

# MobileNext Broadband Gateway

## Charging for GGSN/PDN Gateway



---

Published: 2012-04-11

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

Copyright © 2012, Juniper Networks, Inc. All rights reserved.

Juniper Networks, Junos, Steel-Belted Radius, NetScreen, and ScreenOS are registered trademarks of Juniper Networks, Inc. in the United States and other countries. The Juniper Networks Logo, the Junos logo, and JunosE are trademarks of Juniper Networks, Inc. All other trademarks, service marks, registered trademarks, or registered service marks are the property of their respective owners.

Juniper Networks assumes no responsibility for any inaccuracies in this document. Juniper Networks reserves the right to change, modify, transfer, or otherwise revise this publication without notice.

Products made or sold by Juniper Networks or components thereof might be covered by one or more of the following patents that are owned by or licensed to Juniper Networks: U.S. Patent Nos. 5,473,599, 5,905,725, 5,909,440, 6,192,051, 6,333,650, 6,359,479, 6,406,312, 6,429,706, 6,459,579, 6,493,347, 6,538,518, 6,538,899, 6,552,918, 6,567,902, 6,578,186, and 6,590,785.

*MobileNext Broadband Gateway Charging for GGSN/PDN Gateway*

Copyright © 2012, Juniper Networks, Inc.

All rights reserved.

The information in this document is current as of the date on the title page.

#### YEAR 2000 NOTICE

Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

#### END USER LICENSE AGREEMENT

The Juniper Networks product that is the subject of this technical documentation consists of (or is intended for use with) Juniper Networks software. Use of such software is subject to the terms and conditions of the End User License Agreement ("EULA") posted at <http://www.juniper.net/support/eula.html>. By downloading, installing or using such software, you agree to the terms and conditions of that EULA.

# Table of Contents

	About the Documentation . . . . .	xi
	Documentation and Release Notes . . . . .	xi
	Supported Platforms . . . . .	xi
	Documentation Conventions . . . . .	xi
	Documentation Feedback . . . . .	xiii
	Requesting Technical Support . . . . .	xiii
	Self-Help Online Tools and Resources . . . . .	xiv
	Opening a Case with JTAC . . . . .	xiv
<b>Part 1</b>	<b>Overview</b>	
<b>Chapter 1</b>	<b>Charging Overview . . . . .</b>	<b>3</b>
	Charging . . . . .	3
	Charging Services Overview . . . . .	3
	Charging Data Records . . . . .	5
	Information Collection and CDR Generation . . . . .	7
	CDR Delivery . . . . .	8
	Charging Profiles . . . . .	9
	Charging Profile Selection Process . . . . .	9
<b>Part 2</b>	<b>Configuration</b>	
<b>Chapter 2</b>	<b>Configuration Overview . . . . .</b>	<b>13</b>
	Configuring Charging . . . . .	13
<b>Chapter 3</b>	<b>Configuration Tasks for Charging . . . . .</b>	<b>15</b>
	Configuring GTP Prime for Charging . . . . .	15
	Configuring GTP Prime for Transferring CDRs . . . . .	15
	Configuring GTP Prime Peers . . . . .	16
	Configuring Persistent Storage . . . . .	17
	Configuring Local Persistent Storage . . . . .	17
	Tracing Persistent Storage Operations . . . . .	18
	Configuring the Solid State Disk for Persistent Storage . . . . .	19
	Initializing the Solid State Disk for Persistent Storage . . . . .	20
	Ejecting the Solid State Disk . . . . .	20
	Installing the Solid State Disk . . . . .	21
	Configuring Transport Profiles . . . . .	21
	Configuring Charging Trigger Events . . . . .	23
	Configuring CDR Attributes . . . . .	25
	Configuring Charging Profiles . . . . .	26
	Configuring Charging Profiles for APNs . . . . .	28

<b>Chapter 4</b>	<b>Configuration Statements</b>	<b>29</b>
	[edit unified-edge gateways] Hierarchy Level	29
	cdr-aggregation-limit	30
	cdr-profile	31
	cdr-profiles	33
	cdr-release	34
	cdrs-per-file	35
	charging	36
	charging-gateways	40
	charging-profiles	41
	container-limit	42
	default-rating-group	43
	default-service-id	44
	description	45
	destination-ipv4-address (GTP Prime)	46
	destination-port (GTP Prime)	47
	direction (Trigger Profiles)	48
	disable-replication	49
	disk-space-policy	50
	down-detect-time (GTP Prime)	51
	echo-interval (GTP Prime)	52
	enable-reduced-partial-cdrs	53
	exclude (Trigger Profiles)	54
	exclude-ie-options	57
	file-age	61
	file-creation-policy	62
	file-format	63
	file-name-private-extension	64
	file-size	66
	gtp	68
	header-type (GTP Prime)	69
	local-persistent-storage-options	70
	local-storage	71
	mtu (Transport Profiles)	72
	n3-requests (GTP Prime)	73
	no-path-management (GTP Prime)	74
	offline (Transport Profiles)	75
	offline (Trigger Profiles)	76
	peer (GTP Prime)	77
	peer (Peer Order)	78
	peer-order	79
	pending-queue-size (GTP Prime)	80
	persistent-storage-order	81
	profile-id	82
	reconnect-time (GTP Prime)	83
	service-mode (Charging Profiles)	84
	service-mode (Transport Profiles)	86
	sgsn-sgw-change-limit (GGSN or P-GW)	87
	source-interface (GTP Prime)	88

	switch-back-time . . . . .	89
	t3-response (GTP Prime) . . . . .	90
	tariff-time-list . . . . .	91
	time-limit . . . . .	92
	traceoptions (Charging) . . . . .	93
	traceoptions (Local Persistent Storage) . . . . .	96
	transport-profile . . . . .	98
	transport-profiles . . . . .	100
	transport-protocol (GTP Prime) . . . . .	101
	trigger-profile . . . . .	102
	trigger-profiles . . . . .	103
	user-name (Local Persistent Storage) . . . . .	104
	version (GTP Prime) . . . . .	105
	volume-limit . . . . .	106
	watermark-level-1 . . . . .	107
	watermark-level-2 . . . . .	108
	watermark-level-3 . . . . .	109
	world-readable (Local Persistent Storage) . . . . .	110
<b>Part 3</b>	<b>Administration</b>	
<b>Chapter 5</b>	<b>Monitoring the Charging Configuration . . . . .</b>	<b>113</b>
	Verifying and Managing the Charging Configuration . . . . .	113
<b>Chapter 6</b>	<b>Operational Commands . . . . .</b>	<b>115</b>
	clear unified-edge ggsn-pgw charging cdr . . . . .	116
	clear unified-edge ggsn-pgw charging cdr wfa . . . . .	117
	clear unified-edge ggsn-pgw charging local-persistent-storage statistics . . . . .	118
	clear unified-edge ggsn-pgw charging path statistics . . . . .	119
	clear unified-edge ggsn-pgw charging transfer statistics . . . . .	120
	request system storage unified-edge charging media start . . . . .	121
	request system storage unified-edge charging media stop . . . . .	122
	request system storage unified-edge media eject . . . . .	123
	request system storage unified-edge media prepare . . . . .	124
	show unified-edge ggsn-pgw charging global statistics . . . . .	125
	show unified-edge ggsn-pgw charging local-persistent-storage statistics . . . . .	128
	show unified-edge ggsn-pgw charging path statistics . . . . .	134
	show unified-edge ggsn-pgw charging path status . . . . .	139
	show unified-edge ggsn-pgw charging service-mode . . . . .	142
	show unified-edge ggsn-pgw charging transfer statistics . . . . .	145
	show unified-edge ggsn-pgw charging transfer status . . . . .	148
	show unified-edge ggsn-pgw charging trigger-profile . . . . .	151
<b>Part 4</b>	<b>Troubleshooting</b>	
<b>Chapter 7</b>	<b>Acquiring Troubleshooting Information . . . . .</b>	<b>155</b>
	Tracing Charging Operations . . . . .	155
	Configuring the Trace Log Filename . . . . .	156
	Configuring the Tracing Flags . . . . .	156

## Part 5

## Index

Index .....	161
-------------	-----

# List of Figures

Part 1	Overview	
Chapter 1	Charging Overview .....	3
	Figure 1: Simple Charging Topology .....	4





# List of Tables

	<b>About the Documentation</b> . . . . .	<b>xi</b>
	Table 1: Notice Icons . . . . .	xii
	Table 2: Text and Syntax Conventions . . . . .	xii
<b>Part 2</b>	<b>Configuration</b>	
<b>Chapter 4</b>	<b>Configuration Statements</b> . . . . .	<b>29</b>
	Table 3: Triggers and Corresponding IEs . . . . .	55
<b>Part 3</b>	<b>Administration</b>	
<b>Chapter 6</b>	<b>Operational Commands</b> . . . . .	<b>115</b>
	Table 4: show unified-edge sgw charging global statistics Output Fields . . . . .	125
	Table 5: show unified-edge ggsn-pgw charging local-persistent-storage statistics Output Fields . . . . .	128
	Table 6: show unified-edge ggsn-pgw charging path statistics Output Fields . .	135
	Table 7: show unified-edge ggsn-pgw charging path status Output Fields . . . .	140
	Table 8: show unified-edge ggsn-pgw charging service-mode Output Fields . . .	142
	Table 9: show unified-edge ggsn-pgw charging transfer statistics Output Fields . . . . .	145
	Table 10: show unified-edge ggsn-pgw charging transfer status Output Fields . . . . .	148
	Table 11: show unified-edge ggsn-pgw charging trigger-profile Output Fields . . .	151



# About the Documentation

- Documentation and Release Notes on page xi
- Supported Platforms on page xi
- Documentation Conventions on page xi
- Documentation Feedback on page xiii
- Requesting Technical Support on page xiii

## Documentation and Release Notes

---

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

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

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

## Supported Platforms

---

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

- MX240 Routers
- MX960 Routers
- MX480 Routers

## Documentation Conventions

---

Table 1 on page 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
<b>Bold text like this</b>	Represents text that you type.	To enter configuration mode, type the <b>configure</b> command:  user@host> <b>configure</b>
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> <b>show chassis alarms</b> No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"> <li>Introduces important new terms.</li> <li>Identifies book names.</li> <li>Identifies RFC and Internet draft titles.</li> </ul>	<ul style="list-style-type: none"> <li>A policy <i>term</i> is a named structure that defines match conditions and actions.</li> <li><i>Junos OS System Basics Configuration Guide</i></li> <li>RFC 1997, <i>BGP Communities Attribute</i></li> </ul>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name:  [edit] root@# <b>set system domain-name</b> <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; interface names; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> <li>To configure a stub area, include the <b>stub</b> statement at the [edit protocols ospf area area-id] hierarchy level.</li> <li>The console port is labeled <b>CONSOLE</b>.</li> </ul>
< > (angle brackets)	Enclose optional keywords or variables.	<b>stub</b> <default-metric <i>metric</i> >;

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

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

## Documentation Feedback

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

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

## Requesting Technical Support

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

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

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

## Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

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

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

## Opening a Case with JTAC

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

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

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

## PART 1

# Overview

- [Charging Overview on page 3](#)





## CHAPTER 1

# Charging Overview

- [Charging on page 3](#)
- [Charging Services Overview on page 3](#)
- [Charging Data Records on page 5](#)
- [Charging Profiles on page 9](#)

## Charging

---

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 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.

The broadband gateway provides support for billing through offline charging, RADIUS accounting, or both. RADIUS accounting delivers accounting information used for billing to the RADIUS accounting server.

### Related Documentation

- [Charging Services Overview on page 3](#)

## Charging Services 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

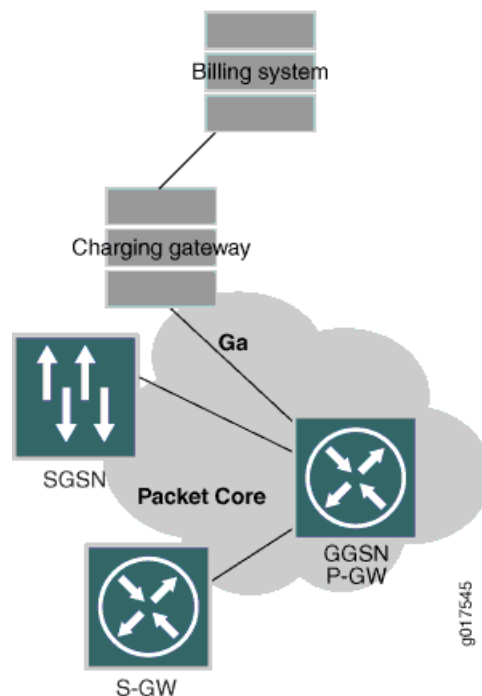
record collection for their mobile subscribers. The broadband gateway gathers Charging Data Records (CDRs) and delivers them to the charging gateway function (CGF) over the Ga interface using the GTP Prime protocol. The billing function is distributed across all modules of the broadband gateway, which performs these tasks for billing:

- Accurate CDR creation and closure
- Partial record generation
- ASN.1 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 4 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 AVP 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**

- [Configuring GTP Prime for Charging on page 15](#)
- [Configuring Persistent Storage on page 17](#)
- [Charging Data Records on page 5](#)
- [Charging Profiles on page 9](#)

---

## 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 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***\_***RC***\_***date***\_***time***[***.PI***].cdr, where:

- *NodeID*—Name of the host that generated the file.
- *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*.

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

- [Configuring Charging on page 13](#)
- [Configuring Transport Profiles on page 21](#)

---

## 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**

- [Configuring Charging Profiles on page 26](#)
- [Configuring Transport Profiles on page 21](#)
- [Configuring Charging Trigger Events on page 23](#)
- [Configuring CDR Attributes on page 25](#)
- [Configuring Charging Profiles for APNs on page 28](#)



## PART 2

# Configuration

- [Configuration Overview on page 13](#)
- [Configuration Tasks for Charging on page 15](#)
- [Configuration Statements on page 29](#)



## CHAPTER 2

# Configuration Overview

- [Configuring Charging on page 13](#)

### Configuring 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 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 do not configure the GTP Prime properties for the 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 15](#)
- [Configuring Persistent Storage on page 17](#)
- [Configuring Transport Profiles on page 21](#)

- [Configuring Charging Trigger Events on page 23](#)
- [Configuring CDR Attributes on page 25](#)
- [Configuring Charging Profiles on page 26](#)
- [Configuring Charging Profiles for APNs on page 28](#)
- [Tracing Charging Operations on page 155](#)
- [Charging Data Records on page 5](#)

## CHAPTER 3

# Configuration Tasks for Charging

- [Configuring GTP Prime for Charging on page 15](#)
- [Configuring Persistent Storage on page 17](#)
- [Configuring the Solid State Disk for Persistent Storage on page 19](#)
- [Configuring Transport Profiles on page 21](#)
- [Configuring Charging Trigger Events on page 23](#)
- [Configuring CDR Attributes on page 25](#)
- [Configuring Charging Profiles on page 26](#)
- [Configuring Charging Profiles for APNs on page 28](#)

### 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 15](#)
- [Configuring GTP Prime Peers on page 16](#)

### 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
```

8. 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
```

9. 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
```

10. 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
```

11. 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
```

12. 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
```

13. 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:

1. 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
```

2. 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
```

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

- Related Documentation**
- [Configuring Charging on page 13](#)
  - [Configuring Transport Profiles on page 21](#)
  - [Charging Services Overview on page 3](#)

## 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 17](#)
- [Tracing Persistent Storage Operations on page 18](#)

### 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
<b>all</b>	Trace all operations
<b>connection</b>	Trace connection establishment between the Routing Engine and all session DPCs for CDR file backup
<b>file-operations</b>	Trace file operations (open, write, close)
<b>general</b>	Trace miscellaneous operations
<b>journaling</b>	Trace file journaling operations
<b>mirror</b>	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 19](#)
- [Configuring Charging on page 13](#)
- [Configuring Transport Profiles on page 21](#)
- [Charging Services Overview on page 3](#)
- [Configuring S-GW-Specific Charging Parameters](#)
- [Configuring S-GW Global Charging Profiles and Selection Order](#)
- [Configuring S-GW Charging Traceoptions](#)
- [Configuring S-GW Charging Traceoptions](#)

## 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 20](#)
- [Ejecting the Solid State Disk on page 20](#)
- [Installing the Solid State Disk on page 21](#)

## 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 17](#)
- [request system storage unified-edge charging media start on page 121](#)
- [request system storage unified-edge charging media stop on page 122](#)
- [request system storage unified-edge media eject on page 123](#)
- [request system storage unified-edge media prepare on page 124](#)

## Configuring Transport Profiles

A transport profile provides information for transporting the Charging Data Records (CDRs) from the charging data function (CDF) to the charging gateways or to local persistent storage. A transport profile can be associated with different charging profiles. You can define up to eight transport profiles.

To configure transport profiles:

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
```

2. Specify a description for the profile.

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

3. Configure offline charging in the transport profile.

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

4. 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
```

5. Specify the time 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
```

6. 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
```

7. 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 (r99 | r7 | r8)
```

8. Specify the number of CDRs in one DRT message.

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

9. Configure the maximum transmission unit (MTU) of the DRT message.

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

#### Related Documentation

- [Configuring Charging on page 13](#)
- [Configuring GTP Prime for Charging on page 15](#)
- [Configuring Persistent Storage on page 17](#)
- [Configuring Charging Profiles on page 26](#)
- [Charging Profiles on page 9](#)
- [Configuring S-GW-Specific Charging Parameters](#)

- Configuring S-GW Global Charging Profiles and Selection Order
- Configuring S-GW Charging Traceoptions
- Configuring S-GW Charging Traceoptions

## Configuring Charging Trigger Events

A trigger profile defines the charging events that cause Charging Data Record (CDR) changes.

To configure trigger profiles:

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
```

2. Specify a description for the profile.

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

3. Configure offline charging in the trigger profile.

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

4. Specify a time limit for closing the container. 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
```

5. Specify the bearer information change that does 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
```

The following table describes the bearer information changes that can be ignored for charging data updates.

Bearer Information Change	Description
<b>ms-timezone-change</b>	MS time zone
<b>plmn-change</b>	Public Land Mobile Network (PLMN)
<b>qos-change</b>	Quality of service (QoS)
<b>rat-change</b>	Radio Access Technology (RAT)
<b>sgsn-sgw-change</b>	SGSN or S-GW limit

Bearer Information Change	Description
<b>user-location-change</b>	User location information

For example:

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

- 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
```

- 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)
```

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

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

- Specify the number of SGSN or S-GW changes that can occur before the CDR is updated and closed. A value of zero (0) disables this trigger.

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

- 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.

```
[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

- [Configuring Charging on page 13](#)
- [Configuring Charging Profiles on page 26](#)
- [Charging Profiles on page 9](#)
- [Configuring S-GW-Specific Charging Parameters](#)

- Configuring S-GW Global Charging Profiles and Selection Order
- Configuring S-GW Charging Traceoptions
- Configuring S-GW Charging Traceoptions

## Configuring CDR Attributes

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

To configure CDR profiles:

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
```
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 information elements to exclude from the CDR. You can specify the excluded information elements so that you can manage the size of the CDR. By default, all informational elements are included in the CDR.
 

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

The following table describes the information elements that can be excluded from CDRs.

Information Element	Information in CDRs
<b>apn-ni</b>	Access point name (APN) network identifier
<b>apn-selection-mode</b>	APN selection mode
<b>cc-selection-mode</b>	Charging characteristic selection mode
<b>dynamic-address</b>	Dynamic Packet Data Protocol (PDP) address indication
<b>list-of-service-data</b>	List of service data
<b>list-of-traffic-volumes</b>	List of traffic volumes
<b>lrsn</b>	Local record sequence number
<b>ms-time-zone</b>	Mobile station (MS) time zone

Information Element	Information in CDRs
<b>network-initiation</b>	Network initiation flag
<b>node-id</b>	Node identifier
<b>pdn-connection-id</b>	Packet data network (PDN) connection ID
<b>pdppdn-type</b>	PDP or PDN type
<b>pgw-plmn-identifier</b>	Packet Data Network Gateway (P-GW) Public Land Mobile Network (PLMN) identifier field
<b>rat-type</b>	Radio Access Technology (RAT) type
<b>record-sequence-number</b>	Record sequence number
<b>served-imeisv</b>	Served International Mobile Equipment Identity and Software Version Number (IMEISV)
<b>served-msisdn</b>	Served mobile station ISDN (MSISDN)
<b>served-pdppdn-address</b>	Served PDP context or IP-CAN bearer address
<b>serving-node-plmn-identifier</b>	Serving node PLMN identifier field
<b>start-time</b>	Time when session established; added to first CDR
<b>stop-time</b>	Time when session terminated; added to last CDR
<b>user-location-information</b>	User location information

#### Related Documentation

- [Configuring Charging on page 13](#)
- [Configuring Charging Profiles on page 26](#)
- [Charging Profiles on page 9](#)
- [Configuring S-GW-Specific Charging Parameters](#)
- [Configuring S-GW Global Charging Profiles and Selection Order](#)
- [Configuring S-GW Charging Traceoptions](#)
- [Configuring S-GW Charging Traceoptions](#)

## 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, a trigger profile, and other default service-aware charging information.



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
```

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 defined.

```
[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. This option is useful for the 3GPP Release 8 specifications or for generating a Release 7 service data container.

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

6. (Optional) Specify the default service identifier for the service or the service component. This option is useful for the 3GPP Release 8 specifications or for generating a Release 7 service data container.

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

7. (Optional) Specify the CDR profile referenced by this charging profile. The CDR profile must be defined.

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

8. (Optional) Specify the trigger profile referenced by this charging profile. The trigger profile must be defined.

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

#### Related Documentation

- [Configuring Charging on page 13](#)
- [Charging Profiles on page 9](#)
- [Configuring S-GW-Specific Charging Parameters](#)
- [Configuring S-GW Global Charging Profiles and Selection Order](#)
- [Configuring S-GW Charging Traceoptions](#)

- [Configuring S-GW Charging Traceoptions](#)

## 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:

1. 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
```

2. 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
```

3. 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 Charging on page 13](#)
- [Charging Profiles on page 9](#)
- [Configuring S-GW-Specific Charging Parameters](#)
- [Configuring S-GW Global Charging Profiles and Selection Order](#)
- [Configuring S-GW Charging Traceoptions](#)
- [Configuring S-GW Charging Traceoptions](#)

## CHAPTER 4

# Configuration Statements

- [\[edit unified-edge gateways\] Hierarchy Level on page 29](#)

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

---

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

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

#### **Related Documentation**


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

## cdr-aggregation-limit

---

<b>Syntax</b>	<code>cdr-aggregation-limit value;</code>
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	<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 <b>cdr-aggregation-limit</b> or the <b>mtu</b> size is reached (whichever comes first). For efficient transmissions of DRT messages, you may want to set the <b>cdr-aggregation-limit</b> to the maximum value of 16.</p>
<b>Options</b>	<p><b>value</b>—Number of CDRs that can be added to a DRT message.</p> <p><b>Range:</b> 1 through 16</p> <p><b>Default:</b> 5</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">charging-gateways on page 40</a></li><li>• <a href="#">Configuring Transport Profiles on page 21</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## cdr-profile

<b>Syntax</b>	<code>cdr-profile <i>profile-name</i>;</code>
<b>Hierarchy Level</b>	<code>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>],</code> <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>]</code>
<b>Release Information</b>	<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 charging-profiles <i>profile-name</i>]</code> hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
<b>Description</b>	<p>Associate a Charging Data Record (CDR) profile with a charging profile. However, make sure this profile has been previously defined.</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 and is used for billing purposes.</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"> <li>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></li> <li>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></li> </ul>
	<div>  <p><b>TIP:</b> 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"> <li>GGSN or P-GW—<code>set unified-edge gateways ggsn-pgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i></code></li> <li>S-GW—<code>set unified-edge gateways sgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i></code></li> </ul> </div>
<b>Options</b>	<i>profile-name</i> —Name of the CDR profile to be associated with the charging profile.
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">charging-profiles on page 41</a></li> <li><a href="#">Configuring Charging Profiles on page 26</a></li> </ul>

- [Configuring Charging on page 13](#)
- [Charging Profiles on page 9](#)

## cdr-profiles

<b>Syntax</b>	<pre> cdr-profiles <i>profile-name</i> {   <i>description string</i>;   enable-reduced-partial-cdrs;   exclude-ie-options {     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;     rat-type;     record-sequence-number;     served-imeisv;     served-msisdn;     served-pdppdn-address;     serving-node-plmn-identifier;     sgw-change; # S-GW only     start-time;     stop-time;     user-location-information;   } } </pre>
<b>Hierarchy Level</b>	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging],  [edit unified-edge gateways sgw <i>gateway-name</i> charging]</p>
<b>Release Information</b>	<p>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.</p>
<b>Description</b>	<p>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 and is used for billing purposes.</p> <p>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.</p> <p>The maximum number of CDR profiles supported for the broadband gateway is 255.</p> <p>The remaining statements are explained separately.</p>

<b>Options</b>	<i>profile-name</i> —Name of the CDR profile. <b>Values:</b> 1 through 128 bytes
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">charging on page 36</a></li> <li>• <a href="#">Configuring CDR Attributes on page 25</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## cdr-release

<b>Syntax</b>	<code>cdr-release (r7   r8   r99);</code>
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	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 and 99 are not applicable to the Serving Gateway (S-GW). 3GPP release version 8 is applicable to the GGSN, P-GW, and S-GW.

<b>Options</b>	<p><b>r7</b>—3GPP release version, 7.</p> <p><b>r8</b>—3GPP release version, 8.</p> <p><b>r99</b>—3GPP release version, 99.</p> <p><b>Default:</b> r8</p>
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">charging-gateways on page 40</a></li> <li>• <a href="#">Configuring Transport Profiles on page 21</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>



## cdrs-per-file

<b>Syntax</b>	<code>cdrs-per-file value;</code>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<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"> <li>• Number of CDRs per file reaches the configured or default limit.</li> <li>• Size of the file reaches the configured or default limit.</li> <li>• Age of the file reaches the configured or default limit.</li> </ul>
	<div>  <p><b>NOTE:</b> The default limit is applicable only if you have not configured any value.</p> </div>
<b>Options</b>	<p><b>value</b>—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><b>Range:</b> 5000 through 1,000,000</p> <p><b>Default:</b> 0, which indicates that there is no trigger for the CDR count per file.</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">local-persistent-storage-options on page 70</a></li> <li>• <a href="#">Configuring Persistent Storage on page 17</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## charging

```
Syntax  charging {
        cdr-profiles profile-name {
            description string;
            enable-reduced-partial-cdrs;
            exclude-ie-options {
                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;
                rat-type;
                record-sequence-number;
                served-imeisv;
                served-msisdn;
                served-pdppdn-address;
                serving-node-plmn-identifier;
                sgw-change; # S-GW only
                start-time;
                stop-time;
                user-location-information;
            }
        }
        charging-profiles profile-name {
            cdr-profile profile-name;
            default-rating-group rg-num;
            default-service-id id-num;
            description string;
            profile-id id-num;
            transport-profile profile-name;
            trigger-profile profile-name;
            service-mode maintenance;
        }
        global-profile { # S-GW only
            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> <no-world-readable | world-readable> <size size>;
    flag flag;
    level (all | critical | error | info | notice | verbose | warning);
    no-remote-trace;
}
transport-profiles profile-name {
    description string;
    offline {
        charging-gateways {
            cdr-aggregation-limit value;
            cdr-release (r7 | r8 | r99);
            mtu value;
            peer-order {
                [peer charging-gateway-peer-name];
            }
            persistent-storage-order {
                local-storage;
            }
            switch-back-time seconds;
        }
    }
    service-mode maintenance;
}
trigger-profiles profile-name {
    description string;
    offline {
        container-limit value;
        exclude {
            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 value; #S-GW only
        sgsn-sgw-change-limit value; #P-GW only
        time-limit value;
        volume-limit {
            value;
            direction (both | uplink);
        }
    }
}
tariff-time-list {

```

```

        [tariff-time];
    }
}

```

<b>Hierarchy Level</b>	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> ], [edit unified-edge gateways sgw <i>gateway-name</i> ]
<b>Release Information</b>	Statement introduced in Junos OS Mobility Release 11.2W. Support at the [edit unified-edge gateways sgw <i>gateway-name</i> ] hierarchy level introduced in Junos OS Mobility Release 11.4W.
<b>Description</b>	The configuration in this hierarchy determines the overall charging configuration for a subscriber.  The remaining statements are explained separately.
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• ggsn-pgw</li> <li>• <a href="#">Configuring Charging on page 13</a></li> <li>• <a href="#">Charging on page 3</a></li> <li>• <a href="#">Charging Services Overview on page 3</a></li> <li>• <a href="#">Charging Data Records on page 5</a></li> <li>• <a href="#">Charging Profiles on page 9</a></li> <li>• sgw</li> </ul>

## charging-gateways

---

<b>Syntax</b>	<pre>charging-gateways {   cdr-aggregation-limit value;   cdr-release (r7   r8   r99);   mtu value;   peer-order {     [peer charging-gateway-peer-name];   }   persistent-storage-order {     local-storage;   }   switch-back-time seconds; }</pre>
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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] hierarchy level introduced in Junos OS Mobility Release 11.4W.
<b>Description</b>	<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"><li>• The maximum CDRs that can be added to a Data Record Transfer (DRT) message.</li><li>• The maximum transmission unit of a DRT message.</li><li>• The generated CDRs to be compliant with a specific 3GPP release.</li><li>• The duration the charging data function (CDF) waits before transmitting the CDRs to a peer that has recently come up and has the highest priority among all the peers, which are alive.</li></ul> <p>The remaining statements are explained separately.</p>
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">offline on page 75</a></li><li>• <a href="#">Configuring Transport Profiles on page 21</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## charging-profiles

<b>Syntax</b>	<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>; }</pre>
<b>Hierarchy Level</b>	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging], [edit unified-edge gateways sgw <i>gateway-name</i> charging]
<b>Release Information</b>	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.
<b>Description</b>	<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> <p>The remaining statements are explained separately.</p>
<b>Options</b>	<p><i>profile-name</i>—Name of the charging profile.</p> <p><b>Values:</b> 1 through 128 bytes</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">charging on page 36</a></li> <li>• <a href="#">Configuring Charging Profiles on page 26</a></li> <li>• <a href="#">Charging Profiles on page 9</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>


## container-limit

---

<b>Syntax</b>	container-limit <i>value</i> ;
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	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.
<b>Options</b>	<i>value</i> —Maximum number of containers. <b>Range:</b> 1 through 15 <b>Default:</b> 5
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">offline on page 76</a></li><li>• <a href="#">Configuring Charging Trigger Events on page 23</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>




## default-rating-group

<b>Syntax</b>	<code>default-rating-group <i>rg-num</i>;</code>
<b>Hierarchy Level</b>	<code>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>],</code> <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>]</code>
<b>Release Information</b>	Statement introduced in Junos OS Mobility Release 11.2W. Support at the <code>[edit unified-edge gateways sgw <i>gateway-name</i> charging charging-profiles <i>profile-name</i>]</code> hierarchy level introduced in Junos OS Mobility Release 11.4W.
<b>Description</b>	Specify a default rating group to be used for charging service data containers. The rating group represents a collection of services.  When this option is configured and if the Charging Data Record (CDR) release used is <b>r7</b> , then the P-GW generates a service data container, which is added to the CDR.
<div>  <p><b>NOTE:</b> This configuration is not applicable for the Serving Gateway (S-GW).</p> </div>	
<b>Options</b>	<i>rg-num</i> —Default rating group to be used for charging.
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">charging-profiles on page 41</a></li> <li>• <a href="#">Configuring Charging Profiles on page 26</a></li> <li>• <a href="#">Charging Profiles on page 9</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## 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	<p>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.</p> <p>When this option is configured and if the Charging Data Record (CDR) release used is r7, then the P-GW generates a service data container, which is added to the CDR.</p>
<div> <b>NOTE:</b> 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"><li>• <a href="#">charging-profiles on page 41</a></li><li>• <a href="#">Configuring Charging Profiles on page 26</a></li><li>• <a href="#">Charging Profiles on page 9</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## description

<b>Syntax</b>	<code>description string;</code>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<p>Enter a description for the Charging Data Record (CDR) profile, charging profile, transport profile, or trigger profile (which can be used to capture the purpose of the profile). For example, you might have a description to differentiate the default profile from other profiles, as follows:</p> <p><b>This is the default profile to be used when a subscriber cannot be categorized into any other profile.</b></p> <p>However, make sure that the description is 255 characters or fewer.</p>
<b>Options</b>	<p><b>string</b>—Description of the profile.</p> <p><b>Values:</b> Up to 255 characters</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">cdr-profiles on page 33</a></li> <li>• <a href="#">charging-profiles on page 41</a></li> <li>• <a href="#">transport-profiles on page 100</a></li> <li>• <a href="#">trigger-profiles on page 103</a></li> <li>• <a href="#">Configuring CDR Attributes on page 25</a></li> <li>• <a href="#">Configuring Charging Profiles on page 26</a></li> <li>• <a href="#">Configuring Transport Profiles on page 21</a></li> <li>• <a href="#">Configuring Charging Trigger Events on page 23</a></li> </ul>

## destination-ipv4-address (GTP Prime)

---

<b>Syntax</b>	<code>destination-ipv4-address <i>address</i>;</code>
<b>Hierarchy Level</b>	[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> ]
<b>Release Information</b>	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.
<b>Description</b>	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.
<b>Options</b>	<i>address</i> —IPv4 address of the CGF server.
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">peer (GTP Prime) on page 77</a></li><li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li><li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li></ul>

## destination-port (GTP Prime)

<b>Syntax</b>	<code>destination-port <i>port-number</i>;</code>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<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>
<b>Options</b>	<p><b><i>port-number</i></b>—TCP or UDP port on which the CGF server listens to the GTP Prime messages sent from the CDF.</p> <p><b>Range:</b> 1 through 65535</p> <p><b>Default:</b> 3386</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">gtp on page 68</a></li> <li>• <a href="#">peer (GTP Prime) on page 77</a></li> <li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li> <li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li> </ul>

## direction (Trigger Profiles)

---

<b>Syntax</b>	direction (both   uplink);
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	<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>
<b>Default</b>	If you do not configure the <b>direction</b> statement, then the configured volume limit includes the total volume of data transmitted in both uplink and downlink directions.
<b>Options</b>	<p><b>both</b>—The configured volume limit must include the total volume of data transmitted in both uplink and downlink directions.</p> <p><b>uplink</b>—The configured volume limit must include the volume of data transmitted only in the uplink direction.</p>
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">volume-limit on page 106</a></li><li>• <a href="#">Configuring Charging Trigger Events on page 23</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## disable-replication

---

<b>Syntax</b>	disable-replication;
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	Statement introduced in Junos OS Mobility Release 11.2W. Support at the <b>[edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options]</b> hierarchy level introduced in Junos OS Mobility Release 11.4W.
<b>Description</b>	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.
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">local-persistent-storage-options on page 70</a></li> <li>• <a href="#">Configuring Persistent Storage on page 17</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## disk-space-policy

<b>Syntax</b>	<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>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<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>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">local-persistent-storage-options on page 70</a></li> <li>• <a href="#">Configuring Persistent Storage on page 17</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>



## down-detect-time (GTP Prime)

<b>Syntax</b>	<code>down-detect-time <i>duration</i>;</code>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<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 <math>n3 * t3</math> 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>
<b>Options</b>	<p><b><i>duration</i></b>—Duration the CDF waits after the <math>n3 * t3</math> 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><b>Range:</b> 0 through 255 seconds</p> <p><b>Default:</b> 10 seconds</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">gtp on page 68</a></li> <li>• <a href="#">peer (GTP Prime) on page 77</a></li> <li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li> <li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## echo-interval (GTP Prime)

---

<b>Syntax</b>	<code>echo-interval <i>duration</i>;</code>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	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.
<b>Description</b>	<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"><li>• Sent only for UDP connections.</li><li>• Not sent more than once in a minute.</li></ul> <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</p>
<b>Options</b>	<p><b><i>duration</i></b>—Number of seconds that the CDF waits before sending an echo request message to the CGF server.</p> <p><b>Range:</b> 60 through 255 seconds</p> <p><b>Default:</b> 60 seconds</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">gtp on page 68</a></li><li>• <a href="#">peer on page 77</a></li><li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li><li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## enable-reduced-partial-cdrs

<b>Syntax</b>	enable-reduced-partial-cdrs;
<b>Hierarchy Level</b>	[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> ]
<b>Release Information</b>	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.
<b>Description</b>	Enable the generation of reduced partial Charging Data Records (RPCs). 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.
<b>Default</b>	If this statement is not configured, the generation of fully qualified partial CDR (FQPC) is supported. FQPC 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.
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">cdr-profiles on page 33</a></li> <li>• <a href="#">Configuring CDR Attributes on page 25</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## exclude (Trigger Profiles)

---

<b>Syntax</b>	<pre>exclude {   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>
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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 and the sgsn-mme-change option introduced in Junos OS Mobility Release 11.4W.
<b>Description</b>	<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"><li>• <b>set unified-edge gateways ggsn-pgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> exclude qos-change</b> for the gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW).</li><li>• <b>set unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> exclude qos-change</b> for the Serving Gateway (S-GW).</li></ul> <p>You may have configured certain information elements (IEs) to be excluded from the CDR using the statements at the [edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i> exclude-ie-options] or the [edit unified-edge gateways sgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i> exclude-ie-options] hierarchy levels. Irrespective of this configuration, some of the IEs are to the CDR if the corresponding triggering event is not disabled. The following table lists the triggers and the corresponding IEs.</p>

Table 3: Triggers and Corresponding IEs

Trigger	IE
<b>ms-timezone-change</b>	Mobile Station (MS) time zone
<b>plmn-change</b>	Serving node PLMN identifier
<b>rat-change</b>	RAT type
<b>user-location-change</b>	User location information

## Options



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

- **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 RAT change. Otherwise, when a Radio Access Technology (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], SAI [Service Area identity], Location Area Identity [LAI], or Cell Global Identity [CGI]) occurs, the open containers are closed and added to the CDR.

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

**Related Documentation**

- [offline on page 76](#)
- [Configuring Charging Trigger Events on page 23](#)
- [Configuring Charging on page 13](#)

## exclude-ie-options

<b>Syntax</b>	<pre> exclude-ie-options {   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;   rat-type;   record-sequence-number;   served-imeisv;   served-msisdn;   served-pdppdn-address;   serving-node-plmn-identifier;   sgw-change; # S-GW only   start-time;   stop-time;   user-location-information; } </pre>
<b>Hierarchy Level</b>	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i>],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging cdr-profiles <i>profile-name</i>]</p>
<b>Release Information</b>	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p><b>pgw-address-used</b> and <b>sgw-change</b> options and support for them 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.</p>
<b>Description</b>	<p>The mobile operator can provision certain optional information elements (parameters) to be excluded from the Charging Data Record (CDR). Use this statement to configure the information elements (IEs) that are to be excluded from the CDR. By default, all informational elements are included in the CDR.</p>



**CAUTION:** Some of the IEs 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** IEs 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 **trigger-profiles > exclude** hierarchy level.

## Options



**NOTE:** The following options are applicable to both the gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW) and Serving Gateway (S-GW) CDRs unless otherwise specified.

- **apn-ni**—The Access Point Name Network Identifier (APN-NI) defines the external network to which the user wants to connect to through the GGSN.
- **apn-selection-mode**—Indicates the origin of the APN and whether or not 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.  
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.  
Indicates that the network provided a default APN because the MS 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.  
Indicates that the MS or the network provided the APN and that the HLR or HSS verified the user's subscription to the network.
- **cc-selection-mode**—Indicates 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**—This field, if present in the CDR, indicates that the packet data protocol (PDP) address has been dynamically allocated for the specific PDP context.
- **list-of-service-data**—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**—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 IE element is applicable for CDRs that are compliant with the 3GPP R7 and R99 release specifications, only.

- **lrsn**—The Local Record Sequence Number (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**—Mobile Station (MS) time zone.

This IE 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. See [exclude](#) to disable this triggering event.



This IE is applicable for CDRs that are compliant with the 3GPP R7 and R8 release specifications, only.

- **network-initiation**—This field, if present in the CDR, indicates that the PDP context is network initiated.

This information element is applicable for CDRs that are compliant with the 3GPP R7 and R99 release specifications, only.

- **node-id**—ID of the network element node that generates the CDR.

In the MX Series router, the node-id is *ggsn/pgw-ip-address:virtual-spic-id*.

- **pdn-connection-id**—This ID uniquely identifies different records belonging to the same Packet Data Network (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 information element is applicable for CDRs that are compliant with the 3GPP R8 release specification, only.

- **pdppdn-type**—Both PDP Type and PDN Type define the end-user protocol used between the external PDN and the MS.

This information element is applicable for CDRs that are compliant with the 3GPP R8 release specification, only.

- **pgw-address-used**—Exclude the P-GW address-used IE from the CDR. This option is applicable only to the S-GW.
- **pgw-plmn-identifier**—P-GW PLMN identifier (mobile country code and mobile network code).

This information element is applicable for CDRs that are compliant with the 3GPP R8 and R99 release specifications, only.

- **rat-type**—The Radio Access Technology (RAT) type used by the MS: eUTRAN, GERAN, WLAN, GAN, HSPA Evolution, or evolved High Rate Packet Data (eHRPD).

This IE 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. See [exclude](#) to disable this triggering event.

This information element is applicable for CDRs that are compliant with the 3GPP R7 and R8 release specifications, only.

- **record-sequence-number**—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**—The International Mobile Station Equipment Identity and Software Version Number (IMEISV) IE of the served mobile equipment (ME).
- **served-msisdn**—The MSISDN number of the served equipment.
- **served-pdppdn-address**—The served PDP context or IP-CAN bearer address IE.

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

This IE 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. See [exclude](#) to disable this triggering event.

This information element is applicable for CDRs that are compliant with the 3GPP R8 release specification, only.

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

This information element is applicable for CDRs that are compliant with the 3GPP R8 release specification, only.

- **stop-time**—Time when the user IP-CAN session is terminated for the last bearer in this session.

This information element is applicable for CDRs that are compliant with the 3GPP R8 release specification, only.


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

This IE 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. See [exclude](#) to disable this triggering event.

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

<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">cdr-profiles on page 33</a></li><li>• <a href="#">Configuring CDR Attributes on page 25</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>
------------------------------	---

## file-age

<b>Syntax</b>	<pre>file-age {     age;     disable; }</pre>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<p>Statement introduced in Junos OS Mobility Release 11.2W.</p> <p><b>disable</b> 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>
<b>Description</b>	<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"> <li>• The age of the file reaches the configured or default limit.</li> <li>• The size of the file reaches the configured or default limit.</li> <li>• The number of CDRs per file reaches the configured or default limit.</li> </ul> <div style="margin-top: 20px;">  <p><b>NOTE:</b> The default limit is applicable only if you have not configured any value.</p> </div>
<b>Default</b>	<p>If you do not configure this statement, then the trigger based on file age is enabled by default.</p>
<b>Options</b>	<p><b>age</b>—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><b>Range:</b> 20 through 7200 minutes</p> <p><b>Default:</b> 120 minutes</p> <p><b>disable</b>—Disable the file age trigger.</p>
<b>Required Privilege Level</b>	<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 17](#)
  - [Configuring Charging on page 13](#)
  - [local-persistent-storage-options on page 70](#)

---

## file-creation-policy

---

<b>Syntax</b>	file-creation-policy (shared-file   unique-file);
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	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 ( <b>shared-file</b> option) or to multiple files, with each file storing CDRs generated from a single services PIC ( <b>unique-file</b> configuration).
<b>Default</b>	If you do not include the <b>file-creation-policy</b> statement, CDRs from all the services PICs are routed to a single temporary file ( <b>shared-file</b> option)
<b>Options</b>	<p><b>shared-file</b>—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><b>unique-file</b>—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>
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">local-persistent-storage-options on page 70</a></li><li>• <a href="#">Configuring Persistent Storage on page 17</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## file-format

---

<b>Syntax</b>	<code>file-format (3gpp   raw-asn);</code>
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	Statement introduced in Junos OS Mobility Release 11.2W. Support at the <b>[edit unified-edge gateways sgw <i>gateway-name</i> charging local-persistent-storage-options]</b> hierarchy level introduced in Junos OS Mobility Release 11.4W.
<b>Description</b>	Specify the file format for Charging Data Records (CDRs) stored in the CDR log files.
<b>Default</b>	If you do not include the <b>file-format</b> statement, the CDRs are stored in a format compliant with the 3GPP 32297 technical specification release ( <b>3gpp</b> option).
<b>Options</b>	<b>3gpp</b> —CDRs are stored in a format that is compliant with the 3GPP 32297 technical specification release.  <b>raw-asn</b> —CDRs are stored in raw Abstract Syntax Notation One (ASN.1) format.
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">local-persistent-storage-options on page 70</a></li> <li>• <a href="#">Configuring Persistent Storage on page 17</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## file-name-private-extension

<b>Syntax</b>	<code>file-name-private-extension <i>string</i>;</code>
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	Specify a private extension (string) that is appended to the filenames.



**NOTE:** The filenaming format is as follows, which is compliant with the Third-Generation Partnership Project (3GPP) 32.297 technical release specification:


*NodeID\_-RC.date\_-time[.PI][.FE]*

- **NodeID**—Name of the host that generated the file (*Host\_Name\_Gateway\_Name*).
- **RC**—A running counter, starting at 1.
- **date**—Date when the CDR file was closed in YYYYMMDD (year, month, day) format.
- **time**—Time when the CDR file was closed in HHMMshhmm format.
  - *HHMM* indicates the local time (hours and minutes) in a 24-hour format.
  - *s* indicates the sign of the local time differential from the UTC (+ or -). If the time differential to the UTC is 0, then the sign can be arbitrarily set to + or -.
  - *hhmm* indicates the time differential (hours and minutes) from the UTC.
- **PI**—Optional private extension.
- **FE**—Optional file extension.

<b>Options</b>	<i>string</i> —Private extension. <b>Values:</b> 1 through 16 bytes
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">local-persistent-storage-options on page 70</a></li> </ul>

- [Configuring Persistent Storage on page 17](#)
- [Configuring Charging on page 13](#)

## file-size

<b>Syntax</b>	<pre>file-size {     size;     disable; }</pre>
<b>Hierarchy Level</b>	<p>[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]</p>
<b>Release Information</b>	<p>Statement introduced in Junos OS Mobility Release 11.2W.  <b>disable</b> statement and 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.</p>
<b>Description</b>	<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 (<i>/opt/mobility/charging/ggsn/final_log</i>), 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"> <li>• Size of the file reaches the configured or default limit.</li> <li>• Age of the file reaches the configured or default limit.</li> <li>• Number of CDRs per file reaches the configured or default limit.</li> </ul> <div style="margin-top: 20px;">  <p><b>NOTE:</b> The default limit is applicable only if you have not configured any value.</p> </div>
<b>Default</b>	<p>If you do not configure this statement, then the trigger based on file size is enabled by default.</p>
<b>Options</b>	<p><b>value</b>—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><b>Range:</b> 1 MB to 1024 MB</p> <p><b>Default:</b> 10 MB</p> <p><b>disable</b>—Disable the file size trigger.</p>
<b>Required Privilege Level</b>	<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 17](#)
  - [Configuring Charging on page 13](#)
  - [local-persistent-storage-options on page 70](#)

## gtp

<b>Syntax</b>	<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>
<b>Hierarchy Level</b>	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging], [edit unified-edge gateways sgw <i>gateway-name</i> charging]
<b>Release Information</b>	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.
<b>Description</b>	<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 on page 36](#)
- [Configuring GTP Prime for Charging on page 15](#)
- [Configuring GTP Prime Peers on page 16](#)
- [Configuring Charging on page 13](#)

## 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 68](#)
- [peer \(GTP Prime\) on page 77](#)
- [Configuring GTP Prime for Charging on page 15](#)
- [Configuring GTP Prime Peers on page 16](#)
- [Configuring Charging on page 13](#)

## 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.

<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">charging on page 36</a></li> <li>• <a href="#">Configuring Persistent Storage on page 17</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## local-storage

<b>Syntax</b>	local-storage;
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	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.
<b>Default</b>	If you do not include the <b>local-storage</b> statement, the backup storage is disabled.
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">persistent-storage-order on page 81</a></li> <li>• <a href="#">Configuring Persistent Storage on page 17</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## mtu (Transport Profiles)

---

<b>Syntax</b>	<code>mtu value;</code>
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	<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 <b>cdr-aggregation-limit</b> or the <b>mtu</b> size is reached (whichever comes first).</p>
<b>Options</b>	<p><b>value</b>—Maximum size, in bytes, for a DRT message.</p> <p><b>Range:</b> 300 through 8000 bytes</p> <p><b>Default:</b> 1500 bytes</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">charging-gateways on page 40</a></li><li>• <a href="#">Configuring Transport Profiles on page 21</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## n3-requests (GTP Prime)

<b>Syntax</b>	<code>n3-requests <i>requests</i>;</code>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<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 <a href="#">down-detect-time</a>) 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>
<b>Options</b>	<p><b><i>requests</i></b>—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 <a href="#">down-detect-time</a>) before declaring the server as Down.</p> <p><b>Range:</b> 1 through 5</p> <p><b>Default:</b> 3</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">gtp on page 68</a></li> <li>• <a href="#">peer (GTP Prime) on page 77</a></li> <li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li> <li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## no-path-management (GTP Prime)

<b>Syntax</b>	no-path-management;
<b>Hierarchy Level</b>	[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> ]
<b>Release Information</b>	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.
<b>Description</b>	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.

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

<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">gtp on page 68</a></li> <li>• <a href="#">peer (GTP Prime) on page 77</a></li> <li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li> <li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>
------------------------------	---



## offline (Transport Profiles)

<b>Syntax</b>	<pre> offline {   charging-gateways {     cdr-aggregation-limit value;     cdr-release (r7   r8   r99);     mtu value;     peer-order {       [peer charging-gateway-peer-name];     }     persistent-storage-order {       local-storage;     }     switch-back-time seconds;   } } </pre>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<p>Configure the transport parameters for offline charging records, such as:</p> <ul style="list-style-type: none"> <li>• The charging gateway peers that store the CDRs.</li> <li>• The maximum Charging Data Records (CDRs) that can be added to a Data Record Transfer (DRT) message.</li> <li>• The maximum transmission unit of a DRT message.</li> <li>• The generated CDRs to be compliant with a specific 3GPP release.</li> <li>• The duration that the charging data function (CDF) waits before transmitting the CDRs to a peer that has recently come up and has the highest priority among all the peers, which are alive.</li> <li>• Whether to use the local Routing Engine disk for CDR storage.</li> </ul> <p>The remaining statements are explained separately.</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">transport-profiles on page 100</a></li> <li>• <a href="#">Configuring Transport Profiles on page 21</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## offline (Trigger Profiles)

<b>Syntax</b>	<pre> offline {   container-limit value;   exclude {     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 value; #S-GW only   sgsn-sgw-change-limit value; #P-GW only   time-limit value;   volume-limit {     value;     direction (both   uplink);   } } </pre>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
<b>Description</b>	<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 (<b>time-limit</b>), maximum volume of data that can be transmitted before closing a CDR (<b>volume-limit</b>), 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>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">trigger-profiles on page 103</a></li> <li>• <a href="#">Configuring Charging Trigger Events on page 23</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## peer (GTP Prime)


<b>Syntax</b>	<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>
<b>Hierarchy Level</b>	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging gtp], [edit unified-edge gateways sgw <i>gateway-name</i> charging gtp]
<b>Release Information</b>	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.
<b>Description</b>	<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>
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">gtp on page 68</a></li> <li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li> <li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## peer (Peer Order)

---

<b>Syntax</b>	<code>peer charging-gateway-peer-name;</code>
<b>Hierarchy Level</b>	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways peer-order], [edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways peer-order]
<b>Release Information</b>	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 peer-order] hierarchy level introduced in Junos OS Mobility Release 11.4W.
<b>Description</b>	<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"><li>• <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).</li><li>• <code>set unified-edge gateways sgw <i>gateway-name</i> charging gtp peer</code> for the Serving Gateway (S-GW).</li></ul>
<b>Options</b>	<i>charging-gateway-peer-name</i> —Name of the charging gateway server.
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">peer-order on page 79</a></li><li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li><li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## peer-order

<b>Syntax</b>	<pre>peer-order {   [peer charging-gateway-peer-name]; }</pre>
<b>Hierarchy Level</b>	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways],</p> <p>[edit unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i> offline charging-gateways]</p>
<b>Release Information</b>	<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] hierarchy level introduced in Junos OS Mobility Release 11.4W.</p>
<b>Description</b>	<p>Configure the charging gateway function (CGF) servers. You can configure up to a maximum of three servers for a transport profile.</p> <p>When multiple CGF servers are available for storing Charging Data Records (CDRs), the charging data function (CDF) needs to identify the server to which to route the CDRs 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 and not to all. 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 <b>switch-back-time</b> configuration.</p> <p>When required, the priority of any peer can be changed by using the configuration option to <b>insert before</b> or <b>insert after</b> the existing peers.</p> <div style="margin-top: 20px;">  <p><b>NOTE:</b> 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 multiple peers come alive, then CDF waits for the configured <b>switch-back-time</b> duration and routes the CDRs to the highest priority peer that is alive after this duration. The CDRs that were getting 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 SSS FTP (SFTP) from the following location on the disk:</p> <p><code>/opt/mobility/charging/ggsn/final_log.</code></p> </div> <p>The remaining statements are explained separately.</p>
<b>Required Privilege Level</b>	<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-gateways on page 40](#)
  - [Configuring GTP Prime Peers on page 16](#)
  - [Configuring GTP Prime for Charging on page 15](#)
  - [Configuring Charging on page 13](#)

---

## pending-queue-size (GTP Prime)


---

<b>Syntax</b>	<code>pending-queue-size <i>value</i>;</code>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	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.
<b>Description</b>	<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>
<b>Options</b>	<p><b>value</b>—Maximum number of DRT messages that can be queued without an acknowledgement from the CGF server.</p> <p><b>Range:</b> 1 through 4096</p> <p><b>Default:</b> 1024</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">gtp on page 68</a></li><li>• <a href="#">peer (GTP Prime) on page 77</a></li><li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li><li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## persistent-storage-order

<b>Syntax</b>	<code>persistent-storage-order {     local-storage; }</code>
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	<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"> <li>• When there are no charging gateway peers configured for a transport profile</li> <li>• When none of the primary, secondary, or tertiary charging gateway peers can be reached (that is, when they are down)</li> </ul> <p>The remaining statement is explained separately.</p>
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">charging-gateways on page 40</a></li> <li>• <a href="#">Configuring Transport Profiles on page 21</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## profile-id

<b>Syntax</b>	<code>profile-id <i>id-num</i>;</code>
<b>Hierarchy Level</b>	[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> ]
<b>Release Information</b>	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.
<b>Description</b>	<p>Configure a unique identifier to be associated with a charging profile. It can range from 1 through 255. This is a mandatory configuration.</p> <p>Based on the user 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 server 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 profile-id that you have configured 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, which is next in priority, is taken into consideration. If none of the profile IDs match, then charging is disabled for the customer.</p>
<div>  <p><b>NOTE:</b> The RADIUS server returns the profile-id as a four-byte hexadecimal value in the access accept message.</p> </div>	
<b>Options</b>	<p><i>id-num</i>—A unique number to be associated with a charging profile.</p> <p><b>Range:</b> 1 through 65534</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">charging-profiles on page 41</a></li> <li>• <a href="#">Configuring Charging Profiles on page 26</a></li> <li>• <a href="#">Charging Profiles on page 9</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>



## reconnect-time (GTP Prime)

<b>Syntax</b>	<code>reconnect-time <i>duration</i>;</code>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<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>
<b>Options</b>	<p><b><i>duration</i></b>—Duration after which the CDF tries to reconnect to a CGF server that was previously down.</p> <p><b>Range:</b> 60 through 255 seconds. Enter 0 if you do not want to attempt to reconnect to a peer.</p> <p><b>Default:</b> 60 seconds</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">gtp on page 68</a></li> <li>• <a href="#">peer (GTP Prime) on page 77</a></li> <li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li> <li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## service-mode (Charging Profiles)

---

<b>Syntax</b>	<code>service-mode maintenance;</code>
<b>Hierarchy Level</b>	<code>[edit unified-edge gateways ggsn-pgw gateway-name charging charging-profiles profile-name],</code> <code>[edit unified-edge gateways sgw gateway-name charging charging-profiles profile-name]</code>
<b>Release Information</b>	Statement introduced in Junos OS Mobility Release 11.2W. Support at the <code>[edit unified-edge gateways sgw gateway-name charging charging-profiles profile-name]</code> hierarchy level introduced in Junos OS Mobility Release 11.4W.
<b>Description</b>	<p>Place the respective charging profile under maintenance mode.</p> <p>When you have to make the following changes to the existing charging profile configuration, you must put the charging profile in maintenance mode:</p> <ul style="list-style-type: none"><li>• Change the CDR profile, transport profile, or the trigger profile associated with this charging profile</li><li>• Change the profile ID configuration</li><li>• Delete the charging profile</li></ul> <p>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 above-mentioned charging profile attributes or delete the charging profile. Use the following commands to help you with maintenance mode tasks:</p> <ul style="list-style-type: none"><li>• 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"><li>• 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 charging-profile profile-name</code></li><li>• For the Serving Gateway (S-GW)—<code>show unified-edge sgw charging service-mode gateway gateway-name charging-profile profile-name</code></li></ul></li><li>• To verify that the subscriber count has reached zero, use one of the following commands, as applicable:<ul style="list-style-type: none"><li>• For the GGSN or P-GW—<code>show unified-edge ggsn-pgw subscribers charging charging-profile profile-name gateway gateway-name</code></li><li>• For the S-GW—<code>show unified-edge sgw subscribers charging charging-profile profile-name gateway gateway-name</code></li></ul></li><li>• 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:</li></ul>

- 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 *name***
  - For the S-GW—**clear unified-edge sgw charging cdr transport-profile-name *profile-name* gateway-name *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**

- [charging-profiles on page 41](#)
- Changing a Charging Profile
- Mobility Maintenance Mode Overview

## service-mode (Transport Profiles)

---

<b>Syntax</b>	<code>service-mode maintenance;</code>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	Statement introduced in Junos OS Mobility Release 11.2W. 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.
<b>Description</b>	<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"><li>• Change the CDR encoding format to comply with a different 3GPP technical specification release (that is, changing the <code>cdr-release</code> configuration)</li><li>• Delete the transport profile</li></ul> <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"><li>• 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"><li>• 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></li><li>• For the Serving Gateway (S-GW)—<code>show unified-edge sgw charging service-mode gateway gateway-name transport-profile profile-name</code></li></ul></li><li>• To verify that the subscriber count has reached zero, use one of the following commands, as applicable:<ul style="list-style-type: none"><li>• For the GGSN or P-GW—<code>show unified-edge ggsn-pgw subscribers charging transport-profile profile-name gateway gateway-name</code></li><li>• For the S-GW—<code>show unified-edge sgw subscribers charging transport-profile profile-name gateway gateway-name</code></li></ul></li><li>• 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"><li>• For the GGSN or P-GW—<code>show unified-edge ggsn-pgw charging transfer status transport-profile-name profile-name</code></li></ul></li></ul>

- 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 100](#)
- Changing a Transport Profile
- Mobility Maintenance Mode Overview

## sgsn-sgw-change-limit (GGSN or P-GW)

<b>Syntax</b>	<b>sgsn-sgw-change-limit</b> <i>value</i> ;
<b>Hierarchy Level</b>	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i> offline]
<b>Release Information</b>	Statement introduced in Junos OS Mobility Release 11.2W.
<b>Description</b>	Configure the maximum number of Serving GPRS Support Node (SGSN) or Serving Gateway (S-GW) changes that can occur before the CDR is updated and closed.
<b>Options</b>	<p><b>value</b>—Maximum number of SGSN or S-GW changes.</p> <p><b>Range:</b> 1 through 5.</p> <p><b>Default:</b> 4</p>
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">offline on page 76</a></li> <li>• <a href="#">Configuring Charging Trigger Events on page 23</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## source-interface (GTP Prime)

---

<b>Syntax</b>	<pre>source-interface {     interface-name;     ipv4-address address; }</pre>
<b>Hierarchy Level</b>	[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> ]
<b>Release Information</b>	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.
<b>Description</b>	<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>
<b>Options</b>	<p><b>address</b>—IPv4 address of the local loopback interface from which the GTP Prime packets are sent. This is a mandatory configuration.</p> <p><b>interface-name</b>—Name of the local loopback interface from which the GTP Prime packets are sent. This is a mandatory configuration.</p>
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">gtp on page 68</a></li><li>• <a href="#">peer (GTP Prime) on page 77</a></li><li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li><li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## switch-back-time

<b>Syntax</b>	<code>switch-back-time <i>seconds</i>;</code>
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	The charging data function (CDF) transmits Charging Data Records (CDRs) to the highest-priority peer. The priority is determined by the <b>peer-order</b> 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.`

<b>Options</b>	<b>seconds</b> —Time, in seconds, CDF waits before transmitting the CDRs to the highest-priority peer. <b>Range:</b> 0 through 300 seconds <b>Default:</b> 30 seconds
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">charging-gateways on page 40</a></li><li>• <a href="#">Configuring Transport Profiles on page 21</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

---

## t3-response (GTP Prime)

---

<b>Syntax</b>	t3-response <i>response-interval</i> ;
<b>Hierarchy Level</b>	[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> ]
<b>Release Information</b>	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.
<b>Description</b>	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.  When there are global-level and peer-level configurations, the peer-level configuration takes precedence.
<b>Options</b>	<b>response-interval</b> —Time that the CDF waits before resending a GTP Prime message when the response to a request has not been received. <b>Range:</b> 1 through 5 seconds <b>Default:</b> 5 seconds
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">gtp on page 68</a></li><li>• <a href="#">peer (GTP Prime) on page 77</a></li><li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li><li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>



## tariff-time-list

---


<b>Syntax</b>	<code>tariff-time-list {     [<i>tariff-time</i>]; }</code>
<b>Hierarchy Level</b>	[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> ]
<b>Release Information</b>	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.
<b>Description</b>	<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>
<b>Options</b>	<b><i>tariff-time</i></b> —Local time at which to generate a CDR, in hh:mm format, when the tariff changes.
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">trigger-profiles on page 103</a></li> <li>• <a href="#">Configuring Charging Trigger Events on page 23</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## time-limit

---

<b>Syntax</b>	<code>time-limit <i>value</i>;</code>
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	<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>
<b>Options</b>	<p><b>value</b>—Duration in seconds.</p> <p><b>Range:</b> 600 through 65,535 seconds</p> <p><b>Default:</b> 0, indicates that no time limit is set.</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">offline on page 76</a></li><li>• <a href="#">Configuring Charging Trigger Events on page 23</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## traceoptions (Charging)

<b>Syntax</b>	<pre> traceoptions {     file <i>file-name</i> &lt;files <i>number</i>&gt; &lt;no-world-readable   world-readable&gt; &lt;size <i>size</i>&gt;;     flag <i>flag</i>;     level (all   critical   error   info   notice   verbose   warning);     no-remote-trace; } </pre>
<b>Hierarchy Level</b>	[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging]
<b>Release Information</b>	Statement introduced in Junos OS Mobility Release 11.2W.
<b>Description</b>	Specify tracing options for charging.
<b>Options</b>	<p><b>file <i>file-name</i></b>—Name of the file to receive the output of the tracing operation. The router appends <b>-msfpc#pic#</b> to the filename and places the file in the <b>/var/log</b> directory. For example, if you configured the filename as <b>smd</b>, then the actual log filename on the router is <b>smd-ms50</b>, where ms stands for multiservices card, and 5 and 0 are the FPC and PIC slot numbers.</p> <p><b>Range:</b> 1 through 1024 bytes</p> <p><b>files <i>number</i></b>—(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><b>Range:</b> 2 through 1000 files</p> <p><b>Default:</b> 3 files</p> <p><b>flag <i>flag</i></b>—Specify which operations are to be traced. To specify more than one operation, include multiple flag statements.</p>
	<div>  <p><b>CAUTION:</b> You might 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.</p> </div>
	<ul style="list-style-type: none"> <li>• <b>all</b>—Trace all operations of all charging submodules.</li> <li>• <b>cdr-encoding</b>—Trace ASN1 encoding of the CDRs.</li> <li>• <b>client-fsm</b>—Trace the charging-specific finite state machine (FSM) in the application framework (mobile-smd).</li> <li>• <b>config</b>—Trace configuration events on both daemons (chargemand and mobile-smd).</li> <li>• <b>fsm</b>—Trace FSM.</li> <li>• <b>general</b>—Trace general events that do not fit in any specific traces, such as errors in chargemand.</li> </ul>

- **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.
- **path-management**—Trace path management operations within the path manager module within chargemand.
- **request**—This flag is currently disabled.
- **resource**—Trace resources, such as memory, counters, and so on.
- **response**—This flag is currently disabled.
- **timers**—Trace resources associated with timer processing.
- **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.

<b>Required Privilege</b>	trace and unified-edge—To view this statement in the configuration.
<b>Level</b>	trace-control and unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">charging on page 36</a></li><li>• <a href="#">Tracing Charging Operations on page 155</a></li></ul>

## traceoptions (Local Persistent Storage)

<b>Syntax</b>	<pre> traceoptions {     file <i>file-name</i> &lt;files <i>number</i>&gt; &lt;match <i>regular-expression</i>&gt; &lt;no-world-readable       world-readable&gt; &lt;size <i>size</i>&gt;;     flag <i>flag</i>;     level (all   critical   error   info   notice   verbose   warning);     no-remote-trace; } </pre>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	Specify tracing options related to the storage of Charging Data Records (CDRs) on the local Routing Engine disk.
<b>Options</b>	<p><b>file <i>filename</i></b>—Name of the file to receive the output of the tracing operation.</p> <p><b>Range:</b> 1 through 1024 bytes</p> <p><b>files <i>number</i></b>—(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><b>Range:</b> 2 through 1000 files</p> <p><b>Default:</b> 3 files</p> <p><b>flag <i>flag</i></b>—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 Level** trace and unified-edge—To view this statement in the configuration.  
trace-control and unified-edge-control—To add this statement to the configuration.

**Related Documentation**

- [local-persistent-storage-options on page 70](#)
- [Configuring Persistent Storage on page 17](#)

## transport-profile

<b>Syntax</b>	<code>transport-profile <i>profile-name</i>;</code>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<p>Associate a transport profile with a charging profile. However, make sure this profile has been previously defined. This is a mandatory configuration.</p> <p>When a subscriber session is created, the subscriber is bound to a charging profile and the transport profile configuration associated with this 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 or the local Routing Engine disk, or both.</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"> <li>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></li> <li>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></li> </ul> <div style="margin-top: 20px;">  <p><b>TIP:</b> 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"> <li>GGSN or P-GW—<code>set unified-edge gateways ggsn-pgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i></code></li> <li>S-GW—<code>set unified-edge gateways sgw <i>gateway-name</i> charging transport-profiles <i>profile-name</i></code></li> </ul> </div>
<b>Options</b>	<i>profile-name</i> —Name of the transport profile to be associated with the charging profile.
<b>Required Privilege Level</b>	<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 41](#)
  - [Configuring Charging Profiles on page 26](#)
  - [Charging Profiles on page 9](#)
  - [Configuring Charging on page 13](#)


## transport-profiles

<b>Syntax</b>	<pre> transport-profiles <i>profile-name</i> {   <i>description string</i>;   offline {     charging-gateways {       <i>cdr-aggregation-limit value</i>;       <i>cdr-release</i> (r7   r8   r99);       <i>mtu value</i>;       peer-order {         [<i>peer charging-gateway-peer-name</i>];       }       persistent-storage-order {         <i>local-storage</i>;       }       <i>switch-back-time seconds</i>;     }   }   <i>service-mode</i> maintenance; } </pre>
<b>Hierarchy Level</b>	<p>[edit unified-edge gateways ggsn-pgw <i>gateway-name</i> charging],  [edit unified-edge gateways sgw <i>gateway-name</i> charging]</p>
<b>Release Information</b>	<p>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.</p>
<b>Description</b>	<p>Configure a transport profile, which determines how the Charging Data Records (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. This is a mandatory configuration.</p> <p>You can configure up to a maximum of eight transport profiles.</p> <p>The remaining statements are explained separately.</p>
<b>Options</b>	<p><b><i>profile-name</i></b>—Name of the transport profile.  <b>Range:</b> 1 through 128 bytes</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.  unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">charging on page 36</a></li> <li>• <a href="#">Configuring Transport Profiles on page 21</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## transport-protocol (GTP Prime)

<b>Syntax</b>	<code>transport-protocol (tcp   udp);</code>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<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>
<b>Options</b>	<p><b>tcp</b>—Transport protocol used is TCP.</p> <p><b>udp</b>—Transport protocol used is UDP.</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">gtp on page 68</a></li> <li>• <a href="#">peer (GTP Prime) on page 77</a></li> <li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li> <li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## trigger-profile

<b>Syntax</b>	<code>trigger-profile <i>profile-name</i>;</code>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<p>Associate a trigger profile with a charging profile. However, make sure this profile has been previously defined.</p> <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 style="margin-top: 20px;">  <p><b>TIP:</b> 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"> <li>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></li> <li>For the Serving Gateway (S-GW)—<code>set unified-edge gateways sgw <i>gateway-name</i> charging trigger-profiles <i>profile-name</i></code></li> </ul> </div>
<b>Options</b>	<i>profile-name</i> —Name of the trigger profile to be associated with the charging profile.
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.</p> <p>unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">charging-profiles on page 41</a></li> <li><a href="#">Configuring Charging Profiles on page 26</a></li> <li><a href="#">Charging Profiles on page 9</a></li> <li><a href="#">Configuring Charging on page 13</a></li> </ul>

## trigger-profiles

**Syntax** `trigger-profiles profile-name {  
     description string;  
     offline {  
         container-limit value;  
         exclude {  
             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 value; #S-GW only  
         sgsn-sgw-change-limit value; #P-GW only  
         time-limit value;  
         volume-limit {  
             value;  
             direction (both | uplink);  
         }  
     }  
     tariff-time-list {  
         tariff-time;  
     }  
 }`

**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 trigger profile, which determines the events that trigger the creation of a Charging Data Record (CDR), 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 CDR profile determines the content of a CDR, whereas the transport profile determines how the generated CDRs are transmitted to the charging gateway function (CGF) server.

The remaining statements are explained separately.

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

**Values:** 1 through 128 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**

- [charging on page 36](#)
- [Configuring Charging Trigger Events on page 23](#)
- [Configuring Charging on page 13](#)

---

## user-name (Local Persistent Storage)

---

**Syntax** `user-name string;`

**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** 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** *string*—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**

- [local-persistent-storage-options on page 70](#)
- [Configuring Persistent Storage on page 17](#)
- [Configuring Charging on page 13](#)

## version (GTP Prime)

<b>Syntax</b>	<code>version (v0   v1   v2);</code>
<b>Hierarchy Level</b>	<code>[edit unified-edge gateways ggsn-pgw gateway-name charging gtp peer peer-name],</code> <code>[edit unified-edge gateways ggsn-pgw gateway-name charging gtp peer peer-name],</code> <code>[edit unified-edge gateways sgw gateway-name charging gtp],</code> <code>[edit unified-edge gateways sgw gateway-name charging gtp peer peer-name]</code>
<b>Release Information</b>	<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>
<b>Description</b>	<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: <b>v0</b>, <b>v1</b>, or <b>v2</b>.</p> <p>When there are global-level and peer-level configurations, the peer-level configuration takes precedence.</p>
<b>Options</b>	<p><b>v0</b>—GTP Prime version supported is v0.</p> <p><b>v1</b>—GTP Prime version supported is v1.</p> <p><b>v2</b>—GTP Prime version supported is v2.</p>
<b>Required Privilege Level</b>	<p><b>unified-edge</b>—To view this statement in the configuration.</p> <p><b>unified-edge-control</b>—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">gtp on page 68</a></li> <li>• <a href="#">peer (GTP Prime) on page 77</a></li> <li>• <a href="#">Configuring GTP Prime for Charging on page 15</a></li> <li>• <a href="#">Configuring GTP Prime Peers on page 16</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## volume-limit

---

<b>Syntax</b>	<pre>volume-limit {     value;     direction (both   uplink); }</pre>
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	<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>
<b>Default</b>	If you do not include the <b>volume-limit</b> statement, the volume limit trigger is disabled.
<b>Options</b>	<p><b>value</b>—Maximum volume of data transmitted, in bytes, after which the CDR is updated and closed.</p> <p><b>Range:</b> 1 through 4 GB</p> <p>The remaining statement is explained separately.</p>
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">offline on page 76</a></li><li>• <a href="#">Configuring Charging Trigger Events on page 23</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>



## watermark-level-1

<b>Syntax</b>	<pre>watermark-level-1 {   notification-level (both   snmp-alarm   syslog);   percentage <i>value</i>; }</pre>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<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>
<b>Options</b>	<p><b>notification-level (both   snmp-alarm   syslog)</b>—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"> <li>• <b>both</b>—Log the alert information on system log files and also raise an SNMP alarm.</li> <li>• <b>snmp-alarm</b>—Raise an SNMP alarm.</li> <li>• <b>syslog</b>—Log the alert information on system log files.</li> </ul> <p><b>Default:</b> syslog</p> <p><b>percentage <i>value</i></b>—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><b>Default:</b> 70 percent of the Routing Engine disk space</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.          unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">disk-space-policy on page 50</a></li> <li>• <a href="#">Configuring Persistent Storage on page 17</a></li> <li>• <a href="#">Configuring Charging on page 13</a></li> </ul>

## watermark-level-2

---

<b>Syntax</b>	<pre>watermark-level-2 {   notification-level (both   snmp-alarm   syslog);   percentage <i>value</i>; }</pre>
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	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.
<b>Options</b>	<p><b>notification-level (both   snmp-alarm   syslog)</b>—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"><li>• <b>both</b>—Log the alert information on system log files and raise an SNMP alarm.</li><li>• <b>snmp-alarm</b>—Raise an SNMP alarm.</li><li>• <b>syslog</b>—Log the alert information on system log files.</li></ul> <p><b>Default:</b> syslog</p> <p><b>percentage <i>value</i></b>—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><b>Default:</b> 80 percent of the Routing Engine disk space</p>
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">disk-space-policy on page 50</a></li><li>• <a href="#">Configuring Persistent Storage on page 17</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## watermark-level-3

<b>Syntax</b>	<pre>watermark-level-3 {   notification-level (both   snmp-alarm   syslog);   percentage <i>value</i>; }</pre>
<b>Hierarchy Level</b>	<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>
<b>Release Information</b>	<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>
<b>Description</b>	<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>
<b>Options</b>	<p><b>notification-level (both   snmp-alarm   syslog)</b>—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"> <li><b>both</b>—Log the alert information on system log files and also raise an SNMP alarm.</li> <li><b>snmp-alarm</b>—Raise an SNMP alarm.</li> <li><b>syslog</b>—Log the alert information on system log files.</li> </ul> <p><b>Default:</b> syslog</p> <p><b>percentage <i>value</i></b>—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><b>Default:</b> 90 percent of the Routing Engine disk space</p>
<b>Required Privilege Level</b>	<p>unified-edge—To view this statement in the configuration.          unified-edge-control—To add this statement to the configuration.</p>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">disk-space-policy on page 50</a></li> <li><a href="#">Configuring Persistent Storage on page 17</a></li> <li><a href="#">Configuring Charging on page 13</a></li> </ul>

## world-readable (Local Persistent Storage)

---

<b>Syntax</b>	world-readable;
<b>Hierarchy Level</b>	[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]
<b>Release Information</b>	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.
<b>Description</b>	Allow all users to have read permissions on the Charging Data Record (CDR) files. By default, this is disabled.
<b>Required Privilege Level</b>	unified-edge—To view this statement in the configuration. unified-edge-control—To add this statement to the configuration.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">local-persistent-storage-options on page 70</a></li><li>• <a href="#">Configuring Persistent Storage on page 17</a></li><li>• <a href="#">Configuring Charging on page 13</a></li></ul>

## PART 3

# Administration

- [Monitoring the Charging Configuration on page 113](#)
- [Operational Commands on page 115](#)



# Monitoring the Charging Configuration

- [Verifying and Managing the Charging Configuration on page 113](#)

## Verifying and Managing the Charging Configuration

---

**Purpose** Display or clear information about the charging configuration.

- 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 display information about the trigger profiles:  
user@host> **show unified-edge ggsn-pgw charging trigger-profile**
  - 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 17](#)

- [Configuring GTP Prime for Charging on page 15](#)
- [Configuring Transport Profiles on page 21](#)
- [Configuring Charging Trigger Events on page 23](#)
- Configuring S-GW-Specific Charging Parameters
- Configuring S-GW Global Charging Profiles and Selection Order
- Configuring S-GW Charging Traceoptions
- Configuring S-GW Charging Traceoptions



## CHAPTER 6

# Operational Commands

## clear unified-edge ggsn-pgw charging cdr

---

<b>Syntax</b>	<b>clear unified-edge ggsn-pgw charging cdr gateway-name <i>name</i></b> <b>&lt;transport-profile-name <i>profile-name</i>&gt;</b>
<b>Release Information</b>	Command introduced in Junos OS Mobility Release 11.2W.
<b>Description</b>	Clear the Charging Data Records (CDRs) from the services PICs for the configured transport profiles on the specified gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW).
<b>Options</b>	<b>gateway-name <i>name</i></b> —Clear CDRs from the services PICs for the specified GGSN or P-GW. <b>transport-profile-name <i>profile-name</i></b> —(Optional) Clear CDRs from the services PICs only for the specified transport profile.
<b>Required Privilege Level</b>	clear, unified-edge
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">show unified-edge ggsn-pgw charging transfer status on page 148</a></li></ul>
<b>List of Sample Output</b>	<a href="#">clear unified-edge ggsn-pgw charging cdr gateway-name <i>name</i> on page 116</a>
<b>Output Fields</b>	No message is displayed on successful execution of this command; otherwise an error message is displayed.

### Sample Output

<b>clear unified-edge ggsn-pgw charging cdr gateway-name <i>name</i></b>	<b>user@host&gt; clear unified-edge ggsn-pgw charging cdr gateway-name PGW</b>
--	--

## clear unified-edge ggsn-pgw charging cdr wfa

<b>Syntax</b>	<code>clear unified-edge ggsn-pgw charging cdr wfa gateway-name <i>name</i> &lt;transport-profile-name <i>profile-name</i>&gt;</code>
<b>Release Information</b>	Command introduced in Junos OS Mobility Release 11.2W.
<b>Description</b>	Clear from the services PICs the Charging Data Records (CDRs) that have not received an acknowledgement from the charging gateway function (CGF), the Routing Engine, or both.
<b>Options</b>	<p><b>gateway-name <i>name</i></b>—Clear the unacknowledged CDRs from the services PICs for the specified GGSN or P-GW.</p> <p><b>transport-profile-name <i>profile-name</i></b>—(Optional) Clear the unacknowledged CDRs from the services PICs only for the specified transport profile.</p>
<b>Required Privilege Level</b>	clear, unified-edge
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show unified-edge ggsn-pgw charging transfer status on page 148</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">clear unified-edge ggsn-pgw charging cdr wfa gateway-name <i>name</i> on page 117</a>
<b>Output Fields</b>	No message is displayed on successful execution of this command; otherwise an error message is displayed.

### Sample Output

```
clear unified-edge user@host> clear unified-edge ggsn-pgw charging cdr wfa gateway-name PGW
ggsn-pgw charging cdr
wfa gateway-name
name
```

## clear unified-edge ggsn-pgw charging local-persistent-storage statistics

---

<b>Syntax</b>	<b>clear unified-edge ggsn-pgw charging local-persistent-storage statistics gateway-name name</b>
<b>Release Information</b>	Command introduced in Junos OS Mobility Release 11.2W.
<b>Description</b>	Clear the storage statistics of the Charging Data Record (CDR) files on the local Routing Engine disk on the specified Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW).
<b>Options</b>	<b>gateway-name name</b> —Clear the storage statistics for the specified gateway.
<b>Required Privilege Level</b>	clear, unified-edge
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">show unified-edge ggsn-pgw charging local-persistent-storage statistics on page 128</a></li></ul>
<b>List of Sample Output</b>	<a href="#">clear unified-edge ggsn-pgw charging local-persistent-storage statistics gateway-name name on page 118</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

### Sample Output

clear unified-edge	user@host> clear unified-edge ggsn-pgw charging local-persistent-storage statistics
ggsn-pgw charging	gateway-name PGW
local-persistent-storage	Cleared charging local persistent storage statistics
statistics	
gateway-name name	

## clear unified-edge ggsn-pgw charging path statistics

<b>Syntax</b>	<code>clear unified-edge ggsn-pgw charging path statistics gateway-name <i>name</i></code> <code>&lt;fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i>&gt;</code> <code>&lt;gtp-peer-addr <i>ipv4-address</i>&gt;</code> <code>&lt;gtp-peer-name <i>peer-name</i>&gt;</code>
<b>Release Information</b>	Command introduced in Junos OS Mobility Release 11.2W.
<b>Description</b>	Clear the path management message statistics between the charging data function (CDF) and the charging gateway function (CGF) servers for the specified gateway GPRS support node (GGSN) or Packet Data Network Gateway (P-GW).
<b>Options</b>	<p><b>gateway-name <i>name</i></b>—Clear the path management message statistics for the specified GGSN or P-GW.</p> <p><b>fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></b>—(Optional) Clear the path management message statistics only for the specified FPC slot number and PIC slot number.</p> <p><b>gtp-peer-addr <i>ipv4-address</i></b>—(Optional) Clear the path management message statistics only for the GTP Prime peer with the specified IPv4 address.</p> <p><b>gtp-peer-name <i>peer-name</i></b>—(Optional) Clear the path management message statistics only for the GTP Prime peer with the specified name.</p>
<b>Required Privilege Level</b>	clear, unified-edge
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show unified-edge ggsn-pgw charging path statistics on page 134</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">clear unified-edge ggsn-pgw charging path statistics gateway-name <i>name</i> on page 119</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

### Sample Output

```
clear unified-edge user@host> clear unified-edge ggsn-pgw charging path statistics gateway-name PGW
ggsn-pgw charging Cleared charging path statistics
path statistics
gateway-name name
```

## clear unified-edge ggsn-pgw charging transfer statistics

---

Syntax	<code>clear unified-edge ggsn-pgw charging transfer statistics gateway-name <i>name</i></code> <code>&lt;fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i>&gt;</code> <code>&lt;transport-profile-name <i>profile-name</i>&gt;</code>
Release Information	Command introduced in Junos OS Mobility Release 11.2W.
Description	Clear the charging transfer statistics on one or more gateway GPRS support nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then charging transfer statistics for all GGSNs or P-GWs are cleared.
Options	<p><b>gateway-name <i>name</i></b>—Clear the transfer statistics for the specified GGSN or P-GW.</p> <p><b>fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></b>—(Optional) Clear the transfer statistics for the configured transport profiles for the specified FPC slot number and PIC slot number.</p> <p><b>transport-profile-name <i>profile-name</i></b>—(Optional) Clear the transfer statistics only for the specified transport profile.</p>
Required Privilege Level	clear, unified-edge
Related Documentation	<ul style="list-style-type: none"><li>• <a href="#">show unified-edge ggsn-pgw charging transfer statistics on page 145</a></li></ul>
List of Sample Output	<a href="#">clear unified-edge ggsn-pgw charging transfer statistics gateway-name name on page 120</a>
Output Fields	When you enter this command, you are provided feedback on the status of your request.

### Sample Output

<code>clear unified-edge ggsn-pgw charging transfer statistics gateway-name name</code>	<code>user@host&gt; clear unified-edge ggsn-pgw charging transfer statistics gateway-name PGW</code> Cleared charging transfer statistics
---	--

## [request system storage unified-edge charging media start](#)

---

<b>Syntax</b>	<code>request system storage unified-edge charging media start</code> <code>&lt;re0   re1&gt;</code>
<b>Release Information</b>	Command introduced in Junos OS Mobility Release 11.2W.
<b>Description</b>	Enable use of local persistent storage for Charging Data Records (CDRs).
<b>Options</b>	<b>re0   re1</b> —(Optional) On routers that support dual or redundant Routing Engines, use the disk on the Routing Engine in slot 0 ( <b>re0</b> ) or Routing Engine in slot 1 ( <b>re1</b> ).
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">request system storage unified-edge media prepare on page 124</a></li><li>• <a href="#">request system storage unified-edge charging media stop on page 122</a></li><li>• <a href="#">show unified-edge ggsn-pgw charging local-persistent-storage statistics on page 128</a></li></ul>
<b>List of Sample Output</b>	<a href="#">request system storage unified-edge charging media start on page 121</a>
<b>Output Fields</b>	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</code> <code>storage unified-edge</code> <code>charging media start</code>	<code>user@host&gt; request system storage unified-edge charging media start</code>
---	---

## [request system storage unified-edge charging media stop](#)

---

<b>Syntax</b>	<code>request system storage unified-edge charging media stop &lt;re0   re1&gt;</code>
<b>Release Information</b>	Command introduced in Junos OS Mobility Release 11.2W.
<b>Description</b>	Disable use of local persistent storage for Charging Data Records (CDRs).
<b>Options</b>	<b>re0   re1</b> —(Optional) On routers that support dual or redundant Routing Engines, use the disk on the Routing Engine in slot 0 ( <b>re0</b> ) or Routing Engine in slot 1 ( <b>re1</b> ).
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">request system storage unified-edge media eject on page 123</a></li><li>• <a href="#">request system storage unified-edge charging media start on page 121</a></li></ul>
<b>List of Sample Output</b>	<a href="#">request system storage unified-edge charging media stop on page 122</a>
<b>Output Fields</b>	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&gt; request system storage unified-edge charging media stop</code>
--	--




## request system storage unified-edge media eject

<b>Syntax</b>	request system storage unified-edge media eject <re0   re1>
<b>Release Information</b>	Command introduced in Junos OS Mobility Release 11.2W.
<b>Description</b>	Prepare the Solid State Disk (SSD) for removal from the Routing Engine. This command unmounts the SSD from <b>/opt/mobility</b> .
<b>Options</b>	<b>re0   re1</b> —(Optional) On routers that support dual or redundant Routing Engines, prepare the disk on the Routing Engine in slot 0 ( <b>re0</b> ) or Routing Engine in slot 1 ( <b>re1</b> ).
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request system storage unified-edge charging media stop on page 122</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">request system storage unified-edge media eject on page 123</a>
<b>Output Fields</b>	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

<b>Syntax</b>	request system storage unified-edge media prepare <no-format> <re0   re1>
<b>Release Information</b>	Command introduced in Junos OS Mobility Release 11.2W.
<b>Description</b>	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><b>NOTE:</b> If you do not want to format the existing content on the SSD, you must specify the <code>no-format</code> option.</p>
<b>Options</b>	<p><b>no-format</b>—(Optional) Do not format the existing content on the SSD when preparing the disk on the Routing Engine.</p> <p><b>re0   re1</b>—(Optional) On routers that support dual or redundant Routing Engines, prepare the disk on the Routing Engine in slot 0 (<b>re0</b>) or Routing Engine in slot 1 (<b>re1</b>).</p>
<b>Required Privilege Level</b>	maintenance
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">request system storage unified-edge charging media start on page 121</a></li> <li>• <a href="#">show unified-edge ggsn-pgw charging local-persistent-storage statistics on page 128</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">request system storage unified-edge media prepare on page 124</a>
<b>Output Fields</b>	When you enter this command, you are provided feedback on the status of your request.

### Sample Output

```

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

```

## show unified-edge ggsn-pgw charging global statistics

<b>Syntax</b>	show unified-edge ggsn-pgw charging global statistics <brief   detail> <fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i> > <gateway <i>gateway-name</i> >
<b>Release Information</b>	Command introduced in Junos OS Mobility Release 11.4W.
<b>Description</b>	Display the global statistics for charging for one or more Gateway GPRS Support Nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then the statistics for all GGSNs and P-GWs are displayed.
<b>Options</b>	<p><b>none</b>—(Same as brief) Display the global statistics for charging, in brief.</p> <p><b>brief   detail</b>—(Optional) Display the specified level of output. The <b>brief</b> option displays the statistics per GGSN or P-GW for all services PICs. The <b>detail</b> option displays the statistics per GGSN or P-GW for each services PIC.</p> <p><b>fpc-slot <i>slot-number</i> pic-slot <i>slot-number</i></b>—(Optional) Display the global statistics for charging only for the specified FPC slot number and PIC slot number.</p> <p><b>gateway <i>gateway-name</i></b>—(Optional) Display the global statistics for charging for the specified GGSN or P-GW.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show unified-edge ggsn-pgw charging local-persistent-storage statistics on page 128</a></li> <li>• <a href="#">show unified-edge ggsn-pgw charging path statistics on page 134</a></li> <li>• <a href="#">show unified-edge ggsn-pgw charging transfer statistics on page 145</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show unified-edge ggsn-pgw charging global statistics brief on page 126</a> <a href="#">show unified-edge ggsn-pgw charging global statistics detail on page 126</a>
<b>Output Fields</b>	Table 4 on page 125 lists the output fields for the <b>show unified-edge ggsn-pgw charging global statistics</b> command. Output fields are listed in the approximate order in which they appear.

Table 4: show unified-edge sgw charging global statistics Output Fields

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

Table 4: 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 ggsn-pgw charging global statistics brief
user@host> show unified-edge ggsn-pgw charging global statistics brief
Gateway: PGW
Charging Global Statistics
CDR Send Errors           : 8
CDR Encode Errors         : 0
CDR Alloc Failures        : 0
Container Failures        : 0
Charging Bearers Created  : 100
Charging Bearers Destroyed : 4

```

```

show unified-edge ggsn-pgw charging global statistics detail
user@host> show unified-edge ggsn-pgw charging global statistics detail
Gateway: PGW
Charging Global Statistics
FPC/PIC: 1/0
CDR Send Errors           : 4
CDR Encode Errors         : 0
CDR Alloc Failures        : 0
Container Failures        : 0
Charging Bearers Created  : 50
Charging Bearers Destroyed : 2

FPC/PIC: 3/0
CDR Send Errors           : 4
CDR Encode Errors         : 0
CDR Alloc Failures        : 0

```

Container Failures	: 0
Charging Bearers Created	: 50
Charging Bearers Destroyed	: 2

## show unified-edge ggsn-pgw charging local-persistent-storage statistics

<b>Syntax</b>	<b>show unified-edge ggsn-pgw charging local-persistent-storage statistics</b> <b>&lt;gateway gateway&gt;</b>
<b>Release Information</b>	Command introduced in Junos OS Mobility Release 11.2W. <b>gateway-name</b> option introduced in Junos OS Mobility Release 11.4W.
<b>Description</b>	Display the storage statistics of the Charging Data Record (CDR) files on the local Routing Engine disk for one or more Gateway GPRS Support Nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then the status for all GGSNs and P-GWs is displayed.
<b>Options</b>	<b>gateway gateway-name</b> —(Optional) Display the storage statistics for the specified GGSN or P-GW.
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">clear unified-edge ggsn-pgw charging local-persistent-storage statistics on page 118</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show unified-edge ggsn-pgw charging local-persistent-storage statistics on page 132</a>
<b>Output Fields</b>	<a href="#">Table 5 on page 128</a> lists the output fields for the <b>show unified-edge ggsn-pgw charging local-persistent-storage statistics</b> command. Output fields are listed in the approximate order in which they appear.

**Table 5: show unified-edge ggsn-pgw charging local-persistent-storage statistics Output Fields**

Field Name	Field Description
<b>Batch Messages received</b>	Total number of batch messages sent from services PICs to the Routing Engine disk. The CDRs generated in services PICs are sent to the local Routing Engine disk as batch messages.
<b>Batch Responses sent</b>	Total number of responses sent for the received batch messages.
<b>Invalid Messages received</b>	Total number of invalid batch messages sent from services PICs to the Routing Engine disk.
<b>Number of temp log files opened</b>	<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 (<b>/opt/mobility/charging/ggsn/final_log</b>) within the same Routing Engine disk, from where they can be transferred using SSH FTP (SFTP). A file is 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, when no limit is configured).</p>

**Table 5: show unified-edge ggsn-pgw charging local-persistent-storage statistics Output Fields (*continued*)**

Field Name	Field Description
<b>Number of journal files opened</b>	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.
<b>Number of journal files closed</b>	Total number of journal files closed.
<b>Number of CDR log files closed</b>	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.
<b>Number of CDR files closed due to file-age</b>	Total number of temporary CDR log files closed because the age of the files reached the configured limit (or the default limit, when no limit is configured).  The default value for the file age is 120 minutes.
<b>Number of CDR files closed due to file-size</b>	Total number of number of temporary CDR log files closed because the size of the files reached the configured limit (or the default limit, when no limit is configured).  The default file size is 10 MB.
<b>Number of CDR files closed due to cdr-count</b>	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.
<b>Abnormal file closures</b>	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.
<b>Normal file closures</b>	Total number of normal temporary CDR log file closures. This counter is incremented when changes in the configuration, such as a file format change, trigger temporary CDR log file closures.
<b>Number of CDR log files closed in TS_32_297 format</b>	Total number of closed temporary CDR log files that are compliant with the format specified in the 32297 technical specification release.
<b>Number of CDR log files closed in raw asnl format</b>	Total number of closed temporary CDR log files that are in the raw ASN.1 format.
<b>Total number of CDRs backed up</b>	Total number of CDRs backed up to the standby Routing Engine.

**Table 5: show unified-edge ggsn-pgw 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 full and unable to accept any more charging data.</p> <p>You can 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"> <li>• <code>request system storage unified-edge charging media stop</code></li> <li>• <code>request system storage unified-edge media eject</code></li> </ul>
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"> <li>• <code>DISK_AVAILABLE</code></li> <li>• <code>DISK_AT_WATERMARK_LEVEL1</code></li> <li>• <code>DISK_AT_WATERMARK_LEVEL2</code></li> <li>• <code>DISK_AT_WATERMARK_LEVEL3</code></li> <li>• <code>DISK_OFFLINE</code>—Indicates that a disk is not present or the <code>request system storage unified-edge charging media stop</code> command has been issued.</li> <li>• <code>DISK_OFFLINE_PENDING</code>—Indicates whether any CDRs are being written or mirrored on the backup Routing Engine. This interim status message is displayed after the <code>request system storage unified-edge charging media stop</code> command has been issued but before the disk goes offline.</li> </ul>
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 configured 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>
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 corrective measures to free the disk space. If an alert is not configured, the services PICs stop sending the charging data to the Routing Engine disk and you must transfer the files using SFTP to free the disk space. However, this data is not lost because it is buffered in the services PICs. The services PICs can buffer up to a maximum of 2 GB of data, after which a Call Admission Control (CAC) is triggered.</p>



**Table 5: show unified-edge ggsn-pgw charging local-persistent-storage statistics Output Fields (*continued*)**

Field Name	Field Description
<b>Temporary CDR log file Statistics</b>	
<p><b>NOTE:</b> The information about temporary CDR log files is displayed only if temporary CDR log files are currently open.</p>	
<b>File Name</b>	Name of the temporary CDR log file.
<b>Journal file name</b>	Name of the journal file.
<b>Current number of CDRs</b>	Total number of CDRs that have been currently added to the temporary CDR log file.
<b>Current file size (bytes)</b>	Current size, in bytes, of the temporary CDR log file.
<b>File age trigger (mins)</b>	Configured duration, in minutes, after which the temporary CDR log file is closed. If this parameter is not configured, then the default value is displayed.
<b>File size trigger (bytes)</b>	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.
<b>CDR count trigger</b>	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.
<b>Global Statistics</b>	
<b>Disk Offline messages sent</b>	<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"> <li>• <b>request system storage unified-edge media prepare</b></li> <li>• <b>request system storage unified-edge charging media start</b></li> </ul>
<b>Disk Available messages sent</b>	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.
<b>Number of CDR storage files on disk</b>	Total number of CDR files stored on the local Routing Engine disk.
<b>Current storage space in use (MB)</b>	Storage space, in MB, that is currently being used.
<b>Available storage space on disk (MB)</b>	Total free space, in MB, available for storage on the disk.
<b>Total storage space on disk (MB)</b>	Total storage space, in MB, on the disk.
<b>Mirroring Connection Information</b>	

Table 5: show unified-edge ggsn-pgw charging local-persistent-storage statistics Output Fields (*continued*)

Field Name	Field Description
Connection state	State of the mirroring connection. The following states are possible: <ul style="list-style-type: none"> <li>• <b>Active</b>—Indicates that the mirroring status on Routing Engine is active.</li> <li>• <b>Standalone</b>—Indicates that the backup Routing Engine is down, or that graceful Routing Engine switchover (GRES) is not configured.</li> <li>• <b>Standby</b>—Indicates that the backup Routing Engine is on standby.</li> </ul>
Other RE mirroring connection present	Indicates whether the mirroring connection is established with the other Routing Engine or not
GRES configured	Indicates whether GRES is configured or not.

### Sample Output

```

show unified-edge user@host> show unified-edge ggsn-pgw charging local-persistent-storage statistics
ggsn-pgw charging Gateway: PGW
local-persistent-storage Charging local-persistent-storage Statistics
statistics
    Batch Messages received           : 46
    Batch Responses sent              : 46
    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    : 949
    Disk Full messages sent           : 0
    Disk Full resolve messages sent   : 0
    Number of async IO reqs written   : 46
    Disk space status                 : DISK_AVAILABLE
    Watermark level1 at(MB)           : 618(70%)
    Watermark level2 at(MB)           : 706(80%)
    Watermark level3 at(MB)           : 794(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            : 949
    Current file size(bytes)           : 288642
    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)	: 582
Total storage space on disk(MB)	: 883
Mirroring Connection Information	
Connection state	: STANDALONE
Other RE mirroring connection present	: NO
GRES configured	: NO

## show unified-edge ggsn-pgw charging path statistics

<b>Syntax</b>	<pre>show unified-edge ggsn-pgw charging path statistics &lt;brief   detail&gt; &lt;fpc-slot slot-number pic-slot slot-number&gt; &lt;gateway gateway-name&gt; &lt;gtp-peer-addr ipv4-address&gt; &lt;gtp-peer-name peer-name&gt;</pre>
<b>Release Information</b>	<p>Command introduced in Junos OS Mobility Release 11.2W.</p> <p><b>gateway-name</b> option introduced in Junos OS Mobility Release 11.4W.</p>
<b>Description</b>	<p>Display the path management message statistics (between the Charging Data Function (CDF) and the Charging Gateway Function (CGF) servers) for one or more gateway GPRS support nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then the statistics for all GGSNs and P-GWs is displayed.</p>
<b>Options</b>	<p><b>none</b>—(Same as brief) Display the path management message statistics.</p> <p><b>brief   detail</b>—(Optional) Display the specified level of output.</p> <p>The <b>brief</b> option displays the statistics per GGSN or P-GW for all services PICs. The <b>detail</b> option displays the statistics per GGSN or P-GW for each services PIC.</p> <p><b>fpc-slot slot-number pic-slot slot-number</b>—(Optional) Display the path management message statistics only for the specified Flexible PIC Concentrator (FPC) slot number and PIC slot number.</p> <p><b>gateway gateway-name</b>—(Optional) Display the path management statistics for the specified GGSN or P-GW.</p> <p><b>gtp-peer-addr ipv4-address</b>—(Optional) Display the path management message statistics only for the GPRS tunneling protocol Prime (GTP Prime) peer with the specified IPv4 address.</p> <p><b>gtp-peer-name peer-name</b>—(Optional) Display the path management message statistics only for the GTP Prime peer with the specified name.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">clear unified-edge ggsn-pgw charging path statistics on page 119</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show unified-edge ggsn-pgw charging path statistics brief on page 137</a></p> <p><a href="#">show unified-edge ggsn-pgw charging path statistics detail on page 137</a></p>
<b>Output Fields</b>	<p><a href="#">Table 6 on page 135</a> lists the output fields for the <b>show unified-edge ggsn-pgw charging path statistics</b> command. Output fields are listed in the approximate order in which they appear.</p>

Table 6: show unified-edge ggsn-pgw charging path statistics Output Fields

Field Name	Field Description	Level of Output
<b>Gateway</b>	Name of the GGSN or P-GW.	All levels none
<b>FPC/PIC</b>	FPC slot number and PIC slot number for which the statistics are displayed.	<b>detail</b>
<b>CGF Address</b>	Address of the CGF server (GTP Prime peer).	All levels none
<b>CGF Server Name</b>	Name of the CGF server (GTP Prime peer).	All levels none
<b>Echo Requests Rx</b>	Total number of echo requests received by the CDF from the CGF sever.	All levels none
<b>Echo Responses Tx</b>	Total number of echo responses transmitted by the CDF to the CGF sever.	All levels none
<b>Echo Responses Rx</b>	Total number of echo responses received by the CDF from the CGF server.	All levels none
<b>Echo Requests Tx</b>	Total number of echo requests transmitted by the CDF to the CGF server.	All levels none
<b>Node-Alive Requests Rx</b>	Total number of node alive requests received by the CDF from the CGF server.	All levels none
<b>Node-Alive Responses Tx</b>	Total number of responses transmitted by the CDF to the node alive requests received from the CGF server.	All levels none
<b>Version Not Supported Rx</b>	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 none
<b>Version Not Supported Tx</b>	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 none
<b>Echo Requests timed out</b>	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 none

Table 6: show unified-edge ggsn-pgw charging path statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Echo Interval</b>	Configured echo interval, in seconds. If the echo interval is not configured, then the default value is displayed.	All levels none
<b>Down Detection Interval</b>	Configured down detect time, in seconds. If the down detect time is not configured, then the default value is displayed.	All levels none
<b>Reconnect Time Interval</b>	Configured reconnect time, in seconds. If the reconnect time is not configured, then the default value is displayed.	All levels none
<b>Destination Port</b>	Configured destination port. If the destination port is not configured, then the default port (3386) is displayed.	All levels none
<b>Pending Queue Size</b>	Configured pending queue size. If the pending queue size is not configured, then the default value (1024) is displayed.	All levels none
<b>Path Manager FPC Slot</b>	FPC slot that manages the path management messages.	All levels none
<b>Path Manager PIC Slot</b>	PIC slot that manages the path management messages.	All levels none
<b>Path Manager Port</b>	Port used for path management messages.	All levels none
<b>T3 Response Time Interval</b>	Configured T3 response time interval, in seconds. If the T3 response time is not configured, then the default value (5 seconds) is displayed.	All levels none
<b>Source Interface Valid</b>	Indicates whether the source interface is valid or not.	All levels none
<b>GTPP Header Type</b>	Configured header type for the GTP Prime messages.	All levels none
<b>N3 Requests</b>	Configured value for <b>N3 requests</b> . If the <b>N3 requests</b> value is not configured, then the default value (3) is displayed.	All levels none
<b>Local Address</b>	Address of the local loopback source interface from which the GTP Prime packets are sent to the CGF server.	All levels none

Table 6: show unified-edge ggsn-pgw charging path statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>GTPP Version</b>	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 none
<b>Transport Protocol</b>	Configured transport protocol for sending the GTP Prime packets from CDF to the CGF server.	All levels none
<b>TCP Port Range Start</b>	Start of the range of source ports from which the TCP connection from each services PIC to the CGF server can originate. The GGSN or P-GW assigns a range of source ports internally.	All levels none
<b>TCP Port Range End</b>	End of the range of source ports from which the TCP connection from each services PIC to the CGF server can originate. The GGSN or P-GW assigns a range of source ports internally.	All levels none
<b>TCP Connection State</b>	Indicates whether the TCP connection state on the services PIC has been established or not.	<b>detail</b>

## Sample Output

**show unified-edge  
ggsn-pgw charging  
path statistics brief**

```
user@host> show unified-edge ggsn-pgw charging path statistics brief
Gateway: PGW
Charging Path Statistics
```

CGF Address	: 2.2.2.2	CGF Server Name	: p_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	: 5	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	: 12.4.1.1
GTPP Version	: V0	Transport Protocol	: TCP
TCP Port Range Start	: 30277	TCP Port Range End	: 30308

**show unified-edge  
ggsn-pgw charging  
path statistics detail**


```
user@host> show unified-edge ggsn-pgw charging path statistics detail
Gateway: PGW
Charging Path Statistics
FPC/PIC: 5/0
```

CGF Address	: 2.2.2.2	CGF Server Name	: p_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	: 5	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	: 12.4.1.1
GTPP Version	: V0	Transport Protocol	: TCP
TCP Port Range Start	: 30277	TCP Port Range End	: 30308
TCP Connection State	: Established		



## show unified-edge ggsn-pgw charging path status

<b>Syntax</b>	<pre>show unified-edge ggsn-pgw charging path status &lt;brief   detail&gt; &lt;fpc-slot slot-number pic-slot slot-number&gt; &lt;gateway gateway-name&gt; &lt;gtp-peer-addr ipv4-address&gt; &lt;gtp-peer-name peer-name&gt;</pre>
<b>Release Information</b>	<p>Command introduced in Junos OS Mobility Release 11.2W.</p> <p><b>gateway-name</b> option introduced in Junos OS Mobility Release 11.4W.</p>
<b>Description</b>	<p>Display the status of the configured GPRS tunneling protocol (GTP) Prime peers for one or more gateway GPRS support nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then the status for all GGSNs and P-GWs is displayed.</p> <p>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.</p> <div style="margin-top: 20px;">  <p><b>NOTE:</b> In charging, the terms GTP Prime peers and charging gateway function (CGF) server are used interchangeably.</p> </div>
<b>Options</b>	<p><b>none</b>—(Same as brief) Display the status of the configured peers.</p> <p><b>brief   detail</b>—(Optional) Display the specified level of output.</p> <p><b>fpc-slot slot-number pic-slot slot-number</b>—(Optional) Display the status of the configured peers only for the specified FPC slot number and PIC slot number.</p> <p><b>gateway gateway-name</b>—(Optional) Display the path management statistics for the specified GGSN or P-GW.</p> <p><b>gtp-peer-addr ipv4-address</b>—(Optional) Display the status of the configured peers only for the GTP Prime peer with the specified IPv4 address.</p> <p><b>gtp-peer-name peer-name</b>—(Optional) Display the status of the configured peers only for the GTP Prime peer with the specified name.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show unified-edge ggsn-pgw charging path statistics on page 134</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show unified-edge ggsn-pgw charging path status on page 140</a></p> <p><a href="#">show unified-edge ggsn-pgw charging path status detail on page 140</a></p>

**Output Fields** Table 7 on page 140 lists the output fields for the **show unified-edge ggsn-pgw charging path status** command. Output fields are listed in the approximate order in which they appear.

**Table 7: show unified-edge ggsn-pgw charging path status Output Fields**

Field Name	Field Description	Level of Output
<b>Gateway</b>	Name of the GGSN or P-GW.	All levels none
<b>Peer-Address</b>	Address of the CGF server (GTP Prime peer).	All levels none
<b>Peer-Name</b>	Name of the CGF server (GTP Prime peer).	All levels none
<b>Local-Address</b>	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 none
<b>Status</b>	Status of the CGF server: <ul style="list-style-type: none"> <li>• <b>Connected</b></li> <li>• <b>Down</b></li> <li>• <b>In-Progress</b></li> </ul>	All levels none
<b>Echo</b>	Indicates whether echo messages are enabled or disabled. The possible values are: <ul style="list-style-type: none"> <li>• <b>Enabled</b> or <b>Disabled</b> for UDP connections</li> <li>• <b>N/A</b> (Not Applicable) for TCP connections</li> </ul>	All levels none
<b>Cause</b>	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.	<b>detail</b>
<b>FPC/PIC</b>	FPC and PIC slot numbers.	<b>detail</b>

## Sample Output

```

show unified-edge user@host> show unified-edge ggsn-pgw charging path status
ggsn-pgw charging
path status      Gateway: PGW
                  Charging Path Status
                  Peer-Address    Peer-Name    Local-Address    Status    Echo
                  2.2.2.2         p_cgf        12.4.1.1         Connected N/A

```

```

show unified-edge user@host> show unified-edge ggsn-pgw charging path status detail
ggsn-pgw charging
path status detail Gateway: PGW
                  Charging Path Status

```

```
FPC/PIC 5/0
Peer-Address 2.2.2.2
Peer-Name    p_cgf
Local-Address 12.4.1.1
Status       Connected
Echo         N/A
```

## show unified-edge ggsn-pgw charging service-mode

<b>Syntax</b>	<b>show unified-edge ggsn-pgw charging service-mode gateway <i>gateway-name</i></b> <b>&lt;brief   detail&gt;</b> <b>&lt;charging-profile <i>profile-name</i>&gt;</b> <b>&lt;transport-profile <i>profile-name</i>&gt;</b>
<b>Release Information</b>	Command introduced in Junos OS Mobility Release 11.2W.
<b>Description</b>	Display the charging service mode information for the specified Gateway GPRS Support Node (GGSN) or Packet Data Network Gateway (P-GW).
<b>Options</b>	<p><b>gateway <i>gateway-name</i></b>—Display the charging service mode information for the specified GGSN or P-GW.</p> <p><b>brief   detail</b>—(Optional) Display the specified level of output.</p> <p><b>charging-profile-name <i>profile-name</i></b>—(Optional) Display the service mode information for the specified charging profile.</p> <p><b>transport-profile-name <i>profile-name</i></b>—(Optional) Display the service mode information for the specified transport profile.</p>
<b>Required Privilege Level</b>	view
<b>List of Sample Output</b>	<a href="#">show unified-edge ggsn-pgw charging service-mode gateway PGW brief on page 143</a> <a href="#">show unified-edge ggsn-pgw charging service-mode gateway PGW detail on page 144</a>
<b>Output Fields</b>	<a href="#">Table 8 on page 142</a> lists the output fields for the <b>show unified-edge ggsn-pgw charging service-mode</b> command. Output fields are listed in the approximate order in which they appear.

Table 8: show unified-edge ggsn-pgw charging service-mode Output Fields

Field Name	Field Description	Level of Output
Gateway Name	Name of the GGSN or P-GW.	All levels

Table 8: show unified-edge ggsn-pgw charging service-mode Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Service Mode</b>	Service mode for the gateway. The following service modes are possible: <ul style="list-style-type: none"> <li>Maintenance—Gateway is in maintenance mode.</li> <li><b>MM Active Phase</b>—In this mode, you can make changes to any of the configuration options under the <code>[edit unified-edge gateways ggsn-pgw gateway-name charging charging-profiles]</code> or the <code>[edit unified-edge gateways ggsn-pgw gateway-name charging transport-profiles]</code> hierarchy levels.</li> <li><b>MM In/Out Phase</b>—In this mode, you cannot make changes to the configuration options under the <code>[edit unified-edge gateways ggsn-pgw gateway-name charging charging-profiles]</code> or the <code>[edit unified-edge gateways ggsn-pgw gateway-name charging transport-profiles]</code> hierarchy levels.</li> <li><b>Operational</b>—Gateway is still in operational mode and not in maintenance mode. You can use the following commands to put the charging profile or transport profile in maintenance mode: <ul style="list-style-type: none"> <li><code>set unified-edge gateways ggsn-pgw gateway-name charging charging-profiles profile-name service-mode maintenance</code></li> <li><code>set unified-edge gateways ggsn-pgw gateway-name charging transport-profiles profile-name service-mode maintenance</code></li> </ul> </li> </ul>	All levels
<b>Charging Profile(s) or Charging Profile</b>	Name of the charging profile.	All levels
<b>Service Mode</b>	Service mode for the charging profile.	All levels
<b>Transport Profile(s) or Transport Profile</b>	Name of the transport profile.	<b>brief</b>
<b>Service Mode</b>	Service mode for the transport profile.	All levels
<b>Pending Maintenance Mode Ready Ack</b>	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.	<b>detail</b>

## Sample Output

```

show unified-edge ggsn-pgw charging service-mode gateway PGW brief
user@host> show unified-edge ggsn-pgw charging service-mode gateway PGW 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      : PGW
Service Mode      : Operational

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

```

p\_tsp

Operational

```
show unified-edge      user@host> show unified-edge ggsn-pgw charging service-mode gateway PGW detail
ggsn-pgw charging      Gateway Name      : PGW
service-mode gateway    Service Mode      : Operational
PGW detail              Charging Profile: p_juniper
                        Service Mode      : Operational
                        Transport Profile: p_tsp
                        Service Mode      : Operational
```

## show unified-edge ggsn-pgw charging transfer statistics

<b>Syntax</b>	<pre>show unified-edge ggsn-pgw charging transfer statistics &lt;brief   detail&gt; &lt;fpc-slot slot-number pic-slot slot-number&gt; &lt;gateway gateway-name&gt; &lt;transport-profile-name profile-name&gt;</pre>
<b>Release Information</b>	<p>Command introduced in Junos OS Mobility Release 11.2W.</p> <p><b>gateway</b> option introduced in Junos OS Mobility Release 11.4W.</p>
<b>Description</b>	Display the transfer statistics for the configured transport profiles on one or more Gateway GPRS Support Nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then statistics for all GGSNs and P-GWs are displayed.
<b>Options</b>	<p><b>none</b>—(Same as brief) Display the transfer statistics for the configured transport profiles for all GGSNs or P-GWs.</p> <p><b>brief   detail</b>—(Optional) Display the specified level of output.</p> <p><b>fpc-slot slot-number pic-slot slot-number</b>—(Optional) Display the transfer statistics only for the specified FPC slot number and PIC slot number.</p> <p><b>gateway gateway-name</b>—(Optional) Display the transfer statistics for the specified GGSN or P-GW.</p> <p><b>transport-profile-name profile-name</b>—(Optional) Display the transfer statistics only for the specified transport profile.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li><a href="#">clear unified-edge ggsn-pgw charging transfer statistics on page 120</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show unified-edge ggsn-pgw charging transfer statistics brief on page 147</a></p> <p><a href="#">show unified-edge ggsn-pgw charging transfer statistics detail on page 147</a></p>
<b>Output Fields</b>	<p><a href="#">Table 9 on page 145</a> lists the output fields for the <b>show unified-edge ggsn-pgw charging transfer statistics</b> command. Output fields are listed in the approximate order in which they appear.</p>

Table 9: show unified-edge ggsn-pgw charging transfer statistics Output Fields

Field Name	Field Description	Level of Output
Gateway	Name of the GGSN or P-GW.	All levels
		none
Transport-Profile	Name of the transport profile.	All levels
		none

Table 9: show unified-edge ggsn-pgw charging transfer statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Redirection Requests Rx</b>	<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 can send these messages to inform CDF about the following:</p> <ul style="list-style-type: none"> <li>• The CGF server is about to stop service (possibly due to an error condition or for maintenance).</li> <li>• The next node in the chain (such as a billing server) has lost its connection to the CGF server.</li> </ul>	<p>All levels</p> <p>none</p>
<b>Redirection Responses Tx</b>	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.	<p>All levels</p> <p>none</p>
<b>DRT Responses Rx</b>	Total number of DRT response messages received for the Data Record Transfer (DRT) request messages sent. DRT response messages indicate whether a DRT request was successful or not.	<p>All levels</p> <p>none</p>
<b>DRT Requests Tx</b>	Total number of DRT request messages transmitted to the CGF server. These messages are used to transfer CDRs from the CDF to the CGF server.	<p>All levels</p> <p>none</p>
<b>DRT successful Responses Rx</b>	Total number of successful DRT response messages received for the DRT request messages sent.	<p>All levels</p> <p>none</p>
<b>DRT Error Responses Rx</b>	Total number of DRT error response messages received for the DRT request messages sent.	<p>All levels</p> <p>none</p>
<b>DRT Requests timed out</b>	Total number of DRT requests sent that timed out before receiving any responses from the CGF server.	<p>All levels</p> <p>none</p>
<b>CGF Switch Back Times</b>	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.	<p>All levels</p> <p>none</p>
<b>Batch Requests Tx</b>	Total number of batch requests transmitted (from services PICs) for a transport profile.	<p>All levels</p> <p>none</p>
<b>Batch Response Errors Rx</b>	Total number of error responses sent by the Routing Engine to the services PICs for the batch requests messages received.	<p>All levels</p> <p>none</p>
<b>Batch CDR's Tx</b>	Total number of CDRs transmitted from services PICs to the Routing Engine.	<p>All levels</p> <p>none</p>
<b>CDR Count</b>	Total number of CDRs transmitted to the CGF server.	<p>All levels</p> <p>none</p>



Table 9: show unified-edge ggsn-pgw charging transfer statistics Output Fields (*continued*)

Field Name	Field Description	Level of Output
<b>Total WFA</b>	Total number of request messages awaiting acknowledgements from either the Routing Engine or the CGF server.	All levels none
<b>Open Batch Requests Timed out</b>	Number of open batch requests timed out.  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.	All levels none
<b>FPC/PIC</b>	FPC and PIC slot numbers.	detail

### Sample Output

```

show unified-edge ggsn-pgw charging transfer statistics brief
user@host> show unified-edge ggsn-pgw charging transfer statistics brief
Gateway: PGW
Charging Transfer Statistics
Transport-Profile : p_tsp
  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 ggsn-pgw charging transfer statistics detail
user@host> show unified-edge ggsn-pgw charging transfer statistics detail
Gateway: PGW
Charging Transfer Statistics
FPC/PIC: 3/0
Transport-profile : p_tsp
  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 ggsn-pgw charging transfer status

<b>Syntax</b>	<pre>show unified-edge ggsn-pgw charging transfer status &lt;brief   detail&gt; &lt;fpc-slot slot-number pic-slot slot-number&gt; &lt;gateway gateway-name&gt; &lt;transport-profile-name profile-name&gt;</pre>
<b>Release Information</b>	<p>Command introduced in Junos OS Mobility Release 11.2W.</p> <p><b>gateway</b> option introduced in Junos OS Mobility Release 11.4W.</p>
<b>Description</b>	Display the Charging Data Record (CDR) transfer status for the configured transport profiles for one or more gateway GPRS support nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then the status for all GGSNs and P-GWs is displayed.
<b>Options</b>	<p><b>none</b>—(Same as brief) Display the total number of unacknowledged and buffered CDRs for the configured transport profiles for all GGSNs or P-GWs.</p> <p><b>brief   detail</b>—(Optional) Display the specified level of output.</p> <p><b>fpc-slot slot-number pic-slot slot-number</b>—(Optional) Display the total number of unacknowledged and buffered CDRs only for the specified FPC slot number and PIC slot number.</p> <p><b>gateway gateway-name</b>—(Optional) Display the total number of unacknowledged and buffered CDRs for the configured transport profiles for the specified GGSN or P-GW.</p> <p><b>transport-profile-name profile-name</b>—(Optional) Display the total number of unacknowledged and buffered CDRs only for the specified transport profile.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">show unified-edge ggsn-pgw charging transfer statistics on page 145</a></li> </ul>
<b>List of Sample Output</b>	<p><a href="#">show unified-edge ggsn-pgw charging transfer status on page 149</a></p> <p><a href="#">show unified-edge ggsn-pgw charging transfer status detail on page 149</a></p>
<b>Output Fields</b>	Table 10 on page 148 lists the output fields for the <b>show unified-edge ggsn-pgw charging transfer status</b> command. Output fields are listed in the approximate order in which they appear.

Table 10: show unified-edge ggsn-pgw charging transfer status Output Fields

Field Name	Field Description	Level of Output
Gateway	Name of the GGSN or P-GW	All levels
		none

Table 10: show unified-edge ggsn-pgw charging transfer status Output Fields (*continued*)

Field Name	Field Description	Level of Output
FPC/PIC	FPC and PIC slot numbers.	detail
Transport-Profile	Name of the transport profile.	All levels none
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 none
Total Buffered CDR's	Total number of buffered CDRs (for the transport profile) in the services PICs.	All levels none

### Sample Output

```

show unified-edge user@host> show unified-edge ggsn-pgw charging transfer status
ggsn-pgw charging
transfer status
Gateway: PGW
Charging Transfer Status
Transport-Profile : p_tsp
  Total UnAck CDR's      : 2
  Total Buffered CDR's   : 0

Transport-Profile : 2
  Total UnAck CDR's      : 0
  Total Buffered CDR's   : 0

Gateway: PGW2
Charging Transfer Status
Transport-Profile : p_tsp
  Total UnAck CDR's      : 5
  Total Buffered CDR's   : 0

Transport-Profile : 2
  Total UnAck CDR's      : 0
  Total Buffered CDR's   : 0

show unified-edge user@host> show unified-edge ggsn-pgw charging transfer status detail
ggsn-pgw charging
transfer status detail
Gateway: PGW
Charging Transfer Status
FPC/PIC: 2/0
Transport-profile      : p_tsp
Transport-profile Id   : 3
Total UnAck CDR's      : 2
Total Buffered CDR's   : 0

Transport-profile      : 2
Transport-profile Id   : 1
Total UnAck CDR's      : 0
Total Buffered CDR's   : 0

```

Gateway: PGW2  
Charging Transfer Status  
FPC/PIC: 2/1  
Transport-profile : p\_tsp  
Transport-profile Id : 6  
Total UnAck CDR's : 5  
Total Buffered CDR's : 0  
  
Transport-profile : 2  
Transport-profile Id : 4  
Total UnAck CDR's : 0  
Total Buffered CDR's : 0

## show unified-edge ggsn-pgw charging trigger-profile

<b>Syntax</b>	<b>show unified-edge ggsn-pgw charging trigger-profile</b> <b>&lt;gateway gateway&gt;</b> <b>&lt;trigger-profile-name profile-name&gt;</b>
<b>Release Information</b>	Statement introduced in Junos OS Mobility Release 11.2W. gateway argument introduced in Junos OS Mobility Release 11.4W.
<b>Description</b>	Display the configuration of the trigger profiles for one or more Gateway GPRS Support Nodes (GGSNs) or Packet Data Network Gateways (P-GWs). If a GGSN or P-GW is not specified, then information for all GGSNs and P-GWs is displayed.
<b>Options</b>	<p><b>none</b>—Display the configuration of the trigger profiles.</p> <p><b>gateway gateway</b>—(Optional) Display the configuration of the trigger profiles for the total number of unacknowledged and buffered CDRs for the configured transport profiles for the specified gateway.</p> <p><b>trigger-profile-name profile-name</b>—(Optional) Display the configuration only for the specified trigger profile.</p>
<b>Required Privilege Level</b>	view
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">trigger-profiles on page 103</a></li> </ul>
<b>List of Sample Output</b>	<a href="#">show unified-edge ggsn-pgw charging trigger-profile on page 152</a>
<b>Output Fields</b>	<a href="#">Table 11 on page 151</a> lists the output fields for the <b>show unified-edge ggsn-pgw charging trigger-profile</b> command. Output fields are listed in the approximate order in which they appear.

**Table 11: show unified-edge ggsn-pgw charging trigger-profile Output Fields**

Field Name	Field Description
<b>Profile Name</b>	Name of the trigger profile.
<b>Profile ID</b>	ID of the trigger profile.
<b>Time Limit</b>	Time limit for the trigger profile, if any.
<b>Volume Limit</b>	Volume limit for the trigger profile, if any.
<b>PLMN change trigger</b>	<p>Indicates whether the Public Land Mobile Network (PLMN) change trigger is enabled or not.</p> <p>If this trigger is enabled, a PLMN change usually results in the CDR being updated with the charging information and then closed.</p>

**Table 11: show unified-edge ggsn-pgw charging trigger-profile Output Fields (*continued*)**

Field Name	Field Description
<b>QOS change trigger</b>	Indicates whether the quality-of-service (QoS) change trigger is enabled or not.  If this trigger is enabled, a QoS change usually results in a container being added to the CDR.
<b>RAT change trigger</b>	Indicates whether the Radio Access Technology (RAT) change trigger is enabled or not.  If this trigger is enabled, a RAT change usually results in the CDR being updated with the charging information and then closed.
<b>SGSN/SGW change trigger</b>	Indicates whether the Serving GPRS Support Node (SGSN) or Serving Gateway (S-GW) change trigger is enabled or not.  If this trigger is enabled, then for each change, the SGSN or S-GW address is recorded in the CDR.
<b>User location change trigger</b>	Indicates whether the user-location change trigger is enabled or not.  If this trigger is enabled, a user location change usually results in the current container being closed and added to the CDR.
<b>MS Timezone change trigger</b>	Indicates whether the mobile station (MS) time zone change trigger is enabled or not.  If this trigger is enabled, an MS time zone change usually results in the CDR being updated with the charging information and then closed.

## Sample Output

```

show unified-edge ggsn-pgw charging trigger-profile
user@host> show unified-edge ggsn-pgw charging trigger-profile
Gateway Name: PGW
Profile Name: p_tp
Profile ID : 1
Profile Name: p_tp
Profile ID : 1
Time Limit: None
Volume Limit: 1024 Byte (Uplink and Downlink Combined)
PLMN change trigger: Enabled
QOS change trigger : Enabled
RAT change trigger : Enabled
SGSN/SGW change trigger : Enabled
User location change trigger: Enabled
MS Timezone change trigger: Enabled

```

## PART 4

# Troubleshooting

- [Acquiring Troubleshooting Information on page 155](#)





## CHAPTER 7

# Acquiring Troubleshooting Information

- [Tracing Charging Operations on page 155](#)

## 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 156](#)
- [Configuring the Tracing Flags on page 156](#)

## 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. The following table describes the flags that you can include.

Flag	Description
<b>all</b>	Trace all operations
<b>cdr-encoding</b>	Trace CDR encoding
<b>client-fsm</b>	Trace client finite state machine (FSM)
<b>config</b>	Trace configuration events
<b>fsm</b>	Trace FSM
<b>general</b>	Trace general flow
<b>group-fsm</b>	Trace group FSM
<b>init</b>	Trace initialization events
<b>ipc</b>	Trace IPC
<b>path-management</b>	Trace path management module
<b>request</b>	Trace requests
<b>resource</b>	Trace resources

Flag	Description
response	Trace responses
timers	Trace timers
transport	Trace transport group
triggers	Trace trigger information

**Related  
Documentation**

- [Configuring Charging on page 13](#)
- Configuring S-GW-Specific Charging Parameters
- Configuring S-GW Global Charging Profiles and Selection Order
- Configuring S-GW Charging Traceoptions
- Configuring S-GW Charging Traceoptions



## PART 5

# Index

- [Index on page 161](#)



# Index

## Symbols

#, comments in configuration statements.....	xiii
( ), in syntax descriptions.....	xiii
< >, in syntax descriptions.....	xii
[ ], in configuration statements.....	xiii
{ }, in configuration statements.....	xiii
(pipe), in syntax descriptions.....	xiii

## B

braces, in configuration statements.....	xiii
brackets	
angle, in syntax descriptions.....	xii
square, in configuration statements.....	xiii

## C

CDR profiles	
configuring.....	25
cdr-aggregation-limit statement.....	30
cdr-profile statement.....	31
cdr-profiles statement.....	33
cdr-release statement	
charging gateways.....	34
CDRs	
GTP Prime properties.....	15
cdrs-per-file statement.....	35
charging	
configuring.....	13
disabling persistent storage.....	122
enabling persistent storage.....	121
charging configurations	
managing.....	113
monitoring.....	113
charging profiles	
APN	
configuring.....	28
CDR profiles.....	25
configuring.....	26
transport profiles.....	21
trigger profiles.....	23
charging statement.....	36
charging-gateways statement.....	40

charging-profiles statement.....	41
clear unified-edge ggsn-pgw charging cdr	
command.....	116
clear unified-edge ggsn-pgw charging cdr wfa	
command.....	117
clear unified-edge ggsn-pgw charging	
local-persistent-storage statistics	
command.....	118
clear unified-edge ggsn-pgw charging path	
statistics command.....	119
clear unified-edge ggsn-pgw charging transfer	
statistics command.....	120
comments, in configuration statements.....	xiii
container-limit statement.....	42
conventions	
text and syntax.....	xii
curly braces, in configuration statements.....	xiii
customer support.....	xiii
contacting JTAC.....	xiii

## D

default-rating-group statement.....	43
default-service-id statement.....	44
description statement	
CDR profiles.....	45
charging profiles.....	45
transport profiles.....	45
trigger profiles.....	45
destination-ipv4-address statement	
GTP Prime.....	46
destination-port statement	
GTP Prime.....	47
direction statement	
trigger profiles.....	48
disable-replication statement.....	49
disk-space-policy statement.....	50
documentation	
comments on.....	xiii
down-detect-time statement	
GTP Prime.....	51

## E

echo-interval statement	
GTP Prime.....	52
edit unified-edge gateways statement	
hierarchy.....	29
enable-reduced-partial-cdrs statement.....	53
exclude statement	
trigger profiles.....	54

exclude-ie-options statement.....57

## F

file-age statement.....61  
 file-creation-policy statement.....62  
 file-format statement.....63  
 file-name-private-extension statement.....64  
 file-size statement.....66  
 font conventions.....xii

## G

GTP Prime peers  
     GTP Prime properties.....16  
 GTP Prime properties  
     configuring.....15, 16  
 gtp statement.....68

## H

header-type statement  
     GTP Prime.....69

## L

local-persistent-storage-options statement.....70  
 local-storage statement.....71

## M

manuals  
     comments on.....xiii  
 mobile charging  
     flags for tracing operations.....156  
     log filenames for tracing operations.....156  
     tracing operations.....155  
 mobile subscribers  
     CDR profiles.....25  
     charging profiles.....26  
         APN.....28  
     monitoring.....113  
     persistent storage of CDR.....17  
     tracing operations.....155  
     transport profiles.....21  
     trigger profiles.....23  
 mtu statement  
     transport profiles.....72

## N

n3-requests statement  
     GTP Prime.....73  
 no-path-management statement  
     GTP Prime.....74

## O

offline charging  
     configuring.....13  
 offline statement  
     transport profiles.....75  
     trigger profiles.....76

## P

parentheses, in syntax descriptions.....xiii  
 peer statement  
     GTP Prime.....77  
     peer order  
         charging gateways.....78  
 peer-order statement  
     charging gateways.....79  
 pending-queue-size statement  
     GTP Prime.....80  
 persistent storage  
     configuring.....17  
     configuring the SSD.....19, 21  
     disabling for charging.....122  
     ejecting the SSD.....20  
     enabling for charging.....121  
     formatting SSD.....124  
     initializing the SSD.....20  
     preparing SSD.....123, 124  
     removing SSD.....123  
     tracing operations.....18  
 persistent-storage-order statement.....81  
 profile-id statement.....82

## R

reconnect-time statement  
     GTP Prime.....83  
 request system storage unified-edge charging  
     media start command.....121  
 request system storage unified-edge charging  
     media stop command.....122  
 request system storage unified-edge media eject  
     command.....123  
 request system storage unified-edge media prepare  
     command.....124

## S

service-mode statement  
     charging profiles.....84  
     transport profiles.....86  
 sgsn-sgw-change-limit statement.....87



show unified-edge ggsn-pgw charging global statistics command.....	125
show unified-edge ggsn-pgw charging local-persistent-storage statistics command.....	128
show unified-edge ggsn-pgw charging path statistics command.....	134
show unified-edge ggsn-pgw charging path status command.....	139
show unified-edge ggsn-pgw charging service-mode command.....	142
show unified-edge ggsn-pgw charging transfer statistics command.....	145
show unified-edge ggsn-pgw charging transfer status command.....	148
show unified-edge ggsn-pgw charging trigger-profile command.....	151
source-interface statement	
GTP Prime.....	88
peer.....	88
support, technical <i>See</i> technical support	
switch-back-time statement.....	89
syntax conventions.....	xii

## T

t3-response statement	
GTP Prime.....	90
tariff-time-list statement.....	91
technical support	
contacting JTAC.....	xiii
time-limit statement.....	92
traceoptions statement	
charging.....	93
local persistent storage.....	96
tracing operations	
for persistent storage.....	18
mobile charging.....	155
mobile subscribers.....	155
transport profiles	
configuring.....	21
transport-profile statement.....	98
transport-profiles statement.....	100
transport-protocol statement	
GTP Prime.....	101
trigger profiles	
configuring.....	23
trigger-profile statement.....	102
trigger-profiles statement.....	103

## U

user-name statement	
local persistent storage.....	104

## V

version statement	
GTP Prime.....	105
volume-limit statement.....	106

## W

watermark-level-1 statement.....	107
watermark-level-2 statement.....	108
watermark-level-3 statement.....	109
world-readable statement	
local persistent storage.....	110

