

Managing the SRC Diameter Server



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Managing the SRC Diameter Server

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About the Documentation

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Documentation and Release Notes

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

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

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

Supported Platforms

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

- C Series

Documentation Conventions

Table 1 on page viii 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.

Documentation Conventions

Table 1 on page viii defines the notice icons used in this guide. Table 3 on page viii 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.

Table 3: Text Conventions

Convention	Description	Examples
Bold text like this	<ul style="list-style-type: none"> Represents keywords, scripts, and tools in text. Represents a GUI element that the user selects, clicks, checks, or clears. 	<ul style="list-style-type: none"> Specify the keyword exp-msg. Run the install.sh script. Use the pkgadd tool. To cancel the configuration, click Cancel.

Table 3: Text Conventions (*continued*)

Bold text like this	Represents text that the user must type.	user@host# set cache-entry-age <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"> Represents configuration statements. Indicates SRC CLI commands and options in text. Represents examples in procedures. Represents URLs. 	<ul style="list-style-type: none"> system ldap server{ stand-alone; Use the request sae modify device failover command with the force option user@host# ... http://www.juniper.net/techpubs/software/management/sdx/api-index.html
<i>Italic sans serif typeface</i>	Represents variables in SRC CLI commands.	user@host# set local-address <i>local-address</i>
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"> Emphasizes words. Identifies book names. Identifies distinguished names. Identifies files, directories, and paths in text but not in command examples. 	<ul style="list-style-type: none"> There are two levels of access: <i>user</i> and <i>privileged</i>. <i>SRC-PE Getting Started Guide</i>. <i>o=Users, o=UMC</i> The <i>/etc/default.properties</i> file.
Backslash	At the end of a line, indicates that the text wraps to the next line.	<pre> Plugin.radiusAcct-1.class=\ net.juniper.smgmt.sae.plugin\ RadiusTrackingPluginEvent </pre>
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.)	diagnostic line

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at

<https://www.juniper.net/cgi-bin/docbugreport/> . If you are using e-mail, be sure to include the following information with your comments:

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

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

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

Self-Help Online Tools and Resources

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

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

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

Opening a Case with JTAC

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

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

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

PART 1

Overview

- [Software Features Overview on page 3](#)

CHAPTER 1

Software Features Overview

- [SRC Component Overview on page 3](#)

SRC Component Overview

The SRC software is a dynamic system. It contains many components that you use to build a subscriber management environment. You can use these tools to customize and extend the SRC software for your use and to integrate the SRC software with other systems. The SRC software also provides the operating system and management tools for C Series Controllers.

[Table 4 on page 3](#) gives a brief description of the components that make up the SRC software.

Table 4: Descriptions of SRC Components

Component	Description
Server Components	
Service activation engine (SAE)	<ul style="list-style-type: none">• Authorizes, activates, and deactivates subscriber and service sessions by interacting with systems such as Juniper Networks routers, cable modem termination system (CMTS) devices, RADIUS servers, and directories.• Collects accounting information about subscribers and services from routers, and stores the information in RADIUS accounting servers, flat files, and other accounting databases.• Provides plug-ins and application programming interfaces (APIs) for starting and stopping subscriber and service sessions and for integrating with systems that authorize subscriber actions and track resource usage.
Subscriber Information Collector (SIC)	Used in conjunction with the MX Series router running the packet-triggered subscribers and policy control (PTSP) solution, the SIC listens for RADIUS accounting events from IP edge devices (accounting clients) and stores them in the Session State Registrar (SSR), or forwards them to a remote AAA server, allowing the SRC software to gain increased subscriber awareness. Additionally, the SIC can optionally edit accounting events before routing them.
Juniper Policy Server (JPS)	Acts as a policy decision point (PDP) and policy enforcement point (PEP) that manages the relationships between application managers and CMTS devices in a PCMM environment.

Table 4: Descriptions of SRC Components *(continued)*

Component	Description
Network information collector (NIC)	Collects information about the state of the network and can provide a mapping from a given type of network data to another type of network data.
Redirect Server	Redirects HTTP requests received from IP Filter to a captive portal page.
3GPP Gateway	The SRC Third-Generation Partnership Project (3GPP) gateway is a Diameter-based component in the SRC software, which provides integration with 3GPP Policy and Charging Control environments, to provide fixed-mobile convergence (FMC). The SRC 3GPP gateway provides Gx-based integration with the Policy and Charging Rules Function (PCRF). The SRC 3GPP gateway uses the Gx interface to mediate between the PCRF and Juniper Networks routers like the E Series Broadband Services routers and MX Series routers. The Gx interface on the SRC 3GPP gateway communicates with the PCRF using the Diameter protocol.
Web Application Service	The SRC software includes a Web application server that hosts the Web Services Gateway and the Volume Tracking Application (SRC VTA). In production environments, this application server is designed to host only these applications. However, you can load your own applications into this server for testing or demonstration purposes.
Web Services Gateway	<p>Allows a gateway client—an application that is not part of the SRC network—to interact with SRC components through a Simple Object Access Protocol (SOAP) interface.</p> <p>The Web Services Gateway provides the Dynamic Service Activator which allows a gateway client to dynamically activate and deactivate SRC services for subscribers and to run scripts that manage the SAE.</p>
Repository	
Directory	<p>The SRC software includes the Juniper Networks database, which is a built-in Lightweight Directory Access Protocol (LDAP) directory for storing all SRC data including services, policies, and small subscriber databases.</p> <p>For large subscriber databases, you must supply your own directory.</p>
Session State Registrar (SSR)	The SSR is a stateless, highly reliable and highly available database cluster. When used in conjunction with an MX Series router running the packet-triggered subscribers and policy control (PTSP) solution, the SSR stores the IP edge attachment subscriber sessions data learned from IP edge devices in the centralized SSR database.

SRC Configuration and Management Tools

Table 4: Descriptions of SRC Components (*continued*)

Component	Description
SRC command line interface (CLI)	Provides a way to configure the SRC software on a C Series Controller from a Junos OS–like CLI. The SRC CLI includes the policies, services, and subscribers CLI, which has separate access privileges.
C-Web interface	Provides a way to configure, monitor, and manage the SRC software on a C Series Controller through a Web browser. The C-Web interface includes a policies, services, and subscribers component, which has separate access privileges.
Simple Network Management Protocol (SNMP) agent	Monitors system performance and availability. It runs on all the SRC hosts and makes management information available through SNMP tables and sends notifications by means of SNMP traps.
Service Management Applications (Run on external system)	
IMS Services Gateway	Integrates into an IP multimedia system (IMS) environment. The SRC software provides a Diameter protocol-based interface that allows the SRC software to integrate with services found on the application layer of IMS.
SRC Programming Interfaces	
NETCONF API	Allows you to configure or request information from the NETCONF server on a C Series Controller that runs the SRC software. Applications developed with the NETCONF API run on a system other than a C Series Controller.
CORBA plug-in service provider interface (SPI)	Tracks sessions and enables linking the rest of the service provider's operations support system (OSS) with the SRC software so that the OSS can be notified of events in the life cycle of SAE sessions. Hosted plug-ins only.
CORBA remote API	Provides remote access to the SAE core API. Applications that use these extensions to the SRC software run on a system other than a C Series Controller.
NIC access API	Performs NIC resolutions. Applications that use these extensions to the SRC software run on a system other than a C Series Controller.
SAE core API	Controls the behavior of the SRC software. Applications that use these extensions to the SRC software run on a system other than a C Series Controller.

Table 4: Descriptions of SRC Components (*continued*)

Component	Description
Script services	Provides an interface to call scripts that supply custom services such as provisioning policies on a number of systems across a network.
VTA API	The Volume Tracking Application (VTA) API is a Simple Object Access Protocol (SOAP) interface that allows developers to create gateway clients and that administrators use to manage VTA subscribers and sessions. The SRC Web Services Gateway allows a gateway client—an application that is not part of the SRC network—to interact with SRC components, such as the VTA, through a SOAP interface.
Authorization and Accounting Applications	
AAA RADIUS servers	Authenticates subscribers and authorizes their access to the requested system or service. Accepts accounting data—time active and volume of data sent—about subscriber and service sessions. RADIUS servers run on a system other than a C Series Controller.
SRC Admission Control Plug-In (SRC ACP)	Authorizes and tracks subscribers' use of network resources associated with services that the SRC application manages.
Flat file accounting	Stores tracking data to accounting flat files that can be made available to external systems that send the data to a rating and billing system.
Volume Tracking Application	<p>The SRC Volume Tracking Application (SRC VTA) is an SRC component that allows service providers to track and control the network usage of subscribers and services. You can control volume and time usage on a per-subscriber or per-service basis. This level of control means that service providers can offer tiered services that use volume as a metric, while also controlling abusive subscribers and applications.</p> <p>When a subscriber or service exceeds bandwidth limits (or quotas), the SRC VTA can take actions including imposing rate limits on traffic, sending an e-mail notification, or charging extra for additional bandwidth consumed.</p>
Demonstration Applications (available on the Juniper Networks Web site)	
Enterprise Audit Plug-In	Defines a callback interface, which receives events when IT managers complete specified operations.
Enterprise Manager Portal	<p>Allows service providers to provision services for enterprise subscribers on routers running JunosE or Junos OS and allows IT managers to manage services.</p> <p>Enterprise Manager Portal can be used with NAT Address Management Portal to allow service providers to manage public IP addresses for use with NAT services on routers running Junos OS and to allow IT managers to make requests about public IP addresses through the Enterprise Manager Portal.</p>

Table 4: Descriptions of SRC Components *(continued)*

Component	Description
Monitoring Agent application	Integrates IP address managers, such as a DHCP server or a RADIUS server, into an SRC-managed network so that the SAE is notified about subscriber events. The Monitoring Agent application runs on a Solaris platform.
Residential service selection portals	Provides a framework for building Web applications that allow residential and enterprise subscribers to manage their own network services. It comes with several full-featured sample Web applications that are easy to customize and suitable for deployment. The Residential service selection portals run on a Solaris platform.
Sample enterprise service portal	Lets service providers supply an interface to their business customers for managing and provisioning services.

Related Documentation

- SRC Product Description

PART 2

Configuration

- [Configuration Tasks for the SRC Diameter Server on page 11](#)

CHAPTER 2

Configuration Tasks for the SRC Diameter Server

- [Configuring the Diameter Application \(SRC CLI\) on page 11](#)
- [Configuring Diameter Peers \(SRC CLI\) on page 16](#)

Configuring the Diameter Application (SRC CLI)

Tasks to configure the Diameter application are:

- [Configuring the Diameter Application Properties on page 11](#)
- [Configuring the Diameter Client Properties on page 14](#)
- [Configuring the Diameter Server Properties on page 15](#)
- [Configuring Logging Destinations on page 15](#)

Configuring the Diameter Application Properties

Use the following configuration statements to configure the properties for the Diameter application:

```
system diameter {
  java-heap-size java-heap-size;
  java-new-size java-new-size;
  java-garbage-collection-options java-garbage-collection-options;
  protocol [(tcp | sctp)...];
  local-address [local-address...];
  port port;
  origin-host origin-host;
  origin-realm origin-realm;
  active-peers;
  debug-mode;
  load-balancing-mode (failover | round-robin);
  transaction-processing-log (log-no-messages | log-severe-messages |
    log-normal-messages | log-debug-messages);
  packet-trace-log (log-no-messages | log-severe-messages | log-normal-messages |
    log-debug-messages);
  peer-state-machine-log (log-no-messages | log-severe-messages | log-normal-messages |
    log-debug-messages);
  configuration-log (log-no-messages | log-severe-messages | log-normal-messages |
    log-debug-messages);
```

```
}
```

To configure the Diameter application:

1. From configuration mode, access the statement for the Diameter application.

```
user@host# edit system diameter
```



NOTE: The java-* options have default values that should not be changed unless directed by Juniper Networks Technical Assistance Center (JTAC).

2. If you encounter problems caused by lack of memory, change the maximum memory size available to the JRE.

```
[edit system diameter]  
user@host# set java-heap-size java-heap-size
```

3. Configure the amount of space available to the JRE when the Diameter server starts.

```
[edit system diameter]  
user@host# set java-new-size java-new-size
```

4. Configure the garbage collection functionality of the Java Virtual Machine.

```
[edit system diameter]  
user@host# set java-garbage-collection-options java-garbage-collection-options
```

5. Specify the protocol for the transport connection.

```
[edit system diameter]  
user@host# set protocol [(tcp | sctp) ...]
```

6. (Optional) Specify the local IP addresses that remote peers can use to reach this server.

```
[edit system diameter]  
user@host# set local-address [local-address ...]
```

7. (Optional) Specify the port for the server.

```
[edit system diameter]  
user@host# set port port
```

8. (Optional) Specify the fully qualified domain name (FQDN) used to identify this host to its Diameter peers.

```
[edit system diameter]  
user@host# set origin-host origin-host
```

9. (Optional) Specify the realm used to identify this host to its Diameter peers.

```
[edit system diameter]  
user@host# set origin-realm origin-realm
```


The Diameter realm should be configured to the domain name of the origin host. For example, if the FQDN of the host is host.juniper.net, then the realm should be juniper.net. For PTSP, realm-based Diameter routing is not used.

10. (Optional) Specify whether the peer connection is in active mode.

```
[edit system diameter]
user@host# set active-peers
```



NOTE: Active mode means that the SRC software actively tries to connect to the peer. Make sure the peer you are connecting to supports active peers. The MX Series router does not support active peers. The SRC software can still be configured, but the connection attempts will not work.

11. (Optional) Specify whether the peer connection is in debug mode.

```
[edit system diameter]
user@host# set debug-mode
```

12. (Optional) Configure the load-balancing mode for peer selection when forwarding a request message.

```
[edit system diameter]
user@host# set load-balancing-mode (failover | round-robin)
```

13. (Optional) Configure the log level for the transaction processing log.

```
[edit system diameter]
user@host# set transaction-processing-log log-level
```

where *log-level* is one of the following:

- **log-no-messages**—Do not log any messages.
- **log-severe-messages**—Log only severe messages.
- **log-normal-messages**—Log only normal messages.
- **log-debug-messages**—Log only debug messages.

14. (Optional) Configure the log level for the packet tracing log.

```
[edit system diameter]
user@host# set packet-trace-log log-level
```

where *log-level* is one of the following:

- **log-no-messages**—Do not log any messages.
- **log-severe-messages**—Log only severe messages.

- **log-normal-messages**—Log only normal messages.
- **log-debug-messages**—Log only debug messages.

15. (Optional) Configure the log level for the peer state machine log.

```
[edit system diameter]
user@host# set peer-state-machine-log log-level
```

where *log-level* is one of the following:

- **log-no-messages**—Do not log any messages.
- **log-severe-messages**—Log only severe messages.
- **log-normal-messages**—Log only normal messages.
- **log-debug-messages**—Log only debug messages.

16. (Optional) Configure the log level for the configuration log.

```
[edit system diameter]
user@host# set configuration-log log-level
```

where *log-level* is one of the following:

- **log-no-messages**—Do not log any messages.
- **log-severe-messages**—Log only severe messages.
- **log-normal-messages**—Log only normal messages.
- **log-debug-messages**—Log only debug messages.

Configuring the Diameter Client Properties

This procedure configures the client-side adapter of the SRC Diameter server, which handles client connections. Configuration should be necessary only if you encounter performance problems.

Use the following statements to configure the properties for the Diameter client:

```
system diameter client {
  threads threads;
  keep-alive-time keep-alive-time;
}
```

To configure the Diameter client properties:

1. From configuration mode, access the statement for the Diameter client.

```
user@host# edit system diameter client
```

2. (Optional) Specify the number of threads to use.

```
[edit system diameter client]
```

```
user@host# set threads threads
```

3. (Optional) Specify the time to wait for new commands.

```
[edit system diameter client]
user@host# set keep-alive-time keep-alive-time
```

Configuring the Diameter Server Properties

Use the following statements to configure the properties for the Diameter server:

```
system diameter server {
  threads threads;
  keep-alive-time keep-alive-time;
}
```

To configure the Diameter server properties:

1. From configuration mode, access the statement for the Diameter server.

```
user@host# edit system diameter server
```

2. (Optional) Specify the minimum number of threads to use.

```
[edit system diameter server]
user@host# set threads threads
```

3. (Optional) Specify the time to wait for new commands.

```
[edit system diameter server]
user@host# set keep-alive-time keep-alive-time
```

Configuring Logging Destinations

Use the following configuration statements to configure logging destinations for Diameter:

```
system diameter logger name ...

system diameter logger name file {
  filter filter;
  filename filename;
  rollover-filename rollover-filename;
  maximum-file-size maximum-file-size;
}
```

To configure logging destinations to store log messages in a file:

1. From configuration mode, access the statement that configures the name and type of logging destination.

```
user@host# edit system diameter logger name file
```

2. Specify the properties for the logging destination.

```
[edit system diameter logger name file]
```

```
user@host# set ?
```

For more information about configuring properties for the logging destination, see [Configuring Logging Destinations to Store Messages in a File \(SRC CLI\)](#).

Related Documentation

- SRC CLI Commands to Monitor the SRC Diameter Server
- To manage services for JSRC peers on MX Series routers, see [Managing Services on MX Series Routers Using the Diameter Application](#).
- To manage policies for PTSP peers on MX Series routers, see [Configuring PTSP to Manage Subscriber-Level Policies](#).

Configuring Diameter Peers (SRC CLI)

Use the following configuration statements to configure the Diameter peers:

```
shared network diameter peer name {  
  protocol [(tcp | sctp)...];  
  address [address...];  
  enforce-source-address;  
  local-address local-address;  
  connect-timeout connect-timeout;  
  watchdog-timeout watchdog-timeout;  
  state-machine-timeout state-machine-timeout;  
  reconnect-timeout reconnect-timeout;  
  port port;  
  origin-host origin-host;  
  incoming-queue-limit incoming-queue-limit;  
  active-peer;  
}
```

To configure the Diameter peer:

1. From configuration mode, access the statements for the peer.

```
user@host# edit shared network diameter peer name
```

The peer name must be unique.

2. Specify the protocol for the transport connection.

```
[edit shared network diameter peer name]  
user@host# set protocol [(tcp | sctp)...]
```

3. Specify the addresses of the remote peer. If SCTP is the transport protocol, you can specify multiple addresses. If TCP is the transport protocol, you can specify only a single address.

```
[edit shared network diameter peer name]  
user@host# set address [address...]
```

4. (Optional) Specify whether the remote peer must connect from one of the IP addresses listed by the **address** option.

```
[edit shared network diameter peer name]  
user@host# set enforce-source-address
```

5. (Optional) Specify the local address of the peer.

```
[edit shared network diameter peer name]  
user@host# set local-address local-address
```

6. (Optional) Specify the maximum amount of time allowed for the Diameter peer to respond to a connection request.

```
[edit shared network diameter peer name]  
user@host# set connect-timeout connect-timeout
```

7. (Optional) Specify the watchdog timeout used for the connection to the remote peer.

```
[edit shared network diameter peer name]  
user@host# set watchdog-timeout watchdog-timeout
```

8. (Optional) Specify the Diameter state machine timeout.

```
[edit shared network diameter peer name]  
user@host# set state-machine-timeout state-machine-timeout
```

9. (Optional) Specify the time interval between connection attempts when the peer is in the disconnected state.

```
[edit shared network diameter peer name]  
user@host# set reconnect-timeout reconnect-timeout
```

10. (Optional) Specify the port for the client.

```
[edit shared network diameter peer name]  
user@host# set port port
```

11. (Optional) Specify the identifier for the endpoint that the peer presents during connection establishment.

```
[edit shared network diameter peer name]  
user@host# set origin-host origin-host
```

12. (Optional) Specify the number of messages allowed on the incoming message queue for a peer.

```
[edit shared network diameter peer name]  
user@host# set incoming-queue-limit incoming-queue-limit
```

13. (Optional) Specify whether the peer connection is in active mode.

```
[edit shared network diameter peer name]  
user@host# set active-peer
```



.....

NOTE: Active mode means that the SRC software actively tries to connect to the peer. Make sure the peer you are connecting to supports active peers. The MX Series router does not support active peers. The SRC software can still be configured, but the connection attempts will not work.

.....

**Related
Documentation**

- [Configuring the Diameter Application \(SRC CLI\) on page 11](#)
- [Viewing SRC Diameter Server State \(SRC CLI\)](#)

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