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# MX Services Control Gateway (Diameter, Gx Router Driver)



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## Documentation and Release Notes

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## Documentation Conventions

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

Table 1: Notice Icons

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

## Documentation Conventions

Table 1 on page x defines the notice icons used in this guide. Table 3 on page xi defines text conventions used throughout this documentation.

Table 2: 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.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Table 3: Text Conventions

Convention	Description	Examples
<b>Bold text like this</b>	<ul style="list-style-type: none"> <li>Represents keywords, scripts, and tools in text.</li> <li>Represents a GUI element that the user selects, clicks, checks, or clears.</li> </ul>	<ul style="list-style-type: none"> <li>Specify the keyword <b>exp-msg</b>.</li> <li>Run the <b>install.sh</b> script.</li> <li>Use the <b>pkgadd</b> tool.</li> <li>To cancel the configuration, click <b>Cancel</b>.</li> </ul>
<b>Bold text like this</b>	Represents text that the user must type.	<b>user@host# set cache-entry-age</b> <i>cache-entry-age</i>
Fixed-width text like this	Represents information as displayed on your terminal's screen, such as CLI commands in output displays.	<pre>nic-locators {   login {     resolution {       resolver-name /realms/         login/A1;       key-type LoginName;       value-type SaeId;     }   } }</pre>
Regular sans serif typeface	<ul style="list-style-type: none"> <li>Represents configuration statements.</li> <li>Indicates SRC CLI commands and options in text.</li> <li>Represents examples in procedures.</li> <li>Represents URLs.</li> </ul>	<ul style="list-style-type: none"> <li><b>system ldap server{</b> <b>stand-alone;</b></li> <li>Use the <b>request sae modify device failover</b> <b>command</b> with the <b>force</b> option</li> <li><b>user@host# ...</b></li> <li><a href="https://www.juniper.net/techpubs/software/management/sdx/api-index.html">https://www.juniper.net/techpubs/software/management/sdx/api-index.html</a></li> </ul>

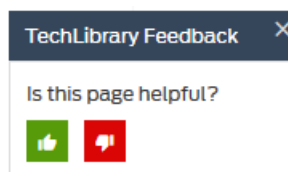
Table 3: Text Conventions (continued)

<i>Italic sans serif typeface</i>	Represents variables in SRC CLI commands.	<code>user@host# set local-address local-address</code>
Angle brackets	In text descriptions, indicate optional keywords or variables.	Another runtime variable is <gfwif>.
Key name	Indicates the name of a key on the keyboard.	Press Enter.
Key names linked with a plus sign (+)	Indicates that you must press two or more keys simultaneously.	Press Ctrl + b.
<i>Italic typeface</i>	<ul style="list-style-type: none"> <li>Emphasizes words.</li> <li>Identifies book names.</li> <li>Identifies distinguished names.</li> <li>Identifies files, directories, and paths in text but not in command examples.</li> </ul>	<ul style="list-style-type: none"> <li>There are two levels of access: <i>user</i> and <i>privileged</i>.</li> <li><i>SRC-PE Getting Started Guide</i>.</li> <li><i>o=Users, o=UMC</i></li> <li>The <i>/etc/default.properties</i> file.</li> </ul>
Backslash	At the end of a line, indicates that the text wraps to the next line.	<code>Plugin.radiusAcct-1.class=\ net.juniper.smgmt.sae.plugin\ RadiusTrackingPluginEvent</code>
Words separated by the   symbol	Represent a choice to select one keyword or variable to the left or right of this symbol. (The keyword or variable may be either optional or required.)	<code>diagnostic   line</code>

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We encourage you to provide feedback so that we can improve our documentation. You can use either of the following methods:

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

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- 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 <https://support.juniper.net/support/requesting-support/>.



## PART 1

# Overview

- [SAE Support Overview on page 3](#)
- [Gx Router Driver Overview on page 11](#)
- [Gx Router Driver Supported 3GPP AVPs on page 17](#)





## CHAPTER 1

# SAE Support Overview

- [SAE Support for Gx Router Driver on page 3](#)
- [Connections to Managed Devices on page 8](#)

## SAE Support for Gx Router Driver

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The SAE performs the following actions using the Gx router driver of the SRC software acting as a policy and charging rule function (PCRF):

- Provides solicited or unsolicited provisioning of Policy and Charging Control (PCC) rules or enhanced PCC (ePCC) rules to the MX Series routers (that is, Services Control Gateway) acting as a policy and charging enforcement function (PCEF).
- Handles traffic plane event received from the Services Control Gateway.
- Removes the provisioned PCC or ePCC rules.
- Monitors service usage for the subscriber.

You can use multiple SAEs (that is, multiple SRC softwares) to manage the same Services Control Gateway. In this scenario, the SAEs elect an active instance of the Gx router driver to manage the Services Control Gateway.

## Subscriber Session Creation

The subscriber session creation sequence is as follows:

1. The Services Control Gateway sends a request message (Credit-Control-Request initial (CCR-I)) to the Diameter server of the SRC software. This message contains Subscription-Id and Auth-Application-Id AVPs.

In the SRC software, the Subscription-Id AVP is mapped to the login-name attribute. When multiple Subscription-Id AVPs are received, the first received identifier is mapped to the login-name attribute.

2. The Diameter server checks whether the Auth-Application-Id AVP in the request message denotes the Gx application identifier. If the Auth-Application-Id AVP is not valid, the Diameter server sends an error response to the Services Control Gateway.
3. If the Auth-Application-Id AVP is valid, the Diameter server checks whether a corresponding Gx router driver is registered with the Diameter server. If no Gx router

driver is registered, the Diameter server sends an error response to the Services Control Gateway.

4. If a registered Gx router driver is available, the Diameter server delegates the request message to the SAE as a Common Object Request Broker Architecture (CORBA) request.
5. The SAE performs interface classification (if configured) and then performs subscriber classification based on the Subscription-Id AVP received in the request message. If there is no subscriber classification available for the subscriber, the SAE classifies the subscriber as an unauthenticated user profile.
6. If the subscriber classification is successful, the SAE creates a user session for the subscriber and activates the activate-on-login subscriptions configured for the subscriber. Then, the SAE associates corresponding PCC or ePCC rules to the service based on the configuration.
7. The SAE sends a success response message (Credit-Control-Answer initial (CCA-I)) with the provisioned rules to the Diameter server that delegates the response message to the Services Control Gateway.
8. The Services Control Gateway applies the provisioned rules to the subscriber.

## Subscriber Session Updation

The subscriber session updation sequence is as follows:

1. The Services Control Gateway sends a request message (CCR update (CCR-U)) to the Diameter server of the SRC software. This message contains Session-Id and Auth-Application-Id AVPs.
2. The Diameter server checks whether the Auth-Application-Id AVP in the request message denotes the Gx application identifier. If the Auth-Application-Id AVP is not valid, the Diameter server sends an error response to the Services Control Gateway.
3. If the Auth-Application-Id AVP is valid, the Diameter server checks whether a corresponding Gx router driver is registered with the Diameter server. If no Gx router driver is registered, the Diameter server sends an error response to the Services Control Gateway.
4. If a registered Gx router driver is available, the Diameter server delegates the request message to the SAE as a CORBA request.
5. The SAE searches for the subscriber session using the Session-Id AVP. If no matching session is available, the SAE sends an error response to the Services Control Gateway.
6. If a matching session is identified, the SAE performs the following actions:
  - Updates the session with the information received in the request message.
  - Notifies the SAE plug-ins about the event that triggered the request message.

- Publishes the received information to the SAE plug-ins.
  - Triggers a Re-Auth-Request (RAR) message with Charging-Rule-Install AVP or Charging-Rule-Remove AVP only when you invoke the Dynamic Service Activator (DSA) portal APIs or SAE core APIs.
7. The SAE sends a success response message (CCA update (CCA-U)) to the Diameter server that delegates the response message to the Services Control Gateway as an acknowledgement.

If the `AutoDeactivateOnThreshold` flag is enabled at service level configuration and the usage monitoring threshold is reached, the SAE sends the Charging-Rule-Remove AVP in the response message (CCA-U).

## Subscriber Session Reauthorization

The subscriber session reauthorization sequence is as follows:

1. The SAE retrieves the subscriber session if the subscription change request message is received from the DSA or SAE CORBA API, any policy parameter is changed, or any subscription is changed for the subscriber profile.
2. The SAE rebuilds the provisioning set based on the configured rules and updates the profile.
3. The SAE constructs a RAR message with Charging-Rule-Remove AVP or Charging-Rule-Install AVP based on the policy changes, subscription changes, service activation, and service deactivation.
4. The SAE sends the RAR messages to the Diameter server that delegates the RAR message to the Services Control Gateway.
5. The Services Control Gateway acknowledges the RAR message by sending the Re-Auth-Answer (RAA) message.



**NOTE:** SRC software does not send the RAR message to the Services Control Gateway when the 3GPP attributes are modified at the subscriber level or service level for the logged in subscribers.

## Subscriber Session Detach

The subscriber session detach sequence is as follows:

1. The Services Control Gateway sends a request message (CCR termination (CCR-T)) to the Diameter server of the SRC software.
2. The Diameter server delegates the request message to the SAE as a CORBA request.
3. The SAE searches for the subscriber session using the Session-Id AVP. If no matching session is available, the SAE sends an error response to the Services Control Gateway.
4. If a matching session is identified, the SAE performs the following actions:
  - Deletes the session details from the SAE user manager.

- Publishes the subscriber and service tracking stop events to the SAE plug-ins.
  - Updates the subscriber session detach information in the session store.
5. The SAE sends a response message (CCA termination (CCA-T)) to the Diameter server that delegates the response message to the Services Control Gateway.

## Service Accounting

You can perform service accounting for one or more PCC or ePCC rules.

When a SRC software requests service accounting, the SRC software should configure the Event-Trigger AVP to USAGE\_REPORT and also should enable the accounting flag for at least one policy rule for a service. SRC software must send the Usage-Monitoring-Information AVP either in the RAR message (if the SRC software initiates the rule changes) or the CCA message.

The SRC software provides usage threshold levels to the Services Control Gateway during session establishment (CCA or RAR message). This is done, by setting a usage monitoring threshold in the grouped Granted-Service-Unit AVP per Monitoring-Key in the Usage-Monitoring-Information AVP. The threshold level may be defined for:

- Total volume only (CC-Total-Octets AVP within Granted-Service-Unit hold threshold for total volume)
- Uplink volume only (CC-Input-Octets AVP within Granted-Service-Unit hold threshold for uplink volume)
- Downlink volume only (CC-Output-Octets AVP within Granted-Service-Unit hold threshold for downlink volume)
- Both uplink and downlink volume (CC-Input-Octets and CC-Output-Octets AVPs within Granted-Service-Unit)

The Services Control Gateway sends the accounting updates by setting the usage counters in the Used-Service-Unit AVP within the Usage-Monitoring-Information AVP. Like the Granted-Service-Unit AVP (for setting the threshold), the Used-Service-Unit AVP is a grouped AVP and the Services Control Gateway uses the CC-Total-Octet, CC-Input-Octets, and CC-Output-Octets AVP within the Used-Service-Unit AVP to report the service usage to the SRC software. The Services Control Gateway sends the accounting updates only in CCR-U or CCR-T message (not in RAA message).

The Services Control Gateway reports the used service units when any of the following conditions are met:

- Usage threshold is reached.
- Service is deactivated (the PCC or ePCC rule, for which service accounting is enabled, is removed).
- Service accounting is explicitly disabled by the SRC software for a specific PCC or ePCC rule.

- IP-CAN session is terminated (either by the SRC software through the RAR message, or initiated by the Services Control Gateway).
- SRC software requested the Services Control Gateway to share the accounting update.



**NOTE:** The SRC software does not support interim accounting interval configuration for the Gx router driver.

## SAE Plug-In Attributes

When the Gx router driver is used to manage the Services Control Gateway, the SAE publishes the event-trigger information (such as APPLICATION\_START, APPLICATION\_STOP, and USAGE\_REPORT) to the plug-ins on receiving a CCR-U message from the Services Control Gateway.

The SAE publishes the usage monitoring information to the plug-ins on receiving the CCR-T message from the Services Control Gateway. [Table 4 on page 7](#) lists the plug-in attributes used by the SAE to publish event-trigger and usage monitoring information.

**Table 4: Plug-In Attributes Used by SAE to Publish Event-Trigger and Usage Monitoring Information**

Plug-in Attributes	Description	Supported Plug-in Type
PA_RATING_GROUP	Rating group identifier. Services of same rating type are managed through the same rating group.	<ul style="list-style-type: none"> <li>• Service Authorization Plug-in</li> <li>• Service Tracking Plug-in</li> </ul>
PA_SERVICE_IDENTIFIER	Service identifier or service configuration.	<ul style="list-style-type: none"> <li>• Service Authorization Plug-in</li> <li>• Service Tracking Plug-in</li> </ul>
PA_EVENT_TRIGGER	Event type (such as APPLICATION_START and APPLICATION_STOP).	User Tracking Plug-in
PA_TDF_APP_ID	Identifier representing an application in which Application Detection and Control (ADC) rule is applied.	User Tracking Plug-in
PA_TDF_APP_INSTANCE_ID	Application instance identifier dynamically assigned by the Services Control Gateway.	User Tracking Plug-in
PA_TOTAL_OCTETS	Total bandwidth (uplink and downlink) consumed by the subscriber.	<ul style="list-style-type: none"> <li>• User Tracking Plug-in</li> <li>• Service Tracking Plug-in</li> </ul>

### Related Documentation

- [Connections to Managed Devices on page 8](#)
- [Managing MX Series Routers Acting as a PCEF Using the SRC Software Overview on page 11](#)
- [Mapping Between SRC Software, Junos OS, and PCC or ePCC Concepts on page 12](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)

- [Configuring the SAE to Manage Routers Acting as a PCEF and Running Junos OS \(SRC CLI\) on page 31](#)
- [Gx Router Driver Supported 3GPP AVPs Definition on page 17](#)

## Connections to Managed Devices

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This topic describes the connections between the SAE and Juniper Networks routers and CMTS devices.

### COPS Connection Between JunosE Routers and the SAE

The SAE and JunosE routers communicate using the Common Open Policy Service (COPS) protocol. The SAE supports two versions of COPS:

- COPS usage for policy provisioning (COPS-PR)
- COPS External Data Representation Standard (XDR) mode

The version of COPS that you use depends on the version of COPS that your JunosE router supports. When you set up your JunosE router to work with the SAE, you enable either COPS-PR mode or COPS XDR mode. There are no configuration differences on the SAE between COPS-PR and COPS XDR.

The following SRC features require the use of COPS-PR:

- Policy sharing on JunosE routers
- Multiple classify traffic conditions in policy lists

### BEEP Connection Between Devices Running Junos OS and the SAE

The SAE interacts with a Junos OS process, referred to as the SRC software process, on a device running Junos OS. The SAE and the SRC software process communicate using the Blocks Extensible Exchange Protocol (BEEP).

When a device running Junos OS that the SAE manages goes online, it initiates a BEEP session for the SAE. The SAE gets configuration information from the router, and then it builds and installs the policies that control the router's behavior. If the policies are subsequently modified in the directory, the SAE builds a new configuration and reconfigures the interface on the device running Junos OS.



**NOTE:** The SAE manages interfaces on devices running Junos OS only when the interfaces are configured in the global configuration and the router sends added, changed, or deleted notifications to the SAE. Router administrators should not manually change the configuration of interfaces that the SAE is managing. If you manually change a configuration, you must remove the SAE from the system.

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When there are configuration changes on the router, the router sends a notification to the SAE through the BEEP connection. The notification does not include the content of the configuration changes. When the SAE receives the notification, it uses its Junos XML management protocol client to get the changed configuration from the router.

Interfaces that have been deleted from the router along with their associated objects (sessions, policies) remain on the router until state synchronization occurs.

## COPS Connection Between CMTS Devices and the SAE

The SAE uses the COPS protocol as specified in the PacketCable Multimedia Specification PKT-SP-MM-I03-051221 to manage *PacketCable Multimedia Specification* (PCMM)-compliant CMTS devices in a cable network environment. The SAE connects to the CMTS device by using a COPS over Transmission Control Protocol (TCP) connection.

In cable environments, the SAE manages the connection to the CMTS device. The CMTS device does not provide address requests or notify the SAE of new subscribers, subscriber IP addresses, or any other attributes. IP address detection and all other subscriber attributes are collected outside of the COPS connection to the CMTS device. The SAE uses COPS only to push policies to the CMTS device and to learn about the CMTS status and usage data.

Because the CMTS device does not have the concept of interfaces, the SRC module uses pseudointerfaces to model CMTS subscriber connections similar to subscriber connections for devices running Junos OS and JunosE routers.

## Diameter Connection Between Junos OS Routers and the SAE

The Diameter base protocol provides basic services to several applications (also called functions) each running in a different Diameter instance. Each individual application provides the extended authentication, authorization, and accounting (AAA) functionality. The supported applications that use the Diameter protocol are Juniper Networks Session Resource Control (JSRC) and Gx (Services Control Gateway).

The SRC software uses the Diameter protocol for communication between the local SRC peer on a Juniper Networks routing platform, such as the Juniper Networks MX Series Ethernet Services Router, and the SAE. The details of Diameter application and the application ID are:

- JSRC—A Juniper Networks Diameter application registered with the Internet Assigned Numbers Authority (IANA) as Juniper Policy-Control-JSRC, with an ID of 16777244. The JSRC application communicates with the SAE (remote SRC peer).
- Gx-SCG—An application that extends the 3GPP Gx interface and communicates with the SRC software acting as a PCRF for this interface. The 3GPP Gx is registered with the IANA. The application ID of the 3GPP Gx is 16777238.

- Related Documentation**
- *PCMM Environment Overview*
  - *Configuring the SAE to Manage Devices Running Junos OS (SRC CLI)*

- *Adding JunosE Routers and Virtual Routers (SRC CLI)*



## CHAPTER 2

# Gx Router Driver Overview

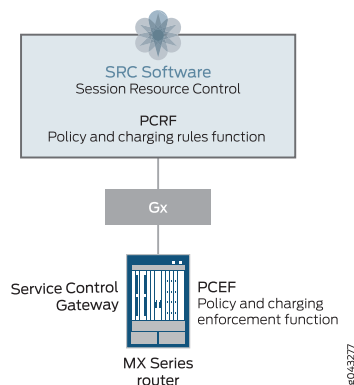
- [Managing MX Series Routers Acting as a PCEF Using the SRC Software Overview on page 11](#)
- [Mapping Between SRC Software, Junos OS, and PCC or ePCC Concepts on page 12](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)

## Managing MX Series Routers Acting as a PCEF Using the SRC Software Overview

The SRC software acting as a PCRF uses the Gx router driver to establish a southbound Gx interface between the SRC software and the MX Series router (that is, Services Control Gateway) acting as a PCEF. The SRC software provisions static PCC rules, dynamic PCC rules, or dynamic ePCC rules to the Services Control Gateway over the Gx interface using the Diameter attribute-value pairs (AVPs). The SRC software can also send a Diameter message over the Gx interface to the Services Control Gateway to activate the rules predefined on the Services Control Gateway. The Services Control Gateway enforces policy decisions specified by the rules and also provides usage monitoring information and subscriber information to the SRC software. The SRC software uses the Diameter protocol for communication between the SRC software and the Services Control Gateway.

[Figure 1 on page 11](#) represents the interface between the SRC software and the Services Control Gateway.

*Figure 1: Interface Between the SRC software and the Services Control Gateway*



- Related Documentation**
- [SAE Support for Gx Router Driver on page 3](#)
  - [Adding the Routers Acting as a PCEF and Running Junos OS \(SRC CLI\) on page 29](#)
  - [Configuring Service-Level 3GPP Attributes for Gx Router Driver \(SRC CLI\) on page 59](#)
  - [Configuring Subscriber-Level 3GPP Attributes for Gx Router Driver \(SRC CLI\) on page 62](#)
  - [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)

## Mapping Between SRC Software, Junos OS, and PCC or ePCC Concepts

This section describes the mapping between the SRC software, Junos OS, and PCC or ePCC concepts. [Table 5 on page 12](#) lists the mapping between SRC software and Junos OS terminology and the PCC or ePCC function terminology.

*Table 5: SRC Software and Junos OS Terminology Versus PCC or ePCC Terminology*

SRC Software and Junos OS Terminology	PCC or ePCC Terminology
Subscriber session	IP CAN Session
Service associated with service policies	PCC Rule
Service associated with application policies	ePCC Rule
Service activation	Rule-Install
Service deactivation	Rule-Remove
Service accounting	Usage-Monitoring
Subscriber Session Termination	Subscriber Session Detach
Policies, defined by the SRC software	Dynamic Rule

### Charging Rule Installation (Service Activation)

SRC software can activate any number of predefined PCC or ePCC rules in the same CCA-I or RAR message by providing a Charging-Rule-Install AVP. The Charging-Rule-Install AVP is sent for each service session to be activated. The Charging-Rule-Install AVP can contain multiple Charging-Rule-Name AVPs, one for each static PCC rule or contain multiple Charging-Rule-Definition AVPs, one for each dynamic PCC rule or ePCC rule.



**NOTE:** The names appearing in the Charging-Rule-Name AVPs must be unique across all policies for a particular subscriber session.

The Services Control Gateway expects to receive the following Charging-Rule-Install AVP from the SRC software in CCA and RAR messages:

```
Charging-Rule-Install ::= < AVP Header: 1001 >
  * [ Charging-Rule-Definition ] <grouped>
  * [ Charging-Rule-Name ] 1005
  * [ Charging-Rule-Base-Name ] 1004
```

```
Charging-Rule-Definition ::= < AVP Header: 1003 >
  { Charging-Rule-Name } 1005
  [ Service-Identifier ] 439
  [ Rating-Group ] 432
  * [ Flow-Information ] <grouped>
  [ TDF-Application-Identifier ] 1088
  [ TDF-Application-Id-Base ] 1100
  [ Flow-Status ] 511
  [ QoS-Information ] <grouped>
  [ Reporting-Level ] 1011
  [ Online ] 1009
  [ Precedence ] 1010
  [ Monitoring-Key ] 1066
  [ Steering-Information ] <grouped>
  [ Redirect-Information ] <grouped>
  [ Mute-Notification ] 2809
  [ Forwarding-Class-Name ] 1104
  [ LRF-Profile-Name ] 1102
  [ HCM-Profile-Name ] 1103
```

```
Flow-Information ::= < AVP Header: 1058 >
  [ Flow-Description ] 507
  [ ToS-Traffic-Class ] 1014
  [ Security-Parameter-Index ] 1056
  [ Flow-Label ] 1057
  [ Flow-Direction ] 1080
```

```
QoS-Information ::= < AVP Header: 1016 >
  [ Max-Requested-Bandwidth-UL ] 516
  [ Max-Requested-Bandwidth-DL ] 515
```

```
Steering-Information ::= < AVP Header: 1108 >
  [ Service-Chain-Identifier ] 1101
  [ Steering-Uplink-VRF ] 1109
  [ Steering-Downlink-VRF ] 1110
  [ Steering-IP-Address ] 1111
  [ Keep-Existing-Steering ] 1112
```

```
Redirect-Information ::= < AVP Header: 1085 >
  [ Redirect-Support ] 1086
```

```
[ Redirect-Address-Type ] 433  
[ Redirect-Server-Address ] 435
```

## Charging Rule Removal (Service Deactivation)

The SRC software sends a Charging-Rule-Remove AVP for each PCC or ePCC rule in the same CCA-U or RAR message while deactivating a service.

The following AVPs are expected by the router from the SRC software in CCA-U and RAR messages:

```
Charging-Rule-Remove ::= <AVP Header: 1022>  
  [ Charging-Rule-Name ] 1005  
  [ Charging-Rule-Base-Name ] 1004
```

## Charging Rule Report

The router can send charging rule reports for any number of services in the same CCR-U request or RAA message. This is achieved by providing a Charging-Rule-Report AVP for each failed rule. The Charging-Rule-Report AVP contains a single Charging-Rule-Name AVP.

```
Charging-Rule-Report ::= < AVP Header: 1018 >  
  * [ Charging-Rule-Name ]  
  * [ Charging-Rule-Base-Name ]  
  [ PCC-Rule-Status ]  
  [ Rule-Failure-Code ]
```

### Related Documentation

- [SAE Support for Gx Router Driver on page 3](#)
- [Managing MX Series Routers Acting as a PCEF Using the SRC Software Overview on page 11](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)
- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)

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## Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF

The SRC software acting as PCRF uses the Gx router driver to establish a southbound Gx interface between the SRC software and the MX Series router (that is, Services Control Gateway) acting as PCEF.

The Gx router driver has the following responsibilities:

- Manage subscriber sessions signaled by the Services Control Gateway.
- Activate or deactivate services as specified by the SAE.
- Log out subscribers as specified by the SAE.
- Update the SAE with status of new service activations and deactivations.
- Notify the SAE when subscribers log out.

The Gx router driver responds to requests from the Services Control Gateway, which signals subscribers logging in and logging out. The driver publishes interface tracking events, performs interface classification to determine any default policies, and initiates SAE subscriber session login and logout processing.

The SRC software provisions static PCC rules, dynamic PCC rules, and dynamic ePCC rules to the Services Control Gateway through the Gx router driver using the PULL or PUSH procedure based on subscriber profile configuration. The PCC and ePCC rules provide the policy control and applicable charging information for a service data flow.

In PUSH procedure (unsolicited provisioning of the rules), the SRC software provisions the rules in the RAR message to the Services Control Gateway without receiving any request from the Services Control Gateway.

In PULL procedure (solicited provisioning of the rules), the SRC software provisions the rules in the CCA message to the Services Control Gateway on receiving a request from the Services Control Gateway.

**Related  
Documentation**

- [SAE Support for Gx Router Driver on page 3](#)
- [Managing MX Series Routers Acting as a PCEF Using the SRC Software Overview on page 11](#)
- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Configuration Statements for Policies Used for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 65](#)



## CHAPTER 3

# Gx Router Driver Supported 3GPP AVPs

- [Gx Router Driver Supported 3GPP AVPs Definition on page 17](#)
- [3GPP AVPs Supported for Gx Router Driver in Request and Response Messages on page 23](#)

## Gx Router Driver Supported 3GPP AVPs Definition

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The Gx router driver of the SRC software supports specific 3GPP attributes or AVPs for managing the Services Control Gateway.

[Table 6 on page 17](#) describes the 3GPP AVPs supported by the Gx router driver.

**Table 6: Gx Router Driver Supported AVPs Definitions**

AVP	AVP Code	Type	Description
Session-Id	263	UTF8String	Session identifier generated by the Services Control Gateway.
User-Name	1	UTF8String	Username provided by the Services Control Gateway.
Framed-IP-Address	8	OctetString	IPv4 address allocated to the user.
Framed-IPv6-Prefix	97	OctetString	IPv6 address allocated to the user.
Auth-Application-Id	258	Unsigned32	Application identifier provided by the Services Control Gateway.
Origin-Host	264	DiameterIdentity	Host that originated the Diameter message.
Origin-Realm	296	DiameterIdentity	Realm of the host that originated the Diameter message.
Result-Code	268	Unsigned32	Indicates whether the request is completed successfully or an error have occurred.

Table 6: Gx Router Driver Supported AVPs Definitions (continued)

AVP	AVP Code	Type	Description
CC-Request-Type	416	Enumerated	Reason for sending the request message. <ul style="list-style-type: none"> <li>1—INITIAL_REQUEST</li> <li>2—UPDATE_REQUEST</li> <li>3—TERMINATION_REQUEST</li> </ul>
CC-Request-Number	415	Unsigned32	Number for the request message.
*Event-Trigger	1006	Enumerated	When sent from Services Control Gateway to SRC software, indicates that the mentioned event has occurred at the Services Control Gateway.  When sent from SRC software to Services Control Gateway, indicates the event triggers to which the SRC software is subscribed. <ul style="list-style-type: none"> <li>14—NO_EVENT_TRIGGER</li> <li>39—APPLICATION_START</li> <li>40—APPLICATION_STOP</li> <li>33—USAGE_REPORT</li> </ul>
Origin-State-Id	278	Unsigned32	Indicates the startup time of Diameter entity or a monotonically increasing value that is advanced when the Diameter entity restarts with previous state lost.  <b>NOTE:</b> The SRC software does not generate any origin state ID but maintains the origin state ID of the Services Control Gateway.
*Failed-AVP	279	Grouped	Denotes the erroneous AVPs.
Destination-Realm	283	DiameterIdentity	Realm of the host to which the message is to be routed.
Destination-Host	293	DiameterIdentity	Host to which the message is to be routed.
Re-Auth-Request-Type	285	Enumerated	Indicates the action to be taken by the equipment after the expiry of authorization lifetime. <ul style="list-style-type: none"> <li>0—AUTHORIZE_ONLY</li> </ul>
Session-Release-Cause	1045	Enumerated	Indicates why the IP-CAN session is released by the SRC software. <ul style="list-style-type: none"> <li>0—UNSPECIFIED_REASON</li> <li>1—UE_SUBSCRIPTION_REASON</li> </ul>
*Subscription-Id	443	Grouped	



Table 6: Gx Router Driver Supported AVPs Definitions (continued)

AVP	AVP Code	Type	Description
Subscription-Id-Type	450	Enumerated	Subscription ID type. <ul style="list-style-type: none"> <li>0—END_USER_E164</li> <li>1—END_USER_IMSI</li> </ul>
Subscription-Id-Data	444	UTF8String	Identity of end user.
<b>*Charging-Rule-Install</b>	<b>1001</b>	<b>Grouped</b>	
*Charging-Rule-Name	1005	OctetString	Name for a PCC or ePCC rule. For PCC or ePCC rules provided by the SRC software, uniquely identifies a PCC or ePCC rule within one IP CAN session. For PCC or ePCC rules predefined at the Services Control Gateway, uniquely identifies a PCC or ePCC rule within the IP CAN session.
*Charging-Rule-Base-Name	1004	UTF8String	Name of a predefined group of PCC or ePCC rules residing at the Services Control Gateway.
<b>*Charging-Rule-Definition</b>	<b>1003</b>	<b>Grouped</b>	
Charging-Rule-Name	1005	OctetString	Name for a PCC or ePCC rule. For PCC or ePCC rules provided by the SRC software, uniquely identifies a PCC or ePCC rule within one IP CAN session. For PCC or ePCC rules predefined at the Services Control Gateway, uniquely identifies a PCC or ePCC rule within the IP CAN session.
Service-Identifier	439	Unsigned32	Identifier of the service.
Rating-Group	432	Unsigned32	Identifier of a rating group. All the services subject to the same rating type are part of the same rating group.
TDF-Application-Identifier	1088	OctetString	Identifier represents an application for which ADC rule is applied.
TDF-Application-Id-Base	1100	OctetString	Group name for a group of Application IDs.
Flow-Status	511	Enumerated	Status of the traffic flow. <ul style="list-style-type: none"> <li>0—ENABLED-UPLINK</li> <li>1—ENABLED-DOWNLINK</li> <li>2—ENABLED</li> <li>3—DISABLED</li> <li>4—REMOVED</li> </ul>

Table 6: Gx Router Driver Supported AVPs Definitions (continued)

AVP	AVP Code	Type	Description
Reporting-Level	1011	Enumerated	Level at which the TDF reports the usage for the related PCC rule. <ul style="list-style-type: none"> <li>0—SERVICE_IDENTIFIER_LEVEL</li> <li>1—RATING_GROUP_LEVEL</li> <li>2—SPONSORED_CONNECTIVITY_LEVEL</li> </ul>
Online	1009	Enumerated	Defines whether the online charging interface provided by the TDF can be used for the associated PCC rule. <ul style="list-style-type: none"> <li>0—DISABLE_ONLINE</li> <li>1—ENABLE_ONLINE</li> </ul>
Precedence	1010	Unsigned32	Order in which the service data flow templates are applied at service data flow detection at the TDF. A PCC rule with lower precedence value is applied before a PCC rule with higher precedence value. The precedence value is unique for an IP CAN session.
Monitoring-Key	1066	OctetString	Identifier to a usage monitoring control instance.
Mute-Notification	2809	Enumerated	Defines whether the notification about the application start or stop is sent to the SRC software or not. <ul style="list-style-type: none"> <li>0—MUTE_REQUIRED</li> </ul>
Forwarding-Class-Name	1104	OctetString	Name of the forwarding class on the Services Control Gateway.
LRF-Profile-Name	1102	OctetString	Name of the LRF profile.
HCM-Profile-Name	1103	OctetString	Name of the HCM profile.
<b>*Flow-Information</b>	<b>1058</b>	<b>Grouped</b>	
Flow-Description	507	IPFilterRule	Defines a packet filter for an IP flow.
ToS-Traffic-Class	1014	OctetString	Defines the IPv4 ToS and ToS mask or IPv6 traffic class and traffic class mask.
Security-Parameter-Index	1056	OctetString	Security parameter index of the IPSec packet.
Flow-Label	1057	OctetString	IPv6 flow label header.

Table 6: Gx Router Driver Supported AVPs Definitions (continued)

AVP	AVP Code	Type	Description
Flow-Direction	1080	Enumerated	Direction for which the filter is applicable. <ul style="list-style-type: none"> <li>0—UNSPECIFIED</li> <li>1—DOWNLINK</li> <li>2—UPLINK</li> <li>3—BIDIRECTIONAL</li> </ul>
<b>QoS-Information</b>	<b>1016</b>	<b>Grouped</b>	
Max-Requested-Bandwidth-UL	516	Unsigned32	Maximum bit rate allowed for the uplink.
Max-Requested-Bandwidth-DL	515	Unsigned32	Maximum bit rate allowed for the downlink.
<b>Steering-Information</b>	<b>1108</b>	<b>Grouped</b>	
Service-Chain-Identifier	1101	octet-string	Identifier of the service chain.
Steering-Uplink-VRF	1109	octet-string	VRF information about the steering uplink.
Steering-Downlink-VRF	1110	octet-string	VRF information about the steering downlink.
Steering-IP-Address	1111	Address	IP address of the steering interface.
Keep-Existing-Steering	1112	Enumerated	Indicates whether to keep the steering information or not. <ul style="list-style-type: none"> <li>0—Keep-Existing-Steering Disabled</li> <li>1—Keep-Existing-Steering Enabled</li> </ul>
<b>Redirect-Information</b>	<b>1085</b>	<b>Grouped</b>	
Redirect-Support	1086	Enumerated	Indicates whether the redirection support is enabled or not. <ul style="list-style-type: none"> <li>0—REDIRECTION_DISABLED</li> <li>1—REDIRECTION_ENABLED</li> </ul>
Redirect-Address-Type	433	Enumerated	Type of address. <ul style="list-style-type: none"> <li>0—IPv4 address</li> <li>1—IPv6 address</li> <li>2—URL</li> <li>3—SIP Uniform Resource Identifier (URI)</li> </ul>
Redirect-Server-Address	435	UTF8String	Address of the redirect server with which the end user should be connected when the account cannot cover the service cost.
<b>Charging-Information</b>	<b>618</b>	<b>Grouped</b>	
Primary-Event-Charging-Function-Name	619	DiameterURI	Address of the primary online charging system.

Table 6: Gx Router Driver Supported AVPs Definitions (continued)

AVP	AVP Code	Type	Description
Secondary-Event-Charging-Function-Name	620	DiameterURI	Address of the secondary online charging system.
Primary-Charging-Collection-Function-Name	621	DiameterURI	Address of the primary offline charging system.
Secondary-Charging-Collection-Function-Name	622	DiameterURI	Address of the secondary offline charging system.
<b>*Usage-Monitoring-Information</b>	<b>1067</b>	<b>Grouped</b>	
Monitoring-Key	1066	Octetstring	Identifier of the usage monitoring control instance.
Usage-Monitoring-Level	1068	Enumerated	Indicates whether the usage monitoring instance is applicable for IP-CAN session, PCC rules, or ADC rules. <ul style="list-style-type: none"> <li>1—PCC_RULE_LEVEL</li> </ul>
Usage-Monitoring-Report	1069	Enumerated	Indicates that the Services Control Gateway should report accumulated usage to the SRC software. <ul style="list-style-type: none"> <li>0—USAGE_MONITORING_REPORT_REQUIRED</li> </ul>
Usage-Monitoring-Support	1070	Enumerated	Indicates that the usage monitoring is disabled. <ul style="list-style-type: none"> <li>0—USAGE_MONITORING_DISABLED</li> </ul>
<b>Granted-Service-Unit</b>	<b>431</b>	<b>Grouped</b>	
CC-Total-Octets	421	Unsigned64	Total number of requested, granted, or used octets regardless of the direction.
CC-Input-Octets	412	Unsigned64	Number of requested, granted, or used octets received from the user equipment.
CC-Output-Octets	414	Unsigned64	Number of requested, granted, or used octets sent to the user equipment.
<b>*Charging-Rule-Remove</b>	<b>1022</b>	<b>Grouped</b>	
Charging-Rule-Name	1005	OctetString	Name for a PCC or ePCC rule. For PCC or ePCC rules provided by the SRC software, uniquely identifies a PCC or ePCC rule within one IP CAN session. For PCC or ePCC rules predefined at the Services Control Gateway, uniquely identifies a PCC or ePCC rule within the IP CAN session.
Charging-Rule-Base-Name	1004	UTF8String	Name of a predefined group of PCC or ePCC rules residing at the Services Control Gateway.

**Related Documentation** • [SAE Support for Gx Router Driver on page 3](#)

- [Managing MX Series Routers Acting as a PCEF Using the SRC Software Overview on page 11](#)
- [Mapping Between SRC Software, Junos OS, and PCC or ePCC Concepts on page 12](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)
- [3GPP AVPs Supported for Gx Router Driver in Request and Response Messages on page 23](#)

## 3GPP AVPs Supported for Gx Router Driver in Request and Response Messages

Table 7 on page 23 lists the 3GPP attributes supported in CCR, CCA, RAR, and RAA messages handled by the SRC Gx router driver.

*Table 7: 3GPP Attributes Supported in Messages Handled by Gx Router Driver*

AVP	CCR-I	CCA-I	CCR-U	CCA-U	CCR-T	CCA-T	RAR	RAA
Session-Id	✓	✓	✓	✓	✓	✓	✓	✓
Subscription-Id	✓	–	–	–	–	–	–	–
User-Name	✓	–	–	–	–	–	–	–
Framed-IP-Address	✓	–	–	–	–	–	–	–
Framed-IPv6-Prefix	✓	–	–	–	–	–	–	–
Auth-Application-Id	✓	✓	✓	✓	✓	✓	✓	✓
Origin-Host	✓	✓	✓	✓	✓	✓	✓	✓
Origin-Realm	✓	✓	✓	✓	✓	✓	✓	✓
Result-Code	–	✓	–	✓	–	✓	–	✓
CC-Request-Type	✓	✓	✓	✓	✓	✓	–	–
CC-Request-Number	✓	✓	✓	✓	✓	✓	–	–
Event-Trigger	–	✓	✓	–	–	–	✓	–
Origin-State-Id	✓	–	✓	–	✓	–	–	–
Failed-AVP	–	✓	–	✓	–	✓	–	✓
Destination-Realm	✓	–	✓	–	✓	–	✓	–
Destination-Host	✓	–	✓	–	✓	–	✓	–

Table 7: 3GPP Attributes Supported in Messages Handled by Gx Router Driver (continued)

AVP	CCR-I	CCA-I	CCR-U	CCA-U	CCR-T	CCA-T	RAR	RAA
Re-Auth-Request-Type	-	-	-	-	-	-	✓	-
Session-Release-Cause	-	-	-	-	-	-	✓	-
Charging-Rule-Name	-	✓	✓	✓	-	-	✓	✓
Charging-Rule-Base-Name	-	✓	✓	✓	-	-	✓	✓
Service-Identifier	-	✓	-	-	-	-	✓	-
Rating-Group	-	✓	-	-	-	-	✓	-
TDF-Application-Identifier	-	✓	✓	-	-	-	✓	-
TDF-Application-Id-Base	-	✓	✓	-	-	-	✓	-
Flow-Status	-	✓	-	-	-	-	✓	-
Reporting-Level	-	✓	-	-	-	-	✓	-
Online	-	✓	-	-	-	-	✓	-
Precedence	-	✓	-	-	-	-	✓	-
Monitoring-Key	-	✓	✓	-	✓	-	✓	-
Mute-Notification	-	✓	-	-	-	-	✓	-
Forwarding-Class-Name	-	✓	-	-	-	-	✓	-
LRF-Profile-Name	-	✓	-	-	-	-	✓	-
HCM-Profile-Name	-	✓	-	-	-	-	✓	-
Flow-Description	-	✓	✓	-	-	-	✓	-
ToS-Traffic-Class	-	✓	-	-	-	-	✓	-
Security-Parameter-Index	-	✓	-	-	-	-	✓	-
Flow-Label	-	✓	-	-	-	-	✓	-
Flow-Direction	-	✓	✓	-	-	-	✓	-
Max-Requested-Bandwidth-UL	-	✓	-	-	-	-	✓	-
Max-Requested-Bandwidth-DL	-	✓	-	-	-	-	✓	-

Table 7: 3GPP Attributes Supported in Messages Handled by Gx Router Driver (continued)

AVP	CCR-I	CCA-I	CCR-U	CCA-U	CCR-T	CCA-T	RAR	RAA
Service-Chain-Identifier	-	✓	-	-	-	-	✓	-
Steering-Uplink-VRF	-	✓	-	-	-	-	✓	-
Steering-Downlink-VRF	-	✓	-	-	-	-	✓	-
Steering-IP-Address	-	✓	-	-	-	-	✓	-
Keep-Existing-Steering	-	✓	-	-	-	-	✓	-
Redirect-Support	-	✓	-	-	-	-	✓	-
Redirect-Address-Type	-	✓	-	-	-	-	✓	-
Redirect-Server-Address	-	✓	-	-	-	-	✓	-
Primary-Event-Charging-Function-Name	-	✓	-	-	-	-	✓	-
Secondary-Event-Charging-Function-Name	-	✓	-	-	-	-	✓	-
Primary-Charging-Collection-Function-Name	-	✓	-	-	-	-	✓	-
Secondary-Charging-Collection-Function-Name	-	✓	-	-	-	-	✓	-
Usage-Monitoring-Level	-	✓	-	-	-	-	✓	-
Usage-Monitoring-Report	-	-	-	-	-	-	✓	-
Usage-Monitoring-Support	-	-	-	-	-	-	✓	-
CC-Total-Octets	-	✓	✓	-	✓	-	✓	-
CC-Input-Octets	-	✓	✓	-	✓	-	✓	-
CC-Output-Octets	-	✓	✓	-	✓	-	✓	-

**Related Documentation**

- [SAE Support for Gx Router Driver on page 3](#)
- [Managing MX Series Routers Acting as a PCEF Using the SRC Software Overview on page 11](#)
- [Mapping Between SRC Software, Junos OS, and PCC or ePCC Concepts on page 12](#)

- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)
- [Gx Router Driver Supported 3GPP AVPs Definition on page 17](#)



## PART 2

# Configuration

- [Configuration Tasks for the SAE on page 29](#)
- [Configuration Tasks for Services Control Gateway Policies on page 37](#)
- [Configuration Tasks for PCC or ePCC Rules on page 43](#)
- [Configuration Tasks for Gx Router Driver 3GPP Attributes on page 59](#)
- [Configuration Statements and Commands on page 65](#)



## CHAPTER 4

# Configuration Tasks for the SAE

- Adding the Routers Acting as a PCEF and Running Junos OS (SRC CLI) on page 29
- Configuring the SAE to Manage Routers Acting as a PCEF and Running Junos OS (SRC CLI) on page 31
- Specifying Initialization Scripts for the Gx Router Driver (SRC CLI) on page 34

### Adding the Routers Acting as a PCEF and Running Junos OS (SRC CLI)

Use the following configuration statements to add and configure the router (Services Control Gateway) running Junos OS and acting as a PCEF:

```
shared network device name {
  device-type (junose | junos-ise | junos | pcmm | thirdparty | junos-gx);
  peers [peers...];
}
shared network device name virtual-router name {
  sae-connection [sae-connection...];
}
shared network device name charging-server-info {
  primary-event-charging-function primary-event-charging-function;
  sec-event-charging-function sec-event-charging-function;
  primary-charging-collection-function primary-charging-collection-function;
  sec-charging-collection-function sec-charging-collection-function;
}
```

To configure the router (Services Control Gateway) acting as a PCEF:

1. From configuration mode, access the configuration statements that configure network devices. You must specify the name of a device with lowercase characters. This procedure uses `gx.englab.juniper.net` as the name of the router.

```
[edit]
user@host# edit shared network device gx.englab.juniper.net
```

2. Set the type of device to `junos-gx`.

```
[edit shared network device gx.englab.juniper.net]
user@host# set device-type junos-gx
```

- Specify the configured peers associated with the device. See *Configuring Diameter Peers (SRC CLI)*.

```
[edit shared network device gx.englab.juniper.net]
user@host# set peers [peers...]
```

- From configuration mode, access the configuration statements for virtual routers. You must specify the name of a device with lowercase characters.

```
[edit]
user@host# edit shared network device gx.englab.juniper.net virtual-router *
```



**NOTE:** For the Gx router driver, you can create only one virtual router with the name set to wildcard '\*'.

- Specify the SAEs that can manage this router.

```
[edit shared network device gx.englab.juniper.net virtual-router *]
user@host# set sae-connection [sae-connection...]
```

- (Optional) From configuration mode, access the configuration statements that configure charging information for the Services Control Gateway.

```
[edit]
user@host# edit shared network device gx.englab.juniper.net charging-server-info
```

- (Optional) Specify the address of the primary online charging system.

```
[edit shared network device gx.englab.juniper.net charging-server-info]
user@host# set primary-event-charging-function primary-event-charging-function
```

- (Optional) Specify the address of the secondary online charging system.

```
[edit shared network device gx.englab.juniper.net charging-server-info]
user@host# set sec-event-charging-function sec-event-charging-function
```

- (Optional) Specify the address of the primary offline charging system.

```
[edit shared network device gx.englab.juniper.net charging-server-info]
user@host# set primary-charging-collection-function
primary-charging-collection-function
```

- (Optional) Specify the address of the secondary offline charging system.

```
[edit shared network device gx.englab.juniper.net charging-server-info]
user@host# set sec-charging-collection-function sec-charging-collection-function
```

- (Optional) Verify your configuration.

```
[edit shared network device gx.englab.juniper.net]
user@host# show
```

```

device-type junos-gx;
peers [peers...];
virtual-router * {
  sae-connection [sae-connection...];
}

```

#### Related Documentation

- [Configuring the SAE to Manage Routers Acting as a PCEF and Running Junos OS \(SRC CLI\) on page 31](#)
- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Configuring Service-Level 3GPP Attributes for Gx Router Driver \(SRC CLI\) on page 59](#)
- [Configuring Subscriber-Level 3GPP Attributes for Gx Router Driver \(SRC CLI\) on page 62](#)
- [Viewing the State of Gx Router Drivers \(SRC CLI\) on page 69](#)
- [Managing MX Series Routers Acting as a PCEF Using the SRC Software Overview on page 11](#)

## Configuring the SAE to Manage Routers Acting as a PCEF and Running Junos OS (SRC CLI)

To set up the SAE to manage the routers (Services Control Gateways) running Junos OS and acting as a PCEF, configure a Gx router driver that establishes and maintains a connection with the peer.

Use the following configuration statements to configure the SAE to manage the routers (Services Control Gateways) acting as a PCEF:

```

shared sae configuration driver junos-gx {
  sae-community-manager sae-community-manager;
  concurrent-request-timeout concurrent-request-timeout;
  concurrent-requests concurrent-requests ;
  enable-disconnect-ontimeout;
  keep-alive-timeout keep-alive-timeout;
  registry-retry-interval registry-retry-interval;
  reply-timeout reply-timeout;
  sequential-message-timeout sequential-message-timeout;
  thread-pool-size thread-pool-size;
  thread-idle-timeout thread-idle-timeout;
}
shared sae configuration driver junos-gx charging-server-info {
  primary-event-charging-function primary-event-charging-function;
  sec-event-charging-function sec-event-charging-function;
  primary-charging-collection-function primary-charging-collection-function;
  sec-charging-collection-function sec-charging-collection-function;
}

```



**NOTE:** You can configure the charging information under the [edit shared sae group *group-name* configuration driver junos-gx] or [edit shared network device] hierarchy. The settings configured under the [edit shared network device] hierarchy override the settings under the [edit shared sae group *group-name* configuration driver junos-gx] hierarchy.

To configure the SAE to manage the routers (Services Control Gateways) acting as a PCEF:

1. From configuration mode, access the configuration statement that configures the Gx router driver. In this sample procedure, the Gx driver is configured in the POP-ID group.

```
[edit]
user@host# edit shared sae group POP-ID configuration driver junos-gx
```

2. Specify the name of the community manager that manages Gx driver communities. Active SAEs are selected from this community.

```
[edit shared sae group POP-ID configuration driver junos-gx]
user@host# set sae-community-manager sae-community-manager
```

3. (Optional) Specify the keepalive timeout till which the SAE waits for a response from the Diameter server before deleting the registered Diameter server entry.

```
[edit shared sae group POP-ID configuration driver junos-gx]
user@host# set keep-alive-timeout keep-alive-timeout
```

4. (Optional) Specify the interval between retrying a failed registered Diameter server entry.

```
[edit shared sae group POP-ID configuration driver junos-gx]
user@host# set registry-retry-interval registry-retry-interval
```

5. (Optional) Specify the time till which the SAE waits for a response from the Diameter server.

```
[edit shared sae group POP-ID configuration driver junos-gx]
user@host# set reply-timeout reply-timeout
```

6. (Optional) Specify the timeout before an expected message expires.

```
[edit shared sae group POP-ID configuration driver junos-gx]
user@host# set sequential-message-timeout sequential-message-timeout
```

7. (Optional) Configure the session store parameters for the Gx router driver.

From configuration mode, access the configuration statement that configures the session store for the Gx router driver.

```
[edit]
user@host# edit shared sae group POP-ID configuration driver junos-gx session-store
```

For more information about configuring session store parameters, see *Configuring the Session Store Feature (SRC CLI)*.

8. (Optional) Specify the timeout for sending concurrent requests. You can configure a value ranging from 0 through 900 seconds. Default value is 30 seconds.

```
[edit shared sae group POP-ID configuration driver junos-gx]
user@host# set concurrent-request-timeout concurrent-request-timeout
```

9. (Optional) Specify the number of unsolicited requests that can be sent concurrently. You can configure a value ranging from 1 through 500. Default value is 100.

```
[edit shared sae group POP-ID configuration driver junos-gx]
user@host# set concurrent-requests concurrent-requests
```

10. (Optional) Specify whether the user session needs to be removed from the router.

```
[edit shared sae configuration driver junos-gx]
user@host# set enable-disconnect-ontimeout
```

11. (Optional) Specify the timeout till which the SAE waits for the thread to work before declaring the thread as idle and stopping the thread.

```
[edit shared sae group POP-ID configuration driver junos-gx]
user@host# set thread-idle-timeout thread-idle-timeout
```

12. (Optional) Specify the number of working threads that process requests.

```
[edit shared sae group POP-ID configuration driver junos-gx]
user@host# set thread-pool-size thread-pool-size
```

13. (Optional) From configuration mode, access the configuration statements that configure charging information for the Services Control Gateway at group level.

```
[edit]
user@host# edit shared sae group POP-ID configuration driver junos-gx
charging-server-info
```

14. (Optional) Specify the address of the primary online charging system.

```
[edit shared sae group POP-ID configuration driver junos-gx charging-server-info]
user@host# set primary-event-charging-function primary-event-charging-function
```

15. (Optional) Specify the address of the secondary online charging system.

```
[edit shared sae group POP-ID configuration driver junos-gx charging-server-info]
user@host# set sec-event-charging-function sec-event-charging-function
```

16. (Optional) Specify the address of the primary offline charging system.

```
[edit shared sae group POP-ID configuration driver junos-gx charging-server-info]
user@host# set primary-charging-collection-function
primary-charging-collection-function
```

17. (Optional) Specify the address of the secondary offline charging system.

```
[edit shared sae group POP-ID configuration driver junos-gx charging-server-info]
user@host# set sec-charging-collection-function sec-charging-collection-function
```

18. (Optional) Verify your configuration.

```
[edit shared sae group POP-ID configuration driver junos-gx]
user@host# show
charging-server-info {
  primary-charging-collection-function primary-charging-collection-function;
  primary-event-charging-function primary-event-charging-function;
  sec-charging-collection-function sec-charging-collection-function;
  sec-event-charging-function sec-event-charging-function;
}
concurrent-request-timeout concurrent-request-timeout;
concurrent-requests concurrent-requests;
enable-disconnect-ontimeout;
keep-alive-timeout keep-alive-timeout;
registry-retry-interval registry-retry-interval;
reply-timeout reply-timeout;
sequential-message-timeout sequential-message-timeout;
thread-idle-timeout thread-idle-timeout;
thread-pool-size thread-pool-size;
```

#### Related Documentation

- [Adding the Routers Acting as a PCEF and Running Junos OS \(SRC CLI\) on page 29](#)
- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Configuring Service-Level 3GPP Attributes for Gx Router Driver \(SRC CLI\) on page 59](#)
- [Configuring Subscriber-Level 3GPP Attributes for Gx Router Driver \(SRC CLI\) on page 62](#)
- [Viewing the State of Gx Router Drivers \(SRC CLI\) on page 69](#)
- [Managing MX Series Routers Acting as a PCEF Using the SRC Software Overview on page 11](#)

## Specifying Initialization Scripts for the Gx Router Driver (SRC CLI)

Use the following configuration statements to specify initialization scripts for the Gx router driver:

```
shared sae configuration driver scripts {
  extension-path extension-path;
  general general;
  junos-gx junos-gx;
}
```

To configure initialization scripts for the Gx router driver:



1. From configuration mode, access the configuration statements that configure initialization scripts. In this sample procedure, the scripts are configured in the west-region group.

```
user@host# edit shared sae group west-region configuration driver scripts
```

2. Specify initialization scripts for the Gx router driver.

```
[edit shared sae group west-region configuration driver scripts]
user@host# set junos-gx junos-gx
```

SAE runs the specified scripts when the Gx router driver is activated and again when the driver is deactivated.



**NOTE:** For the Gx router driver, the SRC software supports only scripts used for publishing the interoperable object reference.

3. Configure initialization scripts that can be used for all other types of routers supported by the SRC module.

```
[edit shared sae group west-region configuration driver scripts]
user@host# set general general
```

4. Configure a path to initialization scripts that are not in the default location, `/opt/UMC/sae/lib`.

```
[edit shared sae group west-region configuration driver scripts]
user@host# set extension-path extension-path
```

5. (Optional) From operational mode, verify your initialization script configuration.

```
[edit shared sae group west-region configuration driver scripts]
user@host# show
junos-gx iorPublisher;
```

#### Related Documentation

- [Copying Initialization Scripts to the C Series Controller](#)
- [Developing Router Initialization Scripts for Network Devices and Juniper Networks Routers](#)



## CHAPTER 5

# Configuration Tasks for Services Control Gateway Policies

- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Configuring Policy Lists for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 38](#)

## Configuring Policies for Router Running Junos OS and Acting as PCEF (SRC CLI)

The role of the policy list for the Services Control Gateway must be set to **junos-gx**. The policy list must be configured to contain the rule of type **gx-static-pcc-rule** or **gx-dynamic-pcc-rule**.

Before you configure policies for the Services Control Gateway, review the information about configuring and managing policies:

- [Policy Management Overview](#)
- [Policy Information Model](#)
- [Before You Configure SRC Policies](#)
- [Enabling the Policy Configuration on the SRC CLI](#)

To configure policies for Services Control Gateway:

1. Create a policy group.

For information about creating the policy group, see [Configuring Policy Groups \(SRC CLI\)](#).

2. Configure the policy list and set the role of the list to **junos-gx** and the **applicability** option to **both**.

For information about configuring the policy list, see [“Configuring Policy Lists for Routers Running Junos OS and Acting as PCEF \(SRC CLI\)” on page 38](#).

3. Configure the policy rule and set the rule type to **gx-static-pcc-rule** or **gx-dynamic-pcc-rule**.

For information about configuring the policy rule, see “Configuring Static PCC Rules for Routers Running Junos OS and Acting as PCEF (SRC CLI)” on page 43 and “Configuring Dynamic PCC Rules for Routers Running Junos OS and Acting as PCEF (SRC CLI)” on page 46.

4. Configure the additional details for the dynamic PCC rule or dynamic ePCC rule.

For information about configuring additional details for the dynamic rules, see the following topics:

- [Configuring the Dynamic PCC Rules Application Information for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 50](#)
- [Configuring the Dynamic PCC Rules Flow Information for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 51](#)
- [Configuring the Dynamic PCC Rules QoS Information for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 53](#)
- [Configuring the Dynamic PCC Rules Steering Information for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 54](#)
- [Configuring the Dynamic PCC Rules Redirect Information for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 56](#)



**NOTE:** If the ADC parameters (mute notification, redirect information, and TDF information) are configured for the dynamic PCC rule, then the rule is called as dynamic ePCC rule.

#### Related Documentation

- [Configuration Statements for Policies Used for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 65](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)

## Configuring Policy Lists for Routers Running Junos OS and Acting as PCEF (SRC CLI)

Use the following configuration statements to configure policy lists for routers (Services Control Gateways) running Junos OS and acting as PCEF.



**NOTE:** To configure policy lists for router (Services Control Gateway) acting as PCEF, you must:

- Set the role of the policy list to `junos-gx`
- Set the policy list rule type to `gx-static-pcc-rule` or `gx-dynamic-pcc-rule`
- Set the policy list applicability option to `both`

```

policies group name list name {
  role junos-gx;
  applicability both;
  description description;
}

```

To configure policy lists:

1. From configuration mode, create a policy list. For example, to create a policy list called `gx-list` within a policy group called `GXnew`:

```

user@host# edit policies group GXnew list gx-list

```

2. Set the role of the policy list to `junos-gx`.

```

[edit policies group GXnew list gx-list]
user@host# set role junos-gx

```

3. Specify where the policy is applied on the device. The **applicability** option must be set to **both**.

```

[edit policies group GXnew list gx-list]
user@host# set applicability both

```

4. (Optional) Specify the description for the policy list.

```

[edit policies group GXnew list gx-list]
user@host# set description description

```

5. (Optional) Modify the policy substitutions for your Gx policies.

Gx policy attributes allow the value substitutions with parameters.

For information about configuring the substitutions for Gx static and dynamic PCC rules, see *Configuring Substitutions for Gx Static PCC Rules* and *Configuring Substitutions for Gx Dynamic PCC Rules*.

6. (Optional) Verify your configuration.

```

[edit policies group GXnew list]
user@host# show
gx-list {
  applicability both;
  role junos-gx;
  rule dynpcc-rull-name {
    dynamic-pcc-rule {
      LRF-profile-name LRF-profile-name;
      application-information {
        TDF-application-id TDF-application-id;
        TDF-application-id-base TDF-application-id-base;
      }
    }
  }
}

```

```

}
charging-rule-name Testnew;
flow-status ENABLED;
forwarding-class-name forwarding-class-name;
gx-flows {
  flow1 {
    flow-description flow-description;
    flow-direction BIDIRECTIONAL;
    flow-label flow-label;
    security-parameter-index security-parameter-index;
    tos-traffic-class tos-traffic-class;
  }
  flow2 {
    flow-description flow-description;
    flow-direction UPLINK;
    flow-label flow-label;
    security-parameter-index security-parameter-index;
    tos-traffic-class tos-traffic-class;
  }
}
mute-notification;
online;
qos-information {
  max-requested-bw-DL max-requested-bw-DL;
  max-requested-bw-UL max-requested-bw-UL;
}
redirect-information {
  redirect-address-type IPv4-Address;
  redirect-server-address redirect-server-address;
}
reporting-level RATING-GROUP-LEVEL;
steering-information {
  keep-existing-steering STEERING-ENABLED;
  service-chain-identifier service-chain-identifier;
  steering-downlink-VRF steering-downlink-VRF;
  steering-ip-address steering-ip-address;
  steering-uplink-VRF steering-uplink-VRF;
}
precedence precedence;
type gx-dynamic-pcc-rule;
}
rule statpcc-rule-name {
  accounting;
  static-pcc-rule {
    charging-rule-name crname;
  }
  type gx-static-pcc-rule;
}
}

```

#### Related Documentation

- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Configuration Statements for Policies Used for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 65](#)

- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)





## CHAPTER 6

# Configuration Tasks for PCC or ePCC Rules

- [Configuring Static PCC Rules for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 43](#)
- [Configuring Dynamic PCC Rules for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 46](#)
- [Configuring the Dynamic PCC Rules Application Information for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 50](#)
- [Configuring the Dynamic PCC Rules Flow Information for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 51](#)
- [Configuring the Dynamic PCC Rules QoS Information for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 53](#)
- [Configuring the Dynamic PCC Rules Steering Information for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 54](#)
- [Configuring the Dynamic PCC Rules Redirect Information for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 56](#)

## Configuring Static PCC Rules for Routers Running Junos OS and Acting as PCEF (SRC CLI)

---

Use the following configuration statements to configure static PCC rules, which enable the SRC software to provision policies (activated only using name) to the routers (Services Control Gateways) acting as PCEF and running Junos OS through the Gx interface by using the Gx router driver.



**NOTE:** You can create multiple static PCC rules. You can configure the usage monitoring information for the service having static PCC rules even though the SRC software does not support monitoring key association for the static PCC rules.

For creating a static PCC rule, you must:

- Set the role of the policy list to `junos-gx`
- Set the policy list rule type to `gx-static-pcc-rule`
- Set the policy list applicability option to `both`

```

policies group name list name rule name {
  type type;
  precedence precedence;
  accounting;
}
policies group name list name rule name static-pcc-rule {
  charging-rule-name charging-rule-name;
  charging-rule-base-name charging-rule-base-name;
  description description;
)

```



**NOTE:** Precedence mapping is not supported for the static PCC rule.

1. From configuration mode, create a static PCC rule inside a policy list that has already been created and configured. For example, to create a static PCC rule called `statpcc-rul1-name` within a policy list called `gx-list`:

```

[edit]
user@host# edit policies group GXnew list gx-list rule statpcc-rul1-name

```

2. Set the type of policy rule to `gx-static-pcc-rule`.

```

[edit policies group GXnew list gx-list rule statpcc-rul1-name]
user@host# set type gx-static-pcc-rule

```

3. (Optional) Enable the accounting flag so that the SRC software requests the usage monitoring information from the Services Control Gateway.



**NOTE:** If you enable the accounting functionality for a rule in the policy group, the accounting functionality is enabled for all rules in the policy group.

When you enable the accounting functionality, you must configure the USAGE\_REPORT event trigger for the subscriber profiles and configure the granted service unit for the subscribed services.

```
[edit policies group GXnew list gx-list rule statpcc-rul1-name]
user@host# set accounting
```

4. From configuration mode, access the configuration statement that configures the static PCC rule.

```
[edit]
user@host# edit policies group GXnew list gx-list rule statpcc-rul1-name static-pcc-rule
```

5. (Optional) Specify a static PCC rule name.



**NOTE:** You must configure either rule name or rule base name for the static PCC rule. The rule name should be unique for each IP CAN session.

```
[edit policies group GXnew list gx-list rule statpcc-rul1-name static-pcc-rule]
user@host# set charging-rule-name charging-rule-name
```

6. (Optional) Specify a name of a PCC rule group residing at the Services Control Gateway.



**NOTE:** You must configure either rule name or rule base name for the static PCC rule. The rule base name should be unique for each IP CAN session.

```
[edit policies group GXnew list gx-list rule statpcc-rul1-name static-pcc-rule]
user@host# set charging-rule-base-name charging-rule-base-name
```

7. (Optional) Specify a description for the static PCC rule.

```
[edit policies group GXnew list gx-list rule statpcc-rul1-name static-pcc-rule]
user@host# set description description
```

8. (Optional) Verify your configuration.

```
[edit policies group GXnew list gx-list rule statpcc-rule-name]
user@host# show
accounting;
precedence precedence;
static-pcc-rule {
  charging-rule-name crname;
}
type gx-static-pcc-rule;
```

#### Related Documentation

- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Configuration Statements for Policies Used for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 65](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)

## Configuring Dynamic PCC Rules for Routers Running Junos OS and Acting as PCEF (SRC CLI)

Use the following configuration statements to configure dynamic PCC rules, which enable the SRC software to provision dynamic policies to the routers (Services Control Gateways) acting as PCEF and running Junos OS through the Gx interface by using the Gx router driver.



**NOTE:** You can create multiple dynamic PCC rules. For creating a dynamic PCC rule, you must:

- Set the role of the policy list to `junos-gx`
- Set the policy list rule type to `gx-dynamic-pcc-rule`
- Set the policy list applicability option to `both`



**NOTE:** If the mute notification, application information, and redirect information are configured, then the rule is called as ePCC rule.

```
policies group name list name rule name {
  type type;
  precedence precedence;
  accounting;
}
policies group name list name rule name dynamic-pcc-rule {
  charging-rule-name charging-rule-name;
  mute-notification;
  flow-status (ENABLED-UPLINK | ENABLED-DOWNLINK | ENABLED | DISABLED |
  REMOVED);
```

```

forwarding-class-name forwarding-class-name;
LRF-profile-name LRF-profile-name;
HCM-profile-name HCM-profile-name;
online;
reporting-level (SERVICE-IDENTIFIER-LEVEL | RATING-GROUP-LEVEL |
  SPONSORED-CONNECTIVITY-LEVEL);
description description;
}

```

1. From configuration mode, create a dynamic PCC rule inside a policy list that has already been created and configured. For example, to create a dynamic PCC rule called `dynpcc-rul1-name` within a policy list called `gx-list`:

```

[edit]
user@host# edit policies group GXnew list gx-list rule dynpcc-rul1-name

```

2. Set the type of policy rule to `gx-dynamic-pcc-rule`.

```

[edit policies group GXnew list gx-list rule dynpcc-rul1-name]
user@host# set type gx-dynamic-pcc-rule

```

3. (Optional) Specify the order in which the service data flow templates are applied when service data flow is detected at the Services Control Gateway. The value ranges from 1 through 65,535.



**NOTE:** The precedence value should be unique for each IP CAN session.

```

[edit policies group GXnew list gx-list rule dynpcc-rul1-name]
user@host# set precedence precedence

```

4. (Optional) Enable the accounting flag so that the SRC software requests the usage monitoring information from the Services Control Gateway.

```

[edit policies group GXnew list gx-list rule dynpcc-rul1-name]
user@host# set accounting

```

5. From configuration mode, access the configuration statement that configures the dynamic PCC rule.

```

[edit]
user@host# edit policies group GXnew list gx-list rule dynpcc-rul1-name
dynamic-pcc-rule

```

6. Specify a dynamic PCC rule name.



**NOTE:** The rule name should be unique for each IP CAN session.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule]
user@host# set charging-rule-name charging-rule-name
```

7. (Optional) Disable sending the PCEF application start or stop notification to the SRC software.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule]
user@host# set mute-notification
```

By default, the PCEF application start or stop notification is sent to the SRC software.

8. (Optional) Specify the traffic flow status.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule]
user@host# set flow-status (ENABLED-UPLINK | ENABLED-DOWNLINK | ENABLED
| DISABLED | REMOVED)
```

9. (Optional) Specify the name of the forwarding class. This value is transmitted between the Services Control Gateway and SRC software through the Juniper Networks VSA (Forwarding-Class-Name).

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule]
user@host# set forwarding-class-name forwarding-class-name
```

10. (Optional) Specify the name of the LRF profile. This value is transmitted between the Services Control Gateway and SRC software through the Juniper Networks VSA (LRF-Profile-Name).

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule]
user@host# set LRF-profile-name LRF-profile-name
```

11. (Optional) Specify the name of the HCM profile. This value is transmitted between the Services Control Gateway and SRC software through the Juniper Networks VSA (HCM-Profile-Name).

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule]
user@host# set HCM-profile-name HCM-profile-name
```

12. (Optional) Specify whether the online charging interface provided by the Services Control Gateway can be used for the dynamic PCC rule.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule]
user@host# set online
```

By default, the online charging interface configured at the Services Control Gateway is used.

13. (Optional) Specify a level at which the Services Control Gateway should report the usage information.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule]
user@host# set reporting-level (SERVICE-IDENTIFIER-LEVEL | RATING-GROUP-LEVEL
| SPONSORED-CONNECTIVITY-LEVEL)
```

14. (Optional) Specify a description for the dynamic PCC rule.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule]
user@host# set description description
```

15. (Optional) Verify your configuration.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule]
user@host# show
LRF-profile-name LRF-profile-name;
application-information {
  TDF-application-id TDF-application-id;
  TDF-application-id-base TDF-application-id-base;
}
charging-rule-name Testnew;
flow-status ENABLED;
forwarding-class-name forwarding-class-name;
gx-flows {
  flow1 {
    flow-description flow-description;
    flow-direction BIDIRECTIONAL;
    flow-label flow-label;
    security-parameter-index security-parameter-index;
    tos-traffic-class tos-traffic-class;
  }
  flow2 {
    flow-description flow-description;
    flow-direction UPLINK;
    flow-label flow-label;
    security-parameter-index security-parameter-index;
    tos-traffic-class tos-traffic-class;
  }
}
mute-notification;
online;
qos-information {
  max-requested-bw-DL max-requested-bw-DL;
  max-requested-bw-UL max-requested-bw-UL;
}
redirect-information {
  redirect-address-type IPv4-Address;
  redirect-server-address redirect-server-address;
}
reporting-level RATING-GROUP-LEVEL;
steering-information {
```

```

keep-existing-steering STEERING-ENABLED;
service-chain-identifier service-chain-identifier;
steering-downlink-VRF steering-downlink-VRF;
steering-ip-address steering-ip-address;
steering-uplink-VRF steering-uplink-VRF;
}

```

#### Related Documentation

- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Configuration Statements for Policies Used for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 65](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)

## Configuring the Dynamic PCC Rules Application Information for Routers Running Junos OS and Acting as PCEF (SRC CLI)

Use the following configuration statements to configure the application information for the dynamic PCC rules. For more information about creating a dynamic PCC rule, see “Configuring Dynamic PCC Rules for Routers Running Junos OS and Acting as PCEF (SRC CLI)” on page 46.

```

policies group name list name rule name dynamic-pcc-rule application-information {
  TDF-application-id TDF-application-id;
  TDF-application-id-base TDF-application-id-base;
}

```

1. From configuration mode, access the configuration statements that configure application information for the dynamic PCC rules. This procedure uses GXnew as the policy group, gx-list as the policy list, and dynpcc-rul1-name as the dynamic PCC rule.

[edit]

```

user@host# edit policies group GXnew list gx-list rule dynpcc-rul1-name
dynamic-pcc-rule application-information

```

2. (Optional) Specify the ID of the PCEF application for which the ADC rules are applied.

```

[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
application-information]

```

```

user@host# set TDF-application-id TDF-application-id

```



**NOTE:** You must specify the application ID that is supported by the Services Control Gateway.



- (Optional) Specify the name for a group of PCEF applications.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
application-information]
user@host# set TDF-application-id-base TDF-application-id-base
```



**NOTE:** You must specify the application base name that is supported by the Services Control Gateway.

- (Optional) Verify your configuration.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
application-information]
user@host# show
TDF-application-id TDF-application-id;
TDF-application-id-base TDF-application-id-base;
```

#### Related Documentation

- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Configuration Statements for Policies Used for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 65](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)

## Configuring the Dynamic PCC Rules Flow Information for Routers Running Junos OS and Acting as PCEF (SRC CLI)

Use the following configuration statements to configure the flow information for the dynamic PCC rules. For more information about creating a dynamic PCC rule, see “Configuring Dynamic PCC Rules for Routers Running Junos OS and Acting as PCEF (SRC CLI)” on page 46.

```
policies group name list name rule name dynamic-pcc-rule gx-flows name {
  flow-description flow-description;
  tos-traffic-class tos-traffic-class;
  security-parameter security-parameter;
  flow-label flow-label;
  flow-direction flow-direction;
}
```

- From configuration mode, access the configuration statements that configure flow information for the dynamic PCC rules. This procedure uses GXnew as the policy group, gx-list as the policy list, dynpcc-rul1-name as the dynamic PCC rule, and flow1 as the flow information name.

```
[edit]
user@host# edit policies group GXnew list gx-list rule dynpcc-rul1-name
dynamic-pcc-rule gx-flows flow1
```

- (Optional) Specify a packet filter for an IP flow.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule gx-flows
flow1]
user@host# set flow-description flow-description
```

- (Optional) Specify the IPv4 ToS and ToS mask or the IPv6 traffic class and traffic class mask.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule gx-flows
flow1]
user@host# set tos-traffic-class tos-traffic-class
```

- (Optional) Specify the security parameter index of a packet.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule gx-flows
flow1]
user@host# set security-parameter-index security-parameter-index
```

- (Optional) Specify an IPv6 flow label header.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule gx-flows
flow1]
user@host# set flow-label flow-label
```

- (Optional) Specify a direction for which the filter is applicable.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule gx-flows
flow1]
user@host# set flow-direction (UNSPECIFIED | DOWNLINK | UPLINK | BIDIRECTIONAL)
```

- (Optional) Verify your configuration.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
gx-flows]
user@host# show
flow1 {
  flow-description flow-description;
  flow-direction BIDIRECTIONAL;
  flow-label flow-label;
  security-parameter-index security-parameter-index;
  tos-traffic-class tos-traffic-class;
}
flow2 {
```

```

flow-description flow-description;
flow-direction UPLINK;
flow-label flow-label;
security-parameter-index security-parameter-index;
tos-traffic-class tos-traffic-class;
}

```

**Related  
Documentation**

- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Configuration Statements for Policies Used for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 65](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)

## Configuring the Dynamic PCC Rules QoS Information for Routers Running Junos OS and Acting as PCEF (SRC CLI)

Use the following configuration statements to configure the QoS information for the dynamic PCC rules. For more information about creating a dynamic PCC rule, see “Configuring Dynamic PCC Rules for Routers Running Junos OS and Acting as PCEF (SRC CLI)” on page 46.

```

policies group name list name rule name dynamic-pcc-rule qos-information {
  max-requested-bw-UL max-requested-bw-UL;
  max-requested-bw-DL max-requested-bw-DL;
}

```

1. From configuration mode, access the configuration statements that configure QoS information for the dynamic PCC rules. This procedure uses GXnew as the policy group, gx-list as the policy list, and dynpcc-rul1-name as the dynamic PCC rule.

```

[edit]
user@host# edit policies group GXnew list gx-list rule dynpcc-rul1-name
dynamic-pcc-rule qos-information

```

2. (Optional) Specify a maximum bit rate for uplink. The value ranges from 1 through 256,000.

```

[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
qos-information]
user@host# set max-requested-bw-UL max-requested-bw-UL

```

3. (Optional) Specify a maximum bit rate for downlink. The value ranges from 1 through 256,000.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
qos-information]
user@host# set max-requested-bw-DL max-requested-bw-DL
```

- (Optional) Verify your configuration.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
qos-information]
user@host# show
max-requested-bw-DL max-requested-bw-DL;
max-requested-bw-UL max-requested-bw-UL;
```

#### Related Documentation

- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Configuration Statements for Policies Used for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 65](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)

## Configuring the Dynamic PCC Rules Steering Information for Routers Running Junos OS and Acting as PCEF (SRC CLI)

Use the following configuration statements to configure the steering information for the dynamic PCC rules. These steering information are transmitted between the SRC software and Services Control Gateway through the Juniper Networks VSAs. For more information about creating a dynamic PCC rule, see “[Configuring Dynamic PCC Rules for Routers Running Junos OS and Acting as PCEF \(SRC CLI\)](#)” on page 46.

```
policies group name list name rule name dynamic-pcc-rule steering-information {
  service-chain-identifier service-chain-identifier;
  steering-uplink-VRF steering-uplink-VRF;
  steering-downlink-VRF steering-downlink-VRF;
  steering-ip-address steering-ip-address;
  keep-existing-steering (STEERING-ENABLED | STEERING-DISABLED);
}
```

- From configuration mode, access the configuration statements that configure PCEF steering information for the dynamic PCC rules. This procedure uses GXnew as the policy group, gx-list as the policy list, and dynpcc-rul1-name as the dynamic PCC rule.

```
[edit]
user@host# edit policies group GXnew list gx-list rule dynpcc-rul1-name
dynamic-pcc-rule steering-information
```

2. (Optional) Specify the service chain identifier. This value is transmitted between the Services Control Gateway and SRC software through the Juniper Networks VSA (Service-Chain-Identifier).

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
steering-information]
user@host# set service-chain-identifier service-chain-identifier
```

3. (Optional) Specify the VRF information about the steering uplink. This value is transmitted between the Services Control Gateway and SRC software through the Juniper Networks VSA (Steering-Uplink-VRF).

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
steering-information]
user@host# set steering-uplink-VRF steering-uplink-VRF
```

4. (Optional) Specify the VRF information about the steering downlink. This value is transmitted between the Services Control Gateway and SRC software through the Juniper Networks VSA (Steering-Downlink-VRF).

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
steering-information]
user@host# set steering-downlink-VRF steering-downlink-VRF
```

5. (Optional) Specify the IP address. This value is transmitted between the Services Control Gateway and SRC software through the Juniper Networks VSA (Steering-IP-Address).

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
steering-information]
user@host# set steering-ip-address steering-ip-address
```

6. (Optional) Specify whether to keep the existing steering information or not. This value is transmitted between the Services Control Gateway and SRC software through the Juniper Networks VSA (Keep-Existing-Steering).

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
steering-information]
user@host# set keep-existing-steering (STEERING-ENABLED | STEERING-DISABLED)
keep-existing-steering
```

7. (Optional) Verify your configuration.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
steering-information]
user@host# show
keep-existing-steering STEERING-ENABLED;
service-chain-identifier service-chain-identifier;
```

```
steering-downlink-VRF steering-downlink-VRF;
steering-ip-address steering-ip-address;
steering-uplink-VRF steering-uplink-VRF;
```

#### Related Documentation

- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Configuration Statements for Policies Used for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 65](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)

## Configuring the Dynamic PCC Rules Redirect Information for Routers Running Junos OS and Acting as PCEF (SRC CLI)

Use the following configuration statements to configure the redirect information for the dynamic PCC rules. For more information about creating a dynamic PCC rule, see “[Configuring Dynamic PCC Rules for Routers Running Junos OS and Acting as PCEF \(SRC CLI\)](#)” on page 46.

```
policies group name list name rule name dynamic-pcc-rule redirect-information {
  redirect-address-type (IPv4-Address | IPv6-Address | URL | SIP-URL);
  redirect-server-address redirect-server-address;
}
```

1. From configuration mode, access the configuration statements that configure redirect information for the dynamic PCC rules. This procedure uses GXnew as the policy group, gx-list as the policy list, and dynpcc-rul1-name as the dynamic PCC rule.

```
[edit]
user@host# edit policies group GXnew list gx-list rule dynpcc-rul1-name
dynamic-pcc-rule redirect-information
```

2. (Optional) Specify the address type.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
redirect-information]
user@host# set redirect-address-type (IPv4-Address | IPv6-Address | URL | SIP-URL)
```

3. (Optional) Specify the address of the redirect server with which the end user should be connected when the account cannot cover the service cost.

```
[edit policies group GXnew list gx-list rule dynpcc-rul1-name dynamic-pcc-rule
redirect-information]
user@host# set redirect-server-address redirect-server-address
```

4. (Optional) Verify your configuration.

```
[edit policies group GXnew list gx-list rule dynpcc-ru11-name dynamic-pcc-rule
redirect-information]
user@host# show
redirect-address-type IPv4-Address;
redirect-server-address redirect-server-address;
```

**Related  
Documentation**

- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Configuration Statements for Policies Used for Routers Running Junos OS and Acting as PCEF \(SRC CLI\) on page 65](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)





## CHAPTER 7

# Configuration Tasks for Gx Router Driver 3GPP Attributes

- [Configuring Service-Level 3GPP Attributes for Gx Router Driver \(SRC CLI\) on page 59](#)
- [Configuring Subscriber-Level 3GPP Attributes for Gx Router Driver \(SRC CLI\) on page 62](#)

### Configuring Service-Level 3GPP Attributes for Gx Router Driver (SRC CLI)

---

Use the following configuration statements to configure service-level 3GPP attributes for the Gx router driver in a global service scope:

```
services global service name attributes-3gpp {  
    service-identifier service-identifier;  
    rating-group rating-group;  
    auto-deactivate-on-threshold;  
}  
services global service name attributes-3gpp monitoring-info granted-service-units {  
    in-octets in-octets;  
    out-octets out-octets;  
    total-octets total-octets;  
}
```

Use the following configuration statements to configure service-level 3GPP attributes for the Gx router driver in a service scope:

```
services scope name service name attributes-3gpp {  
    service-identifier service-identifier;  
    rating-group rating-group;  
    auto-deactivate-on-threshold;  
}  
services scope name service name attributes-3gpp monitoring-info granted-service-units  
{  
    in-octets in-octets;  
    out-octets out-octets;  
    total-octets total-octets;  
}
```

When you configure the monitoring information for the service, you must ensure that the following conditions are met:

- Event trigger for the associated subscriber is set to USAGE\_REPORT.
- Accounting flag for the policy rule is enabled.



**NOTE:** If you modify the 3GPP attributes for the existing service, the modification is applied only for the new subscribers logging in to the SAE.

To configure service-level 3GPP attributes for the Gx router driver:

1. From configuration mode, access the configuration statements that configure service 3GPP attributes used by the Gx router driver. This procedure uses Internet-Bronze as the name of the service.

```
[edit]
user@host# edit services global service Internet-Bronze attributes-3gpp
```

2. (Optional) Specify the service identifier. The value ranges from 0 through 4,294,967,295.

```
[edit services global service Internet-Bronze attributes-3gpp]
user@host# set service-identifier service-identifier
```

3. (Optional) Specify the rating group for the service. The value ranges from 0 through 4,294,967,295.

```
[edit services global service Internet-Bronze attributes-3gpp]
user@host# set rating-group rating-group
```

4. (Optional) Enable the auto deactivate flag to control deactivation of a service on reaching the monitoring threshold.

```
[edit services global service Internet-Bronze attributes-3gpp]
user@host# set auto-deactivate-on-threshold
```

5. (Optional) From configuration mode, access the configuration statements that configure usage monitoring information for the subscriber.

```
[edit]
user@host# edit services global service Internet-Bronze attributes-3gpp
monitoring-info granted-service-units
```

6. (Optional) Specify the input octet threshold value for the granted service unit. The value ranges from 0 through 9,223,372,036,854,775,807.

```
[edit services global service Internet-Bronze attributes-3gpp monitoring-info
granted-service-units]
```

```
user@host# set in-octets in-octets
```

7. (Optional) Specify the output octet threshold value for the granted service unit. The value ranges from 0 through 9,223,372,036,854,775,807.

```
[edit services global service Internet-Bronze attributes-3gpp monitoring-info
  granted-service-units]
user@host# set out-octets out-octets
```

8. (Optional) Specify the total octet threshold value for the granted service unit. The value ranges from 0 through 9,223,372,036,854,775,807.

```
[edit services global service Internet-Bronze attributes-3gpp monitoring-info
  granted-service-units]
user@host# set total-octets total-octets
```

9. (Optional) Modify the service substitutions for your Gx services.

You can make the service substitutions by passing the values through the SAE core API or DSA activationAttributes.



**NOTE:** The Gx services allow you to modify the service attributes (such as, `serviceIdentifier`, `ratingGroup`, `grantTotalOctets`, `grantOutOctets`, and `grantInOctets`).

10. (Optional) Verify your configuration.

```
[edit services global service Internet-Bronze attributes-3gpp]
user@host# show
auto-deactivate-on-threshold;
monitoring-info {
  granted-service-units {
    in-octets in-octets;
  }
}
rating-group rating-group;
service-identifier service-identifier;
```

#### Related Documentation

- [Adding the Routers Acting as a PCEF and Running Junos OS \(SRC CLI\) on page 29](#)
- [Services for the SRC Software Overview](#)
- [SAE Support for Gx Router Driver on page 3](#)
- [Managing MX Series Routers Acting as a PCEF Using the SRC Software Overview on page 11](#)

- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)

## Configuring Subscriber-Level 3GPP Attributes for Gx Router Driver (SRC CLI)

Use the following configuration statements to configure subscriber-level 3GPP attributes for the Gx router driver:

```
subscribers retailer name subscriber-folder folder-name subscriber name attributes-3gpp
{
  event-triggers [ (APPLICATION_START | APPLICATION_STOP | USAGE_REPORT)...];
}
```

When you enable service accounting for the subscriber, you must ensure that the following conditions are met:

- Event trigger of the subscriber profile is set to USAGE\_REPORT.
- Accounting flag for the policy rule is enabled.
- Granted service unit is configured for the subscribed service.



**NOTE:** If you modify the event trigger of the subscriber profile, the modification is applied only for the new subscribers logging in to the SAE.

To configure subscriber-level 3GPP attributes for the Gx router driver:

1. From configuration mode, access the configuration statements that configure subscriber 3GPP attributes used by the Gx router driver. This procedure uses default as the retail subscriber, local as the subscriber folder, and jane as the subscriber name.

```
[edit]
user@host# edit subscribers retailer default subscriber-folder local subscriber jane
attributes-3gpp
```

2. (Optional) Specify the event triggers that are used by the SRC software to subscribe to events received from the TDF.

```
[edit subscribers retailer default subscriber-folder local subscriber jane attributes-3gpp]
user@host# set event-triggers [ (APPLICATION_START | APPLICATION_STOP |
USAGE_REPORT)...]
```

3. (Optional) Verify your configuration.

```
[edit subscribers retailer default subscriber-folder local subscriber jane
attributes-3gpp]
user@host# show
event-triggers [ APPLICATION_START USAGE_REPORT ];
```

**Related  
Documentation**

- [Adding the Routers Acting as a PCEF and Running Junos OS \(SRC CLI\) on page 29](#)
- [Subscribers Overview](#)
- [SAE Support for Gx Router Driver on page 3](#)
- [Managing MX Series Routers Acting as a PCEF Using the SRC Software Overview on page 11](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)



## CHAPTER 8

# Configuration Statements and Commands

- Configuration Statements for Policies Used for Routers Running Junos OS and Acting as PCEF (SRC CLI) on page 65

## Configuration Statements for Policies Used for Routers Running Junos OS and Acting as PCEF (SRC CLI)

---

Use the following configuration statements to configure policies used for routers (Services Control Gateways) running Junos OS and acting as PCEF:

```
policies group name {
  description description;
}
policies group name list name {
  role junos-gx;
  applicability both;
  description description;
}
policies group name list name rule name {
  type type;
  precedence precedence;
  accounting;
}
policies group name list name rule name static-pcc-rule {
  charging-rule-name charging-rule-name;
  charging-rule-base-name charging-rule-base-name;
  description description;
}
policies group name list name rule name dynamic-pcc-rule {
  charging-rule-name charging-rule-name;
  mute-notification;
  flow-status (ENABLED-UPLINK | ENABLED-DOWNLINK | ENABLED | DISABLED |
  REMOVED);
  forwarding-class-name forwarding-class-name;
  LRF-profile-name LRF-profile-name;
  HCM-profile-name HCM-profile-name;
  online;
  reporting-level (SERVICE-IDENTIFIER-LEVEL | RATING-GROUP-LEVEL |
  SPONSORED-CONNECTIVITY-LEVEL);
```

```

    description description;
  }
  policies group name list name rule name dynamic-pcc-rule application-information {
    TDF-application-id TDF-application-id;
    TDF-application-id-base TDF-application-id-base;
  }
  policies group name list name rule name dynamic-pcc-rule gx-flows name {
    flow-description flow-description;
    tos-traffic-class tos-traffic-class;
    security-parameter-index security-parameter-index;
    flow-label flow-label;
    flow-direction (UNSPECIFIED | DOWNLINK | UPLINK | BIDIRECTIONAL);
  }
  policies group name list name rule name dynamic-pcc-rule qos-information {
    max-requested-bw-UL max-requested-bw-UL;
    max-requested-bw-DL max-requested-bw-DL;
  }
  policies group name list name rule name dynamic-pcc-rule steering-information {
    service-chain-identifier service-chain-identifier;
    steering-uplink-VRF steering-uplink-VRF;
    steering-downlink-VRF steering-downlink-VRF;
    steering-ip-address steering-ip-address;
    keep-existing-steering (STEERING-ENABLED | STEERING-DISABLED);
  }
  policies group name list name rule name dynamic-pcc-rule redirect-information {
    redirect-address-type (IPv4-Address | IPv6-Address | URL | SIP-URL);
    redirect-server-address redirect-server-address;
  }
}

```

#### Related Documentation

- [Configuring Policies for Router Running Junos OS and Acting as PCEF \(SRC CLI\) on page 37](#)
- [Managing PCC or ePCC Rules on Routers Running Junos OS and Acting as PCEF on page 14](#)



## PART 3

# Administration

- [Monitoring Gx Router Driver on page 69](#)
- [Monitoring Subscriber Sessions on page 73](#)
- [Monitoring Diameter Server Statistics on page 75](#)



# Monitoring Gx Router Driver

- Viewing the State of Gx Router Drivers (SRC CLI) on page 69
- Viewing SNMP Statistics for Gx Router Drivers (SRC CLI) on page 70

## Viewing the State of Gx Router Drivers (SRC CLI)

---

**Purpose** Display the state of Gx router drivers.

**Action** Use the following operation mode command:

```
show sae drivers <device-name device-name> < (brief) >
```

For example:

```
user@host> show sae drivers device-name *@VP-ams0-bng-srcmx480b

Gx Driver
Device name                *@VP-ams0-bng-srcmx480b
Device type                junos-gx
Local IP                  10.212.10.16
Number of SAP              1
State                      operational
Last Connection Update Time
09:23:52 UTC 2015        c5bng-src6 Thu Aug 27
Active Peers                c5bng-src6
[(SP-04-0-bng-srcmx480b, englab.juniper.net), (SP-04-2-bng-srcmx480b,
englab.juniper.net)]
Length of job queue        0
Number of Initial CCR Messages Received 1
Number of Initial Success CCA Messages Sent 1
Number of Initial Failure CCA Messages Sent 0
Number of Update CCR Messages Received 1
Number of App Start Update CCR Messages Received 0
Number of App Stop Update CCR Messages Received 0
Number of Usage Report Update CCR Messages Received 0
Number of Failure Notified Update CCR Messages Received 1
Number of Unknown Session Update CCR Messages Received 0
Number of Update Success CCA Messages Sent 1
Number of Update Failure CCA Messages Sent 0
Number of Terminate CCR Messages Received 0
Number of Terminate Success CCA Messages Sent 0
Number of Terminate Failure CCA Messages Sent 0
Failure-Notified RAR messages sent 0
```

Number of RAR messages sent	1	
Policy-Add RAR messages attempted	0	
Policy-Remove RAR messages attempted	1	
Policy-Modify RAR messages attempted	0	
Session Release Cause RAR messages attempted	0	
RAA messages Received with Success	1	
RAA messages Received with Failure	0	
Number of active user sessions	1	
Number of active service sessions	1	
Number recovered subscriber sessions	0	
Number recovered service sessions	0	
Number recovered interface sessions	0	
Number invalid subscriber sessions	0	
Number invalid service sessions	0	
Number invalid interface sessions	0	
Background restoration start time	Thu Aug 27 09:22:23 UTC 2015	
Background restoration end time	Thu Aug 27 09:22:23 UTC 2015	
Number subscriber sessions restored in background	0	
Session Store Info		
Session Store Status	sessionsCollected	
Status Last Update Time	Thu Aug 27 09:22:23 UTC 2015	
Current Usage Ratio	0.65512073	
Last Modified Time	Size(KB) Name	
LiveSessions Size(KB)		
Thu Aug 27 09:24:10 UTC 2015	5.9	storeOps_1_1
3.8		

- Related Documentation**
- [Adding the Routers Acting as a PCEF and Running Junos OS \(SRC CLI\) on page 29](#)
  - [Configuring the SAE to Manage Routers Acting as a PCEF and Running Junos OS \(SRC CLI\) on page 31](#)

## Viewing SNMP Statistics for Gx Router Drivers (SRC CLI)

**Purpose** Display SNMP statistics for Gx router drivers.

**Action** Use the following operation mode command:

```
show sae statistics device common junos-gx
```

For example:

```
user@host> show sae statistics device common junos-gx

SNMP Statistics
Driver type          JUNOS GX
Server address       0.0.0.0
Server port          0
Time since last redirect 0
Number of current connections 1
Number of connections accepted 1
```

Number of open requests	1
Number of close requests	0

**Related  
Documentation**

- [Adding the Routers Acting as a PCEF and Running Junos OS \(SRC CLI\) on page 29](#)
- [Configuring the SAE to Manage Routers Acting as a PCEF and Running Junos OS \(SRC CLI\) on page 31](#)



## CHAPTER 10

# Monitoring Subscriber Sessions

- [Viewing Subscriber Sessions \(SRC CLI\) on page 73](#)
- [Viewing General Information About Subscriber Sessions \(SRC CLI\) on page 73](#)

### Viewing Subscriber Sessions (SRC CLI)

---

**Purpose** View all subscriber sessions.

**Action** user@host> **show sae subscribers**

**Related Documentation**

- [Logging Out Simulated Subscribers \(SRC CLI\)](#)
- [Logging In Simulated Subscribers \(SRC CLI\)](#)

### Viewing General Information About Subscriber Sessions (SRC CLI)

---

**Purpose** View general information about subscriber sessions. You can view all or restricted information about all subscriber sessions.

**Action** To view information about all subscriber sessions:

```
user@host> show sae subscribers
```

To view the subscriptions and service sessions from hidden services:

```
user@host> show sae subscribers secret
```

To view only the subscriber session information without service sessions:

```
user@host> show sae subscribers brief
```

```

user@host> show sae subscribers brief
User Session
User IPv4          192.167.0.0/32
User IPv6          2001:db8:85a3:0:0:8a2e:370:1c17/128
User DN            uniqueId=jane,ou=local,retailerName=default,o=Users,o=UMC
MAC Address        41:42:43:44:45:46
Device Name        default:vr0@simJunos
Login Name         jane1@virneo.net
Interface Name     ip/192.167.0.0
RADIUS session ID  wnNbqRW/b0/KMAPo
Login time         Thu May 11 10:15:27 UTC 2017
Session Timeout    -1
Active Services    [Internet-Bronze]
Available Services [News, Internet-Bronze]
user@host>

```

To view the subscriber session ID, login name, and IP address:

```

user@host> show sae subscribers terse
user@host> show sae subscribers terse
User Sessions
Session ID  Login Name          IPv4 Address    IPv6 Address
b0/KMAPo   jane1@virneo.net    192.167.0.0/32 2001:db8:85a3:0:0:8a2e:370:1c17/128
user@host>

```

To restrict the number of displayed results:

```

user@host> show sae subscribers maximum-results maximum-results

```

#### Related Documentation

- [Configuring Access to Subscriber Data \(SRC CLI\)](#)
- [Viewing Information About Subscriber Sessions by DN \(SRC CLI\)](#)
- [Viewing Information About Subscriber Sessions by IP Address, VPN Identifier, or both \(SRC CLI\)](#)
- [Viewing Information About Subscriber Sessions by Service Name \(SRC CLI\)](#)
- [Viewing Information About Subscriber Sessions by Session ID \(SRC CLI\)](#)
- [Viewing Information About Subscriber Sessions by Accounting User Identifier \(SRC CLI\)](#)



# Monitoring Diameter Server Statistics

- [Viewing Statistics for the SRC Diameter Server \(SRC CLI\) on page 75](#)

## Viewing Statistics for the SRC Diameter Server (SRC CLI)

---

**Purpose** View information about the server process and the state of the Diameter server.

**Action** To display information about the server process and the state of the Diameter server:

```
user@host> show diameter statistics
```

- Related Documentation**
- [Configuring the Diameter Application \(SRC CLI\)](#)
  - [SRC CLI Commands to Monitor the SRC Diameter Server](#)

