateway-name* charging trigger-profiles *profile-name* offline exclude] hierarchy level (for the S-GW).
- This information is applicable only for CDRs that are compliant with the 3GPP R8 and R9 release specifications.

- **sgw-change**—Exclude the S-GW change attribute from the CDR. This option is applicable only to the S-GW.
- **start-time**—Exclude (from the CDR) the time when the IP-CAN session is established at the P-GW for the first bearer in this session.

This attribute is applicable only to CDRs that are compliant with the 3GPP R8 and R9 release specification.

- **stop-time**—Exclude (from the CDR) the time when the user IP-CAN session is terminated for the last bearer in this session.

This attribute is applicable only to CDRs that are compliant with the 3GPP R8 and R9 release specification.

- **user-location-information**—Exclude (from the container) the location of the user equipment during the service data container recording interval. If this attribute is excluded from the container, then it is also excluded from the CDR.




NOTE:

- This attribute is added to the CDR, irrespective of whether or not you have configured it to be excluded, if the User Location Change triggering event is enabled. You can disable this triggering event by including the `user-location-change` statement at the [edit unified-edge gateways *ggsn-pgw gateway-name* charging trigger-profiles *profile-name* offline exclude] hierarchy level (for the GGSN or P-GW), or the [edit unified-edge gateways *sgw gateway-name* charging trigger-profiles *profile-name* offline exclude] hierarchy level (for the S-GW).
- This information is applicable only for CDRs that are compliant with the 3GPP R7, R8, and R9 release specifications.

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

Related • [cdr-profiles on page 51](#)
Documentation • [Configuring CDR Attributes on page 32](#)
• [Configuring Offline Charging on page 15](#)

file-age

Syntax	<pre>file-age { age; disable; }</pre>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging local-persistent-storage-options], [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>disable statement and support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the duration, in minutes, after which the temporary Charging Data Record (CDR) log file is closed and moved to a final location within the same disk (/opt/mobility/charging/ggsn/final_log), from where it can be transferred using SSH FTP (SFTP).</p> <p>Files transferred from the final location should be deleted from the local Routing Engine disk after the transfer. Only authorized users can transfer and delete the files (after the transfer). However, any one of the following conditions (whichever comes first) must be met before the files are moved from the temporary location to the final location:</p> <ul style="list-style-type: none"> • The age of the file reaches the configured or default limit. • The size of the file reaches the configured or default limit. • The number of CDRs per file reaches the configured or default limit. <div style="margin-top: 20px;">  <p>NOTE: The default limit is applicable only if you have not configured any value.</p> </div>
Default	<p>If you do not configure this statement, then the trigger based on file age is enabled by default.</p>
Options	<p>age—Duration, in minutes, after which a CDR file is closed and moved to a final location within the Routing Engine disk, from where it can be transferred using SFTP.</p> <p>Range: 20 through 7200 minutes</p> <p>Default: 120 minutes</p> <p>disable—Disable the file age trigger.</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**
- [Configuring Persistent Storage on page 23](#)
 - [Configuring Offline Charging on page 15](#)
 - [local-persistent-storage-options on page 94](#)

file-creation-policy

Syntax	file-creation-policy (shared-file unique-file);
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging local-persistent-storage-options], [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Configure whether Charging Data Records (CDRs) generated for a specific transport profile from all the services PICs should be routed to a single temporary file (shared-file option) or to multiple files, with each file storing CDRs generated from a single services PIC (unique-file configuration).
Default	If you do not include the file-creation-policy statement, CDRs from all the services PICs are routed to a single temporary file (shared-file option)
Options	<p>shared-file—CDRs are routed to the files based on the file-routing criteria of the transport profile. In this configuration, all the CDRs generated for a specific transport profile from all the services PICs are routed to a single CDR temporary file. When a file trigger, such as file size, file age, or CDR count, triggers temporary file closure, the files are moved to the final CDR location (<code>/opt/mobility/charging/ggsn/final_log</code>). This is the default.</p> <p>unique-file—CDRs are routed to the files based on the file routing criteria of the transport profile. In this configuration, all the CDRs generated for a specific transport profile from each services PIC are routed to a separate CDR temporary file. When a file trigger, such as file size, file age, or CDR count, triggers temporary file closure, the files are moved to a final CDR location (<code>/opt/mobility/charging/ggsn/final_log</code>).</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">• local-persistent-storage-options on page 94• Configuring Persistent Storage on page 23• Configuring Offline Charging on page 15

file-format

Syntax	file-format (3gpp raw-asn);
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging local-persistent-storage-options], [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Specify the file format for Charging Data Records (CDRs) stored in the CDR log files.
Default	If you do not include the file-format statement, the CDRs are stored in a format compliant with the 3GPP 32297 technical specification release (3gpp option).
Options	3gpp —CDRs are stored in a format that is compliant with the 3GPP 32297 technical specification release. raw-asn —CDRs are stored in raw Abstract Syntax Notation One (ASN.1) format.
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"> • local-persistent-storage-options on page 94 • Configuring Persistent Storage on page 23 • Configuring Offline Charging on page 15

file-name-private-extension

Syntax	<code>file-name-private-extension <i>string</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging local-persistent-storage-options], [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Specify a private extension (string) that is appended to the filenames.




NOTE: The final CDR log files are stored in the `/opt/mobility/charging/ggsn/final_log` directory in the filename format `NodeID_-_PIC_-_transport-profile-id_-_RC.date_-_time[.PI].cdr`, where:

- *NodeID*—Name of the host that generated the file.
- *PIC*—Number of the PIC that is generating the CDR.
- *transport-profile-id*—Number of the transport profile generating the CDR.
- *RC*—Running count or sequence number, starting with the value of 1.
- *date*—Date when the CDR file was closed in the format `YYYYMMDD`, where `YYYY` is the year, `MM` is the month (01-12), and `DD` is the day (01-31).
- *time*—Time when the CDR file was closed in the format `HHMMshhmm`, where `HH` is the local time hour of day (00-23), `MM` is the local time minute of the hour (00-59), `s` is the sign of local time differential from UTC (+ or -), `hh` is the local time differential hour (00-23), and `mm` is the local time differential minute (00-59).
- *PI*—(Optional) Private information that is explicitly configured.
- *cdr*—File extension is always `cdr`.

Options	<i>string</i> —Private extension. Values: 1 through 16 bytes
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"> • local-persistent-storage-options on page 94 • Configuring Persistent Storage on page 23 • Configuring Offline Charging on page 15

file-size

Syntax	<pre>file-size { size; disable; }</pre>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging local-persistent-storage-options], [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W. disable statement and support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure maximum size that the file can reach, in MB, after which the temporary Charging Data Record (CDR) log file is closed and moved to a final location within the same disk (/opt/mobility/charging/ggsn/final_log), from where it can be transferred using SSH FTP (SFTP).</p> <p>Files transferred from the final location should be deleted from the local Routing Engine disk after the transfer. Only authorized users can transfer and delete the files (after the transfer). However, any one of the following conditions (whichever comes first) must be met before the files are moved from the temporary location to the final location:</p> <ul style="list-style-type: none"> • Size of the file reaches the configured or default limit. • Age of the file reaches the configured or default limit. • Number of CDRs per file reaches the configured or default limit. <div style="margin-top: 20px;">  <p>NOTE: The default limit is applicable only if you have not configured any value.</p> </div>
Default	<p>If you do not configure this statement, then the trigger based on file size is enabled by default.</p>
Options	<p>value—Maximum size that the CDR file can reach, in MB, after which it is closed and moved to a final location within the Routing Engine disk, from where it can be transferred using SFTP.</p> <p>Range: 1 MB to 1024 MB</p> <p>Default: 10 MB</p> <p>disable—Disable the file size trigger.</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Configuring Persistent Storage on page 23](#)
 - [Configuring Offline Charging on page 15](#)
 - [local-persistent-storage-options on page 94](#)

global-profile (Serving Gateway)

Syntax `global-profile {
 default-profile default-profile;
 home-profile home-profile;
 profile-selection-order [profile-selection-method];
 roamer-profile roamer-profile;
 visitor-profile visitor-profile;
 }`

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

Description Configure the global (charging) profiles that will be applicable for the Serving Gateway (S-GW). This is a mandatory configuration if you want to enable charging on the S-GW. Configuring the **profile-selection-order** statement is mandatory if the **global-profile** statement is configured.

The S-GW determines the type of subscriber by using the mobile country code (MCC) and the mobile network code (MNC) values in the Create Session Request message from the subscriber's user equipment (UE) and compares these with the corresponding values configured for the home public land mobile network (HPLMN). Depending on whether a subscriber is a home subscriber, a visitor, or a roamer, the **home-profile**, **visitor-profile**, or **roamer-profile** is applied. If the applicable profile is not configured, then the **default-profile**, if configured, is applied. If **default-profile** is also not configured, then the subscriber session is created with no charging applied.

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 S-GW Global Charging Profiles and Selection Order on page 19](#)
 - [charging \(Serving Gateway\) on page 55](#)

gtp

Syntax	<pre> gtp { destination-port <i>port-number</i>; down-detect-time <i>duration</i>; echo-interval <i>duration</i>; header-type (long short); n3-requests <i>requests</i>; no-path-management; pending-queue-size <i>value</i>; peer <i>peer-name</i> { destination-ipv4-address <i>address</i>; destination-port <i>port-number</i>; down-detect-time <i>duration</i>; echo-interval <i>duration</i>; header-type (long short); n3-requests <i>requests</i>; no-path-management; pending-queue-size <i>value</i>; reconnect-time <i>duration</i>; source-interface <i>interface-name</i> [ipv4-address <i>address</i>]; t3-response <i>response-interval</i>; transport-protocol (tcp udp); version (v0 v1 v2); } reconnect-time <i>duration</i>; source-interface { <i>interface-name</i>; [ipv4-address <i>address</i>; } t3-response <i>response-interval</i>; transport-protocol (tcp udp); version (v0 v1 v2); } </pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging], [edit unified-edge gateways sgw <i>gateway-name</i> charging]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>The statements in this hierarchy enable you to set global as well as unique configurations for the general packet radio service (GPRS) tunneling protocol Prime (GTP Prime) peers (Charging Gateway Function [CGF] servers). If no separate configuration is defined for a peer, then the global configurations apply for that peer.</p> <p>The charging data function (CDF) sends the Charging Data Records (CDRs) as GTP Prime messages to the GTP Prime peer, based on this configuration.</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

- charging (GGSN or P-GW)
- [charging \(Serving Gateway\) on page 55](#)
- [Configuring GTP Prime for Charging on page 21](#)
- [Configuring GTP Prime Peers on page 22](#)
- [Configuring Offline Charging on page 15](#)

header-type (GTP Prime)

Syntax header-type (long | short);

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

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

Description Configure the charging data function (CDF) GTP Prime message header length to match the version supported on the charging gateway function (CGF) server, which can be set to either short (6 bytes) or long (20 bytes). The **long** format is supported only in GTP Prime version 0. GTP Prime versions 1 and 2 support the **short** header length only.

When there are global-level and peer-level configurations, the peer-level configuration takes precedence.

Options **long**—CDF GTP Prime message header length is set to 20 bytes.

short—CDF GTP Prime message header length is set to 6 bytes.

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

Related Documentation

- [gtp on page 91](#)
- [peer \(GTP Prime\) on page 102](#)
- [Configuring GTP Prime for Charging on page 21](#)
- [Configuring GTP Prime Peers on page 22](#)
- [Configuring Offline Charging on page 15](#)

home-profile

Syntax	<code>home-profile <i>home-profile</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> apn-services apns <i>name</i> charging], [edit unified-edge gateways sgw <i>gateway-name</i> charging global-profile]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging global-profile] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Specify the profile that should be used to charge home subscribers. If the profile-selection-order configuration indicates static , then this profile is used for home subscribers.



NOTE: The charging profile must already be configured on the broadband gateway.

The broadband gateway determines whether the subscriber is a home subscriber by using the mobile country code (MCC) and the mobile network code (MNC) values in the Create Session Request message from the subscriber's user equipment (UE). If the subscriber's International Mobile Subscriber Identity (IMSI), MCC, and MNC belong to the same PLMN to which both the GGSN or P-GW and the S-GW belong, then the subscriber is deemed a home subscriber and the **home-profile** is applied. If the **home-profile** is not configured, then the **default-profile**, if configured, is applied. If the **default-profile** is also not configured, then the subscriber session is created with no charging applied.

Options	<i>home-profile</i> —Name of the home profile.
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 Charging, Local Policy, and Policy and Charging Enforcement Function Profiles on a Broadband Gateway APN Configuring S-GW Global Charging Profiles and Selection Order on page 19 charging (APN) charging-profiles on page 62 global-profile (Serving Gateway) on page 90

local-persistent-storage-options

```
Syntax  local-persistent-storage-options {
        cdrs-per-file value;
        disable-replication;
        disk-space-policy {
            watermark-level-1 {
                notification-level (both | snmp-alarm | syslog);
                percentage value;
            }
            watermark-level-2 {
                notification-level (both | snmp-alarm | syslog);
                percentage value;
            }
            watermark-level-3 {
                notification-level (both | snmp-alarm | syslog);
                percentage value;
            }
        }
        file-age {
            age;
            disable;
        }
        file-creation-policy (shared-file | unique-file);
        file-format (3gpp | raw-asn);
        file-name-private-extension string;
        file-size {
            size;
            disable;
        }
        traceoptions {
            file file-name <files number> <match regular-expression> <no-world-readable |
                world-readable> <size size> ;
            flag flag;
            level (all | critical | error | info | notice | verbose | warning);
            no-remote-trace;
        }
        user-name string;
        world-readable;
    }
```

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

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

Description Configure the Charging Data Record (CDR) file storage options, which are measures to prevent loss of the CDR data.

You typically store the CDRs on the local Routing Engine disk when you do not have any external charging gateway function (CGF) servers configured to store them or when all the CGF servers are down.

When you choose to store the CDRs locally, the CDRs generated by the services PICs are routed to a file on the Routing Engine disk. Some of the options that can be configured include the following:

- Action to be taken when the disk space falls below the configured watermark level.
- Restricting access to the files to a specific user.
- File routing criteria—CDRs are routed to the files based on the file-routing criteria of the transport profile. Therefore, all CDRs generated for a given transport profile are saved in a specific CDR log file.

The remaining statements are explained separately.

Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • charging (GGSN or P-GW) • charging (Serving Gateway) on page 55 • Configuring Persistent Storage on page 23 • Configuring Offline Charging on page 15

local-storage

Syntax	local-storage;
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways persistent-storage-order], [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways persistent-storage-order]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways persistent-storage-order] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Configure the Routing Engine disk as backup storage for the Charging Data Records (CDRs) when the external storage resources (charging gateway function [CGF] servers) are down or if no external servers are configured.
Default	If you do not include the local-storage statement, the backup storage is disabled.
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"> • persistent-storage-order on page 106 • Configuring Persistent Storage on page 23 • Configuring Offline Charging on page 15

mtu (Transport Profiles)

Syntax	<code>mtu value;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways], [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the maximum transmission unit (MTU) for a Data Record Transfer (DRT) message, which represents the maximum size in bytes that a DRT message can reach before it is transmitted.</p> <p>A DRT message containing the Charging Data Records (CDRs) is transmitted from the charging data function (CDF) to the charging gateway function (CGF) server, when the cdr-aggregation-limit or the mtu size is reached (whichever comes first).</p>
Options	<p>value—Maximum size, in bytes, for a DRT message.</p> <p>Range: 300 through 8000 bytes</p> <p>Default: 1500 bytes</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">• charging-gateways (Transport Profiles—Offline) on page 61• Configuring Transport Profiles for Offline Charging on page 27• Configuring Offline Charging on page 15

n3-requests (GTP Prime)

Syntax	<code>n3-requests <i>requests</i>;</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp],</p> <p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp] and [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>] hierarchy levels introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the maximum number of times the charging data function (CDF) attempts to send echo request messages to the charging gateway function (CGF) server, after which the CDF waits for a configured duration (see down-detect-time) for any response before declaring the server as Down.</p> <p>The broadband gateway retransmits the requests to the UDP peers. However, for the TCP peers, the requests are retransmitted to a newer peer (when there is a switchover) or to the same peer (when it becomes alive after being Down).</p> <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</p>
Options	<p>requests—Number of times that the CDF attempts to send a request to a CGF server after which the CDF waits for a configured duration (see down-detect-time) before declaring the server as Down.</p> <p>Range: 1 through 5</p> <p>Default: 3</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • gtp on page 91 • peer (GTP Prime) on page 102 • Configuring GTP Prime for Charging on page 21 • Configuring GTP Prime Peers on page 22 • Configuring Offline Charging on page 15

node-id (CDR Profiles)

Syntax	<code>node-id (hostname hostname-spic ipaddress-spic);</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i>]
Release Information	Statement introduced in Junos OS Mobility Release 12.1W.
Description	Specify the format of the node identifier (ID) in the Charging Data Record (CDR). The node identifier indicates the node that generated the CDR.



NOTE:

- If you do not include this statement, then the IP address of the node generating the CDR and the ID of the services PIC on which the CDR was triggered, with a colon (:) as a delimiter, are used as the node identifier in the CDR.
- When you include the `node-id` statement and commit the configuration, the new node ID format comes into effect immediately; that is, all subsequent CDRs use the new node ID format.

Options	<p>hostname—Specify that the hostname of the node generating the CDR is used as the node identifier.</p> <p>hostname-spic—Specify that the hostname of the node generating the CDR and the ID of the services PIC on which the CDR was triggered, delimited by a colon (:), are used as the node identifier. For example, if the hostname of the node is <code>jnprcg</code> and the ID of the services PIC is 2, the node ID is <code>jnprcg:2</code>.</p> <p>ipaddress-spic—Specify that the IP address of the node generating the CDR and the ID of the services PIC on which the CDR was triggered, delimited by a colon (:), are used as the node identifier. For example, if the IP address of the node is 192.168.1.19 and the ID of services PIC is 3, the node ID is 192.168.1.19:3.</p> <p>This is the default.</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"> • cdr-profiles on page 51 • Configuring CDR Attributes on page 32 • Configuring Offline Charging on page 15

no-path-management (GTP Prime)

Syntax	no-path-management;
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp], [edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp], [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-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> charging gtp] and [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>] hierarchy levels introduced in Junos OS Mobility Release 11.4W.
Description	Use this statement to disable path management messages. If this statement is configured, no echo messages are sent. However, the router responds to any echo messages that are received.



NOTE:

- Path management refers to the exchange of echo messages between charging data function (CDF) and charging gateway function (CGF) servers (GTP Prime peers) to find out whether a CGF server is alive to process the GTP Prime messages sent from the CDF.
- Echo messages are sent only for UDP connections.

When there are global-level and peer-level configurations, the peer-level configuration takes precedence.

Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
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Related Documentation	<ul style="list-style-type: none"> • gtp on page 91 • peer (GTP Prime) on page 102 • Configuring GTP Prime for Charging on page 21 • Configuring GTP Prime Peers on page 22 • Configuring Offline Charging on page 15
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offline (Transport Profiles)

Syntax	<pre> offline { charging-function-name <i>function-name</i>;{ charging-gateways { cdr-aggregation-limit <i>value</i>; cdr-release (r7 r8 r9 r99); mtu <i>value</i>; peer-order { [peer <i>charging-gateway-peer-name</i>]; } persistent-storage-order { local-storage; } switch-back-time <i>seconds</i>; } container-limit <i>value</i>; sgsn-sgw-change-limit <i>value</i>; #P-GW only } </pre>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the transport parameters for offline charging records, such as:</p> <ul style="list-style-type: none"> • The charging gateway peers that store the Charging Data Records (CDRs). • The maximum number of CDRs that can be added to a Data Record Transfer (DRT) message. • The maximum transmission unit of a DRT message. • The generated CDRs to be compliant with a specific 3GPP release. • The duration that the charging data function (CDF) waits before transmitting the CDRs to a peer that has recently come up and that has the highest priority among all the peers, which are alive. • Whether to use the local Routing Engine disk for CDR storage. • The charging function name that is used to select the offline charging gateway. <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Offline Charging on page 15 • Configuring Transport Profiles for Offline Charging on page 27

- [transport-profiles on page 129](#)

offline (Trigger Profiles)

Syntax	<pre> offline { exclude { dcca-events; #P-GW only ms-timezone-change; plmn-change; qos-change; rat-change; sgsn-mme-change; #S-GW only sgsn-sgw-change; #P-GW only user-location-change; } sgsn-mme-change-limit <i>value</i>; #S-GW only time-limit <i>value</i>; volume-limit { <i>value</i>; direction (both uplink); } } </pre>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the attributes that trigger charging updates for offline charging records.</p> <p>For example, you can set the maximum duration that the Charging Data Record (CDR) can remain open (time-limit), maximum volume of data that can be transmitted before closing a CDR (volume-limit), maximum number of containers that can be added to a CDR, or maximum number of Serving Gateway (S-GW) or serving GPRS support node (SGSN) changes that can occur before the CDR is updated and closed.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Charging Trigger Events for Offline Charging on page 30 • Configuring Offline Charging on page 15 • trigger-profiles (GGSN or P-GW) • trigger-profiles (Serving Gateway) on page 134

peer (GTP Prime)

Syntax	<pre> peer <i>peer-name</i> { destination-ipv4-address <i>address</i>; destination-port <i>port-number</i>; down-detect-time <i>duration</i>; echo-interval <i>duration</i>; header-type (long short); n3-requests <i>requests</i>; no-path-management; pending-queue-size <i>value</i>; reconnect-time <i>duration</i>; source-interface { interface-name; ipv4-address <i>address</i>; } t3-response <i>response-interval</i>; transport-protocol (tcp udp); version (v0 v1 v2); } </pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp], [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure GTP Prime peers (charging gateway function [CGF] servers). You can configure up to a maximum of 24 peers. The charging data function (CDF) sends the Charging Data Records (CDRs) as GTP Prime messages to the GTP Prime peer, based on this configuration.</p> <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</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"> • gtp on page 91 • Configuring GTP Prime Peers on page 22 • Configuring GTP Prime for Charging on page 21 • Configuring Offline Charging on page 15

peer (Peer Order)

Syntax	<code>[peer <i>charging-gateway-peer-name</i>];</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways peer-order],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways peer-order]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways peer-order] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the name of the charging gateway peer. However, make sure the peer that you specify here is previously configured for its IP address, name, and so on, using one of the following statements, as applicable. Otherwise, you will encounter a configuration error.</p> <ul style="list-style-type: none"> • <code>set unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp peer</code> for the gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW). • <code>set unified-edge gateways sgw <i>gateway-name</i> charging gtp peer</code> for the Serving Gateway (S-GW).
Options	<i>charging-gateway-peer-name</i> —Name of the charging gateway server.
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"> • peer-order on page 104 • Configuring GTP Prime Peers on page 22 • Configuring GTP Prime for Charging on page 21 • Configuring Offline Charging on page 15

peer-order

Syntax	<code>peer-order { [<i>peer charging-gateway-peer-name</i>]; }</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways], [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Configure the charging gateway function (CGF) servers. You can configure up to a maximum of three servers for a transport profile.

When more than one CGF servers are available for storing Charging Data Records (CDRs), the charging data function (CDF) must identify the server to which to route the CDRs to first. The peer order determines this hierarchy, using which the CDF tries to send the CDRs to the server that comes first in this order. The peer that comes first in the order is treated as the highest-priority peer. At any given time, CDRs are sent to only one of the peers. If, for any reason, the first server goes down, the CDF tries to send the CDRs to the server that comes next in the order. However, if a higher-priority peer comes up, the CDRs are sent to this peer after a waiting period determined by the **switch-back-time** configuration.

When required, the priority of any peer can be changed by using the configuration option to **insert before** or **insert after** the existing peers.



NOTE: If all the peers are Down and if you have configured the Routing Engine disk as the backup storage option, then the CDRs are routed to the Routing Engine disk. However, if one or more peers come alive, then CDF waits for the configured **switch-back-time** duration and routes the CDRs to the highest priority peer that is alive after this duration. The CDRs that were previously stored on the Routing Engine disk are not routed to the charging gateway (peer) and remain on the disk. You need to transfer the CDRs using SSH FTP (SFTP) from the following location on the disk:
`/opt/mobility/charging/ggsn/final_log`.

The remaining statements are explained separately.

Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> charging-gateways (Transport Profiles—Offline) on page 61

- [Configuring GTP Prime Peers on page 22](#)
- [Configuring GTP Prime for Charging on page 21](#)
- [Configuring Offline Charging on page 15](#)


pending-queue-size (GTP Prime)

Syntax	<code>pending-queue-size <i>value</i>;</code>
Hierarchy Level	<code>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp],</code> <code>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>],</code> <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp],</code> <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>]</code>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp]</code> and <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>]</code> hierarchy levels introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the maximum number of Data Record Transfer (DRT) messages that can be sent by the charging data function (CDF) without an acknowledgement from the charging gateway function (CGF) server. When the limit is reached, CDF stops sending the messages to that CGF server.</p> <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</p>
Options	<p>value—Maximum number of DRT messages that can be queued without an acknowledgement from the CGF server.</p> <p>Range: 1 through 4096</p> <p>Default: 1024</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"> • gtp on page 91 • peer (GTP Prime) on page 102 • Configuring GTP Prime Peers on page 22 • Configuring GTP Prime for Charging on page 21 • Configuring Offline Charging on page 15


persistent-storage-order

Syntax	<pre>persistent-storage-order { local-storage; }</pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways], [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the local storage of Charging Data Records (CDRs). You may want to store the CDRs on the local Routing Engine disk for one of the following reasons:</p> <ul style="list-style-type: none">• When there are no charging gateway peers configured for a transport profile• When none of the primary, secondary, or tertiary charging gateway peers can be reached (that is, when they are down) <p>The remaining statement is 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">• charging-gateways (Transport Profiles—Offline) on page 61• Configuring Transport Profiles for Offline Charging on page 27• Configuring Offline Charging on page 15


profile-id (Charging Profiles)

Syntax	<code>profile-id <i>id-num</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-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> charging charging-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure a unique identifier to be associated with a charging profile. You must configure a profile ID for a charging profile.</p> <p>Based on the user's subscription, the Serving Gateway (S-GW), serving GPRS support node (SGSN), or RADIUS server returns the charging profile (identified by the profile ID) that must be used for charging the mobile subscriber. If more than one node returns a profile ID, then the profile selection order configuration determines which server's profile ID must be given higher priority. This profile ID is then matched with the configured profile ID to choose the correct charging profile for that subscriber. However, if a server returns an incorrect or unconfigured charging profile ID, the profile ID returned by the server that is next in priority is taken into consideration. If none of the profile IDs match, then charging is disabled for the subscriber.</p>
	<div>  <p>NOTE: The RADIUS server returns the profile ID as a four-byte hexadecimal value in the Access Accept message.</p> </div>
Options	<p><i>id-num</i>—Unique number to be associated with the charging profile.</p> <p>Range: 1 through 65,534</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"> • charging-profiles on page 62 • Charging Profiles on page 11 • Configuring Charging Profiles on page 35 • profile-selection-order (APN) • profile-selection-order (Serving Gateway) on page 108

profile-selection-order (Serving Gateway)

Syntax	<code>profile-selection-order [<i>profile-selection-method</i>];</code>
Hierarchy Level	[edit unified-edge gateways <i>sgw gateway-name</i> charging global-profile]
Release Information	Statement introduced in Junos OS Mobility Release 11.4W.
Description	<p>Specify the order of the methods used to select a charging profile applicable for a subscriber's session on the Serving Gateway (S-GW). You can specify a maximum of three profile selection methods: static, serving, or pgw-cg-addr. If the first choice is not available, then the next choice is considered, and so on.</p> <p>For example, consider a scenario where the profile selection order is static, serving, and pgw-cg-addr. Since static is the first choice, the global (charging) profiles specified are used. If the global profiles are not configured, then the next choice (serving) is considered. If the serving GPRS support node (SGSN) or S-GW does not provide a charging profile ID in the charging characteristics information element (IE) within the GPRS tunneling protocol (GTP) Create Session message, then the next choice (pgw-cg-addr) is considered. With the pgw-cg-addr option, the charging profile is selected based on the IP address of the charging gateway (CG) for the P-GW.</p>
	<div>  <p>NOTE: If the charging profile cannot be selected by any of the methods specified, then charging is disabled for that subscriber.</p> </div>
Options	<p><i>profile-selection-method</i>—One or more profile selection methods, listed in the order in which they should be tried. The method can be one or more of the following:</p> <ul style="list-style-type: none"> • pgw-cg-addr—Use the charging profile based on the on the IP address of the CG for the P-GW. • serving—Use the charging profile sent by the SGSN or the Serving Gateway (S-GW). • static—Use the charging profile configured locally for the S-GW.
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 S-GW Global Charging Profiles and Selection Order on page 19 • global-profile (Serving Gateway) on page 90


rating-group (Trigger Profile)

Syntax	<code>rating-group [value];</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i> trigger-profile <i>profile-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i> trigger-profile <i>profile-name</i>]</p>
Release Information	Statement introduced in Junos OS Mobility Release 12.1W.
Description	<p>Specify one or more rating group identifiers that should be associated with the trigger profile. A rating group represents a collection of services.</p> <p>The rating group is used to select the trigger profile to be associated with a charging profile. If the rating group identifier received by the broadband gateway matches the rating group identifier configured here, then the trigger profile with which the rating group identifier is associated is linked to the charging profile.</p> <div style="margin-top: 20px;">  <p>NOTE: If you do not configure a rating group identifier, then the gateway uses the default trigger profile.</p> </div>
Options	<p>[value]—One or more rating group identifiers. To enter more than one value, enclose the values in square brackets ([]).</p> <p>Range: 0 through 4,294,967,294</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"> • Charging Profiles on page 11 • Configuring Charging Profiles on page 35 • trigger-profile (Charging Profiles) on page 132

reconnect-time (GTP Prime)

Syntax	<code>reconnect-time <i>duration</i>;</code>
Hierarchy Level	<code>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp],</code> <code>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>],</code> <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp],</code> <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>]</code>
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp]</code> and <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>]</code> hierarchy levels introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the duration (in seconds) that the charging data function (CDF) must wait before trying to reconnect to a charging gateway function (CGF) server that was marked Down earlier.</p> <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</p>
Options	<p><i>duration</i>—Duration after which the CDF tries to reconnect to a CGF server that was previously down.</p> <p>Range: 60 through 255 seconds. Enter 0 if you do not want to attempt to reconnect to a peer.</p> <p>Default: 60 seconds</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• gtp on page 91• peer (GTP Prime) on page 102• Configuring GTP Prime Peers on page 22• Configuring GTP Prime for Charging on page 21• Configuring Offline Charging on page 15

report-requested-apn

Syntax	report-requested-apn;
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i>]
Release Information	Statement introduced in Junos OS Mobility Release 12.1W.
Description	Specify that the broadband gateway includes the requested access point name (APN) in the Charging Data Records (CDRs) of subscribers attached to the CDR profile. Therefore, when the APN type is virtual, the broadband gateway includes the requested or virtual APN in the CDRs.
	<div>  <p>NOTE: If you do not include the <code>report-requested-apn</code> statement, then, by default, the broadband gateway includes only the real APN in the CDR. (For virtual APNs, the real APN to which the virtual APN is mapped is included in the CDR.)</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"> • cdr-profiles on page 51 • Configuring CDR Attributes on page 32 • Configuring Offline Charging on page 15

roamer-profile

Syntax	<code>roamer-profile <i>roamer-profile</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> apn-services apns <i>name</i> charging], [edit unified-edge gateways sgw <i>gateway-name</i> charging global-profile]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging global-profile] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Configure the profile that should be used to charge roaming subscribers. If the profile-selection-order configuration indicates static , then this profile is used for roaming subscribers.



NOTE: The charging profile must already be configured on the broadband gateway.

The broadband gateway determines whether the subscriber is a roamer by using the mobile country code (MCC) and the mobile network code (MNC) values in the Create Session Request message from the subscriber's user equipment (UE). If the subscriber's International Mobile Subscriber Identity (IMSI), MCC, and MNC belong to the same PLMN as the GGSN or P-GW, but the S-GW belongs to a different PLMN, then the subscriber is deemed a roamer and the **roamer-profile** is applied. If the **roamer-profile** is not configured, then the **default-profile**, if configured, is applied. If the **default-profile** is also not configured, then the subscriber session is created with no charging applied.

Options	<i>roamer-profile</i> —Name of the roamer profile.
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 Charging, Local Policy, and Policy and Charging Enforcement Function Profiles on a Broadband Gateway APN Configuring S-GW Global Charging Profiles and Selection Order on page 19 charging (APN) charging-profiles on page 62 global-profile (Serving Gateway) on page 90

service-mode (Charging Profiles)

Syntax	<code>service-mode <i>service-mode-options</i>;</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Place the charging profile under maintenance mode.</p> <p>You must put the charging profile in maintenance mode when you have to make any of the following changes to the existing charging profile configuration:</p> <ul style="list-style-type: none"> • Change the CDR profile, transport profile, or the trigger profile associated with this charging profile • Change the profile ID configuration • Delete the charging profile <p>When a charging profile is in maintenance mode, no new subscribers are accepted for that charging profile. However, maintenance mode does not become active until no existing subscriber sessions are using that charging profile and all the corresponding CDRs have been flushed out. Unless the maintenance mode becomes active, you cannot modify the charging profile attributes or delete the charging profile.</p> <p>Use the following commands to help you with maintenance mode tasks:</p> <ul style="list-style-type: none"> • To verify that the charging profile has entered active maintenance mode, use one of the following commands, as applicable: <ul style="list-style-type: none"> • For the Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW)—<code>show unified-edge ggsn-pgw charging service-mode gateway <i>gateway-name</i> charging-profile <i>profile-name</i></code> • For the Serving Gateway (S-GW)—<code>show unified-edge sgw charging service-mode gateway <i>gateway-name</i> charging-profile <i>profile-name</i></code> • To verify that the subscriber count has reached zero, use one of the following commands, as applicable: <ul style="list-style-type: none"> • For the GGSN or P-GW—<code>show unified-edge ggsn-pgw subscribers charging charging-profile <i>profile-name</i> gateway <i>gateway-name</i></code> • For the S-GW—<code>show unified-edge sgw subscribers charging charging-profile <i>profile-name</i> gateway <i>gateway-name</i></code> • To verify that all CDRs for the transport profile referred to by this charging profile have been flushed out, use one of the following commands, as applicable:

- For the GGSN or P-GW—**show unified-edge ggsn-pgw charging transfer status transport-profile-name *profile-name***
- For the S-GW—**show unified-edge sgw charging transfer status transport-profile-name *profile-name***
- To explicitly end any subscriber sessions, use one of the following commands, as applicable:
 - For the GGSN or P-GW—**clear unified-edge ggsn-pgw subscribers charging charging-profile *profile-name* gateway *gateway-name***
 - For the S-GW—**clear unified-edge sgw subscribers charging charging-profile *profile-name* gateway *gateway-name***
- To explicitly flush all the CDRs for the transport profile referred to by this charging profile, use the one of the following commands, as applicable:
 - For the GGSN or P-GW—**clear unified-edge ggsn-pgw charging cdr transport-profile-name *profile-name* gateway *name***
 - For the S-GW—**clear unified-edge sgw charging cdr transport-profile-name *profile-name* gateway *name***

Options ***service-mode-options***—Specify the service mode. Currently, **maintenance** mode is the only option supported.

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

Related Documentation

- [charging-profiles on page 62](#)
- Changing a Charging Profile
- Mobility Maintenance Mode Overview

service-mode (Transport Profiles)

Syntax	<code>service-mode maintenance;</code>
Hierarchy Level	<code>[edit unified-edge gateways ggsn-pgw gateway-name charging transport-profiles profile-name],</code> <code>[edit unified-edge gateways sgw gateway-name charging transport-profiles profile-name]</code>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the <code>[edit unified-edge gateways sgw gateway-name charging transport-profiles profile-name]</code> hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Place the respective transport profile under maintenance mode.</p> <p>To make the following changes to the existing transport profile configuration, you must put that transport profile in maintenance mode:</p> <ul style="list-style-type: none"> • Change the CDR encoding format to comply with a different 3GPP technical specification release (that is, changing the <code>cdr-release</code> configuration) • Delete the transport profile <p>In maintenance mode, no new subscribers are accepted for that transport profile. However, the maintenance mode does not become active until no existing subscriber sessions are using that transport profile and all corresponding CDRs have been flushed out. Unless the maintenance mode becomes active, you cannot modify the above-mentioned transport profile attributes or delete the transport profile. Use the following commands to help you with the maintenance mode tasks:</p> <ul style="list-style-type: none"> • To verify that the transport profile has entered active maintenance mode, use one of the following commands, as applicable: <ul style="list-style-type: none"> • For the gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW)—<code>show unified-edge ggsn-pgw charging service-mode gateway gateway-name transport-profile profile-name</code> • For the Serving Gateway (S-GW)—<code>show unified-edge sgw charging service-mode gateway gateway-name transport-profile profile-name</code> • To verify that the subscriber count has reached zero, use one of the following commands, as applicable: <ul style="list-style-type: none"> • For the GGSN or P-GW—<code>show unified-edge ggsn-pgw subscribers charging transport-profile profile-name gateway gateway-name</code> • For the S-GW—<code>show unified-edge sgw subscribers charging transport-profile profile-name gateway gateway-name</code> • To verify that all CDRs for the transport profile have been flushed out, use one of the following commands, as applicable: <ul style="list-style-type: none"> • For the GGSN or P-GW—<code>show unified-edge ggsn-pgw charging transfer status transport-profile-name profile-name</code>

- For the S-GW—**show unified-edge sgw charging transfer status transport-profile-name *profile-name***
- To explicitly end any subscriber sessions, use one of the following commands, as applicable:
 - For the GGSN or P-GW—**clear unified-edge ggsn-pgw subscribers charging transport-profile *profile-name* gateway *gateway-name***
 - For the S-GW—**clear unified-edge sgw subscribers charging transport-profile *profile-name* gateway *gateway-name***
- To explicitly flush all the CDRs for the transport profile, use one of the following commands, as applicable:
 - For the GGSN or P-GW—**clear unified-edge ggsn-pgw charging cdr transport-profile-name *profile-name***
 - For the S-GW—**clear unified-edge sgw charging cdr transport-profile-name *profile-name***

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

Related Documentation

- [transport-profiles on page 129](#)
- Changing a Transport Profile
- Mobility Maintenance Mode Overview

sgsn-mme-change-limit (Serving Gateway)

Syntax **sgsn-mme-change-limit** *value*;

Hierarchy Level [edit unified-edge gateways sgw *gateway-name* charging trigger-profiles *profile-name* offline]

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

Description Configure the maximum number of serving GPRS support node (SGSN) or Mobility Management Entity (MME) changes that can occur before the Charging Data Record (CDR) is updated and closed.

Options **value**—Maximum number of SGSN or MME changes.
Range: 1 through 5.
Default: 4

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

Related Documentation

- [offline \(Trigger Profiles\) on page 101](#)
- [Configuring Charging Trigger Events for Offline Charging on page 30](#)
- [Configuring Offline Charging on page 15](#)

source-interface (GTP Prime)

Syntax	<pre>source-interface { interface-name; ipv4-address address; }</pre>
Hierarchy Level	<pre>[edit unified-edge gateways ggsn-pgw gateway-name charging gtp], [edit unified-edge gateways ggsn-pgw gateway-name charging gtp peer peer-name], [edit unified-edge gateways sgw gateway-name charging gtp], [edit unified-edge gateways sgw gateway-name charging gtp peer peer-name]</pre>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the <code>[edit unified-edge gateways sgw gateway-name charging gtp]</code> and <code>[edit unified-edge gateways sgw gateway-name charging gtp peer peer-name]</code> hierarchy levels introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the name of the local loopback interface and its IPv4 address as the source interface from which the GTP Prime packets are sent to the charging gateway function (CGF) servers. This is a mandatory configuration. However, before specifying this configuration, make sure that the interface has been previously defined.</p> <p>The following is a sample configuration:</p> <pre>gtp { source-interface { lo0.0; ipv4-address 10.10.10.10; } }</pre> <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</p>
Options	<p>address—IPv4 address of the local loopback interface from which the GTP Prime packets are sent. This is a mandatory configuration.</p> <p>interface-name—Name of the local loopback interface from which the GTP Prime packets are sent.</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"> • gtp on page 91 • peer (GTP Prime) on page 102 • Configuring GTP Prime for Charging on page 21 • Configuring GTP Prime Peers on page 22 • Configuring Offline Charging on page 15

switch-back-time

Syntax	<code>switch-back-time seconds;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways], [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	The charging data function (CDF) transmits Charging Data Records (CDRs) to the highest-priority peer. The priority is determined by the peer-order configuration. If for any reason the highest-priority peer goes down, the CDF transmits the CDRs to the next high-priority peer and so on. If none of the peers are up, then the CDRs are transmitted to the local Routing Engine disk, if it is configured. During this transmission, it is possible that a peer or a peer that is higher in priority might come up. Instead of immediately switching over the transmission of the CDRs to the peer that recently came up, you can configure the duration that the CDF must wait to transmit the CDRs to the highest-priority peer that becomes available after this duration.



NOTE: If all the peers are down, in order not to lose any CDR data, you might want to configure the local storage on the Routing Engine disk using the following statement:

- `set unified-edge gateways ggsn-pgw gateway-name charging transport-profiles profile-name offline charging-gateways persistent-storage-order local-storage` for the gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW).
- `set unified-edge gateways sgw gateway-name charging transport-profiles profile-name offline charging-gateways persistent-storage-order local-storage` for the Serving Gateway (S-GW).

However, even if the Routing Engine disk is not configured for storage, the CDR data is not lost because it gets buffered in the services PICs. Services PICs can buffer up to a maximum of 2 GB of data, after which a call admission control (CAC) is triggered.

In the meantime, if one or multiple peers come alive, then CDF waits for the configured `switch-back-time` duration and routes the CDRs to the highest-priority peer that is alive after this duration. The CDRs that were stored previously on the Routing Engine disk are not routed to the charging gateway (peer) and remain on the disk. You need to transfer the CDRs using SSH FTP (SFTP) from the following location on the disk:

`/opt/mobility/charging/ggsn/final_log.`

Options	<p>seconds—Time, in seconds, CDF waits before transmitting the CDRs to the highest-priority peer.</p> <p>Range: 0 through 300 seconds</p> <p>Default: 30 seconds</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • charging-gateways (Transport Profiles—Offline) on page 61 • Configuring Transport Profiles for Offline Charging on page 27 • Configuring Offline Charging on page 15

t3-response (GTP Prime)

Syntax	<code>t3-response response-interval;</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp],</p> <p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp] and [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>] hierarchy levels introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the duration (in seconds) that the charging data function (CDF) must wait before resending a GTP Prime message when the response to a request has not been received.</p> <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</p>
Options	<p>response-interval—Time that the CDF waits before resending a GTP Prime message when the response to a request has not been received.</p> <p>Range: 1 through 5 seconds</p> <p>Default: 5 seconds</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • gtp on page 91 • peer (GTP Prime) on page 102 • Configuring GTP Prime for Charging on page 21 • Configuring GTP Prime Peers on page 22 • Configuring Offline Charging on page 15


tariff-time-list

Syntax	<pre>tariff-time-list { [tariff-time]; }</pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-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> charging trigger-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure a list of local times (in hh:mm format) at which the tariff changes and Charging Data Records (CDRs) are generated to reflect the change in tariff. Because you can configure multiple values, make sure that there is a difference of at least 15 minutes between these values. You can configure up to a maximum of 24 values.</p> <p>Any change to the existing configuration applies to both existing and new subscriber sessions.</p>
Options	tariff-time —Local time at which to generate a CDR, in hh:mm format, when the tariff changes.
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 Charging Trigger Events for Offline Charging on page 30• Configuring Offline Charging on page 15• trigger-profiles (GGSN or P-GW)• trigger-profiles (Serving Gateway) on page 134

time-limit

Syntax	<code>time-limit <i>value</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline], [edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the duration, in seconds, (since the previous trigger) after which the Charging Data Record (CDR) is updated with the uplink and downlink bytes transmitted in this duration and is closed. For example, if the duration is set to 3600 seconds, then the total resource utilization for the past hour is added to the CDR and the CDR is closed.</p> <p>Any change to the existing configuration does not affect a previously established session. The updated configuration applies only to new sessions.</p>
Options	<p>value—Duration in seconds.</p> <p>Range: 600 through 65,535 seconds</p> <p>Default: 0, indicates that no time limit is set.</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"> • offline (Trigger Profiles) on page 101 • Configuring Charging Trigger Events for Offline Charging on page 30 • Configuring Offline Charging on page 15

traceoptions (Charging)

Syntax	<pre> traceoptions { file { file-name; files number; size size (no-world-readable world-readable); } flag flag; level (all critical error info notice verbose warning); no-remote-trace; } </pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging], [edit unified-edge gateways sgw <i>gateway-name</i> charging]
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p> <p>online and tpm options introduced in Junos OS Mobility Release 12.1W.</p>
Description	Specify tracing options for charging.
Options	<p>file <i>file-name</i>—Name of the file to receive the output of the tracing operation. The router appends -msfpc#pic# to the filename and places the file in the /var/log directory. For example, if you configured the filename as smd, then the actual log filename on the router is smd-ms50, where ms stands for multiservices card, and 5 and 0 are the FPC and PIC slot numbers.</p> <p>Range: 1 through 1024 bytes</p> <p>files <i>number</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>Range: 2 through 1000 files</p> <p>Default: 3 files</p> <p>flag <i>flag</i>—Specify which operations are to be traced. To specify more than one operation, include multiple flag statements.</p>
<div>  <p>CAUTION: You might want to enable traceoptions only when you want to debug specific charging operations. Enabling the traceoptions flags might have an impact on the system performance.</p> </div>	
<ul style="list-style-type: none"> all—Trace all operations of all charging submodules. cdr-encoding—Trace ASN1 encoding of the CDRs. 	

- **client-fsm**—Trace the charging-specific finite state machine (FSM) in the application framework (**mobile-smd**).
- **config**—Trace configuration events on both daemons (**chargemand** and **mobile-smd**).
- **fsm**—Trace FSM.
- **general**—Trace general events that do not fit in any specific traces, such as errors in **chargemand**.
- **group-fsm**—Trace the transport-profile FSM in **chargemand**.
- **init**—Trace initialization events.
- **ipc**—Trace the interprocess communication (IPC) messages between **mobile-smd** and **chargemand**.
- **online**—Trace the Gy module.
- **path-management**—Trace path management operations within the path manager module within **chargemand**.
- **resource**—Trace resources, such as memory, counters, and so on.
- **timers**—Trace resources associated with timer processing.
- **tpm**—Trace the online processing module.
- **transport**—Trace transport-profile-level operations in **chargemand**.
- **triggers**—Trace trigger-profile-related operations used by the **mobile-smd** charging module.

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

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

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

no-world-readable—(Optional) Disable unrestricted file access.

size *size*—(Optional) Maximum size of each trace file, in kilobytes (KB) or megabytes (MB). When a trace file named `trace-file` reaches this size, it is renamed **trace-file.0**. When the trace-file again reaches its maximum size, **trace-file.0** is renamed **trace-file.1** and `trace-file` is renamed **trace-file.0**. This renaming scheme continues 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.

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

Range: 10,240 through 1,073,741,824 bytes

Default: 128 KB

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

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

Related Documentation	<ul style="list-style-type: none">• charging (GGSN or P-GW)• charging (Serving Gateway) on page 55• Tracing Charging Operations on page 189
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traceoptions (Local Persistent Storage)

Syntax	<pre> traceoptions { file <i>file-name</i> <files <i>number</i>> <match <i>regular-expression</i>> <no-world-readable world-readable> <size <i>size</i>>; flag <i>flag</i>; level (all critical error info notice verbose warning); no-remote-trace; } </pre>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging local-persistent-storage-options],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	Specify tracing options related to the storage of Charging Data Records (CDRs) on the local Routing Engine disk.
Options	<p>file <i>filename</i>—Name of the file to receive the output of the tracing operation.</p> <p>Range: 1 through 1024 bytes</p> <p>files <i>number</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>Range: 2 through 1000 files</p> <p>Default: 3 files</p> <p>flag <i>flag</i>—Specify which operations are to be traced. To specify more than one operation, include multiple flag statements.</p>



CAUTION: You may want to enable traceoptions only when you want to debug specific charging operations. Enabling the traceoption flags might have an impact on the system performance.

- **all**—Trace all operations.
- **connection**—Trace the connection establishment between Routing Engine and all services PICs for CDR file backup.
- **file-operations**—Trace all file open, write, and close operations.
- **general**—Trace general operations.

- **journaling**—Trace journaling operations. Journaling creates a log for each file-write operation, which helps to sanitize the CDR data in temporary log files after a reboot.
- **mirror**—Trace mirroring operations. Mirroring enables you to synchronize the CDR file information onto backup.

level—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 must be handled specially.
- **verbose**—Match verbose messages.
- **warning**—Match warning messages.

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

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

no-world-readable—(Optional) Disable unrestricted file access.

size *size*—(Optional) Maximum size of each trace file, in kilobytes (KB) or megabytes (MB). When a trace file named **trace-file** reaches this size, it is renamed **trace-file.0**. When the trace-file again reaches its maximum size, **trace-file.0** is renamed **trace-file.1** and **trace-file** is renamed **trace-file.0**. This renaming scheme continues 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.

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

Range: 10,240 through 1,073,741,824 bytes


Default: 128 KB

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

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

Related Documentation	<ul style="list-style-type: none">• local-persistent-storage-options on page 94• Configuring Persistent Storage on page 23
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transport-profile (Charging Profiles)

Syntax	<code>transport-profile <i>profile-name</i>;</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Associate a previously configured transport profile with a charging profile. You must associate a transport profile with a charging profile.</p> <p>When a subscriber session is created, the subscriber is bound to a charging profile. The transport profile configuration associated with this charging profile determines the transport of the CDRs generated for this subscriber from the charging data function (CDF) to the external charging gateway function (CGF) servers, the local Routing Engine disk, or both the CGF servers and local Routing Engine disk.</p> <p>Any modification to the existing configuration of this attribute must be done only when the charging profile with which it is associated is under active maintenance mode. Use one of the following commands, as applicable, to bring the charging profile under maintenance mode:</p> <ul style="list-style-type: none"> For the Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW)—<code>set unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i> service-mode maintenance</code> For the Serving Gateway (S-GW)—<code>set unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i> service-mode maintenance</code> <div style="margin-top: 20px;">  <p>TIP: If the profile is not already defined, use one of the following commands, as applicable, to define a new transport profile:</p> <ul style="list-style-type: none"> GGSN or P-GW—<code>set unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i></code> S-GW—<code>set unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i></code> </div>
Options	<i>profile-name</i> —Name of the previously configured transport profile to be associated with the charging profile.
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**
- [charging-profiles on page 62](#)
 - [Charging Profiles on page 11](#)
 - [Configuring Charging Profiles on page 35](#)
 - [transport-profiles on page 129](#)

transport-profiles

Syntax `transport-profiles profile-name {`
 `description string;`
 `offline {`
 `charging-function-name function-name;`
 `charging-gateways {`
 `cdr-aggregation-limit value;`
 `cdr-release (r7 | r8 | r9 | r99);`
 `mtu value;`
 `peer-order {`
 `[peer charging-gateway-peer-name];`
 `}`
 `persistent-storage-order {`
 `local-storage;`
 `}`
 `switch-back-time seconds;`
 `}`
 `container-limit value;`
 `sgsn-sgw-change-limit value; #P-GW only`
 `}`
 `online { #P-GW only`
 `all-rgs-on-termination;`
 `charging-function-name function-name;`
 `diameter-profile profile-name;`
 `no-mscc-in-ccrt;`
 `quota-request-on-first-packet`
 `send-ccri-on-first-packet`
 `service-context-id service-context-id;`
 `session-failover-not-supported;`
 `single-mscc;`
 `tx-timeout timeout;`
 `}`
 `service-mode maintenance;`
`}`

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

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

Description Configure a transport profile, which determines how the offline Charging Data Records (CDRs) and online messages are transported. You must configure a transport profile for the broadband gateway.



NOTE: You can configure up to a maximum of eight transport profiles.

For offline charging, the following are applicable:

- CDRs are transported from the charging data function (CDF) to a storage resource, which can be external charging gateway function (CGF) servers or the local Routing Engine disk, or both.
- Transport parameters for offline CDRs can be configured using the **charging-gateways** statement.
- The configured **charging-function-name** is used to select the transport profile.

For online charging, the following are applicable:

- Online messages are transported to the online charging system (OCS).
- Transport parameters for online messages can be configured using the **online** statement.
- The configured **charging-collection-function** is used to select the transport profile.

Options *profile-name*—Name of the transport profile.

Range: 1 through 128 bytes

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

- charging (GGSN or P-GW)
- [charging \(Serving Gateway\) on page 55](#)
- [Configuring Offline Charging on page 15](#)
- Configuring Online Charging
- [Configuring Transport Profiles for Offline Charging on page 27](#)
- Configuring Transport Profiles for Online Charging

transport-protocol (GTP Prime)

Syntax	<code>transport-protocol (tcp udp);</code>
Hierarchy Level	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp],</p> <p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p>Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp] and [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp peer <i>peer-name</i>] hierarchy levels introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the transport protocol for transmitting the GTP Prime packets from the charging data function (CDF) to the charging gateway function (CGF) server, which can be either GTP Prime over UDP or GTP Prime over TCP.</p> <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</p>
Options	<p>tcp—Transport protocol used is TCP.</p> <p>udp—Transport protocol used is UDP.</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"> • gtp on page 91 • peer (GTP Prime) on page 102 • Configuring GTP Prime for Charging on page 21 • Configuring GTP Prime Peers on page 22 • Configuring Offline Charging on page 15

trigger-profile (Charging Profiles)

Syntax	<code>trigger-profile <i>profile-name</i> { <i>rating-group</i> [<i>value</i>]; }</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>], [edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-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> charging charging-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Associate a previously configured trigger profile with a charging profile. You can associate more than one trigger profile with a charging profile. For each trigger profile that you configure, you can specify one or more rating groups to be associated with that trigger profile. When more than one trigger profile is configured, the broadband gateway uses the rating group identifier to select the trigger profile to be associated with the charging profile.
<div>  <p>NOTE: If you do not configure a trigger profile, then the gateway uses the default trigger profile.</p> </div>	
<p>When a subscriber session is created, the subscriber is bound to a charging profile and the trigger profile configuration associated with this profile determines the events that result in the creation of a CDR, the addition of a container to a CDR, and the closure of a CDR.</p>	
<div>  <p>TIP: If the profile is not already defined, use one of the following commands, as applicable, to define a new trigger profile:</p> <ul style="list-style-type: none"> For the Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW)—<code>set unified-edge gateways ggsn-pgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i></code> For the Serving Gateway (S-GW)—<code>set unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i></code> </div>	
Options	<i>profile-name</i> —Name of the previously configured trigger profile to be associated with the charging profile.
Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.

- Related Documentation**
- [charging-profiles on page 62](#)
 - [Charging Profiles on page 11](#)
 - [Configuring Charging Profiles on page 35](#)
 - [trigger-profiles \(GGSN or P-GW\)](#)
 - [trigger-profiles \(Serving Gateway\) on page 134](#)

trigger-profiles (Serving Gateway)

```
Syntax  trigger-profiles profile-name {
        description string;
        offline {
            exclude {
                ms-timezone-change;
                plmn-change;
                qos-change;
                rat-change;
                sgsn-mme-change;
                user-location-change;
            }
            sgsn-mme-change-limit value;
            time-limit value;
            volume-limit {
                value;
                direction (both | uplink);
            }
        }
        tariff-time-list {
            tariff-time;
        }
    }
```

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

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

Description Configure a trigger profile, which determines the events that trigger the creation of a Charging Data Record (CDR), the addition of a container to a CDR, and the closure of a CDR.

You can configure up to a maximum of 16 trigger profiles.



NOTE: If you do not configure a trigger profile, then the broadband gateway uses the default trigger profile.

Options *profile-name*—Name of the trigger profile.

Values: 1 through 128 bytes

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

- [charging \(Serving Gateway\) on page 55](#)
- [Configuring Charging Trigger Events for Offline Charging on page 30](#)

- [Configuring Offline Charging on page 15](#)

user-name (Local Persistent Storage)

Syntax	<code>user-name <i>string</i>;</code>
Hierarchy Level	[edit unified-edge gateways <i>ggsn-pgw gateway-name</i> charging local-persistent-storage-options], [edit unified-edge gateways <i>sgw gateway-name</i> charging local-persistent-storage-options]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways <i>sgw gateway-name</i> charging local-persistent-storage-options] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Restrict access to the Charging Data Record (CDR) files to a specific user. In addition to the non-root user who is authorized using this statement, the root user always has access permissions.
Options	<i>string</i> —Username. Values: 1 through 32 bytes
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"> • local-persistent-storage-options on page 94 • Configuring Persistent Storage on page 23 • Configuring Offline Charging on page 15

version (GTP Prime)

Syntax	<code>version (v0 v1 v2);</code>
Hierarchy Level	<code>[edit unified-edge gateways ggsn-pgw gateway-name charging gtppeer peer-name]</code> , <code>[edit unified-edge gateways ggsn-pgw gateway-name charging gtppeer peer-name]</code> , <code>[edit unified-edge gateways sgw gateway-name charging gtppeer peer-name]</code> , <code>[edit unified-edge gateways sgw gateway-name charging gtppeer peer-name]</code>
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the <code>[edit unified-edge gateways sgw gateway-name charging gtppeer peer-name]</code> and <code>[edit unified-edge gateways sgw gateway-name charging gtppeer peer-name]</code> hierarchy levels introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the latest GTP Prime version that is supported on the configured local loopback source interface's IP address from which the GTP Prime packets are sent to the charging gateway function (CGF) server. The possible values are: v0, v1, or v2.</p> <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</p>
Options	<p>v0—GTP Prime version supported is v0.</p> <p>v1—GTP Prime version supported is v1.</p> <p>v2—GTP Prime version supported is v2.</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">• gtppeer on page 91• peer (GTP Prime) on page 102• Configuring GTP Prime for Charging on page 21• Configuring GTP Prime Peers on page 22• Configuring Offline Charging on page 15

visitor-profile

Syntax	<code>visitor-profile <i>visitor-profile</i>;</code>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> apn-services apns <i>name</i> charging], [edit unified-edge gateways sgw <i>gateway-name</i> charging global-profile]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging global-profile] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Specify the profile that should be used to charge visiting subscribers. If the profile-selection-order configuration indicates static , then this profile is used for visiting subscribers.



NOTE: The charging profile must already be configured on the broadband gateway.

The broadband gateway determines whether the subscriber is a visitor by using the mobile country code (MCC) and the mobile network code (MNC) values in the Create Session Request message from the subscriber's user equipment (UE). If the subscriber's International Mobile Subscriber Identity (IMSI), MCC, and MNC do not belong to the PLMN to which both the GGSN or P-GW and the S-GW belong, then the subscriber is deemed a visitor and the **visitor-profile** is applied. If the **visitor-profile** is not configured, then the **default-profile**, if configured, is applied. If the **default-profile** is also not configured, then the subscriber session is created with no charging applied.

Options	<i>visitor-profile</i> —Name of the visitor profile.
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 Charging, Local Policy, and Policy and Charging Enforcement Function Profiles on a Broadband Gateway APN Configuring S-GW Global Charging Profiles and Selection Order on page 19 charging (APN) charging-profiles on page 62 global-profile (Serving Gateway) on page 90

volume-limit

Syntax	<pre>volume-limit { value; direction (both uplink); }</pre>
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline], [edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	<p>Configure the volume of data, in bytes, that is transmitted (since the previous trigger) before the Charging Data Record (CDR) is updated with the transmitted bytes and is closed. In addition, you can specify whether the maximum volume of data transmitted includes the data transmitted in both the uplink and downlink directions, or only in the uplink direction.</p> <p>Any change to the existing configuration does not affect a previously established session. The updated configuration applies only to new sessions.</p>
Default	If you do not include the volume-limit statement, the volume limit trigger is disabled.
Options	<p>value—Maximum volume of data transmitted, in bytes, after which the CDR is updated and closed.</p> <p>Range: 1 byte through 4 GB</p> <p>The remaining statement is explained separately.</p>
Required Privilege Level	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Charging Trigger Events for Offline Charging on page 30• Configuring Offline Charging on page 15• offline (Trigger Profiles) on page 101

watermark-level-1

Syntax	<pre> watermark-level-1 { notification-level (both snmp-alarm syslog); percentage <i>value</i>; } </pre>
Hierarchy Level	<p>[edit unified-edge gateways <i>ggsn-pgw gateway-name</i> charging local-persistent-storage-options disk-space-policy], [edit unified-edge gateways <i>sgw gateway-name</i> charging local-persistent-storage-options disk-space-policy]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways <i>sgw gateway-name</i> charging local-persistent-storage-options disk-space-policy] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the percentage of Routing Engine disk space to be used for storage and the action to be taken when this limit is reached, such as raise SNMP alarms, record the alert information in the system logs, or both. You can then take appropriate measures to prevent any loss of Charging Data Record (CDR) data.</p>
Options	<p>notification-level (both snmp-alarm syslog)—Specify whether you want to raise SNMP alarms, log information on the system logs, or both, when the watermark level is reached.</p> <ul style="list-style-type: none"> • both—Log the alert information on system log files and also raise an SNMP alarm. • snmp-alarm—Raise an SNMP alarm. • syslog—Log the alert information on system log files. <p>Default: syslog</p> <p>percentage <i>value</i>—Percentage of Routing Engine disk space to be used for storage after which you get an alert (if it is configured). Entering 0 disables the checking for the watermark level.</p> <p>Default: 70 percent of the Routing Engine disk space</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • disk-space-policy on page 72 • Configuring Persistent Storage on page 23 • Configuring Offline Charging on page 15

watermark-level-2

Syntax	<pre>watermark-level-2 { notification-level (both snmp-alarm syslog); percentage <i>value</i>; }</pre>
Hierarchy Level	[edit unified-edge gateways <i>ggsn-pgw gateway-name</i> charging local-persistent-storage-options disk-space-policy], [edit unified-edge gateways <i>sgw gateway-name</i> charging local-persistent-storage-options disk-space-policy]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways <i>sgw gateway-name</i> charging local-persistent-storage-options disk-space-policy] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Configure the percentage of Routing Engine disk space to be used for storage and also the action to be taken when this limit is reached, such as raise SNMP alarms, record the alert information in the system logs, or both. You can then take appropriate measures to prevent any loss of Charging Data Record (CDR) data.
Options	<p>notification-level (both snmp-alarm syslog)—Specify whether you want to raise SNMP alarms, log information on the system logs, or both when the watermark level is reached.</p> <ul style="list-style-type: none">• both—Log the alert information on system log files and raise an SNMP alarm.• snmp-alarm—Raise an SNMP alarm.• syslog—Log the alert information on system log files. <p>Default: syslog</p> <p>percentage <i>value</i>—Percentage of Routing Engine disk space to be used for storage after which you get an alert (if it is configured). Entering 0 disables the checking for the watermark level.</p> <p>Default: 80 percent of the Routing Engine disk space</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">• disk-space-policy on page 72• Configuring Persistent Storage on page 23• Configuring Offline Charging on page 15

watermark-level-3

Syntax	<pre>watermark-level-3 { notification-level (both snmp-alarm syslog); percentage <i>value</i>; }</pre>
Hierarchy Level	<p>[edit unified-edge gateways <i>ggsn-pgw gateway-name</i> charging local-persistent-storage-options disk-space-policy], [edit unified-edge gateways <i>sgw gateway-name</i> charging local-persistent-storage-options disk-space-policy]</p>
Release Information	<p>Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways <i>sgw gateway-name</i> charging local-persistent-storage-options disk-space-policy] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
Description	<p>Configure the percentage of Routing Engine disk space to be used for storage and also the action to be taken when this limit is reached, such as raise SNMP alarms, record the alert information in the system logs, or both.</p> <p>When this watermark level is reached, the charging daemon stops writing the Charging Data Records (CDRs) to the local Routing Engine disk till the CDR storage space is restored by transferring the files using SSH FTP (SFTP) and deleting the files from the CDR log directory. However, the data is not immediately lost because the services PICs buffer up to 2 GB of data.</p>
Options	<p>notification-level (both snmp-alarm syslog)—Specify whether you want to raise SNMP alarms, log information on the system logs, or both when the watermark level is reached.</p> <ul style="list-style-type: none"> • both—Log the alert information on system log files and also raise an SNMP alarm. • snmp-alarm—Raise an SNMP alarm. • syslog—Log the alert information on system log files. <p>Default: syslog</p> <p>percentage <i>value</i>—Percentage of Routing Engine disk space to be used for storage after which you get an alert (if it is configured). Entering 0 disables the checking for the watermark level.</p> <p>Default: 90 percent of the Routing Engine disk space</p>
Required Privilege Level	<p>unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • disk-space-policy on page 72 • Configuring Persistent Storage on page 23 • Configuring Offline Charging on page 15

world-readable (Local Persistent Storage)

Syntax	world-readable;
Hierarchy Level	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging local-persistent-storage-options], [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options]
Release Information	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options] hierarchy level introduced in Junos OS Mobility Release 11.4W.
Description	Allow all users to have read permissions on the Charging Data Record (CDR) files. By default, this is disabled.
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">• local-persistent-storage-options on page 94• Configuring Persistent Storage on page 23• Configuring Offline Charging on page 15

PART 3

Administration

- [Monitoring the Charging Configuration on page 145](#)
- [Operational Commands on page 147](#)

Monitoring the Charging Configuration

- [Verifying and Managing the Charging Configuration on page 145](#)

Verifying and Managing the Charging Configuration

Purpose Display or clear information about the charging configuration.



NOTE: This topic lists commands that are applicable only to the Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW). However, you can display or clear information about the charging configuration for the Serving Gateway (S-GW). Replace the `ggsn-pgw` keyword in the commands below with `sgw` to run the corresponding commands for the S-GW; for example, `show unified-edge sgw charging local-persistent-storage statistics` displays information about the local persistent storage statistics on the S-GW.

- Action**
- To display information about the local persistent storage statistics:

```
user@host> show unified-edge ggsn-pgw charging local-persistent-storage statistics
```
 - To display information about the path management message statistics:

```
user@host> show unified-edge ggsn-pgw charging path statistics
```
 - To display information about the status of the configured peers:

```
user@host> show unified-edge ggsn-pgw charging path status
```
 - To display information about the transfer statistics for configured transport profiles:

```
user@host> show unified-edge ggsn-pgw charging transfer statistics
```
 - To display information about the transfer status for configured transport profiles:

```
user@host> show unified-edge ggsn-pgw charging transfer status
```
 - To clear the locally-stored CDRs:

```
user@host> clear unified-edge ggsn-pgw charging cdr
```
 - To clear the local persistent storage statistics:

```
user@host> clear unified-edge ggsn-pgw charging local-persistent-storage statistics
```

- To clear the path management message statistics:
user@host> clear unified-edge ggsn-pgw charging path statistics
- To clear the transfer statistics:
user@host> clear unified-edge ggsn-pgw charging transfer statistics

**Related
Documentation**

- [Configuring Persistent Storage on page 23](#)
- [Configuring GTP Prime for Charging on page 21](#)
- [Configuring Transport Profiles for Offline Charging on page 27](#)
- [Configuring Charging Trigger Events for Offline Charging on page 30](#)
- [Configuring S-GW-Specific Charging Parameters on page 17](#)
- [Configuring S-GW Global Charging Profiles and Selection Order on page 19](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)

CHAPTER 6

Operational Commands

clear unified-edge sgw charging cdr

Syntax	clear unified-edge sgw charging cdr gateway <i>gateway-name</i> <transport-profile-name <i>profile-name</i>>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Clear the Charging Data Records (CDRs) from the services PICs for the configured transport profiles on the specified Serving Gateway (S-GW).
Options	gateway <i>gateway-name</i> —Clear the CDRs from the services PICs for the specified gateway. transport-profile-name <i>profile-name</i> —(Optional) Clear the CDRs from the services PICs for the specified transport profile.
Required Privilege Level	clear, unified-edge
Related Documentation	<ul style="list-style-type: none">• clear unified-edge sgw charging cdr wfa on page 149• show unified-edge sgw charging transfer status on page 183
List of Sample Output	clear unified-edge sgw charging cdr gateway SGW on page 148
Output Fields	No message is displayed on successful execution of this command; otherwise an error message is displayed.

Sample Output

clear unified-edge sgw charging cdr gateway SGW	<pre>user@host> clear unified-edge sgw charging cdr gateway SGW</pre>
--	--

clear unified-edge sgw charging cdr wfa

Syntax	<code>clear unified-edge sgw charging cdr wfa gateway <i>gateway-name</i> <transport-profile-name <i>profile-name</i>></code>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Clear from the services PICs (for one or more Serving Gateways [S-GWs]) the Charging Data Records (CDRs) that have not received an acknowledgement from the charging gateway function (CGF), the Routing Engine, or both.
Options	<p>gateway <i>gateway-name</i>—Clear the unacknowledged CDRs from the services PICs for the specified S-GW.</p> <p>transport-profile-name <i>profile-name</i>—(Optional) Clear the unacknowledged CDRs from the services PICs only for the specified transport profile.</p>
Required Privilege Level	clear, unified-edge
Related Documentation	<ul style="list-style-type: none"> • clear unified-edge sgw charging cdr on page 148 • show unified-edge sgw charging transfer status on page 183
List of Sample Output	clear unified-edge sgw charging cdr wfa gateway <i>gateway-name</i> on page 149
Output Fields	No message is displayed on successful execution of this command; otherwise an error message is displayed.

Sample Output

```
clear unified-edge sgw charging cdr wfa
gateway
gateway-name
```

```
user@host> clear unified-edge sgw charging cdr wfa gateway PGW
```

clear unified-edge sgw charging local-persistent-storage statistics

Syntax	<code>clear unified-edge sgw charging local-persistent-storage statistics gateway <i>gateway-name</i></code>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Clear the storage statistics of the Charging Data Record (CDR) files on the local Routing Engine disk on the specified Serving Gateway (S-GW).
Options	<code>gateway <i>gateway-name</i></code> —Clear the storage statistics for the specified gateway.
Required Privilege Level	clear, unified-edge
Related Documentation	<ul style="list-style-type: none">• show unified-edge sgw charging local-persistent-storage statistics on page 160
List of Sample Output	clear unified-edge sgw charging local-persistent-storage statistics gateway SGW on page 150
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

<code>clear unified-edge sgw charging local-persistent-storage statistics gateway SGW</code>	<pre>user@host> clear unified-edge sgw charging local-persistent-storage statistics gateway SGW Cleared charging local persistent storage statistics</pre>
--	---

clear unified-edge sgw charging path statistics

Syntax	<pre>clear unified-edge sgw charging path statistics <fpc-slot slot-number> <gateway gateway-name> <gtp-peer-addr ipv4-address> <gtp-peer-name peer-name> <pic-slot slot-number></pre>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Clear the path management message statistics (between the charging data function [CDF] and the charging gateway function [CGF] servers) on one or more Serving Gateways (S-GWs). If a gateway name is not specified, then the path management statistics for all S-GWs are cleared.
Options	<p>fpc-slot slot-number—(Optional) Clear the path management message statistics for the specified FPC slot number.</p> <p>gateway gateway-name—(Optional) Clear the path management message statistics for the specified gateway.</p> <p>gtp-peer-addr ipv4-address—(Optional) Clear the path management message statistics for the GTP Prime peer with the specified IPv4 address.</p> <p>gtp-peer-name peer-name—(Optional) Clear the path management message statistics for the GTP Prime peer with the specified name.</p> <p>pic-slot slot-number—(Optional) Clear the path management message statistics for the specified PIC slot number. You must first specify an FPC slot number before specifying the PIC slot number.</p>
Required Privilege Level	clear, unified-edge
Related Documentation	<ul style="list-style-type: none"> • show unified-edge sgw charging path statistics on page 166
List of Sample Output	clear unified-edge sgw charging path statistics on page 151
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

```
clear unified-edge sgw charging path statistics
user@host> clear unified-edge sgw charging path statistics
Cleared charging path statistics
```

clear unified-edge sgw charging transfer statistics

Syntax	<code>clear unified-edge sgw charging transfer statistics</code> <code><fpc-slot slot-number></code> <code><gateway gateway-name></code> <code><pic-slot slot-number></code> <code><transport-profile-name profile-name></code>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Clear the transfer statistics on one or more Serving Gateways (S-GWs). If a gateway name is not specified, then the transfer statistics for all S-GWs are cleared.
Options	<p>none—Clear the transfer statistics for all S-GWs.</p> <p>fpc-slot slot-number—(Optional) Clear the transfer statistics for the specified FPC slot number.</p> <p>gateway gateway-name—(Optional) Clear the transfer statistics for the specified gateway.</p> <p>pic-slot slot-number—(Optional) Clear the transfer statistics for the specified PIC slot number. You must first specify an FPC slot number before specifying the PIC slot number.</p> <p>transport-profile-name profile-name—(Optional) Clear the transfer statistics for the specified transport profile.</p>
Required Privilege Level	clear, unified-edge
Related Documentation	<ul style="list-style-type: none">• show unified-edge sgw charging transfer statistics on page 178
List of Sample Output	clear unified-edge sgw charging transfer statistics on page 152
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

<code>clear unified-edge sgw charging transfer statistics</code>	<pre>user@host> clear unified-edge sgw charging transfer statistics Cleared charging transfer statistics</pre>
--	---

request system storage unified-edge charging media start

Syntax	request system storage unified-edge charging media start <re0 re1>
Release Information	Command introduced in Junos OS Mobility Release 11.2W.
Description	Enable use of local persistent storage for Charging Data Records (CDRs).
Options	re0 re1 —(Optional) On routers that support dual or redundant Routing Engines, use the disk on the Routing Engine in slot 0 (re0) or Routing Engine in slot 1 (re1).
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • request system storage unified-edge media prepare on page 156 • request system storage unified-edge charging media stop on page 154 • show unified-edge ggsn-pgw charging local-persistent-storage statistics
List of Sample Output	request system storage unified-edge charging media start on page 153
Output Fields	When you enter this command, there is no output for success but an error displays if the command fails to complete.

Sample Output

```
request system
storage unified-edge
charging media start
```

```
user@host> request system storage unified-edge charging media start
```

request system storage unified-edge charging media stop

Syntax	request system storage unified-edge charging media stop <re0 re1>
Release Information	Command introduced in Junos OS Mobility Release 11.2W.
Description	Disable use of local persistent storage for Charging Data Records (CDRs).
Options	re0 re1 —(Optional) On routers that support dual or redundant Routing Engines, use the disk on the Routing Engine in slot 0 (re0) or Routing Engine in slot 1 (re1).
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none">• request system storage unified-edge media eject on page 155• request system storage unified-edge charging media start on page 153
List of Sample Output	request system storage unified-edge charging media stop on page 154
Output Fields	When you enter this command, there is no output for success but an error displays if the command fails to complete.

Sample Output

<code>request system storage unified-edge charging media stop</code>	<code>user@host> request system storage unified-edge charging media stop</code>
--	--


request system storage unified-edge media eject

Syntax	request system storage unified-edge media eject <re0 re1>
Release Information	Command introduced in Junos OS Mobility Release 11.2W.
Description	Prepare the Solid State Disk (SSD) for removal from the Routing Engine. This command unmounts the SSD from /opt/mobility .
Options	re0 re1 —(Optional) On routers that support dual or redundant Routing Engines, prepare the disk on the Routing Engine in slot 0 (re0) or Routing Engine in slot 1 (re1).
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> • request system storage unified-edge charging media stop on page 154
List of Sample Output	request system storage unified-edge media eject on page 155
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system storage unified-edge media eject	user@host> request system storage unified-edge media eject Media successfully ejected
---	--

request system storage unified-edge media prepare

Syntax	request system storage unified-edge media prepare <no-format> <re0 re1>
Release Information	Command introduced in Junos OS Mobility Release 11.2W.
Description	Prepare the Solid State Disk (SSD) on the Routing Engine for local persistent storage of Charging Data Records (CDRs). This command formats the SSD and mounts it to <code>/opt/mobility</code> .
	 <p>NOTE: If you do not want to format the existing content on the SSD, you must specify the <code>no-format</code> option.</p>
Options	<p>no-format—(Optional) Do not format the existing content on the SSD when preparing the disk on the Routing Engine.</p> <p>re0 re1—(Optional) On routers that support dual or redundant Routing Engines, prepare the disk on the Routing Engine in slot 0 (re0) or Routing Engine in slot 1 (re1).</p>
Required Privilege Level	maintenance
Related Documentation	<ul style="list-style-type: none"> request system storage unified-edge charging media start on page 153 show unified-edge ggsn-pgw charging local-persistent-storage statistics
List of Sample Output	request system storage unified-edge media prepare on page 156
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

```

request system
storage unified-edge
media prepare
user@host> request system storage unified-edge media prepare
Creating filesystem
Mounting media
Media successfully prepared

```

show unified-edge sgw charging global statistics

Syntax	show unified-edge sgw charging global statistics <brief detail> <fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> > <gateway <i>gateway-name</i> >
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Display the global statistics for charging for one or more Serving Gateways (S-GWs). If an S-GW is not specified, then the statistics for all S-GWs are displayed.
Options	<p>none—(Same as brief) Display the global statistics for charging, in brief.</p> <p>brief detail—(Optional) Display the specified level of output. The brief option displays the statistics per GGSN or P-GW for all services PICs. The detail option displays the statistics per GGSN or P-GW for each services PIC.</p> <p>fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i>—(Optional) Display the global statistics for charging only for the specified FPC slot number and PIC slot number.</p> <p>gateway <i>gateway-name</i>—(Optional) Display the global statistics for charging for the specified GGSN or P-GW.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show unified-edge sgw charging local-persistent-storage statistics on page 160 • show unified-edge sgw charging path statistics on page 166 • show unified-edge sgw charging transfer statistics on page 178
List of Sample Output	show unified-edge sgw charging global statistics brief on page 159 show unified-edge sgw charging global statistics detail on page 159
Output Fields	Table 5 on page 157 lists the output fields for the show unified-edge sgw charging global statistics command. Output fields are listed in the approximate order in which they appear.

Table 5: show unified-edge sgw charging global statistics Output Fields

Field Name	Field Description	Level of Output
Gateway	Name of the S-GW.	All levels
		none
FPC/PIC	FPC slot number and PIC slot number for which the statistics are displayed.	detail

Table 5: show unified-edge sgw charging global statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
CDR Send Errors	Number of CDR send errors. This counter indicates an internal error while closing the CDR.	All levels none
CDR Encode Errors	Number of CDR encoding failures. For example, if the buffer is insufficient then the CDR encoding does not take place.	All levels none
CDR Alloc Failures	Number of CDR allocation failures. For example, if there is insufficient memory then the CDR allocation can fail.	All levels none
Container Failures	Number of internal failures pertaining to charging containers.	All levels none
Charging Bearers Created	Number of bearers for which charging is enabled.	All levels none
Charging Bearers Destroyed	Number of charging bearers destroyed.	All levels none

Sample Output

```
show unified-edge sgw charging global statistics brief
user@host> show unified-edge sgw charging global statistics brief
Gateway: SGW
Charging Global Statistics
```

```
CDR Send Errors           : 2
CDR Encode Errors        : 0
CDR Alloc Failures       : 2
Container Failures       : 0
Charging Bearers Created : 133
Charging Bearers Destroyed : 14
```

```
show unified-edge sgw charging global statistics detail
user@host> show unified-edge sgw charging global statistics detail
Gateway: SGW
Charging Global Statistics
```

```
FPC/PIC: 1/1
CDR Send Errors           : 2
CDR Encode Errors        : 0
CDR Alloc Failures       : 2
Container Failures       : 0
Charging Bearers Created : 100
Charging Bearers Destroyed : 10
```

```
FPC/PIC: 3/1
CDR Send Errors           : 0
CDR Encode Errors        : 0
CDR Alloc Failures       : 0
Container Failures       : 0
Charging Bearers Created : 33
Charging Bearers Destroyed : 4
```

show unified-edge sgw charging local-persistent-storage statistics

Syntax	show unified-edge sgw charging local-persistent-storage statistics <gateway gateway>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Display the storage statistics of the Charging Data Record (CDR) files on the local Routing Engine disk for the Serving Gateways (S-GWs). If a gateway name is not specified, then the status for all S-GWs is displayed.
Options	none —Display the storage statistics for all S-GWs. gateway gateway —(Optional) Display the storage statistics for the specified gateway.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear unified-edge sgw charging local-persistent-storage statistics on page 150
List of Sample Output	show unified-edge sgw charging local-persistent-storage statistics on page 164
Output Fields	Table 6 on page 160 lists the output fields for the show unified-edge sgw charging local-persistent-storage statistics command. Output fields are listed in the approximate order in which they appear.

Table 6: show unified-edge sgw charging local-persistent-storage statistics Output Fields

Field Name	Field Description
Batch Messages received	Total number of batch messages sent from services PICs to the Routing Engine disk. CDRs generated in services PICs are sent to the local Routing Engine disk as batch messages.
Batch Responses sent	Total number of responses sent to the batch messages received.
Invalid Messages received	Total number of invalid batch messages sent from services PICs to the Routing Engine disk.
Number of temp log files opened	<p>Total number of temporary CDR files opened on the Routing Engine disk.</p> <p>These files are closed and copied from the temporary location to a final location (/opt/mobility/charging/ggsn/final_log) within the same Routing Engine disk from where the files can be transferred using SSH FTP (SFTP). Files are closed when the file size, file age, or the maximum number of CDRs added to the file reaches the configured limit (or the default limit, if the limit is not configured).</p>

Table 6: show unified-edge sgw charging local-persistent-storage statistics Output Fields (*continued*)

Field Name	Field Description
Number of journal files opened	Total number of open journal files. Journal files are used to remove any unfinished file writes from the temporary log files if a daemon or router crash interrupts the kernel file write. When the daemon or router come back up, the journal log files are read to ensure that the contents of the temporary log file are sane. If there is any unfinished CDR data, the temporary log file is truncated to the last-known successful file write. For each temporary log CDR file, a separate journal file is opened.
Number of journal files closed	Total number of journal files closed.
Number of CDR log files closed	Total number of temporary CDR log files closed. Authorized users can use SFTP to transfer these files from the <code>/opt/mobility/charging/ggsn/final_log</code> location.
Number of CDR files closed due to file-age	Total number of temporary CDR log files closed because the age of the files reached the configured limit (or the default limit, if the limit is not configured). The default file age is 120 minutes.
Number of CDR files closed due to file-size	Total number of temporary CDR log files closed because the size of the files reached the configured limit (or the default limit, if the limit is not configured). The default file size is 10 megabytes (MB).
Number of CDR files closed due to cdr-count	Total number of temporary CDR log files closed because the maximum number of CDRs added to the files reached the configured limit. There is no default limit.
Abnormal file closures	Total number of abnormal temporary CDR log file closures. This counter is incremented when the charging daemon comes up after a system reboot or crash and temporary CDR log file closures are triggered.
Normal file closures	Total number of temporary CDR log file closures. This counter is incremented when changes in the configuration, such as a change in the file format, trigger temporary CDR log file closures.
Number of CDR log files closed in TS_32_297 format	Total number of closed temporary CDR log files that are compliant with the format specified in the 32297 technical specification release.
Number of CDR log files closed in raw asn1 format	Total number of closed temporary CDR log files that are in the raw ASN1 format.
Total number of CDRs backed up	Total number of CDRs backed up to the standby Routing Engine.

Table 6: show unified-edge sgw charging local-persistent-storage statistics Output Fields (*continued*)

Field Name	Field Description
Disk Full messages sent	<p>Total number of messages sent by the Routing Engine to the services PICs to indicate that its disk is already full and is unable to accept any more charging data.</p> <p>Use SFTP to transfer the files from the <code>/opt/mobility/charging/ggsn/final_log</code> location to free disk space, or remove the disk and copy the files.</p> <p>You can remove the disk by issuing the following commands in this order:</p> <ul style="list-style-type: none"> • request system storage unified-edge charging media stop • request system storage unified-edge media eject
Disk Full resolve messages sent	<p>Total number of disk full resolve messages sent. When the disk space is freed, the Routing Engine sends messages to the services PICs indicating that it can receive charging data.</p>
Number of async IO reqs written	<p>Number of asynchronous I/O requests written. This counter is incremented once for every write operation into the temporary log CDR file.</p>
Disk space status	<p>Indicates whether disk space is available for storage. The possible values are:</p> <ul style="list-style-type: none"> • DISK_AVAILABLE • DISK_AT_WATERMARK_LEVEL1 • DISK_AT_WATERMARK_LEVEL2 • DISK_AT_WATERMARK_LEVEL3 • DISK_OFFLINE—Indicates that a disk is not present or the request system storage unified-edge charging media stop command has been issued. • DISK_OFFLINE_PENDING—Indicates whether any CDRs are being written or mirrored on the backup Routing Engine. This interim status message is displayed after the request system storage unified-edge charging media stop command has been issued but before the disk goes offline.
Watermark level1 at (MB)	<p>Indicates the percentage of the total Routing Engine disk space configured for storage. By default, watermark level 1 is set to 70 percent of the total disk space.</p> <p>When this limit is reached, an alert (if configured) is sent and you can take corrective measures to free the disk space.</p>
Watermark level2 at (MB)	<p>Indicates the percentage of the total Routing Engine disk space for storage. By default, watermark level 2 is set to 80 percent of the total disk space.</p> <p>When this limit is reached, an alert (if configured) is sent and you can take corrective measures to free the disk space.</p>

Table 6: show unified-edge sgw charging local-persistent-storage statistics Output Fields (*continued*)

Field Name	Field Description
Watermark level3 at (MB)	<p>Indicates the percentage of the total Routing Engine disk space configured for storage. By default, watermark level 3 is set to 90 percent of the total disk space.</p> <p>When this limit is reached, an alert (if configured) is sent and you can take any corrective measures to free the disk space. Otherwise, the services PICs stop sending the charging data to the Routing Engine disk and you must transfer the files via SFTP to free the disk space. However, the charging data is not lost because it is buffered in the services PICs. Services PICs can buffer up to a maximum of 2 GB of data after which a call admission control (CAC) is triggered.</p>
Temporary CDR log file Statistics	
NOTE: The information about temporary CDR log files is displayed only if temporary CDR log files are currently open.	
File Name	Name of the temporary CDR log file.
Journal file name	Name of the journal file.
Current number of CDRs	Total number of CDRs currently added to the temporary CDR log file.
Current file size (bytes)	Current size, in bytes, of the temporary CDR log file.
File age trigger (mins)	Configured duration, in minutes, after which the temporary CDR log file is closed, in minutes. If this parameter is not configured, then the default value is displayed.
File size trigger (bytes)	Configured size, in bytes, that the temporary CDR log file can reach after which it is closed. If this parameter is not configured, then the default value is displayed.
CDR count trigger	Configured maximum number of CDRs that can be added to the temporary CDR log file, after which it is closed. If this parameter is not configured, then the default value is displayed.
Global Statistics	
Disk Offline messages sent	<p>Total number of messages sent by the Routing Engine to the services PICs to indicate that its disk is offline or is not mounted, and that it is unable to accept any more charging data.</p> <p>You can configure the disk (storage media) to store charging data by issuing these commands:</p> <ul style="list-style-type: none"> • request system storage unified-edge media prepare • request system storage unified-edge charging media start
Disk Available messages sent	When the disk is prepared and mounted, the Routing Engine sends messages to the services PICs to indicate that it can now receive charging data. This field indicates the total number of these messages sent.

Table 6: show unified-edge sgw charging local-persistent-storage statistics Output Fields (*continued*)

Field Name	Field Description
Number of CDR storage files on disk	Total number of CDR files stored on the local Routing Engine disk.
Current storage space in use (MB)	Storage space, in MB, that is currently being used.
Available storage space on disk (MB)	Total free space, in MB, available for storage on the disk.
Total storage space on disk (MB)	Total storage space, in MB, on the disk.
Mirroring Connection Information	
Connection state	<p>State of the mirroring connection. The following states are possible:</p> <ul style="list-style-type: none"> • Active—Indicates that the mirroring status on Routing Engine is active. • Standalone—Indicates that the backup Routing Engine is down, or that graceful Routing Engine switchover (GRES) is not configured. • Standby—Indicates that the backup Routing Engine is on standby.
Other RE mirroring connection present	Indicates whether the mirroring connection is established with the other Routing Engine or not
GRES configured	Indicates whether graceful Routing Engine switchover (GRES) is configured or not.

Sample Output

```

show unified-edge sgw charging user@host> show unified-edge sgw charging local-persistent-storage statistics
Gateway: SGW
Charging local-persistent-storage Statistics

```

local-persistent-storage statistics

```

Batch Messages received           : 76
Batch Responses sent              : 76
Invalid Messages received         : 0
Number of temp log files opened   : 1
Number of journal files opened    : 1
Number of journal files closed    : 0
Number of CDR log files closed    : 0
Number of CDR files closed due to file-age : 0
Number of CDR files closed due to file-size : 0
Number of CDR files closed due to cdr-count : 0
Abnormal file closures            : 0
Normal file closures              : 0
Number of CDR log files closed in TS_32_297 format : 0
Number of CDR log files closed in raw asn1 format : 0
Total number of CDRs backed up    : 2095
Disk Full messages sent           : 0
Disk Full resolve messages sent   : 0
Number of async IO reqs written   : 76
Disk space status                 : DISK_AVAILABLE
Watermark level1 at(MB)           : 618(70%)
Watermark level2 at(MB)           : 707(80%)
Watermark level3 at(MB)           : 795(90%)

```

Temporary CDR log file Statistics

```

File Name: /opt/mobility/charging/ggsn/temp_log/templog_file_1.log
  Journal file name       : /opt/mobility/charging/ggsn/jrn1/jrn1_1.log
  Current number of CDRs  : 2095
  Current file size(bytes) : 553028
  File age trigger(mins)  : 60
  File size trigger(bytes) : 10485760
  CDR count trigger       : 0

```

Global Statistics

```

Disk Offline messages sent       : 0
Disk Available messages sent     : 0
Number of CDR storage files on disk : 0
Current storage space in use(MB)  : 301
Available storage space on disk(MB) : 583
Total storage space on disk(MB)   : 884

```

Mirroring Connection Information

```

Connection state                 : ACTIVE
Other RE mirroring connection present : YES
GRES configured                  : NO

```

show unified-edge sgw charging path statistics

Syntax	show unified-edge sgw charging path statistics <brief detail> <fpc-slot <i>slot-number</i>> <gateway <i>gateway-name</i>> <gtp-peer-addr <i>ipv4-address</i>> <gtp-peer-name <i>peer-name</i>> <pic-slot <i>slot-number</i>>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Display the path management message statistics (between the charging data function [CDF] and the charging gateway function [CGF] servers) on one or more Serving Gateways (S-GWs). If a gateway name is not specified, then the path management statistics for all S-GWs are displayed.
Options	<p>none—(Same as brief) Display the path management message statistics for all S-GWs.</p> <p>brief detail—(Optional) Display the specified level of output. The brief option displays the statistics per S-GW for all services PICs. The detail option displays the statistics per S-GW for each services PIC.</p> <p>fpc-slot <i>slot-number</i>—(Optional) Display the path management message statistics for the specified FPC slot number.</p> <p>gateway <i>gateway-name</i>—(Optional) Display the path management message statistics for the specified gateway.</p> <p>gtp-peer-addr <i>ipv4-address</i>—(Optional) Display the path management message statistics for the GTP Prime peer with the specified IPv4 address.</p> <p>gtp-peer-name <i>peer-name</i>—(Optional) Display the path management message statistics for the GTP Prime peer with the specified name.</p> <p>pic-slot <i>slot-number</i>—(Optional) Display the path management message statistics for the specified PIC slot number. You must first specify an FPC slot number before specifying the PIC slot number.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• clear unified-edge sgw charging path statistics on page 151• show unified-edge sgw charging path status on page 172
List of Sample Output	show unified-edge sgw charging path statistics brief on page 169 show unified-edge sgw charging path statistics detail on page 169

Output Fields Table 7 on page 167 lists the output fields for the **show unified-edge sgw charging path statistics** command. Output fields are listed in the approximate order in which they appear.

Table 7: show unified-edge sgw charging path statistics Output Fields

Field Name	Field Description	Level of Output
Gateway	Name of the S-GW.	All levels
Charging Path Statistics		
FPC/PIC	FPC slot number and PIC slot number for which the statistics are displayed.	detail
CGF Address	Address of the CGF server (GTP Prime peer).	All levels
CGF Server Name	Name of the CGF server (GTP Prime peer).	All levels
Echo Requests Rx	Total number of echo requests received by the CDF from the CGF server.	All levels
Echo Responses Tx	Total number of echo responses transmitted by the CDF to the CGF server.	All levels
Echo Responses Rx	Total number of echo responses received by the CDF from the CGF server.	All levels
Echo Requests Tx	Total number of echo requests transmitted by the CDF to the CGF server.	All levels
Node-Alive Requests Rx	Total number of node alive requests received by the CDF from the CGF server.	All levels
Node-Alive Responses Tx	Total number of responses transmitted by the CDF to the node alive requests received from the CGF server.	All levels
Version Not Supported Rx	Total number of Version Not Supported messages received by the CDF from the CGF server. The CGF server sends these messages to the CDF to indicate that the GTP Prime messages sent by the CDF are incompatible with the GTP Prime version supported by the CGF server.	All levels
Version Not Supported Tx	Total number of Version Not Supported messages transmitted by the CDF to the CGF server. The CDF sends these messages to indicate that the GTP Prime messages sent by the CGF server are incompatible with the GTP Prime version supported by the CDF.	All levels
Echo Requests timed out	Total number of echo requests sent by the CDF for which there were no responses from the CGF server and that have timed out.	All levels
Echo Interval	Configured echo interval, in seconds. If the echo interval is not configured, then the default value is displayed.	All levels
Down Detection Interval	Configured down detect time, in seconds. If the down detect time is not configured, then the default value is displayed.	All levels
Reconnect Time Interval	Configured reconnect time, in seconds. If the reconnect time is not configured, then the default value is displayed.	All levels

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

Field Name	Field Description	Level of Output
Destination Port	Configured destination port. If the destination port is not configured, then the default port (3386) is displayed.	All levels
Pending Queue Size	Configured pending queue size. If the pending queue size is not configured, then the default value (1024) is displayed.	All levels
Path Manager FPC Slot	FPC slot that manages the path management messages.	All levels
Path Manager PIC Slot	PIC slot that manages the path management messages.	All levels
Path Manager Port	Port used for path management messages.	All levels
T3 Response Time Interval	Configured T3 response time interval, in seconds. If the T3 response time interval is not configured, then the default value (5 seconds) is displayed.	All levels
Source Interface Valid	Indicates whether the source interface is valid or not.	All levels
GTPP Header Type	Configured header type for the GTP Prime messages.	All levels
N3 Requests	Configured value for N3 requests . If the N3 requests is not configured, then the default value (3) is displayed.	All levels
Local Address	Address of the local loopback source interface from which the GTP Prime packets are sent to the CGF server.	All levels
GTPP Version	Configured version that is supported on the configured local loopback source interface's IP address, from which the GTP Prime packets are sent to the CGF server.	All levels
Transport Protocol	Configured transport protocol for sending the GTP Prime packets from CDF to the CGF server.	All levels
TCP Port Range Start	Start of the range of source ports from which the TCP connection from each services PIC to the CGF server can originate. The S-GW assigns a range of source ports internally.	All levels
TCP Port Range End	End of the range of source ports from which the TCP connection from each services PIC to the CGF server can originate. The S-GW assigns a range of source ports internally.	All levels
TCP Connection State	Indicates whether the TCP connection state on the services PIC has been established or not.	detail

Sample Output

**show unified-edge sgw
charging path
statistics brief**

user@host> show unified-edge sgw charging path statistics brief

Gateway: SGW

Charging Path Statistics

CGF Address	: 2.2.2.2	CGF Server Name	: s_cgf
Echo Requests	Rx: 0	Echo Responses	Tx: 0
Echo Responses	Rx: 0	Echo Requests	Tx: 0
Node-Alive Requests	Rx: 0	Node-Alive Responses	Tx: 0
Version Not Supported	Rx: 0	Version Not Supported	Tx: 0
Echo Requests timed out	: 0	Echo Interval	: 0
Down Detection Interval	: 10	Reconnect Time Interval	: 60
Destination Port	: 3386	Pending Queue Size	: 1000
Path Manager FPC Slot	: 2	Path Manager PIC Slot	: 0
T3 Response Time Interval	: 5	Path Manager Port	: 30275
Source Interface Valid	: Yes	GTPP Header Type	: long
N3 Requests	: 1	Local Address	: 13.4.1.1
GTPP Version	: V0	Transport Protocol	: TCP
TCP Port Range Start	: 30277	TCP Port Range End	: 30308

Gateway: SGW2

Charging Path Statistics

CGF Address	: 2.2.2.2	CGF Server Name	: s_cgf
Echo Requests	Rx: 0	Echo Responses	Tx: 0
Echo Responses	Rx: 0	Echo Requests	Tx: 0
Node-Alive Requests	Rx: 0	Node-Alive Responses	Tx: 0
Version Not Supported	Rx: 0	Version Not Supported	Tx: 0
Echo Requests timed out	: 0	Echo Interval	: 0
Down Detection Interval	: 10	Reconnect Time Interval	: 60
Destination Port	: 3386	Pending Queue Size	: 1000
Path Manager FPC Slot	: 2	Path Manager PIC Slot	: 1
T3 Response Time Interval	: 5	Path Manager Port	: 30241
Source Interface Valid	: Yes	GTPP Header Type	: long
N3 Requests	: 1	Local Address	: 12.4.1.1
GTPP Version	: V0	Transport Protocol	: TCP
TCP Port Range Start	: 30243	TCP Port Range End	: 30274

**show unified-edge sgw
charging path
statistics detail**

user@host> show unified-edge sgw charging path statistics detail

Gateway: SGW

Charging Path Statistics

FPC/PIC: 2/0

CGF Address	: 2.2.2.2	CGF Server Name	: s_cgf
Echo Requests	Rx: 0	Echo Responses	Tx: 0
Echo Responses	Rx: 0	Echo Requests	Tx: 0
Node-Alive Requests	Rx: 0	Node-Alive Responses	Tx: 0
Version Not Supported	Rx: 0	Version Not Supported	Tx: 0
Echo Requests timed out	: 0	Echo Interval	: 0
Down Detection Interval	: 10	Reconnect Time Interval	: 60
Destination Port	: 3386	Pending Queue Size	: 1000
Path Manager FPC Slot	: 2	Path Manager PIC Slot	: 0
T3 Response Time Interval	: 5	Path Manager Port	: 30275
Source Interface Valid	: Yes	GTPP Header Type	: long
N3 Requests	: 1	Local Address	: 13.4.1.1

```

GTPP Version           : V0           Transport Protocol : TCP
TCP Port Range Start   : 30277        TCP Port Range End   : 30308
TCP Connection State    : Established
FPC/PIC: 5/0

CGF Address             : 2.2.2.2      CGF Server Name      : s_cgf
Echo Requests           Rx: 0          Echo Responses        Tx: 0
Echo Responses          Rx: 0          Echo Requests         Tx: 0
Node-Alive Requests     Rx: 0          Node-Alive Responses  Tx: 0
Version Not Supported    Rx: 0          Version Not Supported  Tx: 0
Echo Requests timed out : 0           Echo Interval         : 0
Down Detection Interval : 10          Reconnect Time Interval : 60
Destination Port        : 3386         Pending Queue Size    : 1000
Path Manager FPC Slot   : 2            Path Manager PIC Slot : 0
T3 Response Time Interval : 5         Path Manager Port     : 30275
Source Interface Valid   : Yes          GTPP Header Type      : long
N3 Requests             : 1            Local Address         : 13.4.1.1

GTPP Version           : V0           Transport Protocol : TCP
TCP Port Range Start   : 30277        TCP Port Range End   : 30308
TCP Connection State    : Not Established

```

Gateway: SGW2
Charging Path Statistics
FPC/PIC: 2/1

```

CGF Address             : 2.2.2.2      CGF Server Name      : s_cgf
Echo Requests           Rx: 0          Echo Responses        Tx: 0
Echo Responses          Rx: 0          Echo Requests         Tx: 0
Node-Alive Requests     Rx: 0          Node-Alive Responses  Tx: 0
Version Not Supported    Rx: 0          Version Not Supported  Tx: 0
Echo Requests timed out : 0           Echo Interval         : 0
Down Detection Interval : 10          Reconnect Time Interval : 60
Destination Port        : 3386         Pending Queue Size    : 1000
Path Manager FPC Slot   : 2            Path Manager PIC Slot : 1
T3 Response Time Interval : 5         Path Manager Port     : 30241
Source Interface Valid   : Yes          GTPP Header Type      : long
N3 Requests             : 1            Local Address         : 12.4.1.1

GTPP Version           : V0           Transport Protocol : TCP
TCP Port Range Start   : 30243        TCP Port Range End   : 30274
TCP Connection State    : Not Established
FPC/PIC: 5/1

CGF Address             : 2.2.2.2      CGF Server Name      : s_cgf
Echo Requests           Rx: 0          Echo Responses        Tx: 0
Echo Responses          Rx: 0          Echo Requests         Tx: 0
Node-Alive Requests     Rx: 0          Node-Alive Responses  Tx: 0
Version Not Supported    Rx: 0          Version Not Supported  Tx: 0
Echo Requests timed out : 0           Echo Interval         : 0
Down Detection Interval : 10          Reconnect Time Interval : 60
Destination Port        : 3386         Pending Queue Size    : 1000
Path Manager FPC Slot   : 2            Path Manager PIC Slot : 1
T3 Response Time Interval : 5         Path Manager Port     : 30241
Source Interface Valid   : Yes          GTPP Header Type      : long
N3 Requests             : 1            Local Address         : 12.4.1.1

GTPP Version           : V0           Transport Protocol : TCP
TCP Port Range Start   : 30243        TCP Port Range End   : 30274
TCP Connection State    : Not Established

```


show unified-edge sgw charging path status

Syntax show unified-edge sgw charging path status
 <brief | detail>
 <fpc-slot *slot-number*>
 <gateway-name *name*>
 <gtp-peer-addr *ipv4-address*>
 <gtp-peer-name *peer-name*>
 <pic-slot *slot-number*>

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

Description Display the status of the configured GPRS tunneling protocol (GTP) Prime peers for the Serving Gateways (S-GWs). If a gateway name is not specified, then the status for all S-GWs is displayed.

The status includes information about whether the GTP Prime peers are connected, down, or still in the process of establishing a connection, and whether the echo messages are enabled or disabled



NOTE: In charging, the terms GTP Prime peers and charging gateway function (CGF) server are used interchangeably.

Options none—(Same as brief) Display the status of the configured GTP Prime peers for all S-GWs.

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

fpc-slot *slot-number*—(Optional) Display the status of the configured GTP Prime peers for the specified FPC slot number.

gtp-peer-addr *ipv4-address*—(Optional) Display the status of the GTP Prime peer with the specified IPv4 address.

gtp-peer-name *peer-name*—(Optional) Display the status of the GTP Prime peer with the specified name.

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

Required Privilege Level view

Related Documentation

- [show unified-edge sgw charging path statistics on page 166](#)

List of Sample Output

- [show unified-edge sgw charging path status brief on page 174](#)
- [show unified-edge sgw charging path status detail on page 174](#)

Output Fields Table 8 on page 173 lists the output fields for the **show unified-edge sgw charging path status** command. Output fields are listed in the approximate order in which they appear.

Table 8: show unified-edge sgw charging path status Output Fields

Field Name	Field Description	Level of Output
Gateway	Name of the S-GW.	All levels
Peer-Address	Address of the charging gateway function (CGF) server (GTP Prime peer).	All levels
Peer-Name	Name of the CGF server (GTP Prime peer).	All levels
Local-Address	IPv4 address of the local loopback source interface from where the GTP Prime packets are sent to the CGF server (GTP Prime peer).	All levels
Status	Status of the CGF server: <ul style="list-style-type: none"> • Connected • Down • In-Progress 	All levels
Echo	Indicates whether echo messages are enabled or disabled. The possible values are: <ul style="list-style-type: none"> • Enabled or Disabled for UDP connections • N/A (Not Applicable) for TCP connections 	All levels
Cause	Probable cause for the current status of the CGF peer. This field is displayed only when the CGF server is down or the connection has not been established.	detail
FPC/PIC	FPC and PIC slot numbers.	detail

Sample Output

**show unified-edge sgw
charging path status
brief**

user@host> show unified-edge sgw charging path status brief

Gateway: SGW

Charging Path Status

Peer-Address	Peer-Name	Local-Address	Status	Echo
3.3.3.3	test	13.4.1.1	In-Progress	N/A
2.2.2.2	s_cgf	13.4.1.1	Connected	N/A

**show unified-edge sgw
charging path status
detail**

user@host> show unified-edge sgw charging path status detail

Gateway: SGW

Charging Path Status

FPC/PIC 2/1

Peer-Address 3.3.3.3

Peer-Name test

Local-Address 13.4.1.1

Status Down

Cause Server Not Responding

Echo N/A

Peer-Address 2.2.2.2

Peer-Name s_cgf

Local-Address 13.4.1.1

Status Connected

Echo N/A

show unified-edge sgw charging service-mode

Syntax	show unified-edge sgw charging service-mode gateway-name <i>gateway-name</i> <brief detail> <charging-profile <i>profile-name</i> > <transport-profile <i>profile-name</i> >
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Display the charging service mode information for the specified Serving Gateway (S-GW).
Options	<p>gateway-name <i>gateway-name</i>—Display the charging service mode information for the specified gateway.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>charging-profile <i>profile-name</i>—(Optional) Display the service mode information for the specified charging profile.</p> <p>transport-profile <i>profile-name</i>—(Optional) Display the service mode information for the specified transport profile.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • service-mode (Charging Profiles) on page 113 • service-mode (Transport Profiles) on page 115
List of Sample Output	show unified-edge sgw charging service-mode gateway SGW brief on page 177 show unified-edge sgw charging service-mode gateway SGW detail on page 177
Output Fields	Table 9 on page 175 lists the output fields for the show unified-edge sgw charging service-mode command. Output fields are listed in the approximate order in which they appear.

Table 9: show unified-edge sgw charging service-mode Output Fields

Field Name	Field Description	Level of Output
Gateway Name	Name of the S-GW.	All levels

Table 9: show unified-edge sgw charging service-mode Output Fields (*continued*)

Field Name	Field Description	Level of Output
Service Mode	Service mode for the gateway. The following service modes are possible: <ul style="list-style-type: none"> Operational—Gateway is in operational mode. Maintenance—Gateway is in maintenance mode. MM Active Phase—In this mode, you can make changes to any of the configuration options under the <code>[edit unified-edge gateways sgw gateway-name charging charging-profiles]</code> or the <code>[edit unified-edge gateways sgw gateway-name charging transport-profiles]</code> hierarchy levels. MM In/Out Phase—In this mode, you cannot make changes to the configuration options under the <code>[edit unified-edge gateways sgw gateway-name charging charging-profiles]</code> or the <code>[edit unified-edge gateways sgw gateway-name charging transport-profiles]</code> hierarchy levels. 	All levels
Charging Profile(s) or Charging Profile	Name of the charging profile.	All levels
Service Mode	Service mode for the charging profile.	All levels
Transport Profile(s) or Transport Profile	Name of the transport profile.	All levels
Service Mode	Service mode for the transport profile.	All levels
Pending Maintenance Mode Ready Ack	Lists the components or modules that are not yet ready to accept the configuration changes. Maintenance mode becomes active only after all the components or modules are ready to accept these changes.	detail

Sample Output

**show unified-edge sgw
charging service-mode
gateway SGW brief**

```
user@host> show unified-edge sgw charging service-mode gateway SGW brief
Maintenance Mode
    MM Active Phase - System is ready to accept configuration changes for all
                      attributes of this object and its sub-hierarchies.
    MM In/Out Phase - System is ready to accept configuration changes only for
                      non-maintenance mode attributes of this object and
                      its sub-hierarchies.
.
Gateway Name      : SGW
Service Mode      : Operational

Charging Profile(s)    Service Mode
p_juniper             Operational
Transport Profile(s)   Service Mode
p_tsp                 Operational
```

**show unified-edge sgw
charging service-mode
gateway SGW detail**

```
user@host> show unified-edge sgw charging service-mode gateway SGW detail
Gateway Name      : SGW
Service Mode      : Operational

Charging Profile: p_juniper
Service Mode      : Operational
Transport Profile: p_tsp
Service Mode      : Operational
```

show unified-edge sgw charging transfer statistics

Syntax	<pre>show unified-edge sgw charging transfer statistics <brief detail> <fpc-slot slot-number> <gateway-name name> <pic-slot slot-number> <transport-profile-name profile-name></pre>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Display the transfer statistics for the configured transport profiles on one or more Serving Gateways (S-GWs). If a gateway name is not specified, then the transfer statistics for all S-GWs are displayed.
Options	<p>none—(Same as brief) Display the transfer statistics for all S-GWs.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>fpc-slot slot-number—(Optional) Display the transfer statistics for the specified FPC slot number.</p> <p>gateway-name name—(Optional) Display the transfer statistics for the specified gateway.</p> <p>pic-slot slot-number—(Optional) Display the transfer statistics for the specified PIC slot number. You must first specify an FPC slot number before specifying the PIC slot number.</p> <p>transport-profile-name profile-name—(Optional) Display the transfer statistics for the specified transport profile.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • clear unified-edge sgw charging transfer statistics on page 152
List of Sample Output	show unified-edge sgw charging transfer statistics brief on page 181 show unified-edge sgw charging transfer statistics detail on page 181
Output Fields	Table 10 on page 178 lists the output fields for the show unified-edge sgw charging transfer statistics command. Output fields are listed in the approximate order in which they appear.

Table 10: show unified-edge sgw charging transfer statistics Output Fields

Field Name	Field Description	Level of Output
Gateway	Name of the S-GW.	All levels
Transport-Profile	Name of the transport profile.	All levels

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

Field Name	Field Description	Level of Output
Redirection Requests Rx	<p>Total number of redirection request messages received by the charging data function (CDF) from the charging gateway function (CGF) server.</p> <p>The CGF server sends these messages to inform the CDF about the following:</p> <ul style="list-style-type: none"> • The CGF server is about to stop service (possibly due to an error or for maintenance). • The next node in the chain (such as a billing server) has lost its connection to the CGF server. 	All levels
Redirection Responses Tx	Total number of redirection response messages transmitted as responses to the redirection requests received. Redirection response messages indicate whether a redirection request message was successful or not.	All levels
DRT Responses Rx	Total number of Data Record Transfer (DRT) response messages received for the DRT request messages sent. DRT response messages indicate whether a DRT request was successful or not.	All levels
DRT Requests Tx	Total number of DRT request messages transmitted to the CGF server. These messages are used to transfer Charging Data Records (CDRs) from the CDF to the CGF server.	All levels
DRT successful Responses Rx	Total number of successful DRT response messages received for the DRT request messages sent.	All levels
DRT Error Responses Rx	Total number of DRT error response messages received for the DRT request messages sent.	All levels
DRT Requests timed out	Total number of DRT requests sent that timed out before receiving a response from the CGF server.	All levels
CGF Switch Back Times	Total number of times the CGF servers were switched, which indicates the number of times that the CGF servers were either offline or down for maintenance.	All levels
Batch Requests Tx	Total number of batch requests transmitted from services PICs for a transport profile.	All levels
Batch Response Errors Rx	Total number of error responses, sent by the Routing Engine to the services PICs, for the batch requests messages received.	All levels
Batch CDR's Tx	Total number of CDRs transmitted from services PICs to the Routing Engine.	All levels
CDR Count	Total number of CDRs transmitted to the CGF server.	All levels
Total WFA	Total number of request messages awaiting acknowledgements from the Routing Engine or the CGF server.	All levels

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

Field Name	Field Description	Level of Output
Open Batch Requests Timed out	Number of open batch requests timed out.	All levels
	Batch message requests are sent to write CDRs into local storage. This counter indicates that no response was received and that the request was timed out.	none
FPC/PIC	FPC and PIC slot numbers.	detail

Sample Output

**show unified-edge sgw
charging transfer
statistics brief**

```
user@host> show unified-edge sgw charging transfer statistics brief
Gateway: SGW
Charging Transfer Statistics
Transport-Profile : trans_p
  Redirection Requests    Rx: 0    Redirection Responses    Tx: 0
  DRT Responses          Rx: 0    DRT Requests            Tx: 0
  DRT successful Responses Rx: 0    DRT Error Responses      Rx: 0
  DRT Requests timed out : 0    CGF Switch Back Times    : 0
  Batch Requests         Tx: 0    Batch Response Errors    Rx: 0
  Batch CDR's           Tx: 0    CDR Count                : 0
  Total WFA              : 0    Open Batch Requests Timed out : 0

Transport-Profile : trans_p2
  Redirection Requests    Rx: 0    Redirection Responses    Tx: 0
  DRT Responses          Rx: 0    DRT Requests            Tx: 0
  DRT successful Responses Rx: 0    DRT Error Responses      Rx: 0
  DRT Requests timed out : 0    CGF Switch Back Times    : 0
  Batch Requests         Tx: 0    Batch Response Errors    Rx: 0
  Batch CDR's           Tx: 0    CDR Count                : 0
  Total WFA              : 0    Open Batch Requests Timed out : 0
```

**show unified-edge sgw
charging transfer
statistics detail**

```
user@host> show unified-edge sgw charging transfer statistics detail
Gateway: SGW
Charging Transfer Statistics
FPC/PIC: 1/1
Transport-profile : trans_p
  Redirection Requests    Rx: 0    Redirection Responses    Tx: 0
  DRT Responses          Rx: 0    DRT Requests            Tx: 0
  DRT successful Responses Rx: 0    DRT Error Responses      Rx: 0
  DRT Requests timed out : 0    CGF Switch Back Times    : 0
  Batch Requests         Tx: 0    Batch Response Errors    Rx: 0
  Batch CDR's           Tx: 0    CDR Count                : 0
  Total WFA              : 0    Open Batch Requests Timed out : 0

Transport-profile : trans_p2
  Redirection Requests    Rx: 0    Redirection Responses    Tx: 0
  DRT Responses          Rx: 0    DRT Requests            Tx: 0
  DRT successful Responses Rx: 0    DRT Error Responses      Rx: 0
  DRT Requests timed out : 0    CGF Switch Back Times    : 0
  Batch Requests         Tx: 0    Batch Response Errors    Rx: 0
  Batch CDR's           Tx: 0    CDR Count                : 0
  Total WFA              : 0    Open Batch Requests Timed out : 0

FPC/PIC: 3/1
Transport-profile : trans_p
  Redirection Requests    Rx: 0    Redirection Responses    Tx: 0
  DRT Responses          Rx: 0    DRT Requests            Tx: 0
  DRT successful Responses Rx: 0    DRT Error Responses      Rx: 0
  DRT Requests timed out : 0    CGF Switch Back Times    : 0
  Batch Requests         Tx: 0    Batch Response Errors    Rx: 0
  Batch CDR's           Tx: 0    CDR Count                : 0
  Total WFA              : 0    Open Batch Requests Timed out : 0

Transport-profile : trans_p2
  Redirection Requests    Rx: 0    Redirection Responses    Tx: 0
  DRT Responses          Rx: 0    DRT Requests            Tx: 0
```

DRT successful Responses	Rx: 0	DRT Error Responses	Rx: 0
DRT Requests timed out	: 0	CGF Switch Back Times	: 0
Batch Requests	Tx: 0	Batch Response Errors	Rx: 0
Batch CDR's	Tx: 0	CDR Count	: 0
Total WFA	: 0	Open Batch Requests Timed out	: 0

show unified-edge sgw charging transfer status

Syntax	<pre>show unified-edge sgw charging transfer status <brief detail> <fpc-slot slot-number> <gateway-name name> <pic-slot slot-number> <transport-profile-name profile-name></pre>
Release Information	Command introduced in Junos OS Mobility Release 11.4W.
Description	Display the Charging Data Record (CDR) transfer status for the transport profiles on one or more Serving Gateways (S-GWs). If a gateway name is not specified, then the transfer status for all S-GWs are displayed.
Options	<p>none—(Same as brief) Display the total number of unacknowledged and buffered CDRs for the configured transport profiles for all S-GWs.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>fpc-slot slot-number—(Optional) Display the total number of unacknowledged and buffered CDRs for the configured transport profiles for the specified FPC slot number.</p> <p>gateway-name name—(Optional) Display the total number of unacknowledged and buffered CDRs for the configured transport profiles for the specified gateway.</p> <p>pic-slot slot-number—(Optional) Display the total number of unacknowledged and buffered CDRs for the configured transport profiles for the specified PIC slot number. You must first specify an FPC slot number before specifying the PIC slot number.</p> <p>transport-profile-name profile-name—(Optional) Display the total number of unacknowledged and buffered CDRs for the configured transport profiles for the specified transport profile.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show unified-edge sgw charging transfer statistics on page 178
List of Sample Output	show unified-edge sgw charging transfer status brief on page 185 show unified-edge sgw charging transfer status detail on page 185
Output Fields	Table 11 on page 183 lists the output fields for the show unified-edge sgw charging transfer status command. Output fields are listed in the approximate order in which they appear.

Table 11: show unified-edge sgw charging transfer status Output Fields

Field Name	Field Description	Level of Output
CAC Status	The call admission control (CAC) status of the transport profile.	All levels none

Table 11: show unified-edge sgw charging transfer status Output Fields (*continued*)

Gateway	Name of the S-GW.	All levels
FPC/PIC	FPC and PIC slot numbers.	detail
Transport-Profile	Name of the transport profile.	All levels
Transport-profile Id	ID of the transport profile.	detail
Total UnAck CDR's	Total number of CDRs (for the transport profile) sent to the charging gateway function (CGF) servers for which no acknowledgements were received.	All levels
Total Buffered CDR's	Total number of buffered CDRs (for the transport profile) in the services PICs.	All levels

Sample Output

**show unified-edge sgw
charging transfer
status brief**

```
user@host> show unified-edge sgw charging transfer status brief
Gateway: SGW
Charging Transfer Status
Transport-Profile : s_tsp
  Total UnAck CDR's      : 0
  Total Buffered CDR's   : 10
  CAC Status              : Operational

Transport-Profile : s_tsp2
  Total UnAck CDR's      : 0
  Total Buffered CDR's   : 0
  CAC Status              : Operational
```

**show unified-edge sgw
charging transfer
status detail**

```
user@host> show unified-edge sgw charging transfer status detail
Gateway: SGW
Charging Transfer Status
FPC/PIC: 2/1
  Transport-profile       : s_tsp
  Transport-profile Id    : 1
  Total UnAck CDR's      : 0
  Total Buffered CDR's   : 2
  CAC Status              : Operational

  Transport-profile       : s_tsp2
  Transport-profile Id    : 2
  Total UnAck CDR's      : 0
  Total Buffered CDR's   : 0
  CAC Status              : Operational

FPC/PIC: 3/1
  Transport-profile       : s_tsp
  Transport-profile Id    : 1
  Total UnAck CDR's      : 0
  Total Buffered CDR's   : 8
  CAC Status              : Operational

  Transport-profile       : s_tsp2
  Transport-profile Id    : 2
  Total UnAck CDR's      : 0
  Total Buffered CDR's   : 0
  CAC Status              : Operational
```


PART 4

Troubleshooting

- [Acquiring Troubleshooting Information on page 189](#)

CHAPTER 7

Acquiring Troubleshooting Information

- [Tracing Charging Operations on page 189](#)
- [Configuring S-GW Local Persistent Storage Traceoptions on page 191](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)

Tracing Charging Operations

Charging tracing operations track mobile charging operations and record them in a log file. The error descriptions captured in the log file provide detailed information to help you solve problems.

All log files are located in the `/var/log` directory. You cannot change the directory in which trace files are located. When the trace file reaches its maximum size, a `.0` is appended to the filename, then a new file is created with a `.1`, and finally a `.2`. When the maximum number of trace files is reached, the oldest trace file is overwritten.



NOTE: You should use care when tracing charging operations because it can have a performance impact.

To configure charging tracing operations:

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

[edit]

`user@host# edit unified-edge gateways ggsn-pgw MBG1 charging traceoptions`

2. (Optional) Configure the name for the file used for the trace output.
3. (Optional) Configure flags to filter the operations to be logged.

The mobile charging traceoptions configuration tasks are described in the following topics:

- [Configuring the Trace Log Filename on page 190](#)
- [Configuring the Tracing Flags on page 190](#)

Configuring the Trace Log Filename

By default, the name of the file that records trace output for mobile charging is **mobile-smd**. You can specify a different name with the **file** option to distinguish trace output for different session Dense Port Concentrators (DPCs). For example, you can specify the filename in the format *filename-msnumberfpcnumberpicnumber*.

To configure the filename for mobile charging tracing operations:

- Specify the name of the file used for the trace output.

```
[edit unified-edge gateways ggsn-pgw MBG1 charging traceoptions]
user@host# set file filename
```

Configuring the Tracing Flags

To configure the flags for the events to be logged:

- Configure the flags.

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

By default, only important events are logged. You can specify which trace operations are logged by including specific tracing flags. [Table 12 on page 190](#) describes the flags that you can include.

Table 12: Charging Tracing Flags

Flag	Description
all	Trace all operations
cdr-encoding	Trace CDR encoding
client-fsm	Trace client finite state machine (FSM)
config	Trace configuration events
fsm	Trace FSM
general	Trace general flow
group-fsm	Trace group FSM
init	Trace initialization events
ipc	Trace IPC
online	Trace Gy active session management (ASM) module
path-management	Trace path management module

Table 12: Charging Tracing Flags (*continued*)

Flag	Description
resource	Trace resources
timers	Trace timers
tpm	Trace online processing module
transport	Trace transport group
triggers	Trace trigger information

**Related
Documentation**

- [Configuring Offline Charging on page 15](#)
- [Configuring S-GW-Specific Charging Parameters on page 17](#)
- [Configuring S-GW Global Charging Profiles and Selection Order on page 19](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)

Configuring S-GW Local Persistent Storage Traceoptions

Local persistent storage tracing operations record detailed messages about the operation of Serving Gateway (S-GW) charging information storage services on the MobileNext Broadband Gateway. You can trace various types of S-GW local persistent storage operations such as file operations, journaling, mirroring, and other information. You can specify which trace operations are logged by including specific tracing flags and levels.

[Table 13 on page 191](#) describes the flags relating to the S-GW that you can include at the **[edit unified-edge gateways sgw gateway-name charging local-persistent-storage traceoptions flag]** hierarchy level.

Table 13: S-GW Local Persistent Storage Trace Flags

Flag	Description
all	Trace everything.
connection	Trace connection establishment with peers.
file-operations	Trace file open, write, and close operations.
general	Trace miscellaneous operations.
journaling	Trace file journaling operations.
mirror	Trace mirroring operations.

Table 14 on page 192 describes the levels you can include.

Table 14: S-GW Local Persistent Storage Trace Levels

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

To configure tracing options for local persistent storage operations:

1. Specify that you want to configure tracing options for local persistent storage operations.

```
[edit unified-edge gateways sgw MBG2 charging local-persistent-storage]
user@host# edit traceoptions
```



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

2. Configure the filename for the trace file.

```
[edit unified-edge gateways sgw MBG2 charging local-persistent-storage traceoptions]
user@host# set file datapath-log
```

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

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



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

4. Configure the tracing flag.

```
[edit unified-edge gateways sgw MBG2 charging local-persistent-storage traceoptions]
user@host# set flag all
```



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

5. Configure the tracing level.

```
[edit unified-edge gateways sgw MBG2 charging local-persistent-storage traceoptions]
user@host# set level error
```

6. View the trace file.

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

Related Documentation

- [Configuring Offline Charging on page 15](#)
- [Configuring S-GW-Specific Charging Parameters on page 17](#)
- [Configuring S-GW Global Charging Profiles and Selection Order on page 19](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)
- [Configuring GTP Prime for Transferring CDRs on page 21](#)
- [Configuring Persistent Storage on page 23](#)
- [Configuring Transport Profiles for Offline Charging on page 27](#)
- [Configuring Charging Trigger Events for Offline Charging on page 30](#)
- [Configuring CDR Attributes on page 32](#)
- [Configuring Charging Profiles on page 35](#)
- [Configuring Charging Profiles for APNs on page 37](#)
- [Tracing Charging Operations on page 189](#)
- [Charging Data Records on page 7](#)
- [Configuring S-GW Traceoptions](#)
- [Configuring S-GW Software Data Path Traceoptions](#)
- [Configuring S-GW GTP Traceoptions](#)
- [Configuring S-GW Charging Traceoptions on page 193](#)

Configuring S-GW Charging Traceoptions

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

[Table 15 on page 193](#) describes the flags relating to the S-GW that you can include at the `[edit unified-edge gateways sgw gateway-name charging traceoptions flag]` hierarchy level.

Table 15: S-GW Charging Trace Flags

Flag	Description
all	Trace everything.

Table 15: S-GW Charging Trace Flags (*continued*)

cdr-encoding	Trace Charging Detail Record (CDR) encoding.
client-fsm	Trace client finite state machine (FSM).
config	Trace configuration events.
fsm	Trace FSM events.
general	Trace general events.
group-fsm	Trace group FSM events.
init	Trace initialization events.
ipc	Trace IPC events.
path-management	Trace path management module.
request	Trace requests.
resource	Trace resources.
response	Trace response.
timers	Trace timers.
transport	Trace transport group.
triggers	Trace trigger information.

[Table 16 on page 194](#) describes the levels you can include.

Table 16: S-GW Charging Trace Levels

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

To configure tracing options for charging operations:

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

```
[edit unified-edge gateways sgw MBG2 charging]
user@host# edit traceoptions
```



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

2. Configure the filename for the trace file.

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

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

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



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

4. Configure the tracing flag.

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



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

5. Configure the tracing level.

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

6. View the trace file.

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

Related Documentation

- [Configuring Offline Charging on page 15](#)
- [Configuring S-GW-Specific Charging Parameters on page 17](#)
- [Configuring S-GW Global Charging Profiles and Selection Order on page 19](#)
- [Configuring S-GW Local Persistent Storage Traceoptions on page 191](#)
- [Configuring GTP Prime for Transferring CDRs on page 21](#)
- [Configuring Persistent Storage on page 23](#)

- [Configuring Transport Profiles for Offline Charging on page 27](#)
- [Configuring Charging Trigger Events for Offline Charging on page 30](#)
- [Configuring CDR Attributes on page 32](#)
- [Configuring Charging Profiles on page 35](#)
- [Configuring Charging Profiles for APNs on page 37](#)
- [Tracing Charging Operations on page 189](#)
- [Charging Data Records on page 7](#)
- [Configuring S-GW Traceoptions](#)
- [Configuring S-GW Software Data Path Traceoptions](#)
- [Configuring S-GW GTP Traceoptions](#)
- [Configuring S-GW Local Persistent Storage Traceoptions on page 191](#)

PART 5

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