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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:

• SRX Series
• vSRX

Using the Examples in This Manual

If you want to use the examples in this manual, you can use the load merge or the load merge relative command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a full example. In this case, use the load merge command.
If the example configuration does not start at the top level of the hierarchy, the example is a snippet. In this case, use the `load merge relative` command. These procedures are described in the following sections.

Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

   For example, copy the following configuration to a file and name the file `ex-script.conf`. Copy the `ex-script.conf` file to the `/var/tmp` directory on your routing platform.

   ```
   system {
   scripts {
   commit {
   file ex-script.xsl;
   }
   }
   }
   interfaces {
   fxp0 {
   disable;
   unit 0 {
   family inet {
   address 10.0.0.1/24;
   }
   }
   }
   }
   }
   ```

2. Merge the contents of the file into your routing platform configuration by issuing the `load merge` configuration mode command:

   ```
   [edit]
   user@host# load merge /var/tmp/ex-script.conf
   load complete
   ```

Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

   For example, copy the following snippet to a file and name the file `ex-script-snippet.conf`. Copy the `ex-script-snippet.conf` file to the `/var/tmp` directory on your routing platform.

   ```
   commit {
   file ex-script-snippet.xsl; }
   ```
2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the `load merge relative` configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the `load` command, see CLI Explorer.

**Documentation Conventions**

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

<table>
<thead>
<tr>
<th>Icon</th>
<th>Meaning</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="i.png" alt="i" /></td>
<td>Informational note</td>
<td>Indicates important features or instructions.</td>
</tr>
<tr>
<td>![!]</td>
<td>Caution</td>
<td>Indicates a situation that might result in loss of data or hardware damage.</td>
</tr>
<tr>
<td><img src="fwarn.png" alt="fwarn" /></td>
<td>Warning</td>
<td>Alerts you to the risk of personal injury or death.</td>
</tr>
<tr>
<td><img src="lwarn.png" alt="lwarn" /></td>
<td>Laser warning</td>
<td>Alerts you to the risk of personal injury from a laser.</td>
</tr>
<tr>
<td><img src="tip.png" alt="tip" /></td>
<td>Tip</td>
<td>Indicates helpful information.</td>
</tr>
<tr>
<td><img src="best.png" alt="best" /></td>
<td>Best practice</td>
<td>Alerts you to a recommended use or implementation.</td>
</tr>
</tbody>
</table>

Table 2 on page xx defines the text and syntax conventions used in this guide.
### Table 2: Text and Syntax Conventions

<table>
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<tr>
<th>Convention</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bold text like this</strong></td>
<td>Represents text that you type.</td>
<td>To enter configuration mode, type the <code>configure</code> command: user@host&gt; configure</td>
</tr>
<tr>
<td><strong>Fixed-width text like this</strong></td>
<td>Represents output that appears on the terminal screen.</td>
<td>user@host&gt; show chassis alarms No alarms currently active</td>
</tr>
<tr>
<td><strong>Italic text like this</strong></td>
<td>• Introduces or emphasizes important new terms.</td>
<td>• A policy term is a named structure that defines match conditions and actions.</td>
</tr>
<tr>
<td><strong>Italic text like this</strong></td>
<td>• Identifies guide names.</td>
<td>• Junos OS CLI User Guide</td>
</tr>
<tr>
<td><strong>Italic text like this</strong></td>
<td>• Identifies RFC and internet draft titles.</td>
<td>• RFC 1997, BGP Communities Attribute</td>
</tr>
<tr>
<td><strong>Italic text like this</strong></td>
<td>Represents variables (options for which you substitute a value) in commands or configuration statements.</td>
<td>Configure the machine's domain name: [edit] root@# set system domain-name domain-name</td>
</tr>
<tr>
<td><strong>Text like this</strong></td>
<td>Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.</td>
<td>To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level.</td>
</tr>
<tr>
<td><strong>&lt; &gt;</strong> (angle brackets)</td>
<td>Encloses optional keywords or variables.</td>
<td>stub &lt;default-metric metric&gt;</td>
</tr>
<tr>
<td>**</td>
<td>** (pipe symbol)</td>
<td>Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.</td>
</tr>
<tr>
<td><strong>#</strong> (pound sign)</td>
<td>Indicates a comment specified on the same line as the configuration statement to which it applies.</td>
<td>rsvp { # Required for dynamic MPLS only</td>
</tr>
<tr>
<td><strong>[]</strong> (square brackets)</td>
<td>Encloses a variable for which you can substitute one or more values.</td>
<td>community name members [ community-ids ]</td>
</tr>
<tr>
<td><strong>Indention and braces ({ })</strong></td>
<td>Identifies a level in the configuration hierarchy.</td>
<td>[edit] routing-options { static { route default { nexthop address; retain; } } }</td>
</tr>
<tr>
<td><strong>;</strong> (semicolon)</td>
<td>Identifies a leaf statement at a configuration hierarchy level.</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bold text like this</strong></td>
<td>Represents graphical user interface (GUI) items you click or select.</td>
<td>• In the Logical Interfaces box, select All Interfaces.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• To cancel the configuration, click Cancel.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In the configuration editor hierarchy, select Protocols &gt; Ospf.</td>
</tr>
<tr>
<td>&gt; (bold right angle bracket)</td>
<td>Separates levels in a hierarchy of menu selections.</td>
<td></td>
</tr>
</tbody>
</table>

**Documentation Feedback**

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

- Online feedback rating system—On any page of the Juniper Networks TechLibrary site at [http://www.juniper.net/techpubs/index.html](http://www.juniper.net/techpubs/index.html), simply click the stars to rate the content, and use the pop-up form to provide us with information about your experience. Alternately, you can use the online feedback form at [http://www.juniper.net/techpubs/feedback/](http://www.juniper.net/techpubs/feedback/).

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- Product warranties—For product warranty information, visit [http://www.juniper.net/support/warranty/](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.

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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: https://prsearch.juniper.net/

• Find product documentation: http://www.juniper.net/documentation/

• 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: http://kb.juniper.net/InfoCenter/

• 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://entitlementsearch.juniper.net/entitlementsearch/

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

User Access and Authentication

- User Access and Authentication Overview on page 3
- Configuring Junos OS User Accounts on page 19
- Configuring User Access Privileges on page 41
- Permissions Flags for User Access Privileges on page 77
- Configuring Authentication Methods on page 335
Chapter 1

User Access and Authentication Overview

- Understanding Login Classes on page 3
- Understanding User Accounts on page 6
- Understanding Junos OS Access Privilege Levels on page 7
- Understanding User Authentication Methods on page 12
- Hardening Shared Secrets in Junos OS on page 12
- Using Trusted Platform Module to Bind Secrets on SRX Series Devices on page 14

Understanding Login Classes

Supported Platforms
SRX Series, vSRX

All users who log in to the device must be in a login class. You can define any number of login classes. You then apply one login class to an individual user account. With login classes, you define the following:

- Access privileges users have when they are logged in to the device.
- Commands and statements that users can and cannot specify.
- How long a login session can be idle before it times out and the user is logged off.

You can define any number of login classes and then apply one login class to an individual user account.

Table 3 on page 3 contains a few predefined login classes. The predefined login classes cannot be modified.

Table 3: Predefined Login Classes

<table>
<thead>
<tr>
<th>Login Class</th>
<th>Permission Bits Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>operator</td>
<td>clear, network, reset, trace, view</td>
</tr>
<tr>
<td>read-only</td>
<td>view</td>
</tr>
<tr>
<td>super-user and superuser</td>
<td>all</td>
</tr>
<tr>
<td>unauthorized</td>
<td>None</td>
</tr>
</tbody>
</table>
NOTE:

- You cannot modify a predefined login class name. If you issue the set command on a predefined class name, the Junos OS appends -local to the login class name. The following message also appears:

  warning: '<class-name>' is a predefined class name; changing to '<class-name>-local'

- You cannot issue the rename or copy command on a predefined login class. Doing so results in the following error message:

  error: target '<class-name>' is a predefined class

This section contains the following topics:

- Permission Bits on page 4
- Denying or Allowing Individual Commands on page 6

Permission Bits

Each top-level CLI command and each configuration statement has an access privilege level associated with it. Users can execute only those commands and configure and view only those statements for which they have access privileges. The access privileges for each login class are defined by one or more permission bits (see Table 4 on page 4).

Two forms for the permissions control the individual parts of the configuration:

- "Plain" form—Provides read-only capability for that permission type. An example is interface.
- Form that ends in -control—Provides read and write capability for that permission type. An example is interface-control.

Table 4: Permission Bits for Login Classes

<table>
<thead>
<tr>
<th>Permission Bit</th>
<th>Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>admin</td>
<td>Can view user account information in configuration mode and with the show configuration command.</td>
</tr>
<tr>
<td>admin-control</td>
<td>Can view user accounts and configure them (at the [edit system login] hierarchy level).</td>
</tr>
<tr>
<td>access</td>
<td>Can view the access configuration in configuration mode and with the show configuration operational mode command.</td>
</tr>
<tr>
<td>access-control</td>
<td>Can view and configure access information (at the [edit access] hierarchy level).</td>
</tr>
<tr>
<td>all</td>
<td>Has all permissions.</td>
</tr>
<tr>
<td>clear</td>
<td>Can clear (delete) information learned from the network that is stored in various network databases (using the clear commands).</td>
</tr>
<tr>
<td>Permission Bit</td>
<td>Access</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>configure</td>
<td>Can enter configuration mode (using the <code>configure</code> command) and commit configurations (using the <code>commit</code> command).</td>
</tr>
<tr>
<td>control</td>
<td>Can perform all control-level operations (all operations configured with the <code>-control</code> permission bits).</td>
</tr>
<tr>
<td>field</td>
<td>Reserved for field (debugging) support.</td>
</tr>
<tr>
<td>firewall</td>
<td>Can view the firewall filter configuration in configuration mode.</td>
</tr>
<tr>
<td>firewall-control</td>
<td>Can view and configure firewall filter information (at the <code>[edit firewall]</code> hierarchy level).</td>
</tr>
<tr>
<td>floppy</td>
<td>Can read from and write to the removable media.</td>
</tr>
<tr>
<td>interface</td>
<td>Can view the interface configuration in configuration mode and with the <code>show configuration</code> operational mode command.</td>
</tr>
<tr>
<td>interface-control</td>
<td>Can view chassis, class of service, groups, forwarding options, and interfaces configuration information. Can configure chassis, class of service, groups, forwarding options, and interfaces (at the <code>[edit]</code> hierarchy).</td>
</tr>
<tr>
<td>maintenance</td>
<td>Can perform system maintenance, including starting a local shell on the device and becoming the superuser in the shell (by issuing the <code>su root</code> command), and can halt and reboot the device (using the <code>request system</code> commands).</td>
</tr>
<tr>
<td>network</td>
<td>Can access the network by entering the <code>ping</code>, <code>ssh</code>, <code>telnet</code>, and <code>traceroute</code> commands.</td>
</tr>
<tr>
<td>reset</td>
<td>Can restart software processes using the <code>restart</code> command and can configure whether software processes are enabled or disabled (at the <code>[edit system processes]</code> hierarchy level).</td>
</tr>
<tr>
<td>rollback</td>
<td>Can use the <code>rollback</code> command to return to a previously committed configuration other than the most recently committed one.</td>
</tr>
<tr>
<td>routing</td>
<td>Can view general routing, routing protocol, and routing policy configuration information in configuration and operational modes.</td>
</tr>
<tr>
<td>routing-control</td>
<td>Can view general routing, routing protocol, and routing policy configuration information and configure general routing (at the <code>[edit routing-options]</code> hierarchy level), routing protocols (at the <code>[edit protocols]</code> hierarchy level), and routing policy (at the <code>[edit policy-options]</code> hierarchy level).</td>
</tr>
<tr>
<td>secret</td>
<td>Can view passwords and other authentication keys in the configuration.</td>
</tr>
<tr>
<td>secret-control</td>
<td>Can view passwords and other authentication keys in the configuration and can modify them in configuration mode.</td>
</tr>
<tr>
<td>security</td>
<td>Can view security configuration in configuration mode and with the <code>show configuration</code> operational mode command.</td>
</tr>
</tbody>
</table>
Table 4: Permission Bits for Login Classes (continued)

<table>
<thead>
<tr>
<th>Permission Bit</th>
<th>Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>security-control</td>
<td>Can view and configure security information (at the [edit security] hierarchy level).</td>
</tr>
<tr>
<td>shell</td>
<td>Can start a local shell on the device by entering the start shell command.</td>
</tr>
<tr>
<td>snmp</td>
<td>Can view SNMP configuration information in configuration and operational modes.</td>
</tr>
<tr>
<td>snmp-control</td>
<td>Can view SNMP configuration information and configure SNMP (at the [edit snmp] hierarchy level).</td>
</tr>
<tr>
<td>system</td>
<td>Can view system-level information in configuration and operational modes.</td>
</tr>
<tr>
<td>system-control</td>
<td>Can view system-level configuration information and configure it (at the [edit system] hierarchy level).</td>
</tr>
<tr>
<td>trace</td>
<td>Can view trace file settings in configuration and operational modes.</td>
</tr>
<tr>
<td>trace-control</td>
<td>Can view trace file settings and configure trace file properties.</td>
</tr>
<tr>
<td>view</td>
<td>Can use various commands to display current system-wide, routing table, and protocol-specific values and statistics.</td>
</tr>
</tbody>
</table>

Denying or Allowing Individual Commands

By default, all top-level CLI commands have associated access privilege levels. Users can execute only those commands and view only those statements for which they have access privileges. For each login class, you can explicitly deny or allow the use of operational and configuration mode commands that are otherwise permitted or not allowed by a permission bit.

Related Documentation

- Understanding User Authentication Methods on page 12
- Understanding User Accounts on page 6
- Understanding Template Accounts on page 22
- Example: Configuring New Users on page 19

Understanding User Accounts

Supported Platforms

SRX Series, vSRX

User accounts provide one way for users to access the device. Users can access the device without accounts if you configured RADIUS or TACACS+ servers. After you have created an account, the device creates a home directory for the user. An account for the user root is always present in the configuration. For each user account, you can define the following:
• Username—Name that identifies the user. It must be unique within the device. Do not include spaces, colons, or commas in the username.

• User’s full name—if the full name contains spaces, enclose it in quotation marks (" "). Do not include colons or commas.

• User identifier (UID)—Numeric identifier that is associated with the user account name. The identifier range from 100 through 64,000 and must be unique within the device. If you do not assign a UID to a username, the software assigns one when you commit the configuration, preferring the lowest available number.

• User’s access privilege—You can create login classes with specific permission bits or use one of the predefined classes.

• Authentication method or methods and passwords that the user can use to access the device—You can use SSH or an MD5 password, or you can enter a plain-text password that Junos OS encrypts using MD5-style encryption before entering it in the password database. If you configure the plain-text-password option, you are prompted to enter and confirm the password.

Related Documentation

• Understanding User Authentication Methods on page 12
• Example: Configuring a RADIUS Server for System Authentication on page 338
• Example: Configuring a TACACS+ Server for System Authentication on page 344
• Example: Configuring Authentication Order on page 347

Understanding Junos OS Access Privilege Levels

Supported Platforms

EX Series, M Series, MX Series, OCX1100, PTX Series, QFabric System, QFX Series, SRX Series, T Series, vSRX

Each top-level CLI command and each configuration statement have an access privilege level associated with them. Users can execute only those commands and configure and view only those statements for which they have access privileges. The access privileges for each login class are defined by one or more permission flags.

For each login class, you can explicitly deny or allow the use of operational and configuration mode commands that would otherwise be permitted or not allowed by a privilege level specified in the permissions statement.

The following sections provide additional information about permissions:

• Junos OS Login Class Permission Flags on page 7
• Allowing or Denying Individual Commands for Junos OS Login Classes on page 11

Junos OS Login Class Permission Flags

The permissions statement specifies one or more of the permission flags listed in Table 5 on page 8. Permission flags are not cumulative, so for each class you must list all the permission flags needed, including view to display information and configure to
enter configuration mode. Two forms of permissions control for individual parts of the configuration are:

- “Plain” form—Provides read-only capability for that permission type. An example is interface.
- Form that ends in -control—Provides read and write capability for that permission type. An example is interface-control.

Table 5 on page 8 lists the Junos OS login class permission flags that you can configure by including the permissions statement at the [edit system login class class-name] hierarchy level.

### Table 5: Login Class Permission Flags

<table>
<thead>
<tr>
<th>Permission Flag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>access</td>
<td>Can view the access configuration in configuration mode and with the show configuration operational mode command.</td>
</tr>
<tr>
<td>access-control</td>
<td>Can view and configure access information at the [edit access] hierarchy level.</td>
</tr>
<tr>
<td>admin</td>
<td>Can view user account information in configuration mode and with the show configuration operational mode command.</td>
</tr>
<tr>
<td>admin-control</td>
<td>Can view user accounts and configure them at the [edit system login] hierarchy level.</td>
</tr>
<tr>
<td>all</td>
<td>Can access all operational mode commands and configuration mode commands. Can modify configuration in all the configuration hierarchy levels.</td>
</tr>
<tr>
<td>clear</td>
<td>Can clear (delete) information learned from the network that is stored in various network databases by using the clear commands.</td>
</tr>
<tr>
<td>configure</td>
<td>Can enter configuration mode by using the configure command.</td>
</tr>
<tr>
<td>control</td>
<td>Can perform all control-level operations—all operations configured with the -control permission flags.</td>
</tr>
<tr>
<td>field</td>
<td>Can view field debug commands. Reserved for debugging support.</td>
</tr>
<tr>
<td>firewall</td>
<td>Can view the firewall filter configuration in configuration mode.</td>
</tr>
<tr>
<td>firewall-control</td>
<td>Can view and configure firewall filter information at the [edit firewall] hierarchy level.</td>
</tr>
<tr>
<td>floppy</td>
<td>Can read from and write to the removable media.</td>
</tr>
<tr>
<td>flow-tap</td>
<td>Can view the flow-tap configuration in configuration mode.</td>
</tr>
</tbody>
</table>
Table 5: Login Class Permission Flags (continued)

<table>
<thead>
<tr>
<th>Permission Flag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>flow-tap-control</td>
<td>Can view the flow-tap configuration in configuration mode and can configure flow-tap configuration information at the [edit services flow-tap] hierarchy level.</td>
</tr>
<tr>
<td>flow-tap-operation</td>
<td>Can make flow-tap requests to the router or switch. For example, a Dynamic Tasking Control Protocol (DTCP) client must have flow-tap-operation permission to authenticate itself to the Junos OS as an administrative user.</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> The flow-tap-operation option is not included in the all-control permissions flag.</td>
</tr>
<tr>
<td>idp-profiler-operation</td>
<td>Can view profiler data.</td>
</tr>
<tr>
<td>interface</td>
<td>Can view the interface configuration in configuration mode and with the show configuration operational mode command.</td>
</tr>
<tr>
<td>interface-control</td>
<td>Can view chassis, class of service (CoS), groups, forwarding options, and interfaces configuration information. Can edit configuration at the following hierarchy levels:</td>
</tr>
<tr>
<td></td>
<td>• [edit chassis]</td>
</tr>
<tr>
<td></td>
<td>• [edit class-of-service]</td>
</tr>
<tr>
<td></td>
<td>• [edit groups]</td>
</tr>
<tr>
<td></td>
<td>• [edit forwarding-options]</td>
</tr>
<tr>
<td></td>
<td>• [edit interfaces]</td>
</tr>
<tr>
<td>maintenance</td>
<td>Can perform system maintenance, including starting a local shell on the router or switch and becoming the superuser in the shell by using the su root command, and can halt and reboot the router or switch by using the request system commands.</td>
</tr>
<tr>
<td>network</td>
<td>Can access the network by using the ping, ssh, telnet, and traceroute commands.</td>
</tr>
<tr>
<td>pgcp-session-mirroring</td>
<td>Can view the pgcp session mirroring configuration.</td>
</tr>
<tr>
<td>pgcp-session-mirroring-control</td>
<td>Can modify the pgcp session mirroring configuration.</td>
</tr>
<tr>
<td>reset</td>
<td>Can restart software processes by using the restart command and can configure whether software processes are enabled or disabled at the [edit system processes] hierarchy level.</td>
</tr>
<tr>
<td>rollback</td>
<td>Can use the rollback command to return to a previously committed configuration other than the most recently committed one.</td>
</tr>
<tr>
<td>routing</td>
<td>Can view general routing, routing protocol, and routing policy configuration information in configuration and operational modes.</td>
</tr>
</tbody>
</table>
## Table 5: Login Class Permission Flags (continued)

<table>
<thead>
<tr>
<th>Permission Flag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>routing-control</td>
<td>Can view general routing, routing protocol, and routing policy configuration information and can configure general routing at the [edit routing-options] hierarchy level, routing protocols at the [edit protocols] hierarchy level, and routing policy at the [edit policy-options] hierarchy level.</td>
</tr>
<tr>
<td>secret</td>
<td>Can view passwords and other authentication keys in the configuration.</td>
</tr>
<tr>
<td>secret-control</td>
<td>Can view passwords and other authentication keys in the configuration and can modify them in configuration mode.</td>
</tr>
<tr>
<td>security</td>
<td>Can view security configuration in configuration mode and with the <code>show configuration</code> operational mode command.</td>
</tr>
<tr>
<td>security-control</td>
<td>Can view and configure security information at the [edit security] hierarchy level.</td>
</tr>
<tr>
<td>shell</td>
<td>Can start a local shell on the router or switch by using the <code>start shell</code> command.</td>
</tr>
<tr>
<td>snmp</td>
<td>Can view Simple Network Management Protocol (SNMP) configuration information in configuration and operational modes.</td>
</tr>
<tr>
<td>snmp-control</td>
<td>Can view SNMP configuration information and can modify SNMP configuration at the [edit snmp] hierarchy level.</td>
</tr>
<tr>
<td>system</td>
<td>Can view system-level information in configuration and operational modes.</td>
</tr>
<tr>
<td>system-control</td>
<td>Can view system-level configuration information and configure it at the [edit system] hierarchy level.</td>
</tr>
<tr>
<td>trace</td>
<td>Can view trace file settings and configure trace file properties.</td>
</tr>
<tr>
<td>trace-control</td>
<td>Can modify trace file settings and configure trace file properties.</td>
</tr>
<tr>
<td>view</td>
<td>Can use various commands to display current system-wide, routing table, and protocol-specific values and statistics. Cannot view the secret configuration.</td>
</tr>
<tr>
<td>view-configuration</td>
<td>Can view all of the configuration excluding secrets, system scripts, and event options.</td>
</tr>
</tbody>
</table>

**NOTE:** Only users with the `maintenance` permission can view commit script, op script, or event script configuration.
Allowing or Denying Individual Commands for Junos OS Login Classes

By default, all top-level CLI commands have associated access privilege levels. Users can execute only those commands and view only those statements for which they have access privileges. For each login class, you can explicitly deny or allow the use of operational and configuration mode commands that would otherwise be permitted or not allowed by a privilege level specified in the permissions statement.

Permission flags are used to grant a user access to operational mode commands and configuration hierarchy levels and statements. By specifying a specific permission flag on the user's login class at the [edit system login class] hierarchy level, you grant the user access to the corresponding commands and configuration hierarchy levels and statements. To grant access to all commands and configuration statements, use the all permissions flag. For permission flags that grant access to configuration hierarchy levels and statements, the flags grant read-only privilege to that configuration. For example, the interface permissions flag grants read-only access to the [edit interfaces] hierarchy level. The -control form of the flag grants read-write access to that configuration. Using the preceding example, interface-control grants read-write access to the [edit interfaces] hierarchy level.

- The all login class permission bits take precedence over extended regular expressions when a user issues rollback command with rollback permission flag enabled.

- Expressions used to allow and deny commands for users on RADIUS and TACACS+ servers have been simplified. Instead of a single, long expression with multiple commands (allow-commands=cmd1 cmd2 ... cmdn), you can specify each command as a separate expression. This new syntax is valid for allow-configuration, deny-configuration, allow-commands, deny-commands, and all user permission bits.

- Users cannot issue the load override command when specifying an extended regular expression. Users can only issue the merge, replace, and patch configuration commands.

- If you allow and deny the same commands, the allow-commands permissions take precedence over the permissions specified by the deny-commands. For example, if you include allow-commands "request system software add" and deny-commands "request system software add", the login class user is allowed to install software using the request system software add command.

- Regular expressions for allow-commands and deny-commands can also include the commit, load, rollback, save, status, and update commands.

- If you specify a regular expression for allow-commands and deny-commands with two different variants of a command, the longest match is always executed.

For example, if you specify a regular expression for allow-commands with the commit-synchronize command and a regular expression for deny-commands with the commit command, users assigned to such a login class would be able to issue the commit synchronize command, but not the commit command. This is because commit-synchronize is the longest match between commit and commit-synchronize and it is specified for allow-commands.
Likewise, if you specify a regular expression for `allow-commands` with the `commit` command and a regular expression for `deny-commands` with the `commit-synchronize` command, users assigned to such a login class would be able to issue the `commit` command, but not the `commit-synchronize` command. This is because `commit-synchronize` is the longest match between `commit` and `commit-synchronize` and it is specified for `deny-commands`.

**Related Documentation**
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- *Regular Expressions for Allowing and Denying Junos OS Operational Mode Commands, Configuration Statements, and Hierarchies*
- Access Privilege User Permission Flags Overview on page 78

### Understanding User Authentication Methods

**Supported Platforms**  
SRX Series, vSRX

Junos OS supports three methods of user authentication: local password authentication, Remote Authentication Dial-In User Service (RADIUS), and Terminal Access Controller Access Control System Plus (TACACS+).

With local password authentication, you configure a password for each user allowed to log in to the device.

RADIUS and TACACS+ are authentication methods for validating users who attempt to access the device using Telnet. Both are distributed client/server systems—the RADIUS and TACACS+ clients run on the device, and the server runs on a remote network system.

You can configure the device to use RADIUS or TACACS+ authentication, or both, to validate users who attempt to access the device. If you set up both authentication methods, you also can configure which method the device will try first.

**Related Documentation**
- Understanding User Accounts on page 6
- Understanding Login Classes on page 3
- Understanding Template Accounts on page 22
- Example: Configuring Authentication Order on page 347
- Example: Configuring a RADIUS Server for System Authentication on page 338
- Example: Configuring a TACACS+ Server for System Authentication on page 344

### Hardening Shared Secrets in Junos OS

**Supported Platforms**  
SRX Series

- Understanding Hardening Shared Secrets on page 13
Understanding Hardening Shared Secrets

Existing shared secrets (format) in Junos OS currently use an obfuscation algorithm, which is not a very strong encryption for configuration secrets. If you want a strong encryption for your configuration secrets, you can configure a master password. The master password is used to derive an encryption key that is used with AES256-GCM to encrypt configuration secrets. This new encryption method uses the format strings.

Starting with Junos OS Release 15.1X49-D50, new CLI commands are introduced to configure a system master password to provide stronger encryption for configuration secrets. The master password encrypts secrets like the RADIUS password, IKE preshared keys, and other shared secrets in the Junos OS management process (mgd) configuration. The master password itself is not saved as part of the configuration. The password quality is evaluated for strength, and the device gives feedback if weak passwords are used.

The master password is used as input to the password based key derivation function (PBKDF2) to generate an encryption key. The key is used as input to the Advanced Encryption Standard in Galois/Counter Mode (AES256-GCM). The plain text that the user enters is processed by the encryption algorithm (with key) to produce the encrypted text (cipher text). See Figure 1 on page 13.

Figure 1: Master Password Encryption

![Figure 1: Master Password Encryption](image)

The configuration secrets can only be shared between devices using the same master password.

The encrypted passwords have the following format:

\[\text{format} = \text{crypt-algo}\text{-hash-algo}\text{-iterations}\text{-salt}\text{-iv}\text{-tag}\text{-encrypted}\]

See Table 6 on page 13 for the master password format details.

Table 6: $8$-encrypted Password Format

<table>
<thead>
<tr>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>crypt-algo</td>
<td>Encryption/decryption algorithm to be used. Currently only AES256-GCM is supported.</td>
</tr>
<tr>
<td>hash-algo</td>
<td>Hash (prf) algorithm to be used for the PBKDF2 key derivation.</td>
</tr>
<tr>
<td>iterations</td>
<td>The number of iterations to use for the PBKDF2 hash function. Current iteration-count default is 100. The iteration count slows the hashing count, thus slowing attacker guesses.</td>
</tr>
</tbody>
</table>
Table 6: $8$-encrypted Password Format (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>salt</td>
<td>Sequence of ASCII64-encoded pseudorandom bytes generated during encryption that are to be used to salt (a random, but known string) the password and input to the PBKDF2 key derivation.</td>
</tr>
<tr>
<td>iv</td>
<td>A sequence of ASCII64-encoded pseudorandom bytes generated during encryption that are to be used as initialization vector for the AES256-GCM encryption function.</td>
</tr>
<tr>
<td>tag</td>
<td>ASCII64-encoded representation of the tag.</td>
</tr>
<tr>
<td>encrypted</td>
<td>ASCII64-encoded representation of the encrypted password.</td>
</tr>
</tbody>
</table>

The ASCII64 encoding is Base64 (RFC 4648) compatible, except no padding (character “=”) is used to keep the strings short. For example:

```
$8$aes256-gcm$hmac-sha2-256$100$y/4YMC4YDLU5f2YDi4jN6YCyQsYLasf8ASllu4jLc2arD9Yny0
/Hejww5okhBic0GakSQ'yXkww
```

### Chassis Cluster Considerations

When defining a chassis cluster on SRX Series devices, be aware of the following restrictions:

- For SRX Series devices, first configure the master password on each node, and then build the cluster. The same master password should be configured on each node.
- In chassis cluster mode, the master password cannot be deleted.

**NOTE:** A change in the master password would mean disruption in chassis clustering; therefore you must change the password on both nodes independently.

### Release History Table

<table>
<thead>
<tr>
<th>Release</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1X49-D50</td>
<td>Starting with Junos OS Release 15.1X49-D50, new CLI commands are introduced to configure a system master password to provide stronger encryption for configuration secrets.</td>
</tr>
</tbody>
</table>

### Using Trusted Platform Module to Bind Secrets on SRX Series Devices

**Supported Platforms**

SRX300, SRX320, SRX340, SRX345

By enabling the Trusted Platform Module (TPM) on the SRX Series devices, the software layer leverages the use of the underlying TPM chip. TPM is a specialized chip that protects certain secrets at rest such as private keys, system master passwords, and other sensitive data by storing it in an AES256 encrypted format (instead of storing sensitive data in a cleartext format). The device also generates a new SHA256 hash of the configuration each time the administrator commits the configuration. This hash is verified each time the system boots up. If the configuration has been tampered with, the verification fails.
and the device will not continue to boot. Both the encrypted data and the hash of the configuration is protected by the TPM module using the master encryption password.

**NOTE:** Hash validation is performed during any commit operation by performing a validation check of the configuration file against the saved hash from previous commits. In a chassis cluster system, hash is independently generated on the backup system as part of the commit process. A commit from any mode, that is, batch-config, dynamic-config, exclusive-config, or private config generates the integrity hash.

**NOTE:** Hash is saved only for the current configuration and not for any rollback configurations. Hash is not generated during reboot or shutdown of the device.

The TPM encrypts the following secrets:

- SHA256 hash of the configuration
- device master-password
- all key-pairs on the device

The TPM chip is available on the SRX300, SRX320, SRX340, and SRX345 devices. TPM is not enabled by default. To enable TPM, see "Enabling the TPM" on page 16.

- Limitations on page 15
- Enabling the TPM on page 16
- Verifying the Status of the TPM on page 16
- Changing the Master Encryption Password on page 16

**Limitations**

The following limitations and exceptions apply to the configuration file integrity feature using TPM:

- This feature is supported only on the SRX300, SRX320, SRX340 and SRX345 devices.
- If the master encryption password is not set, data is stored unencrypted.
- If the master encryption password and the multiple index backup files are deleted, data cannot be decrypted.
- If you set up the master encryption password, downgrading to older releases that do not implement TPM is not supported. You must delete the master encryption password and reenter all sensitive data before downgrading.
- If the master encryption password was deleted before the daemons had a chance to re-encrypt the data, then the data becomes unusable.
- The file integrity feature is not supported along with the configuration file encryption feature that uses keys saved in EEPROM. You can enable only one function at a time.
**Enabling the TPM**

NOTE: Before enabling TPM, ensure that you have configured “set system master-password plain-text-password” otherwise, certain sensitive data will not be protected by the TPM.

You can enable the TPM by setting the master encryption password using the following CLI command:

```plaintext
request security tpm master-encryption-password set plain-text-password
```

You will be prompted to enter the master encryption password twice, to make sure that these passwords match. The master encryption password is validated for required password strength.

After master encryption password is set, the system proceeds to encrypt the sensitive data with the master encryption password which is encrypted by the Master Binding Key that is owned and protected by the TPM chip.

NOTE: If there is any issue with setting the master encryption password, a critical ERROR message is logged on the console and the process is aborted.

**Verifying the Status of the TPM**

You can use the `show security tpm status` command to verify the status of the TPM. The following information is displayed:

- TPM enabled/disabled
- TPM ownership
- TPM’s Master Binding Key status (created or not created)
- master encryption password status (set or not set)

**Changing the Master Encryption Password**

Changing the master encryption password is done using the CLI.

To change the master encryption password, enter the following command from operational mode:

```plaintext
request security tpm master-encryption-password set plain-text-password
```

NOTE: It is recommended that no configuration changes are made while you are changing the master encryption password.
The system checks if the master encryption password is already configured. If master encryption password is configured, then you are prompted to enter the current master encryption password.

The entered master encryption password is validated against the current master encryption password to make sure these master encryption passwords match. If the validation succeeds, you will be prompted to enter the new master encryption password as plain text. You will be asked to enter the key twice to validate the password.

The system then proceeds to re-encrypt the sensitive data with the new master encryption password. You must wait for this process of re-encryption to complete before attempting to change the master encryption password again.

If for some reason, the encrypted master encryption password file is lost or corrupted, the system will not be able to decrypt the sensitive data. The system can only be recovered by re-importing the sensitive data in clear text, and re-encrypting them.

If the system is compromised, the administrator can recover the system using one of the following methods:

- Clear the TPM ownership in u-boot and then install the image in boot loader using TFTP or USB (if USB port is not restricted).
- Snapshot system to the backup partition during routine maintenance, and if system is compromised, you can boot up from the backup partition.

NOTE: If the installed software version is older than Junos OS Release 15.1X49-D110 and the master encryption password is enabled, then installation of Junos OS Release 15.1X49-D110 will fail. You must backup the configuration, certificates, key-pairs, and other secrets and use the TFTP/USB installation procedure.

Related Documentation

- Hardening Shared Secrets in Junos OS on page 12
Example: Configuring New Users

- Requirements on page 19
- Overview on page 19
- Configuration on page 20
- Verification on page 22

Overview

You can add new users to the device's local database. For each account, you define a login name and password for the user and specify a login class for access privileges. The login password must meet the following criteria:

- The password must be at least six characters long.
- You can include most character classes in a password (alphabetic, numeric, and special characters), but not control characters.
- The password must contain at least one change of case or character class.
In this example, you create a login class named operator-and-boot and allow it to reboot the device. You can define any number of login classes. You then allow the operator-and-boot login class to use commands defined in the clear, network, reset, trace, and view permission bits.

Then you create user accounts. User accounts enable you to access the device. (You can access the device without accounts if you configured RADIUS or TACACS+ servers.) You set the username as cmartin and the login class as superuser. Finally, you define the encrypted password for the user.

### Configuration

#### CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter `commit` from configuration mode.

```plaintext
set system login class operator-and-boot allow-commands "request system reboot"
set class system login operator-and-boot permissions [clear network reset trace view]
set system login user cmartin class superuser authentication encrypted-password $1$ABC123
```

#### GUI Step-by-Step Procedure

To configure new users:

1. In the J-Web user interface, select `Configure>`System Properties>`User Management`.
2. Click `Edit`. The Edit User Management dialog box appears.
3. Select the `Users` tab.
4. Click `Add` to add a new user. The Add User dialog box appears.
5. In the User name box, type a unique name for the user.
   - Do not include spaces, colons, or commas in the username.
6. In the User ID box, type a unique ID for the user.
7. In the Full Name box, type the user’s full name.
   - If the full name contains spaces, enclose it in quotation marks. Do not include colons or commas.
8. In the Password and Confirm Password boxes, enter a login password for the user and verify your entry.
9. From the Login Class list, select the user’s access privilege:
   - `operator`
• read-only
• unauthorized

This list also includes any user-defined login classes.

10. Click OK in the Add User dialog box and Edit User Management dialog box.

11. Click OK to check your configuration and save it as a candidate configuration.

12. If you are done configuring the device, click Commit Options > Commit.

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To configure new users:

1. Set the name of the login class and allow the use of the reboot command.
   ```
   [edit system login]
   user@host# set class operator-and-boot allow-commands "request system reboot"
   ```

2. Set the permission bits for the login class.
   ```
   [edit system login]
   user@host# set class operator-and-boot permissions [clear network reset trace view]
   ```

3. Set the username, login class, and encrypted password for the user.
   ```
   [edit system login]
   user@host# set user cmartin class superuser authentication encrypted-password "$1$ABC123"
   ```

Results

From configuration mode, confirm your configuration by entering the show system login command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show system login
class operator-and-boot {
  permissions [ clear network reset trace view ];
  allow-commands "request system reboot";
}
user cmartin {
  class superuser;
  authentication {
    encrypted-password "$1$ABC123";
  }
```
If you are done configuring the device, enter `commit` from configuration mode.

---

**NOTE:** To completely set up RADIUS or TACACS+ authentication, you must configure at least one RADIUS or TACACS+ server and specify a user template account. Do one of the following tasks:

- Configure a user. See "Example: Configuring New Users" on page 19.
- Configure template accounts. See "Example: Creating Template Accounts" on page 23.

---

**Verification**

Confirm that the configuration is working properly.

**Verifying the New Users Configuration**

**Purpose**
Verify that the new users have been configured.

**Action**
From operational mode, enter the `show system login` command.

**Related Documentation**
- Understanding User Authentication Methods on page 12
- Understanding User Accounts on page 6
- Understanding Template Accounts on page 22
- Understanding Login Classes on page 3

---

**Understanding Template Accounts**

**Supported Platforms**
SRX Series, vSRX

You use local user template accounts when you need different types of templates. Each template can define a different set of permissions appropriate for the group of users who use that template. These templates are defined locally on the device and referenced by the TACACS+ and RADIUS authentication servers.

When you configure local user templates and a user logs in, Junos OS issues a request to the authentication server to authenticate the user's login name. If a user is authenticated, the server returns the local username to the device, which then determines...
whether a local username is specified for that login name (local-username for TACACS+, Juniper-Local-User for RADIUS). If so, the device selects the appropriate local user template locally configured on the device. If a local user template does not exist for the authenticated user, the device defaults to the remote template.

**Related Documentation**
- Understanding User Authentication Methods on page 12
- Understanding User Accounts on page 6
- Understanding Login Classes on page 3
- Example: Creating Template Accounts on page 23

**Example: Creating Template Accounts**

**Supported Platforms**

SRX Series, vSRX

This example shows how to create template accounts.

- Requirements on page 23
- Overview on page 23
- Configuration on page 24
- Verification on page 25

**Requirements**

No special configuration beyond device initialization is required before configuring this feature.

**Overview**

You can create template accounts that are shared by a set of users when you are using RADIUS or TACACS+ authentication. When a user is authenticated by a template account, the CLI username is the login name, and the privileges, file ownership, and effective user ID are inherited from the template account.

By default, Junos OS uses the remote template account when:

- The authenticated user does not exist locally on the device.
- The authenticated user’s record in the RADIUS or TACACS+ server specifies local user, or the specified local user does not exist locally on the device.

In this example, you create a remote template account and set the username to remote and the login class for the user as operator. You create a remote template that is applied to users authenticated by RADIUS or TACACS+ that do not belong to a local template account.

You then create a local template account and set the username as admin and the login class as superuser. You use local template accounts when you need different types of templates. Each template can define a different set of permissions appropriate for the group of users who use that template.
Configuration

- Creating a Remote Template Account on page 24
- Creating a Local Template Account on page 24

**Creating a Remote Template Account**

**CLI Quick Configuration**

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter `commit` from configuration mode.

```
set system login user remote class operator
```

**Step-by-Step Procedure**

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the CLI User Guide.

To create a remote template account:

- Set the username and the login class for the user.

  ```
  [edit system login]
  user@host# set user remote class operator
  ```

**Results**

From configuration mode, confirm your configuration by entering the `show system login` command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show system login
user remote {
  class operator;
}
```

If you are done configuring the device, enter `commit` from configuration mode.

**Creating a Local Template Account**

**CLI Quick Configuration**

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter `commit` from configuration mode.

```
set system login user admin class superuser
```
Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To create a local template account:

1. Set the username and the login class for the user.

   ```
   [edit system login]
   user@host# set user admin class superuser
   ```

Results

From configuration mode, confirm your configuration by entering the `show system login` command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show system login
user admin {
    class super-user;
}
```

If you are done configuring the device, enter `commit` from configuration mode.

NOTE: To completely set up RADIUS or TACACS+ authentication, you must configure at least one RADIUS or TACACS+ server and specify a system authentication order. Do one of the following tasks:

- Configure system authentication order. See “Example: Configuring Authentication Order” on page 347.

Verification

Confirm that the configuration is working properly.

Verifying the Template Accounts Creation

Purpose

Verify that the template accounts have been created.

Action

From operational mode, enter the `show system login` command.

Related Documentation

- Understanding User Authentication Methods on page 12
Understanding Administrative Roles

Supported Platforms  SRX Series, vSRX

A system user can be a member of a class that allows the user to act as a particular kind of administrator for the system. Requiring a specific role to view or modify an item restricts the extent of information a user can obtain from the system. It also limits how much of the system is open to intentional or unintentional modification or observation by a user. We recommend that you use the following guidelines when you are designing administrative roles:

• Do not allow any user to log in to the system as root.
• Restrict each user to the smallest set of privileges needed to perform the user’s duties.
• Do not allow any user to belong to a login class containing the shell permission flag. The shell permission flag allows users to run the start shell command from the CLI.
• Allow users to have rollback permissions. Rollback permissions allow users to undo an action performed by an administrator but does not allow them to commit the changes.

You can assign an administrative role to a user by configuring a login class to have the privileges required for that role. You can configure each class to allow or deny access to configuration statements and commands by name. These specific restrictions override and take precedence over any permission flags also configured in the class. You can assign one of the following role attributes to an administrative user.

• Crypto-administrator—Allows the user to configure and monitor cryptographic data.
• Security-administrator—Allows the user to configure and monitor security data.
• Audit-administrator—Allows the user to configure and monitor audit data.
• IDS-administrator—Allows the user to monitor and clear the intrusion detection service (IDS) security logs.

Each role can perform the following specific management functions:

• Cryptographic Administrator
  • Configures the cryptographic self-test.
  • Modifies the cryptographic security data parameters.

• Audit Administrator
  • Configures and deletes the audit review search and sort feature.
  • Searches and sorts audit records.
• Configures search and sort parameters.
• Manually deletes audit logs.

• **Security Administrator**
  • Invokes, determines, and modifies the cryptographic self-test behavior.
  • Enables, disables, determines, and modifies the audit analysis and audit selection functions and configures the device to automatically delete audit logs.
  • Enables or disables security alarms.
  • Specifies limits for quotas on Transport Layer connections.
  • Specifies the limits, network identifiers, and time periods for quotas on controlled connection-oriented resources.
  • Specifies the network addresses permitted to use Internet Control Message Protocol (ICMP) or Address Resolution Protocol (ARP).
  • Configures the time and date used in time stamps.
  • Queries, modifies, deletes, and creates the information flow or access control rules and attributes for the unauthenticated information flow security function policy (SFP), the authenticated information flow SFP, the unauthenticated device services, and the discretionary access control policy.
  • Specifies initial values that override default values when object information is created under unauthenticated information flow SFP, the authenticated information flow SFP, the unauthenticated target of evaluation (TOE) services, and the discretionary access control policy.
  • Creates, deletes, or modifies the rules that control the address from which management sessions can be established.
  • Specifies and revokes security attributes associated with the users, subjects, and objects.
  • Specifies the percentage of audit storage capacity at which the device alerts administrators.
  • Handles authentication failures and modifies the number of failed authentication attempts through SSH or from the CLI that can occur before progressive throttling is enforced for further authentication attempts and before the connection is dropped.
  • Manages basic network configuration of the device.

• **IDS Administrator**—Specifies IDS security alarms, intrusion alarms, audit selections, and audit data.

You need to set the security-role attribute in the classes created for these administrative roles. This attribute restricts which users can show and clear the security logs, actions that cannot be performed through configuration alone.

For example, you need to set the security-role attribute in the `ids-admin` class created for the IDS administrator role if you want to restrict clearing and showing IDS logs to the
IDS administrator role. Likewise, you need to set the security-role to one of the other admin values to restrict that class from being able to clear and show non-IDS logs only.

NOTE: When a user deletes an existing configuration, the configuration statements under the hierarchy level of the deleted configuration (that is, the child objects that the user does not have permission to modify), now remain in the device.

Related Documentation
- Example: Configuring Administrative Roles on page 28

Example: Configuring Administrative Roles

Supported Platforms
M Series, SRX Series, T Series, vSRX

This example shows how to configure individual administrative roles for a distinct, unique set of privileges apart from all other administrative roles.

- Requirements on page 28
- Overview on page 28
- Configuration on page 29
- Verification on page 34

Requirements

No special configuration beyond device initialization is required before configuring this feature.

Overview

This example configures four users:

- audit-officer of the class audit-admin
- crypto-officer of the class crypto-admin
- security-officer of the class security-admin
- ids-officer of the class ids-admin

When a security-admin class is configured, the privileges for creating administrators are revoked from the user who created the security-admin class. Creation of new users and logins is at the discretion of the security-officer.

In this example, you create audit admin, crypto admin, security admin, and ids admin with permission flags pertaining to this role. Then you allow or deny access to configuration statements and commands by name for each administrative role. These specific restrictions take precedence over the permission flags also configured in the class. For example, only the crypto-admin can run the request system set-encryption-key command, which requires having the security permission flag to access it. Only the security-admin
can include the `system time-zone` statement in the configuration, which requires having the `system-control` permission flag.

**Configuration**

**CLI Quick Configuration** To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the `[edit]` hierarchy level, and then enter `commit` from configuration mode.

```plaintext
set system login class audit-admin permissions security
set system login class audit-admin permissions trace
set system login class audit-admin permissions maintenance
set system login class audit-admin allow-commands "^clear (log|security log)"
set system login class audit-admin deny-commands "^clear (security alarms|system login lockout)" file (copy|delete|rename)" request (security|system set-encryption-key)" rollback" set date" show security
(alarms|dynamic-policies|match-policies|policies)" start shell";
set system login class audit-admin security-role audit-administrator
set system login class crypto-admin permissions admin-control
set system login class crypto-admin permissions configure
set system login class crypto-admin permissions maintenance
set system login class crypto-admin permissions security-control
set system login class crypto-admin permissions system-control
set system login class crypto-admin permissions trace
set system login class crypto-admin allow-commands "^request system set-encryption-key"
set system login class crypto-admin deny-commands "^clear (log|security alarms|security log|system login lockout)" file (copy|delete|rename)" rollback" set date" show security
(alarms|dynamic-policies|match-policies|policies)" start shell"
set system login class crypto-admin allow-configuration-regexps "security (ike|ipsec)
(policy|proposal)" "security ipsec "vpn$.* manual
(authentication|encryption|protocol|spi)" "system fips self-test after-key-generation"
set system login class crypto-admin security-role crypto-administrator
set system login class crypto-admin permissions all
set system login class security-admin deny-commands "^clear (log|security log)" (clear|show) security alarms alarm-type idp" request (security|system set-encryption-key)" rollback" start shell"
set system login class security-admin deny-configuration-regexps "security alarms potential-violation idp" "security (ike|ipsec) (policy|proposal)" "security ipsec "vpn$.* manual (authentication|encryption|protocol|spi)" "security log cache" "security log exclude .* event-id IDP_.*" "system fips self-test after-key-generation"
set system login class security-admin security-role security-administrator
set system login class ids-admin permissions configure
set system login class ids-admin permissions security-control
set system login class ids-admin permissions trace
set system login class ids-admin permissions maintenance
set system login class ids-admin allow-configuration-regexps "security alarms potential-violation idp" "security log exclude .* event-id IDP_.*"
set system login class ids-admin deny-commands "^clear log" (clear|show) security alarms (alarm-id|all|newer-than|older-than|process|severity)" (clear|show) security alarms alarm-type
(authentication|cryptographic-self-test|decryption-failures|encryption-failures|ike-phase1-failures|ike-phase2-failures|key-generation-self-test)
```

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non-cryptographic-self-test\(\text{policy}\)\(\text{replay-attacks}\) file\(\text{copy}\)\(\text{delete}\)\(\text{rename}\) request\(\text{security}\)\(\text{system}\)\(\text{set-encryption-key}\) rollback set date show security\(\text{dynamic-policies}\)\(\text{match-policies}\)\(\text{policies}\) \(\text{start shell}\) set system login class ids-admin deny-configuration-regexps security alarms potential-violation\(\text{authentication}\)\(\text{cryptographic-self-test}\)\(\text{decryption-failures}\)\(\text{encryption-failures}\)\(\text{ike-phase1-failures}\)\(\text{ike-phase2-failures}\) key-generation-self-test\(\text{non-cryptographic-self-test}\)\(\text{policy}\)\(\text{replay-attacks}\) set system login class ids-admin security-role ids-admin set system login user audit-officer class audit-admin set system login user crypto-officer class crypto-admin set system login user security-officer class security-admin set system login user ids-officer class ids-admin set system login user audit-officer authentication plain-text-password set system login user crypto-officer authentication plain-text-password set system login user security-officer authentication plain-text-password

**Step-by-Step Procedure**

The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see *Using the CLI Editor in Configuration Mode*.

To configure users in administrative roles:

1. Create the `audit-admin` login class.

   ```
   [edit]  
   user@host# set system login class audit-admin
   [edit system login class audit-admin]  
   user@host# set permissions security
   user@host# set permissions trace
   user@host# set permissions maintenance
   ```

2. Configure the `audit-admin` login class restrictions.

   ```
   [edit system login class audit-admin]  
   user@host# set allow-commands "^clear\( Sec \| \text{security log}\)"  
   user@host# set deny-commands "^clear\(\text{security alarms}\)\(\text{system login lockout}\)\(\text{file copy rename}\) request\(\text{security}\)\(\text{system set-encryption-key}\) rollback set date show security\(\text{dynamic-policies}\)\(\text{match-policies}\)\(\text{policies}\) \(\text{start shell}\)  
   user@host# set security-role audit-administrator
   ```

3. Create the `crypto-admin` login class.

   ```
   [edit]  
   user@host# set system login class crypto-admin
   ```

   ```
   [edit system login class crypto-admin]  
   user@host# set permissions admin-control  
   user@host# set permissions configure  
   user@host# set permissions maintenance  
   user@host# set permissions security-control  
   user@host# set permissions system-control  
   user@host# set permissions trace
   ```
4. Configure the **crypto-admin** login class restrictions.

   ```
   [edit system login class crypto-admin]
   user@host# set allow-commands ""^request system set-encryption-key"
   user@host# set deny-commands ""^clear (log|security alarms|security log|system login lockout)|^file (copy|delete|rename)|^rollback|""^set date|""^show security (alarms|dynamic-policies|match-policies|policies)|""^start shell"
   user@host# set allow-configuration-regexps "security (ike|ipsec) (policy|proposal)" "security ipsec vpn$.* manual (authentication|encryption|protocol|spi)" "system fips self-test after-key-generation"
   user@host# set security-role crypto-administrator
   ```

5. Create the **security-admin** login class.

   ```
   [edit]
   user@host# set system login class security-admin

   [edit system login class security-admin]
   user@host# set permissions all
   ```

6. Configure the **security-admin** login class restrictions.

   ```
   [edit system login class security-admin]
   user@host# set deny-commands ""^clear (log|security log)|^clear|show|security alarms alarm-type idp|request (security|system set-encryption-key)|^rollback|""^start shell"
   user@host# set deny-configuration-regexps "security alarms potential-violation idp" "security (ike|ipsec) (policy|proposal)" "security ipsec vpn$.* manual (authentication|encryption|protocol|spi)" "security log cache" "security log exclude.* event-id IDP_.*" "system fips self-test after-key-generation"
   user@host# set security-role security-administrator
   ```

7. Create the **ids-admin** login class.

   ```
   [edit]
   user@host# set system login class ids-admin

   [edit system login class ids-admin]
   user@host# set permissions configure
   user@host# set permissions maintenance
   user@host# set permissions security-control
   user@host# set permissions trace
   ```

8. Configure the **ids-admin** login class restrictions.

   ```
   [edit system login class ids-admin]
   user@host# set allow-configuration-regexps "security alarms potential-violation idp" "security log exclude.* event-id IDP_.*"
   set system login class ids-admin deny-commands ""^clear log|""^clear|show|security alarms (alarm-id|all|newer-than|older-than|process|severity)""^clear|show|security alarms alarm-type (authentication|cryptographic-self-test|decryption-failures|encryption-failures|ike-phase1-failures|ike-phase2-failures|key-generation-self-test)
   ```
non-cryptographic-self-test|policy|replay-attacks)" * file
(copy|delete|rename)" request (security|system set-encryption-key)"
rollback" set date" show security (dynamic-policies|match-policies|policies)" start
shell"
set system login class ids-admin deny-configuration-regexps "security alarms
potential-violation (authentication|cryptographic-self-test|decryption-
failures|encryption-failures|ike-phase1-failures|ike-phase2-failures|
key-generation-self-test|non-cryptographic-self-test|policy|replay-attacks)"
user@host# set security-role ids-administrator

9. Assign users to the roles.

    [edit]
    user@host# set system login

    [edit system login]
    user@host# set user audit-officer class audit-admin
    user@host# set user crypto-officer class crypto-admin
    user@host# set user security-officer class security-admin
    user@host# set user ids-officer class ids-admin

10. Configure passwords for the users.

    [edit system login]
    user@host# set user audit-officer authentication plain-text-password
    user@host# set user crypto-officer authentication plain-text-password
    user@host# set user security-officer authentication plain-text-password
    user@host# set user ids-officer authentication plain-text-password

Results

From configuration mode, confirm your configuration by entering the show system
command. If the output does not display the intended configuration, repeat the
instructions in this example to correct the configuration.

    [edit]
    user@host# show system
    system {
        login {
            class audit-admin {
                permissions [ maintenance security trace ];
                allow-commands ""clear (log|security log)"";
                deny-commands ""clear (security alarms|system login lockout)"" file
                (copy|delete|rename)" request (security|system
                set-encryption-key)" rollback" set date" show security
                (alarms|dynamic-policies|match-policies|policies)" start shell";
                security-role audit-administrator;
            }
            class crypto-admin {
                permissions [ admin-control configure maintenance security-control system-control
                trace ];
                allow-commands ""request (system set-encryption-key)";
deny-commands "^ clear (log|security alarms)[security log|system login|lockout)]" file (copy|delete|rename)]" rollback]" set date]" show security (alarms|dynamic-policies|match-policies|policies)]" start shell];
allow-configuration-regexps "security (ike|ipsec) (policy|proposal)" "security ipsec vpn$. * manual (authentication|encryption|protocol|spi)" "system fips self-test after-key-generation";
security-role crypto-administrator;
}
class security-admin {
  permissions [all];
deny-commands "^ clear (log|security log)]" (clear|show) security alarms alarm-type idp]" request (security|system set-encryption-key)]" rollback]" start shell];
deny-configuration-regexps "security alarms potential-violation idp" "security (ike|ipsec) (policy|proposal)" "security ipsec vpn$. * manual (authentication|encryption|protocol|spi)" "system fips self-test after-key-generation";
security-role security-administrator;
}
class ids-admin {
  permissions [configure maintenance security-control trace ];
deny-commands "^ clear log]" (clear|show) security alarms (alarm-id|all|newer-than|older-than|process|severity)]" (clear|show) security alarms alarm-type (authentication | cryptographic-self-test | decryption-failures | encryption-failures |ike-phase1-failures|ike-phase2-failures|key-generation-self-test |non-cryptographic-self-test |policy | replay-attacks) ]" file (copy|delete|rename)
  "request (security|system set-encryption-key)]" "rollback]
  "set date]" "show security (dynamic-policies|match-policies|policies)]" "start shell];
allow-configuration-regexps "security alarms potential-violation idp" "security log exclude.* event-id IDP_.*" "system fips self-test after-key-generation";
security-role ids-administrator;
}
class audit-officer {
  class audit-admin;
  authentication {
    encrypted-password "$1$ABC123";## SECRET-DATA
  }
}
class crypto-officer {
  class crypto-admin;
  authentication {
    encrypted-password "$1$ABC123.";## SECRET-DATA
  }
}
class security-officer {
  class security-admin;
  authentication {
    encrypted-password "$1$ABC123.";## SECRET-DATA
  }
}
class ids-officer {
  class ids-admin;
  authetication {
    encrypted-password "$1$ABC123.";## SECRET-DATA
  }
}
If you are done configuring the device, enter `commit` from configuration mode.

**Verification**

Confirm that the configuration is working properly.

**Verifying the Login Permissions**

**Purpose**  Verify the login permissions for the current user.

**Action**  From operational mode, enter the `show cli authorization` command.

```
user@host> show cli authorization
Current user: 'example' class 'super-user'
Permissions:
  admin       -- Can view user accounts
  admin-control-- Can modify user accounts
  clear       -- Can clear learned network info
  configure   -- Can enter configuration mode
  control     -- Can modify any config
  edit        -- Can edit full files
  field       -- Can use field debug commands
  floppy      -- Can read and write the floppy
  interface   -- Can view interface configuration
  interface-control-- Can modify interface configuration
  network     -- Can access the network
  reset       -- Can reset/restart interfaces and daemons
  routing     -- Can view routing configuration
  routing-control-- Can modify routing configuration
  shell       -- Can start a local shell
  snmp        -- Can view SNMP configuration
  snmp-control-- Can modify SNMP configuration
  system      -- Can view system configuration
  system-control-- Can modify system configuration
  trace       -- Can view trace file settings
  trace-control-- Can modify trace file settings
  view        -- Can view current values and statistics
  maintenance -- Can become the super-user
  firewall    -- Can view firewall configuration
  firewall-control-- Can modify firewall configuration
  secret      -- Can view secret statements
  secret-control-- Can modify secret statements
  rollback    -- Can rollback to previous configurations
  security    -- Can view security configuration
  security-control-- Can modify security configuration
  access      -- Can view access configuration
  access-control-- Can modify access configuration
  view-configuration-- Can view all configuration (not including secrets)
  flow-tap     -- Can view flow-tap configuration
  flow-tap-control-- Can modify flow-tap configuration
  idp-profiler-operation-- Can Profiler data
```
pgcp-session-mirroring-- Can view pgcp session mirroring configuration
pgcp-session-mirroring-control-- Can modify pgcp session mirroring configuration
storage -- Can view fibre channel storage protocol configuration
storage-control-- Can modify fibre channel storage protocol configuration
all-control -- Can modify any configuration

Individual command authorization:
  Allow regular expression: none
  Deny regular expression: none
  Allow configuration regular expression: none
  Deny configuration regular expression: none

This output summarizes the login permissions.

**Related Documentation**
- Understanding Administrative Roles on page 26

**Handling Authorization Failure**

**Supported Platforms**
- SRX Series, vSRX

The security administrator can configure the number of times a user can try to log in to the device with invalid login credentials. The device can be locked after the specified number of unsuccessful authentication attempts. This helps to protect the device from malicious users attempting to access the system by guessing an account's password. The security administrator can unlock the user account or define a time period for the user account to remain locked.

The system **lockout-period** defines the amount of time the device can be locked for a user account after a specified number of unsuccessful login attempts.

The security administrator can configure a period of time after which an inactive session will be locked and require re-authentication to be unlocked. This helps to protect the device from being idle for a long period before the session times out.

The system **idle-timeout** defines length of time the CLI operational mode prompt remains active before the session times out.

The security administrator can configure a banner with an advisory notice to be displayed before the identification and authentication screen.

The system **message** defines the system login message. This message appears before a user logs in.

The number of reattempts the device allows is defined by the **tries-before-disconnect** option. The device allows 3 unsuccessful attempts by default or as configured by the administrator. The device prevents the locked users to perform activities that require authentication, until a security administrator manually clears the lock or the defined time period for the device to remain locked has elapsed. However, the existing locks are ignored when the user attempts to log in from the local console.
NOTE: To clear the console during an administrator-initiated logout, the administrator must configure the set system login message “message string” such that, the message-string contains newline (\n) characters and a login banner message at the end of the \n characters.

To ensure that configuration information is cleared completely, the administrator can enter 50 or more \n characters in the message-string of the command set system login message “message string”.

For example, set system login message
"Welcome to Junos!!"

Related Documentation
• Example: Configuring System Retry Options on page 36

Example: Configuring System Retry Options

Supported Platforms
SRX Series, vSRX

This example shows how to configure system retry options to protect the device from malicious users.

• Requirements on page 36
• Overview on page 36
• Configuration on page 38
• Verification on page 39

Requirements
Before you begin, you should understand “Handling Authorization Failure” on page 35.

No special configuration beyond device initialization is required before configuring this feature.

Overview
Malicious users sometimes try to log in to a secure device by guessing an authorized user account’s password. Locking out a user account after a number of failed authentication attempts helps protect the device from malicious users.

Device lockout allows you to configure the number of failed attempts before the user account is locked out of the device and configure the amount of time before the user can attempt to log in to the device again. You can configure the amount of time in-between failed login attempts of a user account and can manually lock and unlock user accounts.
NOTE:
This example includes the following settings:

- **backoff-factor** — Sets the length of delay in seconds after each failed login attempt. When a user incorrectly logs in to the device, the user must wait the configured amount of time before attempting to log in to the device again. The length of delay increases by this value for each subsequent login attempt after the value specified in the backoff-threshold statement. The default value for this statement is five seconds, with a range of five to ten seconds.

- **backoff-threshold** — Sets the threshold for the number of failed login attempts on the device before the user experiences a delay when attempting to reenter a password. When a user incorrectly logs in to the device and hits the threshold of failed login attempts, the user experiences a delay that is set in the backoff-factor statement before attempting to log in to the device again. The default value for this statement is two, with a range of one through three.

- **lockout-period** — Sets the amount of time in minutes before the user can attempt to log in to the device after being locked out due to the number of failed login attempts specified in the tries-before-disconnect statement. When a user fails to correctly login after the number of allowed attempts specified by the tries-before-disconnect statement, the user must wait the configured amount of minutes before attempting to log in to the device again. The lockout-period must be greater than zero. The range at which you can configure the lockout-period is one through 43,200 minutes.

- **tries-before-disconnect** — Sets the maximum number of times the user is allowed to enter a password to attempt to log in to the device through SSH or Telnet. When the user reaches the maximum number of failed login attempts, the user is locked out of the device. The user must wait the configured amount of minutes in the lockout-period statement before attempting to log back in to the device. The tries-before-disconnect statement must be set when the lockout-period statement is set; otherwise, the lockout-period statement is meaningless. The default number of attempts is ten, with a range of one through ten attempts.

Once a user is locked out of the device, if you are the security administrator, you can manually remove the user from this state using the clear system login lockout <username> command. You can also use the show system login lockout command to view which users are currently locked out, when the lockout period began for each user, and when the lockout period ends for each user.

If the security administrator is locked out of the device, he can log in to the device from the console port, which ignores any user locks. This provides a way for the administrator to remove the user lock on their own user account.
In this example, the user waits for the `backoff-threshold` multiplied by the `backoff-factor` interval, in seconds, to get the login prompt. In this example, the user must wait 5 seconds after the first failed login attempt and 10 seconds after the second failed login attempt to get the login prompt. The user gets disconnected after 15 seconds after the third failed attempt because the `tries-before-disconnect` option is configured as 3.

The user cannot attempt another login until 120 minutes has elapsed, unless a security administrator manually clears the lock sooner.

Configuration

**CLI Quick Configuration**

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the `[edit]` hierarchy level, and then enter `commit` from configuration mode.

```
set system login retry-options backoff-factor 5
set system login retry-options backoff-threshold 1
set system login retry-options lockout-period 120
set system login retry-options tries-before-disconnect 3
```

**Step-by-Step Procedure**

To configure system retry-options:

1. Configure the backoff factor.
   
   ```
   [edit]
   user@host# set system login retry-options backoff-factor 5
   ```

2. Configure the backoff threshold.
   
   ```
   [edit]
   user@host# set system login retry-options backoff-threshold 1
   ```

3. Configure the amount of time the device gets locked after failed attempts.
   
   ```
   [edit]
   user@host# set system login retry-options lockout-period 5
   ```

4. Configure the number of unsuccessful attempts during which, the device can remain unlocked.
   
   ```
   [edit]
   user@host# set system login retry-options tries-before-disconnect 3
   ```

**Results**

From configuration mode, confirm your configuration by entering the `show system login retry-options` command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show system login retry-options
backoff-factor 5;
backoff-threshold 1;
```
lockout-period 5;
tries-before-disconnect 3;

Confirm that the configuration is working properly.

If you are done configuring the device, enter commit from configuration mode.

Verification

Displaying the Locked User Logins

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Verify that the login lockout configuration is enabled.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action</td>
<td>Attempt three unsuccessful logins for a particular username. The device will be locked for that username; then log in to the device with a different username. From operational mode, enter the show system login lockout command.</td>
</tr>
<tr>
<td>Meaning</td>
<td>When you perform three unsuccessful login attempts with a particular username, the device is locked for that user for five minutes, as configured in the example. You can verify that the device is locked for that user by logging in to the device with a different username and entering the show system login lockout command.</td>
</tr>
</tbody>
</table>

Related Documentation

• Handling Authorization Failure on page 35
CHAPTER 3

Configuring User Access Privileges

- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands, Configuration Statements, and Hierarchies on page 68

**Example: Configuring User Permissions with Access Privilege Levels**

**Supported Platforms**

EX Series, M Series, MX Series, PTX Series, QFX Series, SRX Series, T Series, vSRX

This example shows how to view permissions for a user account and configure the user permissions with access privileges for a login class. This enables users to execute only those commands and configure and view only those statements for which they have access privileges. This prevents unauthorized users from executing or configuring sensitive commands and statements that could potentially cause damage to the network.

- Requirements on page 41
- Overview on page 42
- Configuration on page 43
- Verification on page 44

**Requirements**

This example uses the following hardware and software components:

- One Juniper Networks device
- One TACACS+ (or RADIUS) server
- Junos OS build running on the Juniper Networks device

Before you begin:

- Establish connection between the device and the TACACS+ server.
For information on configuring a TACACS+ server, see “Configuring TACACS+ Authentication” on page 341.

- Configure at least one user assigned to a login class on the Juniper Networks device. There can be more than one login class, each with varying permission configurations, and more than one user on the device.

**Overview**

Each top-level command-line interface (CLI) command and each configuration statement in Junos OS has an access privilege level associated with it. For each login class, you can explicitly deny or allow the use of operational and configuration mode commands that would otherwise be permitted or not allowed by a privilege level. Users can execute only those commands and configure and view only those statements for which they have access privileges. To configure access privilege levels, include the `permissions` statement at the `[edit system login class class-name]` hierarchy level.

The access privileges for each login class are defined by one or more permission flags specified in the `permissions` statement. Permission flags are used to grant a user access to operational mode commands, statements, and configuration hierarchies. Permission flags are not cumulative, so for each login class you must list all the permission flags needed, including `view` to display information and `configure` to enter configuration mode. By specifying a specific permission flag on the user's login class, you grant the user access to the corresponding commands, statements, and configuration hierarchies. To grant access to all commands and configuration statements, use the all permissions flag. The permission flags provide read-only (“plain” form) and read and write (form that ends in -control) capability for a permission type.

**NOTE:** The all login class permission bits take precedence over extended regular expressions when a user issues a rollback command with the rollback permission flag enabled.

To configure user access privilege levels:

1. View permissions for a user account.
   
   You can view the permissions for a user account before configuring the access privileges for those permissions.
   
   To view the user permissions, enter `?` at the `[edit]` hierarchy level:
   
   ```
   [edit]
   ?
   ```

2. Configure user permissions with access privileges.
   
   All users who can log in to a device must be in a login class. For each login class, you can configure the access privileges that the associated users can have when they are logged in to the device.
To configure access privilege levels for user permissions, include the permissions statement at the [edit system login class class-name] hierarchy level, followed by the user permission, the permissions option, and the required permission flags.

```
[edit system login]
user@host# set class class-name permissions user-permission permissions [permission flags];
```

**Configuration**

**Configuring User Permissions with Access Privilege Levels**

**Step-by-Step Procedure**

To configure access privileges:

1. From the device, view the list of permissions available for the user account. In this example, the username of the user account is host.

```
[edit]
user@host> ?
Possible completions:
clear                Clear information in the system
configure            Manipulate software configuration information
file                 Perform file operations
help                 Provide help information
load                 Load information from file
monitor              Show real-time debugging information
mtrace               Trace multicast path from source to receiver
op                   Invoke an operation script
ping                 Ping remote target
quit                 Exit the management session
request              Make system-level requests
restart              Restart software process
save                 Save information to file
set                  Set CLI properties, date/time, craft interface
message              Show system information
ssh                  Start secure shell on another host
start                Start shell
telnet               Telnet to another host
test                 Perform diagnostic debugging
traceroute           Trace route to remote host
```

The output lists the permissions for the user host. Customized login classes can be created by configuring different access privileges on these user permissions.

2. Configure an access privilege class to enable user host to configure and view SNMP parameters only. In this example, this login class is called network-management. To customize the network-management login class, include the SNMP permission flags to the configure user permission.

```
[edit system login class network-management]
user@host# set permissions configure permissions snmp
user@host# set permissions configure permissions snmp-control
```

Here, the configured permission flags provide both read (snmp) and read-and-write (snmp-control) capability for SNMP, and this is the only allowed access privilege...
for the network-management login class. In other words, all other access privileges other than configuring and viewing SNMP parameters are denied.

**Results**

From configuration mode, confirm your configuration by entering the `show system login` command. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@host# show system login
class network-management {
    permissions [ configure snmp snmp-control ];
}
```

**Verification**

Log in as the username assigned with the new login class, and confirm that the configuration is working properly.

- Verifying SNMP Configuration on page 44
- Verifying non-SNMP Configuration on page 44

**Verifying SNMP Configuration**

**Purpose**

Verify that SNMP configuration can be executed.

**Action**

From configuration mode, execute basic SNMP commands at the `[edit snmp]` hierarchy level.

```
[edit snmp]
user@host# set name device1
user@host# set description switch1
user@host# set location Lab1
user@host# set contact example.com
user@host# commit
```

**Meaning**

The user host assigned to the network-management login class is able to configure SNMP parameters, as the permission flags specified for this class include both snmp (read capabilities) and snmp-control (read and write capabilities) permission bits.

**Verifying non-SNMP Configuration**

**Purpose**

Verify that non-SNMP configuration is denied for the network-management login class.

**Action**

From the configuration mode, execute any non-SNMP configuration, for example, interfaces configuration.

```
[edit]
user@host# edit interfaces
```
Example: Configuring User Permissions with Access Privileges for Operational Mode Commands

Supported Platforms

EX Series, M Series, MX Series, OCX1100, PTX Series, QFabric System, QFX Series, SRX Series, T Series, vSRX

This example shows how to configure custom login classes and assign access privileges for operational mode commands. This enables users of the customized login class to execute only those operational commands for which access privileges have been specified. This prevents unauthorized users from executing sensitive commands that could potentially cause damage to the network.

- Requirements on page 45
- Overview and Topology on page 45
- Configuration on page 48
- Verification on page 53

Requirements

This example uses the following hardware and software components:

- One Juniper Networks device
- One TACACS+ (or RADIUS) server
- Junos OS build running on the Juniper Networks device

Before you begin:

- Establish a TCP connection between the device and the TACACS+ server. In the case of the RADIUS server, establish a UDP connection between the device and the RADIUS server.

For information on configuring a TACACS+ server, see “Configuring TACACS+ Authentication” on page 341.

- Configure at least one user assigned to a login class on the Juniper Networks device. There can be more than one login class, each with varying permission configurations, and more than one user on the device.

Overview and Topology

Each top-level command-line interface (CLI) command and each configuration statement in Junos OS has an access privilege level associated with it. For each login class, you can explicitly deny or allow the use of operational and configuration mode commands that
would otherwise be permitted or not allowed by a privilege level. Users can execute only those commands and configure and view only those statements for which they have access privileges. To configure access privilege levels, include the permissions statement at the [edit system login class class-name] hierarchy level.

The access privileges for each login class are defined by one or more permission flags specified in the permissions statement. In addition to this, you can specify extended regular expressions with the following statements:

- **allow-commands and deny-commands**—Allow or deny access to operational mode commands only.
- **allow-configuration and deny-configuration**—Allow or deny access to a particular configuration hierarchy only.
- **allow-configuration-regexps and deny-configuration-regexps**—Allow or deny access to a particular configuration hierarchy only using strings of regular expressions.

The above statements define a user’s access privileges to individual operational mode commands, configuration statements, and hierarchies. These statements take precedence over a login class permissions bit set for a user.

**Configuration Notes**

When configuring the **allow-commands** and **deny-commands** statements with access privileges, take the following into consideration:

- You can include one **deny-commands** and one **allow-commands** statement in each login class.

- If the exact same command is configured under both **allow-commands** and **deny-commands** statements, then the allow operation takes precedence over the deny command.

For instance, with the following configuration, a user assigned to login class test is allowed to install software using the request system software add command, although the **deny-commands** statement also includes it:

```
[edit system login]
user@host# set class test permissions allow-commands "request system software add"
user@host# set class test permissions deny-commands "request system software add"
```

- If you specify a regular expression for **allow-commands** and **deny-commands** statements with two different variants of a command, the longest match is always executed.

For instance, for the following configuration, a user assigned to test login class is allowed to execute the commit synchronize command and not the commit command. This is because commit-synchronize is the longest match between commit and commit-synchronize and it is specified for **allow-commands**.

```
[edit system login class]
user@host# set class test permissions allow-commands "commit-synchronize"
user@host# set class test permissions deny-commands commit
```
Regular expressions for **allow-commands** and **deny-commands** statements can also include the **commit**, **load**, **rollback**, **save**, **status**, and **update** commands.

If the regular expression contains any spaces, operators, or wildcard characters, enclose the expression in quotation marks. Regular expressions are not case-sensitive, for example, **allow-commands** "show interfaces";

Modifiers, such as set, log, and count, are not supported within the regular expression string to be matched. If a modifier is used, then nothing is matched.

Incorrect configuration:
```
[edit system login]
user@host# set class test permission deny-commands "set protocols"
```

Correct configuration:
```
[edit system login]
user@host# set class test permission deny-commands protocols
```

Anchors are required when specifying complex regular expressions with the **allow-commands** statement.

For example:
```
[edit system login]
user@host# set class test permissions allow-commands "(^monitor) | (^ping) | (^show) | (^exit)"
```

OR
```
set class test permissions allow-commands "allow-commands = "^" (monitor | ping | show | exit)"
```

**Topology**

**Figure 2: Configuring TACACS+ Server Authentication**

Figure 2 on page 47 illustrates a simple topology, where Router R1 is a Juniper Networks device and has a TCP connection established with a TACACS+ server.

In this example, R1 is configured with three customized login classes—Class1, Class2, and Class3—for specifying access privileges with extended regular expressions using the **allow-commands** and **deny-commands** statements differently.

The purpose of each login class is as follows:

- **Class1**—Defines access privileges for the user with the **allow-commands** statement only. This login class provides operator-level user permissions, and should provide authorization for only rebooting the device.
• **Class2**—Defines access privileges for the user with the `deny-commands` statement only. This login class provides operator-level user permissions, and should deny access to `set` commands.

• **Class3**—Defines access privileges for the user with both the `allow-commands` and `deny-commands` statements. This login class provides superuser-level user permissions, and should provide authorization for accessing interfaces and viewing device information. It should also deny access to `edit` and `configure` commands.

Router R1 has three different users, User1, User2, and User3, assigned to Class1, Class2, and Class3 login classes, respectively.

### Configuration

**CLI Quick Configuration**

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the `[edit]` hierarchy level, and then enter `commit` from configuration mode.

```
set system authentication-order tacplus
set system authentication-order radius
set system authentication-order password
set system radius-server 10.209.1.66 secret "$ABC123"
set system tacplus-server 10.209.1.66
set system radius-options enhanced-accounting
set system tacplus-options enhanced-accounting
set system accounting events login
set system accounting events change-log
set system accounting events interactive-commands
set system accounting traceoptions file auditlog
set system accounting traceoptions flag all
set system accounting destination tacplus server 10.209.1.66
set system login class Class1 permissions clear
set system login class Class1 permissions network
set system login class Class1 permissions reset
set system login class Class1 permissions trace
set system login class Class1 permissions view
set system login class Class1 allow-commands "request system reboot"
set system login class Class2 permissions clear
set system login class Class2 permissions network
set system login class Class2 permissions reset
set system login class Class2 permissions trace
set system login class Class2 permissions view
set system login class Class2 deny-commands set
set system login class Class3 permissions all
set system login class Class3 allow-commands configure
set system login class Class3 deny-commands .*
set system login user User1 uid 2001
set system login user User1 class Class1
set system login user User1 authentication encrypted-password "$ABC123"
set system login user User2 uid 2002
set system login user User2 class Class2
set system login user User2 authentication encrypted-password "$ABC123"
set system login user User3 uid 2003
```
set system login user User3 class Class3
set system login user User3 authentication encrypted-password "$ABC123"
set system syslog file messages any any

Configuring Authentication Parameters for Router R1

Step-by-Step Procedure

The following example requires that you navigate various levels in the configuration hierarchy. For information about navigating the CLI, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To configure Router R1 authentication:

1. Configure the order in which authentication should take place for R1. In this example, TACACS+ server authentication is first, followed by RADIUS server authentication, and then the local password.

   [edit system]
   user@R1# set authentication-order tacplus
   user@R1# set authentication-order radius
   user@R1# set authentication-order password

2. Establish R1 connection with the TACACS+ server.

   [edit system]
   user@R1# set tacplus-server 10.209.1.66
   user@R1# set tacplus-options enhanced-accounting
   user@R1# set accounting destination tacplus server 10.209.1.66

3. Configure RADIUS server authentication parameters.

   [edit system]
   user@R1# set radius-server 10.209.1.66 secret "$ABC123"
   user@R1# set radius-options enhanced-accounting

4. Configure R1 accounting configuration parameters.

   [edit system]
   user@R1# set accounting events login
   user@R1# set accounting events change-log
   user@R1# set accounting events interactive-commands
   user@R1# set accounting traceoptions file auditlog
   user@R1# set accounting traceoptions flag all

Configuring Access Privileges with allow-commands Statement Only (Class1)

Step-by-Step Procedure

To specify regular expressions using the allow-commands statement only:

1. Configure Class1 custom login class and assign operator-level user permissions. For information on the predefined system login classes, see the Junos OS Login Classes Overview.

   [edit system login]
   user@R1# set class Class1 permissions clear
user@R1# set class Class1 permissions network
user@R1# set class Class1 permissions reset
user@R1# set class Class1 permissions trace
user@R1# set class Class1 permissions view

2. Specify the command to enable rebooting of R1 in the `allow-commands` statement.

   ```
   [edit system login]
   user@R1# set class Class1 allow-commands "request system reboot"
   ```

3. Configure the user account for the Class1 login class.

   ```
   [edit system login]
   user@R1# set user User1 uid 2001
   user@R1# set user User1 class Class1
   user@R1# set user User1 authentication encrypted-password "$ABC123"
   ```

### Configuring Access Privileges with `deny-commands` Statement Only (Class2)

#### Step-by-Step Procedure

To specify regular expressions using the `deny-commands` statement only:

1. Configure the Class2 custom login class and assign operator-level user permissions. For information on the predefined system login classes, see the *Junos OS Login Classes Overview*.

   ```
   [edit system login]
   user@R1# set class Class1 permissions clear
   user@R1# set class Class1 permissions network
   user@R1# set class Class1 permissions reset
   user@R1# set class Class1 permissions trace
   user@R1# set class Class1 permissions view
   ```

2. Disable execution of any set commands in the `deny-commands` statement.

   ```
   [edit system login]
   user@R1# set class Class1 deny-commands "set"
   ```

3. Configure the user account for the Class2 login class.

   ```
   user@R1# set login user User2 uid 2002
   user@R1# set login user User2 class Class2
   user@R1# set login user User2 authentication encrypted-password "$ABC123"
   ```
Configuring Access Privileges with Both allow-commands and deny-commands Statements (Class3)

**Step-by-Step Procedure**

To specify regular expressions using both the *allow-commands* and *deny-commands* statements:

1. Configure the Class3 custom login class and assign superuser-level user permissions. For information on the predefined system login classes, see the *Junos OS Login Classes Overview*.
   
   ```
   [edit system login]
   user@R1# set class Class3 permissions all
   ```

2. Specify the commands to enable only configure commands in the *allow-commands* statement.
   
   ```
   [edit system login]
   user@R1# set class Class3 allow-commands configure
   ```

3. Disable execution of all commands in the *deny-commands* statement.
   
   ```
   [edit system login]
   user@R1# set class Class3 deny-commands .*
   ```

4. Configure the user account for the Class1 login class.
   
   ```
   [edit system login]
   user@R1# set login user User3 uid 2003
   user@R1# set login user User3 class Class3
   user@R1# set login user User3 authentication encrypted-password "$ABC123"
   ```

**Results**

From configuration mode, confirm your configuration by entering the *show system* command. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
events [ login change-log interactive-commands ];
traceoptions {
  file auditlog;
  flag all;
}
destination {
  tacplus {
    server {
      10.209.1.66;
    }
  }
}
}

login {
  class Class1 {
    permissions [ clear network reset trace view ];
    allow-commands "request system reboot";
  }
  class Class2 {
    permissions [ clear network reset trace view ];
    deny-commands set;
  }
  class Class3 {
    permissions all;
    allow-commands configure;
    deny-commands .*;
  }
  user User1 {
    uid 2001;
    class Class1;
    authentication {
      encrypted-password "$ABC123";
    }
  }
  user User2 {
    uid 2002;
    class Class2;
    authentication {
      encrypted-password "$ABC123";
    }
  }
  user User3 {
    uid 2003;
    class Class3;
    authentication {
      encrypted-password "$ABC123";
    }
  }
}
syslog {
  file messages {
    any any;
  }
}
Verification

Log in as the username assigned with the new login class, and confirm that the configuration is working properly.

- Verifying Class1 Configuration on page 53
- Verifying Class2 Configuration on page 54
- Verifying Class3 Configuration on page 55

Verifying Class1 Configuration

Purpose

Verify that the permissions and commands allowed in the Class1 login class are working.

Action

From operational mode, run the `show system users` command.

```
User1@R1> show system users
12:39PM up 6 days, 23 mins, 6 users, load averages: 0.00, 0.01, 0.00
USER     TTY      FROM                              LOGIN@  IDLE WHAT
User1  p0       abc.example.net 12:34AM 12:04 cli
User2  p1       abc.example.net 12:36AM 12:02 -cli (cli)
User3  p2       abc.example.net 10:41AM    11 -cli (cli)
```

From operational mode, run the `request system reboot` command.

```
User1@R1> request system?
Possible completions:   Reboot the system
  reboot               Reboot the system

Meaning

The Class1 login class to which User1 is assigned has the operator-level user permissions, and is allowed to execute the `request system reboot` command.

The predefined operator login class has the following permission flags specified:

- **clear**—Can clear (delete) information learned from the network that is stored in various network databases by using the `clear` commands.
- **network**—Can access the network by using the `ping`, `ssh`, `telnet`, and `traceroute` commands.
- **reset**—Can restart software processes by using the `restart` command and can configure whether software processes are enabled or disabled at the `[edit system processes]` hierarchy level.
- **trace**—Can view trace file settings and configure trace file properties.
- **view**—Can use various commands to display current system-wide, routing table, and protocol-specific values and statistics. Cannot view the secret configuration.

For the Class1 login class, in addition to the above-mentioned user permissions, User1 can execute the `request system reboot` command. The first output displays the view
permissions as an operator, and the second output shows that the only request command that User1 can execute as an operator is the request system reboot command.

Verifying Class2 Configuration

Purpose
Verify that the permissions and commands allowed for the Class2 login class are working.

Action
From the operational mode, run the ping command.

User2@R1> ping 10.209.1.66
ping 10.209.1.66
PING 10.209.1.66 (10.209.1.66): 56 data bytes
64 bytes from 10.209.1.66: icmp_seq=0 ttl=52 time=212.521 ms
64 bytes from 10.209.1.66: icmp_seq=1 ttl=52 time=212.844 ms
64 bytes from 10.209.1.66: icmp_seq=2 ttl=52 time=211.304 ms
64 bytes from 10.209.1.66: icmp_seq=3 ttl=52 time=210.963 ms
^C
--- 10.209.1.66 ping statistics ---
4 packets transmitted, 4 packets received, 0% packet loss
round-trip min/avg/max/stddev = 210.963/211.908/212.844/0.792 ms

From the CLI prompt, check the available permissions.

User2@R1> ?
Possible completions:
clear Clear information in the system
file Perform file operations
help Provide help information
load Load information from file
monitor Show real-time debugging information
mtrace Trace multicast path from source to receiver
op Invoke an operation script
ping Ping remote target
quit Exit the management session
request Make system-level requests
restart Restart software process
save Save information to file
show Show system information
ssh Start secure shell on another host
start Start shell
telnet Telnet to another host
test Perform diagnostic debugging
traceroute Trace route to remote host

From the CLI prompt, execute any set command.

User2@R1> set
unknown command.

Meaning
The Class2 login class to which User2 is assigned has the operator-level user permissions, and is denied access to all set commands. This is displayed in the command outputs.
The permission flags specified for the predefined operator login class are the same as that of Class1.

Verifying Class3 Configuration

**Purpose**
Verify that the permissions and commands allowed for the Class3 login class are working.

**Action**
From the CLI prompt, check the available permissions.

```
User3@R1> ?
Possible completions:
    configure  Manipulate software configuration information
```

From the operational mode, enter configuration mode.

```
User3@R1> configure
Entering configuration mode
[edit]
```

**Meaning**
The Class3 login class to which User3 is assigned has the superuser (all) user permissions, but is allowed to execute the `configure` command only, and is denied access to all other operational mode commands. Because the regular expressions specified in the `allow/deny-commands` statements take precedence over the user permissions, User3 on R1 has access only to configuration mode, and is denied access to all other operational mode commands.

**Related Documentation**
- Understanding Junos OS Access Privilege Levels on page 7
- *Regular Expressions for Allowing and Denying Junos OS Operational Mode Commands, Configuration Statements, and Hierarchies*
  - Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
  - Example: Configuring User Permissions with Access Privileges for Operational Mode Commands, Configuration Statements, and Hierarchies on page 68

Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies

**Supported Platforms**
EX Series, M Series, MX Series, SRX Series, T Series, vSRX

This example shows how to configure custom login classes and assign access privileges to portions of the configuration hierarchy. This enables users of the customized login class to execute only those configuration statements and hierarchies for which access
privileges have been specified. This prevents unauthorized users from accessing device configurations that could potentially cause damage to the network.

- Requirements on page 56
- Overview and Topology on page 56
- Configuration on page 62
- Verification on page 66

Requirements

This example uses the following hardware and software components:

- One Juniper Networks device
- One TACACS+ (or RADIUS) server
- Junos OS build running on the Juniper Networks device

Before you begin:

- Establish a TCP connection between the device and the TACACS+ server. In the case of the RADIUS server, establish a UDP connection between the device and the RADIUS server.

  For information on configuring a TACACS+ server, see “Configuring TACACS+ Authentication” on page 341.

- Configure at least one user assigned to a login class on the Juniper Networks device. There can be more than one login class, each with varying permission configurations, and more than one user on the device.

Overview and Topology

Each top-level command-line interface (CLI) command and each configuration statement in Junos OS has an access privilege level associated with it. For each login class, you can explicitly deny or allow the use of operational and configuration mode commands that would otherwise be permitted or not allowed by a privilege level. Users can execute only those commands and configure and view only those statements for which they have access privileges. To configure access privilege levels, include the permissions statement at the [edit system login class class-name] hierarchy level.

The access privileges for each login class are defined by one or more permission flags specified in the permissions statement. In addition to this, you can specify extended regular expressions with the following statements:

- allow-commands and deny-commands—Allow or deny access to operational mode commands.

- allow-configuration and deny-configuration—Allow or deny access to parts of the configuration hierarchy.

  These statements perform slower matching, with more flexibility, especially in wildcard matching. However, it can take a very long time to evaluate all of the possible
statements if a great number of full-path regular expressions or wildcard expressions are configured, possibly impacting performance.

- allow-configuration-regexps and deny-configuration-regexps—Allow or deny access to a particular configuration hierarchy using strings of regular expressions. These statements are similar to allow-configuration and deny-configuration statements, except that in the allow/deny-configuration-regexps statements you can configure sets of strings in which the strings include spaces when using the first set of statements.

The above statements define a user’s access privileges to individual operational mode commands, configuration statements, and hierarchies. These statements take precedence over a login class permissions bit set for a user.

**Difference between allow/deny-configuration and allow/deny-configuration-regexps statements**

The allow-configuration and deny-configuration statements were introduced before Junos OS Release 7.4. The allow-configuration-regexps and deny-configuration-regexps statements were introduced in Junos OS Release 11.2. In Junos OS Release 11.4, the allow-configuration and deny-configuration statements were deprecated, but because these statements were useful in executing simple configurations, these statements were undeprecated in Junos OS Release 11.4R6, and starting with the 11.4R6 release, both the allow/deny-configuration and the allow/deny-configuration-regexps statements are supported.

The allow/deny-configuration-regexps statements split up the regular expression into tokens and match each piece against each part of the specified configuration's full path, whereas the allow-configuration statements match against the full string. For allow/deny-configuration-regexps statements, you configure a set of strings in which each string is a regular expression, with spaces between the terms of the string. This provides very fast matching, but with less flexibility. For specifying wildcard expressions you must set up wildcards for each token of the space-delimited string you want to match, and this makes it more tedious to use wildcard expressions for these statements.

For example:

- **Regular expression matching one token using allow-configuration-regexps**

  This example shows that options is the only matched expression against the first token of the statement.

  ```
  [edit system]
  login {
      class test {
          permissions configure;
          allow-configuration-regexps .*options;
      }
  }
  ```

  The above configuration matches the following statements:

  - set policy-**options** condition condition dynamic-db
  - set routing-**options** static route static-route next-hop next-hop
- set event-options generate-event event time-interval seconds

The above configuration does not match the following statements:

- system host-name host-options
- interfaces interface-name description options

- Regular expression matching three tokens using allow-configuration-regexps

This example shows that ssh is the only matched expression against the third token of the statement.

```
[edit system]
login {
    class test {
        permissions configure;
        allow-configuration-regexps ".*.*.*ssh";
    }
}
```

In the above example, the three tokens include .*, *, and *.ssh, respectively.

The above configuration matches the following statements:

- system host-name hostname-ssh
- system services ssh
- system services outbound-ssh

The above configuration does not match the following statement:

- interfaces interface-name description ssh

You can restrict configuration access easily using the deny-configuration statement as compared to using the deny-configuration-regexps statement. Table 7 on page 58 illustrates the use of both the deny-configuration and deny-configuration-regexps statements in different configurations to achieve the same result of restricting access to a particular configuration.

Table 7: Restricting Configuration Access Using deny-configuration and deny-configuration-regexps Statements

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>xnm-ssl</td>
<td>[edit system]</td>
<td>[edit system]</td>
<td>The following configuration statement is denied:</td>
</tr>
<tr>
<td></td>
<td>login {</td>
<td>login {</td>
<td>• system services xnm-ssl</td>
</tr>
<tr>
<td></td>
<td>class test {</td>
<td>class test {</td>
<td></td>
</tr>
<tr>
<td></td>
<td>permissions configure;</td>
<td>permissions configure;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>allow-configuration &quot;.*&quot;;</td>
<td>allow-configuration &quot;.*&quot;;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>deny-configuration &quot;.*xnm-ssl&quot;;</td>
<td>deny-configuration-regexps &quot;.<em>.</em>.*-ssl&quot;;</td>
<td></td>
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<td></td>
<td>}</td>
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<td></td>
<td>}</td>
<td>}</td>
<td></td>
</tr>
</tbody>
</table>

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Table 7: Restricting Configuration Access Using deny-configuration and deny-configuration-regexp Statements (continued)

| ssh | [edit system] login { class test { permissions configure; deny-configuration .ssh; deny-configuration-regexps .ssh; deny-configuration-regexps .*ssh; deny-configuration-regexps .*.*ssh; } } | The following configuration statements are denied: • system host-name hostname-ssh • system services ssh • system services outbound-ssh • security ssh-known-host |

Although the allow/deny-configuration statements are also useful when simple configuration is desired, the allow/deny-configuration-regexp statements provide better performance and overcome the ambiguity that existed when combining expressions set in the allow/deny-configuration statements.

NOTE: The allow/deny-configuration and allow/deny-configuration-regexp statements are mutually exclusive and cannot be configured together for a login class. At a given point in time, a login class can include either the allow/deny-configuration statement, or the allow/deny-configuration-regexp statement. If you have existing configurations using the allow/deny-configuration statements, using the same configuration options with the allow/deny-configuration-regexp statements might not produce the same results, as the search and match methods differ in the two forms of these statements.

Configuration Notes

When configuring the allow-configuration, deny-configuration, allow-configuration-regexp, and deny-configuration-regexp statements with access privileges, take the following into consideration:

- You can include one deny-configuration and one allow-configuration statement in each login class.
- The allow/deny-configuration and allow/deny-configuration-regexp statements are mutually exclusive and cannot be configured together for a login class. At a given point in time, a login class can include either the allow/deny-configuration statement, or the allow/deny-configuration-regexp statement. If you have existing configurations using the allow/deny-configuration statements, using the same configuration options with the allow/deny-configuration-regexp statements might not produce the same results, as the search and match methods differ in the two forms of these statements.
• Explicitly allowing configuration mode hierarchies or regular expressions using the allow-configuration statement adds to the regular permissions set using the permissions statement. Likewise, explicitly denying configuration mode hierarchies or regular expressions using the deny-configuration statement removes permissions for the specified configuration mode hierarchy, from the default permissions provided by the permissions statement.

For example, for the following configuration, the login class user can edit the configuration at the [edit system services] hierarchy level and issue configuration mode commands (such as commit), in addition to just entering the configuration mode using the configure command, which is the permission specified by the configure permission flag:

[edit system login]
user@host# set class test permissions configure allow-configuration "system services"

Likewise, for the following configuration, the login class user can perform all operations allowed by the all permissions flag, except issuing configuration mode commands (such as commit) or modifying the configuration at the [edit system services] hierarchy level:

[edit system login]
user@host# set class test permissions all deny-configuration "system services"

• To define access privileges to parts of the configuration hierarchy, specify the full paths in the extended regular expressions with the allow-configuration and deny-configuration statements. Use parentheses around an extended regular expression that connects two or more expressions with the pipe (|) symbol.

For example:

[edit system login]
user@host# set class test deny-configuration 

When specifying extended regular expressions using the allow/deny-commands and allow/deny-configuration statements, each expression separated by a pipe (|) symbol must be a complete standalone expression, and must be enclosed in parentheses ( ). Do not use spaces between regular expressions separated with parentheses and connected with the pipe (|) symbol.

For example:

[edit system login]
user@host# set class test allow-commands 

When specifying extended regular expressions using the allow-deny-configuration-regexps statement, each expression enclosed within quotes (") and separated by a space must be enclosed in angular brackets [ ].

For example:

[edit system login]
user@host# set class test allow-configuration-regexps [ "interfaces . * description . *" 

"interfaces . * unit . * description . *" 

"interfaces . * disable" ]
If the exact same command is configured under both `allow-configuration` and `deny-configuration` statements, then the allow operation takes precedence over the deny statement.

For instance, with the following configuration, a user assigned to login class test is allowed to access the [edit system services] configuration hierarchy, although the `deny-configuration` statement also includes it:

```
[edit system login]
user@host# set class test permissions allow-configuration "system services"
user@host# set class test permissions deny-configuration "system services"
```

For instance, if a certain command or configuration is allowed, for example, using permission `all`, then we can use the `deny-configuration` command to deny access to a particular hierarchy.

- Modifiers such as `set`, `log`, and `count` are not supported within the regular expression string to be matched. If a modifier is used, then nothing is matched.

Incorrect configuration:

```
[edit system login]
user@host# set class test permission deny-configuration "set protocols"
```

Correct configuration:

```
[edit system login]
user@host# set class test permission deny-configuration protocols
```

- You can use the `*` wildcard character when denoting regular expressions. However, it must be used as a portion of a regular expression. You cannot use `[*]` or `[.*]` alone.

- You cannot configure the `allow-configuration` statement with the `(interfaces (description (\.*))` regular expression, as this evaluates to `allow-configuration = .*` regular expression.

- You can configure as many regular expressions as needed to be allowed or denied. Regular expressions to be denied take precedence over configurations to be allowed.

**Topology**

**Figure 3: Configuring TACACS+ Server Authentication**

Figure 3 on page 61 illustrates a simple topology, where Router R1 is a Juniper Networks device and has a TCP connection established with a TACACS+ server.

In this example, R1 is configured with two customized login classes—Class1 and Class2—for specifying access privileges with extended regular expressions using the `allow-configuration`, `deny-configuration`, `allow-configuration-regexps`, and `deny-configuration-regexps` statements differently.
The purpose of the login classes is as follows:

- **Class1**—Define access privileges for the user with the `allow-configuration` and `deny-configuration` statements. This login class should provide access to configure interfaces hierarchy only, and deny all other access on the device. To do this, the user permissions should include `configure` to provide configuration access. In addition to this, the `allow-configuration` statement should allow interfaces configuration, and the `deny-configuration` statement should deny access to all other configurations. Because the allow statement takes precedence over the deny statement, the users assigned to the Class1 login class can access only the `[edit interfaces]` hierarchy level.

- **Class2**—Define access privileges for the user with the `allow-configuration-regexps` and `deny-configuration-regexps` statements. This login class provides superuser-level user permissions, and in addition, explicitly allows configuration under multiple hierarchy levels for interfaces. It also denies configuration access to the `[edit system]` and `[edit protocols]` hierarchy levels.

Router R1 has two users, User1 and User2, assigned to the Class1 and Class2 login classes, respectively.

**Configuration**

**CLI Quick Configuration**

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the `[edit]` hierarchy level, and then enter `commit` from configuration mode.

```
R1
set system authentication-order tacplus
set system authentication-order radius
set system authentication-order password
set system radius-server 10.209.1.66 secret "$ABC123"
set system tacplus-server 10.209.1.66
set system radius-options enhanced-accounting
set system tacplus-options enhanced-accounting
set system accounting events login
set system accounting events change-log
set system accounting events interactive-commands
set system accounting traceoptions file auditlog
set system accounting traceoptions flag all
set system accounting destination tacplus server 10.209.1.66
set system login class Class1 permissions configure
set system login class Class1 allow-configuration "interfaces.* unit.*"
set system login class Class1 deny-configuration .*
set system login class Class2 permissions all
set system login class Class2 allow-configuration-regexps [ "interfaces.* description.*"
  "interfaces.* unit.* description.*"
  "interfaces.* unit.* family inet address.*"
  "interfaces.* disable"
]
set system login class Class2 deny-configuration-regexps [ "system" "protocols" ]
set system login user User1 uid 2004
set system login user User1 class Class1
set system login user User1 authentication encrypted-password "$ABC123"
set system login user User2 uid 2006
set system login user User2 class Class2
```
set system login user User2 authentication encrypted-password "$ABC123"
set system syslog file messages any any

Configuring Authentication Parameters for Router R1

The following example requires that you navigate various levels in the configuration hierarchy. For information about navigating the CLI, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To configure Router R1 authentication:

1. Configure the order in which authentication should take place for R1. In this example, TACACS+ server authentication is first, followed by RADIUS server authentication, then the local password.

   [edit system]
   user@R1# set authentication-order tacplus
   user@R1# set authentication-order radius
   user@R1# set authentication-order password

2. Establish R1 connection with the TACACS+ server.

   [edit system]
   user@R1# set tacplus-server 10.209.1.66
   user@R1# set tacplus-options enhanced-accounting
   user@R1# set accounting destination tacplus server 10.209.1.66

3. Configure RADIUS server authentication parameters.

   [edit system]
   user@R1# set radius-server 10.209.1.66 secret "$ABC123"
   user@R1# set radius-options enhanced-accounting

4. Configure the R1 accounting configuration parameters.

   [edit system]
   user@R1# set accounting events login
   user@R1# set accounting events change-log
   user@R1# set accounting events interactive-commands
   user@R1# set accounting traceoptions file auditlog
   user@R1# set accounting traceoptions flag all

Configuring Access Privileges with allow-configuration and deny-configuration Statements (Class1)

To specify regular expressions using the allow-configuration and deny-configuration statements:

1. Configure the Class1 custom login class and assign configuration user permissions.

   [edit system login]
   user@R1# set class Class1 permissions configure
2. Specify the regular expression in the `allow-configuration` statement to allow configuration at the `[edit interfaces]` hierarchy level. To allow `set` commands at the `[edit interfaces]` hierarchy level, the regular expression used is `interfaces.* unit .*`.

```
[edit system login]
user@R1# set class Class1 allow-configuration "interfaces.* unit.*"
```

3. Specify the regular expression in the `deny-configuration` statement to disable all configuration access. The regular expression used to deny all configuration access is `.*`.

```
[edit system login]
user@R1# set class Class1 deny-configuration .*
```

4. Configure the user account for the Class1 login class.

```
[edit system login]
user@R1# set system login user User1 uid 2004
user@R1# set system login user User1 class Class1
user@R1# set system login user User1 authentication encrypted-password "$ABC123"
```

### Configuring Access Privileges with `allow-configuration-regexps` and `deny-configuration-regexps` Statements (Class2)

**Step-by-Step Procedure**

To specify regular expressions using the `allow-configuration-regexps` and `deny-configuration-regexps` statements:

1. Configure the Class2 custom login class and assign superuser (all) user permissions. For information on the predefined system login classes, see *Junos OS Login Classes Overview*.

```
[edit system login]
user@R1# set class Class2 permissions all
```

2. Specify the regular expression to allow access to multiple hierarchies under the `[edit interfaces]` hierarchy level.

```
[edit system login]
user@R1# set class Class2 allow-configuration-regexps [ "interfaces.* description .*" "interfaces.* unit.* description.*" "interfaces.* unit.* family inet address.*" "interfaces.* disable" ]
```

3. Specify the regular expression to deny configuration at the `[edit system]` and `[edit protocols]` hierarchy levels.

```
[edit system login]
user@R1# set class Class2 deny-configuration-regexps [ "system" "protocols" ]
```

4. Configure the user account for the Class2 login class.

```
[edit system login]
user@R1# set system login user User2 uid 2006
```
user@R1# set system login user User2 class Class2
user@R1# set system login user User2 authentication encrypted-password "$ABC123"

Results

From configuration mode, confirm your configuration by entering the `show system` command. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```bash
user@R1# show system
authentication-order [ tacplus radius password ];
radius-server {
   10.209.1.66 secret "$ABC123";
}
tacplus-server {
   10.209.1.66;
}
radius-options {
   enhanced-accounting;
}
tacplus-options {
   enhanced-accounting;
}
accounting {
   events [ login change-log interactive-commands ];
   traceoptions {
      file auditlog;
      flag all;
   }
destination {
   tacplus {
      server {
         10.209.1.66;
      }
   }
   }
}
login {
   class Class1 {
      permissions configure;
      allow-configuration "interfaces.* unit.*";
      deny-configuration .*;
   }
   class Class2 {
      permissions all;
      allow-configuration-regexps [ "interfaces.* description.*" "interfaces.* unit.* description.*" "interfaces.* unit.* family inet address.*" "interfaces.* disable" ];
      deny-configuration-regexps [ "system" "protocols" ];
   }
   user User1 {
      uid 2001;
      class Class1;
      authentication {
         encrypted-password "$ABC123";
      }
   }
   user User2 {
      uid 2002;
      class Class2;
      authentication {
         encrypted-password "$ABC123";
      }
   }
```
user User2 {
    uid 2002;
    class Class2;
    authentication {
        encrypted-password "$ABC123";
    }
}

syslog {
    file messages {
        any any;
    }
}

**Verification**

Log in as the username assigned with the new login class, and confirm that the configuration is working properly.

- Verifying Class1 Configuration on page 66
- Verifying Class2 Configuration on page 67

**Verifying Class1 Configuration**

**Purpose**  Verify that the permissions allowed in the Class1 login class are working.
Action  From the CLI prompt, check the available permissions.

User1@R1> ?
Possible completions:
clear                Clear information in the system
configure            Manipulate software configuration information
file                 Perform file operations
help                 Provide help information
load                 Load information from file
op                   Invoke an operation script
quit                 Exit the management session
request              Make system-level requests
save                 Save information to file
set                  Set CLI properties, date/time, craft interface message
start                Start shell
test                 Perform diagnostic debugging

From the configuration mode, check the available configuration permissions.

User1@R1# edit?
Possible completions:
> interfaces           Interface configuration

Meaning  User1 has configure user permissions seen in the first output, and the only configuration access allowed for User1 is at the interfaces hierarchy level. All other configuration is denied, as seen in the second output.

Verifying Class2 Configuration

Purpose  Verify that the Class2 configuration is working.

Action  From the configuration mode, access the interfaces configuration.

[edit interfaces]
User2@R1# set?
Possible completions:
  <interface-name> Interface name
  + apply-groups Groups from which to inherit configuration data
  + apply-groups-except Don't inherit configuration data from these groups
  ge-0/0/3          Interface name
  > interface-range Interface ranges configuration
  > interface-set   Logical interface set configuration
  > traceoptions    Interface trace options

From the configuration mode, access the system and protocols configuration hierarchies.

User2@R1# edit system
^ Syntax error, expecting <statement> or <identifier>.

User2@R1# edit protocols
^ Syntax error, expecting <statement> or <identifier>.
Meaning

User2 has permissions to configure interfaces of R1, but the [edit system] and [edit protocols] hierarchy levels are denied access, as seen in the output.

Related Documentation

- Understanding Junos OS Access Privilege Levels on page 7
- Regular Expressions for Allowing and Denying Junos OS Operational Mode Commands, Configuration Statements, and Hierarchies
  - Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
  - Example: Configuring User Permissions with Access Privileges for Operational Mode Commands, Configuration Statements, and Hierarchies on page 68

Example: Configuring User Permissions with Access Privileges for Operational Mode Commands, Configuration Statements, and Hierarchies

Supported Platforms

EX Series, M Series, MX Series, SRX Series, T Series, vSRX

This example shows how to configure custom login classes and assign access privileges for operational mode commands and to portions of the configuration hierarchy. This enables users of the customized login class to execute only those commands and access only those configuration statements and hierarchies for which access privileges have been specified. This prevents unauthorized users from executing sensitive commands or accessing device configurations that could potentially cause damage to the network.

- Requirements on page 68
- Overview and Topology on page 69
- Configuration on page 72
- Verification on page 75

Requirements

This example uses the following hardware and software components:

- One Juniper Networks device
- One TACACS+ (or RADIUS) server
- Junos OS build running on the Juniper Networks device

Before you begin:

- Establish a TCP connection between the device and the TACACS+ server. In the case of the RADIUS server, establish a UDP connection between the device and the RADIUS server.

For information on configuring a TACACS+ server, see “Configuring TACACS+ Authentication” on page 341.
Configure at least one user assigned to a login class on the Juniper Networks device. There can be more than one login class, each with varying permission configurations, and more than one user on the device.

Overview and Topology

Each top-level command-line interface (CLI) command and each configuration statement in Junos OS has an access privilege level associated with it. For each login class, you can explicitly deny or allow the use of operational and configuration mode commands that would otherwise be permitted or not allowed by a privilege level. Users can execute only those commands and configure and view only those statements for which they have access privileges. To configure access privilege levels, include the permissions statement at the [edit system login class class-name] hierarchy level.

The access privileges for each login class are defined by one or more permission flags specified in the permissions statement. In addition to this, you can specify extended regular expressions with the following statements:

- **allow-commands** and **deny-commands**—Allow or deny access to operational mode commands only.
- **allow-configuration** and **deny-configuration**—Allow or deny access to a particular configuration hierarchy only.
- **allow-configuration-regexps** and **deny-configuration-regexps**—Allow or deny access to a particular configuration hierarchy only using strings of regular expressions.

The above statements define a user’s access privileges to individual operational mode commands, configuration statements, and hierarchies. These statements take precedence over a login class permissions bit set for a user.

Configuration Notes

When configuring the allow-commands, deny-commands, allow-configuration, and deny-configuration statements with access privileges, take the following into consideration:

- You can include the allow/deny statement only once in each login class.

- If the exact same command is configured under both allow-commands and deny-commands statements, or both allow-configuration and deny-configuration statements, then the allow operation takes precedence over the deny statement.

For instance, with the following configuration, a user assigned to login class test is allowed to install software using the request system software add command, although the deny-commands statement also includes it:

```
[edit system login]
user@host# set class test permissions allow-commands "request system software add"
user@host# set class test permissions deny-commands "request system software add"
```
For instance, with the following configuration, a user assigned to login class test is allowed to access the [edit system services] configuration hierarchy, although the deny-configuration statement also includes it:

[edit system login]
user@host# set class test permissions allow-configuration "system services"
user@host# set class test permissions deny-configuration "system services"

• If you specify a regular expression for allow-commands and deny-commands statements with two different variants of a command, the longest match is always executed.

For instance, for the following configuration, a user assigned to test login class is allowed to execute the commit synchronize command and not the commit command. This is because commit-synchronize is the longest match between commit and commit-synchronize, and it is specified for allow-commands.

[edit system login]
user@host# set class test allow-commands "commit-synchronize"
user@host# set class test deny-commands commit

• Regular expressions for allow-commands and deny-commands statements can also include the commit, load, rollback, save, status, and update commands.

• Explicitly allowing configuration mode hierarchies or regular expressions using the allow-configuration statement adds to the regular permissions set using the permissions statement. Likewise, explicitly denying configuration mode hierarchies or regular expressions using the deny-configuration statement removes permissions for the specified configuration mode hierarchy, from the default permissions provided by the permissions statement.

For example, for the following configuration, the login class user can edit the configuration at the [edit system services] hierarchy level and issue configuration mode commands (such as commit), in addition to just entering the configuration mode using the configure command, which is the permission specified by the configure permission flag:

[edit system login]
user@host# set class test permissions configure allow-configuration "system services"

Likewise, for the following configuration, the login class user can perform all operations allowed by the all permissions flag, except issuing configuration mode commands (such as commit) or modifying the configuration at the [edit system services] hierarchy level:

[edit system login]
user@host# set class test permissions all deny-configuration "system services"

• The allow/deny-configuration and allow/deny-configuration-regexps statements are mutually exclusive and cannot be configured together for a login class. At a given point in time, a login class can include either the allow/deny-configuration statement, or the allow/deny-configuration-regexps statement. If you have existing configurations using the allow/deny-configuration statements, using the same configuration options with the allow/deny-configuration-regexps statements might not produce the same results, as the search and match methods differ in the two forms of these statements.
To define access privileges to parts of the configuration hierarchy, specify the full paths in the extended regular expressions with the **allow-configuration** and **deny-configuration** statements. Use parentheses around an extended regular expression that connects two or more expressions with the pipe (|) symbol.

For example:

```
[edit system login]
user@host# set class test deny-configuration "(system login class) | (system services)"
```

- If the regular expression contains any spaces, operators, or wildcard characters, enclose the expression in quotation marks. Regular expressions are not case-sensitive; for example, **allow-commands** "show interfaces".

- Modifiers such as set, log, and count are not supported within the regular expression string to be matched. If a modifier is used, then nothing is matched.

Incorrect configuration:

```
[edit system login]
user@host# set class test permission deny-commands "set protocols"
```

Correct configuration:

```
[edit system login]
user@host# set class test permission deny-commands protocols
```

- Anchors are required when specifying complex regular expressions with the **allow-commands** statement.

For example:

```
[edit system login]
user@host# set class test permissions allow-commands "(^monitor) | (^ping) | (^show) | (^exit)"
```

**OR**

```
set class test permissions allow-commands "allow-commands =""(^monitor | ping | show | exit)"
```

- When specifying extended regular expressions using the **allow/deny-commands** and **allow/deny-configuration** statements, each expression separated by a pipe (|) symbol must be a complete standalone expression, and must be enclosed in parentheses ( ). Do not use spaces between regular expressions separated with parentheses and connected with the pipe (|) symbol.

For example:

```
[edit system login]
user@host# set class test allow-commands "(ping .*)|(traceroute .*)|(show .*)|(configure .*)|(edit)|(exit)|(commit)|(rollback .*)"
user@host# set class test deny-configuration "(system login class)|(system services)"
```

- When specifying extended regular expressions using the **allow/deny-configuration-regexps** statement, each expression enclosed within quotes (" ") and separated by a space must be enclosed in angular brackets [ ].

For example:
[edit system login]
user@host# set class test allow-configuration-regexp [ "interfaces .* description .*"
    "interfaces .* unit .* description .*" "interfaces .* unit .* family inet address .*"
    "interfaces.* disable"
]

- You can use the * wildcard character when denoting regular expressions. However, it must
  be used as a portion of a regular expression. You cannot use [* ] or [.* ] alone.

- You cannot configure the allow-configuration statement with the (interfaces (description
  (.*?) ) regular expression, as this evaluates to allow-configuration =.* regular expression.

- You can configure as many regular expressions as needed to be allowed or denied. Regular
  expressions to be denied take precedence over configurations to be allowed.

Topology

Figure 4: Configuring TACACS+ Server Authentication

Figure 4 on page 72 illustrates a simple topology, where Router R1 is a Juniper
Networks device and has a TCP connection established with a TACACS+ server. In this example,
R1 has a customized login class, Class1, with an associated login user, User1.

The purpose of the Class1 login class is to provide security user permission with access
to only the configure command, and deny access to all other operational mode commands.
The login class again filters the configuration access to only group VPN configuration
under the [edit security] hierarchy, and denies access to the multi-chassis configuration
statement, which is allowed with the security user permissions.

User1 is the login user assigned to the Class1 login class.

Configuration

| CLI Quick Configuration | To quickly configure this example, copy the following commands, paste them into a text
|                        | file, remove any line breaks, change any details necessary to match your network
|                        | configuration, copy and paste the commands into the CLI at the [edit] hierarchy level,
| R1                     | and then enter commit from configuration mode.

```
R1  set system authentication-order tacplus
    set system authentication-order radius
    set system authentication-order password
    set system ports console log-out-on-disconnect
    set system radius-server 10.209.1.66 secret "$ABC123"
    set system tacplus-server 10.209.1.66
    set system radius-options enhanced-accounting
    set system tacplus-options enhanced-accounting
    set system accounting events login
    set system accounting events change-log
    set system accounting events interactive-commands
    set system accounting trace options file auditlog
```
set system accounting traceoptions flag all
set system accounting destination tacplus server 10.209.1.66
set system login class Class1 permissions security
set system login class Class1 allow-commands configure
set system login class Class1 deny-commands.*
set system login class Class1 allow-configuration "security group-vpn"
set system login class Class1 deny-configuration multi-chassis
set system login user User1 uid 2005
set system login user User1 class Class1
set system login user User1 authentication encrypted-password "$ABC123"

Configuring Authentication Parameters for Router R1

Step-by-Step Procedure

The following example requires that you navigate various levels in the configuration hierarchy. For information about navigating the CLI, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To configure Router R1 authentication:

1. Configure the order in which authentication should take place for R1. In this example, TACACS+ server authentication is first, followed by RADIUS server authentication, then the local password.
   
   [edit system]
   user@R1# set authentication-order tacplus
   user@R1# set authentication-order radius
   user@R1# set authentication-order password

2. Establish R1 connection with the TACACS+ server.
   
   [edit system]
   user@R1# set tacplus-server 10.209.1.66
   user@R1# set tacplus-options enhanced-accounting
   user@R1# set accounting destination tacplus server 10.209.1.66

3. Configure RADIUS server authentication parameters.
   
   [edit system]
   user@R1# set radius-server 10.209.1.66 secret "$ABC123"
   user@R1# set radius-options enhanced-accounting

4. Configure the R1 accounting configuration parameters.
   
   [edit system]
   user@R1# set accounting events login
   user@R1# set accounting events change-log
   user@R1# set accounting events interactive-commands
   user@R1# set accounting traceoptions file auditlog
   user@R1# set accounting traceoptions flag all
Configuring Access Privileges with Regular Expressions

Step-by-Step Procedure

To specify regular expressions for user permissions with access privileges:

1. Configure the Class1 custom login class and assign security user permissions.

   ```
   [edit system login]
   user@R1# set class Class1 permissions security
   ```

2. Specify the regular expression in the `allow-commands` statement to enter the configuration mode.

   ```
   [edit system login]
   user@R1# set class Class1 allow-commands configure
   ```

3. Specify the regular expression in the `deny-commands` statement to disable access to all other operational mode commands. The regular expression used to deny all access is `deny-commands.*`.

   ```
   [edit system login]
   user@R1# set class Class1 deny-commands.*
   ```

4. Specify the regular expression in the `allow-configuration` statement to allow access to the group VPN configuration at the [edit security] hierarchy level.

   ```
   [edit system login]
   user@R1# set class Class1 allow-configuration "security group-vpn"
   ```

5. Specify the regular expression in the `deny-configuration` statement to disable access to the `multi-chassis` configuration statement.

   ```
   [edit system login]
   user@R1# set class Class1 deny-configuration multi-chassis
   ```

6. Configure the user account for the Class1 login class.

   ```
   [edit system login]
   user@R1# set user User1 uid 2005
   user@R1# set user User1 class Class1
   user@R1# set user User1 authentication encrypted-password "$ABC123"
   ```

Results

From configuration mode, confirm your configuration by entering the `show system` command. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@R1# show system
authentication-order [ tacplus radius password ];
ports {
  console log-out-on-disconnect;
```
Verification

Log in as the username assigned with the new login class, and confirm that the configuration is working properly.

- Verifying Class1 Configuration on page 75

Verifying Class1 Configuration

Purpose  Verify that the permissions and regular expressions allowed in Class1 login class are working.
Action

From the CLI prompt, view the allowed user permissions.

User1@R1> ?
Possible completions:
configure Manipulate software configuration information

From the configuration mode, enter the [edit security] hierarchy and view the allowed configuration statements.

User1@R1> edit ?
Possible completions:
> group-vpn Group VPN configuration

From the configuration mode, enter the multi-chassis configuration statement.

User1@R1# edit multi-chassis
^ Syntax error, expecting <statement> or <identifier>.

Meaning

User 1 has security user permissions, which allows the user to view the security configuration in configuration mode and with the show configuration operational mode command. However, this has been altered with the allow-commands and deny-commands statements, where User1 is able to enter configuration mode with the configure command in the allow-commands statement, and is denied access to all other operational mode commands with the use of the deny-commands.* statement. As a result, even the show configuration command, which was allowed with the security user permissions, is now denied. This is displayed in the first output.

In the second output, the allow-configuration statement takes effect, and the only allowed configuration under the [edit security] hierarchy level is for group VPN.

In the last output, the deny-configuration statement takes effect, and the multi-chassis configuration statement that is allowed with the security user permissions is denied for User1.

Related Documentation

- Understanding Junos OS Access Privilege Levels on page 7
- Regular Expressions for Allowing and Denying Junos OS Operational Mode Commands, Configuration Statements, and Hierarchies
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
CHAPTER 4

Permissions Flags for User Access Privileges

- Access Privilege User Permission Flags Overview on page 78
- access on page 80
- access-control on page 83
- admin on page 84
- admin-control on page 88
- all-control on page 89
- clear on page 89
- configure on page 159
- control on page 159
- field on page 160
- firewall on page 160
- firewall-control on page 164
- floppy on page 165
- flow-tap on page 165
- flow-tap-control on page 169
- flow-tap-operation on page 169
- idp-profiler-operation on page 170
- interface on page 170
- interface-control on page 174
- maintenance on page 175
- network on page 183
- pgcp-session-mirroring on page 185
- pgcp-session-mirroring-control on page 189
- reset on page 189
- rollback on page 190
- secret on page 190
Permission flags are used to grant a user access to operational mode commands and configuration hierarchy levels and statements. By specifying a specific permission flag on the user’s login class at the [edit system login class] hierarchy level, you grant the user access to the corresponding commands and configuration hierarchy levels and statements. To grant access to all commands and configuration statements, use the all permissions flag.

For permission flags that grant access to configuration hierarchy levels and statements, the flags grant read-only privilege to that configuration. For example, the interface permissions flag grants read-only access to the [edit interfaces] hierarchy level. The -control form of the flag grants read-write access to that configuration. Using the preceding example, interface-control grants read-write access to the [edit interfaces] hierarchy level.

The permission flags listed in "Related Documentation" grant a specific set of access privileges. Each permission flag is listed with the operational mode commands and configuration hierarchy levels and statements for which that flag grants access.

NOTE: Each command listed represents that command and all subcommands with that command as a prefix. Each configuration statement listed represents the top of the configuration hierarchy to which that flag grants access.

Related Documentation
- Understanding Junos OS Access Privilege Levels on page 7
- access on page 80
- access-control on page 83
- admin on page 84
- admin-control on page 88
• all-control on page 89
• clear on page 89
• configure on page 159
• control on page 159
• field on page 160
• firewall on page 160
• firewall-control on page 164
• floppy on page 165
• flow-tap on page 165
• flow-tap-operation on page 169
• idp-profile-operation on page 170
• interface on page 170
• interface-control on page 174
• maintenance on page 175
• network on page 183
• pgcp-session-mirroring on page 185
• pgcp-session-mirroring-control on page 189
• reset on page 189
• rollback on page 190
• secret on page 190
• secret-control on page 195
• security on page 196
• security-control on page 203
• shell on page 206
• snmp on page 206
• system on page 210
• system-control on page 215
• trace on page 217
• trace-control on page 225
• view on page 230
• view-configuration on page 332
**access**

**Supported Platforms**  
EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can view the access configuration in configuration mode.

**Commands**
- clear unified-edge
clear unified-edge ggsn-pgw
- clear unified-edge ggsn-pgw aaa
  clear unified-edge ggsn-pgw aaa radius
  clear unified-edge ggsn-pgw aaa radius statistics
  <clear-mobile-gateway-aaa-radius-statistics>
- clear unified-edge ggsn-pgw aaa statistics
  <clear-mobile-gateway-aaa-aaa-statistics>
- clear unified-edge ggsn-pgw address-assignment
- clear unified-edge ggsn-pgw address-assignment pool
  <clear-mobile-gateway-sm-ippool-pool-sessions>
- clear unified-edge ggsn-pgw address-assignment statistics
  <clear-mobile-gateway-sm-ippool-statistics>
- clear unified-edge ggsn-pgw call-admission-control
- clear unified-edge ggsn-pgw call-admission-control statistics
  <clear-mobile-gateway-cac-statistics>
- clear unified-edge ggsn-pgw charging
  clear unified-edge ggsn-pgw charging cdr
  <clear-mobile-gateway-charging-clear-cdr>
- clear unified-edge ggsn-pgw charging cdr wfa
  <clear-mobile-gateway-charging-clear-cdr-wfa>
- clear unified-edge ggsn-pgw charging local-persistent-storage
  clear unified-edge ggsn-pgw charging local-persistent-storage statistics
  <clear-mobile-gateway-charging-clear-lps-stats>
- clear unified-edge ggsn-pgw charging path
  clear unified-edge ggsn-pgw charging path statistics
  <clear-mobile-gateway-charging-clear-path-stats>
- clear unified-edge ggsn-pgw charging transfer
  clear unified-edge ggsn-pgw charging transfer statistics
  <clear-mobile-gateway-charging-clear-xfer-stats>
- clear unified-edge ggsn-pgw diameter
  clear unified-edge ggsn-pgw diameter dcca-gy
  clear unified-edge ggsn-pgw diameter dcca-gy statistics
  <clear-mobile-gateway-aaa-diam-stats-gy>
- clear unified-edge ggsn-pgw diameter network-element
  clear unified-edge ggsn-pgw diameter network-element statistics
  <clear-mobile-gateway-aaa-diam-ne-statistics>
- clear unified-edge ggsn-pgw diameter pcc-gx
  clear unified-edge ggsn-pgw diameter pcc-gx statistics
  <clear-mobile-gateway-aaa-diam-stats-gx>
- clear unified-edge ggsn-pgw diameter peer
  clear unified-edge ggsn-pgw diameter peer statistics
  <clear-mobile-gateway-aaa-diam-peer-statistics>
- clear unified-edge ggsn-pgw gtp
- clear unified-edge ggsn-pgw gtp peer
  clear unified-edge ggsn-pgw gtp peer statistics
  <clear-mobile-gateway-gtp-peer-statistics>
- clear unified-edge ggsn-pgw gtp statistics
  <clear-mobile-gateway-gtp-statistics>
- clear unified-edge ggsn-pgw ip-reassemble
  clear unified-edge ggsn-pgw ip-reassemble statistics
  <clear-mobile-gateways-ip-reassemble-statistics>
- clear unified-edge ggsn-pgw statistics
clear unified-edge ggsn-pgw subscribers
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clear unified-edge ggsn-pgw subscribers bearer
clear unified-edge ggsn-pgw subscribers charging
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clear unified-edge ggsn-pgw subscribers peer
<clear-mobile-gateway-subscribers-peer>
clear unified-edge sgw
<clear-mobile-gateway-statistics>
clear unified-edge sgw call-admission-control
<clear-mobile-sgw-cac-statistics>
clear unified-edge sgw charging
clear unified-edge sgw charging cdr
<clear-mobile-gateway-sgw-charging-clear-cdr>
clear unified-edge sgw charging cdr wfa
<clear-mobile-gateway-sgw-charging-clear-cdr-wfa>
clear unified-edge sgw charging local-persistent-storage
<clear-mobile-gateway-sgw-charging-clear-lps-stats>
clear unified-edge sgw charging path
<clear-mobile-gateway-sgw-charging-clear-path-stats>
clear unified-edge sgw charging transfer
<clear-mobile-gateway-sgw-charging-clear-xfer-stats>
clear unified-edge sgw gtp
<clear-mobile-gateway-sgw-gtp-statistics>
clear unified-edge sgw gtp peer
<clear-mobile-gateway-sgw-gtp-peer-statistics>
clear unified-edge sgw gtp statistics
<clear-mobile-gateway-sgw-gtp-statistics>
clear unified-edge sgw idle-mode-buffering
<clear-mobile-gw-sgw-idle-mode-buffering-statistics>
clear unified-edge sgw ip-reassembly
<clear-mobile-gateways-sgw-ip-reassembly-statistics-sgw>
clear unified-edge sgw statistics
<clear-mobile-sgw-statistics>
clear unified-edge sgw subscribers
<clear-mobile-sgw-subscribers>
clear unified-edge sgw subscribers charging
<clear-mobile-sgw-subscribers-charging>
clear unified-edge sgw subscribers peer
<clear-mobile-sgw-subscribers-peer>
clear unified-edge tdf
clear unified-edge tdf aaa
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius
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clear unified-edge tdf aaa radius client
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius client statistics
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius network-element
<clear-radius-network-element-statistics>
clear unified-edge tdf aaa radius server
<clear-radius-server-statistics>
clear unified-edge tdf aaa radius snoop-segment
<clear-radius-snoop-segment-statistics>
clear unified-edge tdf aaa statistics
<clear-tdf-gateway-aaa-statistics>
clear unified-edge tdf address-assignment
clear unified-edge tdf address-assignment pool
<clear-mobile-gateway-tdf-sm-ippool-pool-sessions>
clear unified-edge tdf address-assignment statistics
<clear-mobile-gateway-tdf-sm-ippool-statistics>
clear unified-edge tdf call-admission-control
clear unified-edge tdf call-admission-control statistics
<clear-tdf-cac-statistics>
clear unified-edge tdf diameter
clear unified-edge tdf diameter network-element
clear unified-edge tdf diameter network-element statistics
<clear-diameter-network-element-statistics>
clear unified-edge tdf diameter pcc-gx
clear unified-edge tdf diameter pcc-gx statistics
<clear-diameter-statistics-gx>
clear unified-edge tdf diameter peer
clear unified-edge tdf diameter peer statistics
<clear-diameter-peer-statistics>
clear unified-edge tdf statistics
<clear-tdf-statistics>
clear unified-edge tdf subscribers
clear mobile tdf subscribers
<clear-mobile-gateway-tdf-subscribers-peer>
request unified-edge
tdf
request unified-edge ggsn-pgw
request unified-edge ggsn-pgw call-trace
<monitor-mobile-gateways-call-trace-start>
tdf
request unified-edge ggsn-pgw call-trace clear
<get-mobile-gateways-call-trace-clear>
tdf
request unified-edge ggsn-pgw call-trace show
<get-mobile-gateways-call-trace-information>
tdf
request unified-edge ggsn-pgw call-trace start
<get-mobile-gateways-call-trace-start-information>
tdf
request unified-edge ggsn-pgw call-trace stop
<get-mobile-gateways-call-trace-stop-information>
tdf
request unified-edge sgw
request unified-edge sgw call-trace
<get-mobile-gateways-sgw-call-trace-clear>
tdf
request unified-edge sgw call-trace clear
<get-mobile-gateways-sgw-call-trace-information>
tdf
request unified-edge sgw call-trace show
<get-mobile-gateways-sgw-call-trace-start-information>
tdf
request unified-edge sgw call-trace stop
<get-mobile-gateways-sgw-call-trace-stop-information>
tdf
request unified-edge tdf
tdf
request unified-edge tdf call-trace
tdf
request unified-edge tdf call-trace clear
<get-mobile-gateways-tdf-call-trace-clear>
tdf
request unified-edge tdf call-trace show
<get-mobile-gateways-tdf-call-trace-information>
tdf
request unified-edge tdf call-trace start
<get-mobile-gateways-tdf-call-trace-start-information>
tdf
request unified-edge tdf call-trace stop
<get-mobile-gateways-tdf-call-trace-stop-information>
Configuration Hierarchy Levels

- [edit access]
- [edit access diameter]
- [edit access ppp-options]
- [edit access radius]
- [edit dynamic-profile]
- [edit logical-systems access]
- [edit logical-systems routing-instances instance system services static-subscribers access-profile]
- [edit logical-systems routing-instances instance system services static-subscribers dynamic-profile]
- [edit logical-systems routing-instances instance system services static-subscribers group access-profile]
- [edit logical-systems routing-instances instance system services static-subscribers group dynamic-profile]
- [edit logical-systems system services static-subscribers access-profile]
- [edit logical-systems system services static-subscribers dynamic-profile]
- [edit logical-systems system services static-subscribers group access-profile]
- [edit logical-systems system services static-subscribers group dynamic-profile]
- [edit routing-instances instance system services static-subscribers access-profile]
- [edit routing-instances instance system services static-subscribers dynamic-profile]
- [edit routing-instances instance system services static-subscribers group access-profile]
- [edit routing-instances instance system services static-subscribers group dynamic-profile]
- [edit system services extensible-subscriber-services access-profile]
- [edit system services static-subscribers access-profile]
- [edit system services static-subscribers dynamic-profile]
- [edit system services static-subscribers group access-profile]
- [edit system services static-subscribers group dynamic-profile]
- [edit unified-edge]

Related Documentation

- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- access-control on page 83

access-control

Supported Platforms

EX Series, M Series, MX Series, SRX Series, T Series, vSRX

Can view access configuration information. Can edit access configuration at the [edit access], [edit logical-systems], [edit routing-instances], and [edit system services] hierarchy levels.

Configuration Hierarchy Levels

- [edit access]
[edit access ppp-options]
[edit dynamic-profile]
[edit logical-systems access]
[edit logical-systems routing-instances instance system services]
static-subscribers access-profile
[edit logical-systems routing-instances instance system services]
dynamic-profile
[edit logical-systems routing-instances instance system services]
static-subscribers group access-profile
[edit logical-systems routing-instances instance system services]
dynamic-profile
[edit logical-systems system services static-subscribers access-profile]
[edit logical-systems system services static-subscribers dynamic-profile]
[edit logical-systems system services static-subscribers group access-profile]
[edit logical-systems system services static-subscribers group dynamic-profile]
[edit routing-instances instance system services static-subscribers access-profile]
[edit routing-instances instance system services static-subscribers dynamic-profile]
[edit routing-instances instance system services static-subscribers group access-profile]
[edit routing-instances instance system services static-subscribers group dynamic-profile]
[edit system services static-subscribers access-profile]
[edit system services static-subscribers dynamic-profile]
[edit system services static-subscribers group access-profile]
[edit system services static-subscribers group dynamic-profile]

**Related Documentation**
- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- access on page 80

**admin**

**Supported Platforms**
- EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can view user account information in configuration mode.

**Commands**
clear unified-edge
clear unified-edge ggsn-pgw
clear unified-edge ggsn-pgw aaa
clear unified-edge ggsn-pgw aaa radius
clear unified-edge ggsn-pgw aaa radius statistics
<clear-mobile-gateway-aaa-radius-statistics>
clear unified-edge ggsn-pgw aaa statistics
<clear-mobile-gateway-aaa-statistics>
clear unified-edge ggsn-pgw address-assignment
clear unified-edge ggsn-pgw address-assignment pool
clear unified-edge ggsn-pgw address-assignment statistics
<clear-mobile-gateway-sm-ippool-statistics>
clear unified-edge ggsn-pgw call-admission-control statistics
<clear-mobile-gateway-cac-statistics>
clear unified-edge ggsn-pgw charging
clear unified-edge ggsn-pgw charging cdr
<clear-mobile-gateway-charging-clear-cdr>
clear unified-edge ggsn-pgw charging cdr wfa
<clear-mobile-gateway-charging-clear-cdr-wfa>
clear unified-edge ggsn-pgw charging local-persistent-storage
<clear-mobile-gateway-charging-clear-lps-stats>
clear unified-edge ggsn-pgw charging path statistics
<clear-mobile-gateway-charging-clear-path-stats>
clear unified-edge ggsn-pgw charging transfer
<clear-mobile-gateway-charging-clear-xfer-stats>
clear unified-edge ggsn-pgw diameter
clear unified-edge ggsn-pgw diameter dcca-gy
<clear-mobile-gateway-aaa-diam-stats-gy>
clear unified-edge ggsn-pgw diameter network-element
<clear-mobile-gateway-aaa-diam-ne-statistics>
clear unified-edge ggsn-pgw diameter pcc-gx
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clear unified-edge ggsn-pgw diameter peer
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clear unified-edge ggsn-pgw gtp
clear unified-edge ggsn-pgw gtp peer
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clear unified-edge ggsn-pgw gtp peer statistics
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clear unified-edge ggsn-pgw gtp statistics
<clear-mobile-gateway-gtp-statistics>
clear unified-edge ggsn-pgw ip-reassembly
clear unified-edge ggsn-pgw ip-reassembly statistics
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clear unified-edge ggsn-pgw statistics
<clear-mobile-gateway-statistics>
clear unified-edge ggsn-pgw subscribers
<clear-mobile-gateway-subscribers>
clear unified-edge ggsn-pgw subscribers bearer
clear unified-edge ggsn-pgw subscribers charging
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clear unified-edge ggsn-pgw subscribers peer
<clear-mobile-gateway-subscribers-peer>
clear unified-edge sgw
clear unified-edge sgw call-admission-control
<clear-mobile-sgw-cac-statistics>
clear unified-edge sgw charging
clear unified-edge sgw charging cdr
<clear-mobile-gateway-sgw-charging-clear-cdr>
clear unified-edge sgw charging cdr wfa
<clear-mobile-gateway-sgw-charging-clear-cdr-wfa>
clear unified-edge sgw charging local-persistent-storage
clear unified-edge sgw charging local-persistent-storage statistics
<clear-mobile-gateway-sgw-charging-clear-lps-stats>
clear unified-edge sgw charging path
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clear unified-edge sgw charging transfer
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clear unified-edge sgw gtp peer
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clear unified-edge sgw idle-mode-buffering
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clear unified-edge sgw ip-reassembly
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clear unified-edge sgw statistics
<clear-mobile-sgw-statistics>
clear unified-edge sgw subscribers
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clear unified-edge sgw subscribers charging
<clear-mobile-sgw-subscribers-charging>
clear unified-edge sgw subscribers peer
<clear-mobile-sgw-subscribers-peer>
clear unified-edge tdf
<clear-mobile-gateway-tdf-statistics>
clear unified-edge tdf aaa
<clear-mobile-gateway-tdf-aaa-statistics>
clear unified-edge tdf aaa radius
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius client
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius network-element
<clear-radius-network-element-statistics>
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clear unified-edge tdf address-assignment statistics
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request unified-edge ggsn-pgw call-trace  
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request unified-edge sgw call-trace clear  
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<get-mobile-gateways-sgw-call-trace-stop-information>
request unified-edge tdf  
request unified-edge tdf call-trace  
request unified-edge tdf call-trace clear  
<get-mobile-gateways-tdf-call-trace-clear>
request unified-edge tdf call-trace show  
<get-mobile-gateways-tdf-call-trace-information>
request unified-edge tdf call-trace start  
<get-mobile-gateways-tdf-call-trace-start-information>
request unified-edge tdf call-trace stop  
<get-mobile-gateways-tdf-call-trace-stop-information>
show system audit

Configuration
Hierarchy Levels

[edit protocols uplink-failure-detection]
[edit system]
[edit system accounting]
[edit system diag-port-authentication]
[edit system extensions]
[edit system login]
[edit system pic-console-authentication]
[edit system root-authentication]
[edit system services ssh authorized-keys-command]
[edit system services ssh authorized-keys-command-user]
[edit system services ssh ciphers]
[edit system services ssh client-alive-count-max]
[edit system services ssh client-alive-interval]]
[edit system services ssh fingerprint-hash]
[edit system services ssh hostkey-algorithm]
[edit system services ssh key-exchange]
[edit system services ssh macs]
[edit system services ssh max-sessions-per-connection]
Related Documentation

- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

admin-control

Supported Platforms  EX Series, M Series, MX Series, SRX Series, T Series, vSRX

Can view user account information and configure it at the [edit system] hierarchy level.

Commands

- show system audit

Configuration Hierarchy Levels

[edit protocols uplink-failure-detection]
[edit system]
[edit system accounting]
[edit system diag-port-authentication]
[edit system extensions]
[edit system login]
[edit system pic-console-authentication]
[edit system root-authentication]
[edit system services ssh ciphers]
[edit system services ssh hostkey-algorithm]
[edit system services ssh key-exchange]
[edit system services ssh macs]
[edit system services ssh protocol-version]
[edit system services ssh root-login]

Related Documentation

- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

- admin on page 84
**all-control**

**Supported Platforms**  EX Series, M Series, MX Series, SRX Series, T Series, vSRX

Can access all operational mode commands and configuration mode commands. Can modify configuration in all the configuration hierarchy levels.

**Commands**  All CLI commands.

**Configuration Hierarchy Levels**  All CLI configuration hierarchy levels and statements.

**Related Documentation**
- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

**clear**

**Supported Platforms**  EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can clear (delete) information learned from the network that is stored in various network databases.

**Commands**

- clear
- clear access-security
- clear access-security router-advertisement-entries
- <clear-as-router-advertisement-entry>
- clear amt
- clear amt statistics
- <clear-amt-statistics>
- clear amt tunnel
- clear-amt-tunnel
- clear amt tunnel gateway-address
- <clear amt tunnel gateway-address>
- clear amt tunnel statistics
- <clear-amt-tunnel-statistics>
- clear amt tunnel tunnel statistics
- gateway-address
- <clear-amt-tunnel-gateway-address-statistics>
- clear amt tunnel statistics tunnel interface
- <clear-amt-tunnel-interface-statistics>
- clear amt tunnel tunnel interface
- <clear-amt-tunnel-interface>
- clear ancp
- clear ancp neighbor
- <clear-ancp-neighbor-connection>
- clear ancp statistics
- <clear-ancp-statistics>
clear ancp subscriber
<clear-ancp-subscriber-connection>
clear-appqos-counter
<clear-appqos-rate-limiters-statistics>
clear-appqos-rate-limiter-statistics
clear-appqos-rule-statistics
clear arp
<clear-arp-table>
clear auto-configuration
clear auto-configuration interfaces
<clear-auto-configuration-interfaces>
clear bfd
clear bfd adaptation
<clear-bfd-adaptation-information>
clear bfd adaptation address
<clear-bfd-adaptation-address>
clear bfd adaptation discriminator
<clear-bfd-adaptation-discriminator>
clear bfd session
<clear-bfd-session-information>
clear bfd session address
<clear-bfd-session-address>
clear bfd session discriminator
<clear-bfd-session-discriminator>
clear bgp
clear bgp damping
<clear-bgp-damping>
clear bgp neighbor
<clear-bgp-neighbor>
clear bgp table
<clear-bgp-table>
clear bridge
clear bridge evpn
clear bridge evpn arp-table
<clear-bridge-evpn-arp-table>
clear bridge evpn nd-table
<clear-bridge-evpn-nd-table>
clear bridge mac-table
<clear-bridge-mac-table>
clear bridge mac-table interface
<clear-bridge-interface-mac-table>
clear bridge recovery-timeout
<clear-bridge-recovery>
clear bridge recovery-timeout interface
<clear-bridge-recovery-interface>
clear bridge satellite
clear bridge satellite logging
<clear-satellite-control-logging>
clear bridge satellite vlan-auto-sense
<clear-satellite-control-plane-vlan-auto-sense>
clear captive-portal
clear captive-portal firewall
<clear-captive-portal-firewall>
clear captive-portal firewall interface
<clear-captive-portal-firewall-interface>
clear captive-portal interface
<clear-captive-portal-interface-session>
clear captive-portal mac-address
<clear-captive-portal-mac-session>
clear cli
clear cli logical-system
clear cli-logical-system
clear database-replication
clear database-replication statistics
<clear-database-replication-statistics-information>
clear ddos-protection
<clear-ddos-protection-statistics-information>
clear ddos-protection protocols
<clear-ddos-protection-protocols-information>
clear ddos-protection protocols all-fiber-channel-enode
<clear-ddos-all-fc-enode-aggregate-flows>
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<clear-ddos-all-fc-enode-aggregate-states>
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clear ddos-protection protocols bgpv6 aggregate statistics
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clear-ddos-bgpv6-states
clear ddos-protection protocols bgpv6 aggregate
clear ddos-protection protocols bgpv6 aggregate
<clear-ddos-bgpv6-statistics>
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clear ddos-protection protocols dhcpv6 aggregate states
clear-ddos-dhcpv6-aggregate-states
clear ddos-protection protocols dhcpv6 aggregate statistics
clear-ddos-dhcpv6-aggregate-statistics
clear ddos-protection protocols dhcpv6 confirm
clear ddos-protection protocols dhcpv6 confirm culprit-flows
clear ddos-protection protocols dhcpv6 confirm states
clear-ddos-dhcpv6-confirm-states
clear ddos-protection protocols dhcpv6 confirm statistics
clear-ddos-dhcpv6-confirm-statistics
clear ddos-protection protocols dhcpv6 decline
clear ddos-protection protocols dhcpv6 decline states
clear-ddos-dhcpv6-decline-states
clear ddos-protection protocols dhcpv6 decline statistics
clear-ddos-dhcpv6-decline-statistics
clear ddos-protection protocols dhcpv6 information-request
clear ddos-protection protocols dhcpv6 information-request states
clear-ddos-dhcpv6-info-req-states
clear ddos-protection protocols dhcpv6 information-request statistics
clear-ddos-dhcpv6-info-req-statistics
clear ddos-protection protocols dhcpv6 leasequery
clear ddos-protection protocols dhcpv6 leasequery states
clear-ddos-dhcpv6-leasequery-states
clear ddos-protection protocols dhcpv6 leasequery statistics
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clear ddos-protection protocols dhcpv6 leasequery-data
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<clear-mobile-gateway-sgw-ip-reassembly-stats>
clear unified-edge sgw statistics
<clear-mobile-gateway-sgw-stats>
clear unified-edge sgw subscribers
<clear-mobile-gateway-subscribers>
clear unified-edge sgw subscribers charging
<clear-mobile-gateway-subscribers-charging>
clear unified-edge sgw subscribers peer
<clear-mobile-gateway-subscribers-peer>
clear validation
<clear-validation>
clear validation database
<clear-validation-database>
clear validation session
<clear-validation-session>
clear validation statistics
<clear-validation-statistics>
clear virtual-chassis
<clear-virtual-chassis>
clear virtual-chassis heartbeat
<clear-virtual-chassis-heartbeat-stats>
clear virtual-chassis protocol
<clear-virtual-chassis-protocol-stats>
clear virtual-chassis protocol statistics
<clear-virtual-chassis-protocol-stats>
clear virtual-chassis-port-statistics
<clear-virtual-chassis-port-stats>
clear vpls
clear vpls mac-address
<clear-vpls-mac-address>
clear vpls mac-table
<clear-vpls-mac-table>
clear vpls mac-table interface
<clear-vpls-interface-mac-table>
request interface rebalance
request pppoe
request pppoe connect
request pppoe disconnect
request security ike debug-disable
<get-disable-ike-debug>
request security ike debug-enable
<get-enable-ike-debug>
request services rpm twamp start
request services rpm twamp start client
<twamp-test-start>
request services rpm twamp stop
request services rpm twamp stop client
<twamp-test-stop>
request snmp
<request-snmp-utility-mib-clear>
<request-snmp-utility-mib-set>
clear vpls statistics
<clear-vpls-statistics>
clear vrrp
<clear-vrrp-information>
clear vrrp interface
<clear-vrrp-interface-statistics>
request mpls
request mpls lsp
request mpls lsp adjust-autobandwidth
<request-mpls-lsp-autobandwidth-adjust>
clear services inline stateful-firewall
clear services inline stateful-firewall flows
<clear-service-inline-sfw-flow-table-information>
clear services inline stateful-firewall statistics
<clear-inline-stateful-firewall-statistics>
clear services service-sets statistics drop-flow-limit
<clear-service-set-drop-flow-statistics>
clear services service-sets statistics jflow-log
<clear-service-set-jflow-log-statistics>
request services ipsec-vpn ipsec
request services ipsec-vpn ipsec switch
request services ipsec-vpn ipsec switch tunnel
request unified-edge
request unified-edge ggsn-pgw
request unified-edge ggsn-pgw call-trace
<monitor-mobile-gateways-call-trace-start>
request unified-edge ggsn-pgw call-trace clear
<get-mobile-gateways-call-trace-clear>
request unified-edge ggsn-pgw call-trace show
<get-mobile-gateways-call-trace-information>
request unified-edge ggsn-pgw call-trace start
<get-mobile-gateways-call-trace-start-information>
request unified-edge ggsn-pgw call-trace stop
<get-mobile-gateways-call-trace-stop-information>
request unified-edge sgw
request unified-edge sgw call-trace
request unified-edge sgw call-trace clear
<get-mobile-gateways-sgw-call-trace-clear>
request unified-edge sgw call-trace show
<get-mobile-gateways-sgw-call-trace-information>
request unified-edge sgw call-trace start
<get-mobile-gateways-sgw-call-trace-start-information>
request unified-edge sgw call-trace stop
<get-mobile-gateways-sgw-call-trace-stop-information>

Configuration
Hierarchy Levels
No associated CLI configuration hierarchy levels and statements.

Related Documentation
• Access Privilege User Permission Flags Overview on page 78
• Understanding Junos OS Access Privilege Levels on page 7
  • Example: Configuring User Permissions with Access Privilege Levels on page 41
  • Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
  • Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

configure

Supported Platforms EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX
Can enter configuration mode.

Commands
configure
request snmp
request-snmp-utility-mib-clear
request-snmp-utility-mib-set

Configuration
Hierarchy Levels
No associated CLI configuration hierarchy levels and statements.

Related Documentation
• Access Privilege User Permission Flags Overview on page 78
• Understanding Junos OS Access Privilege Levels on page 7
  • Example: Configuring User Permissions with Access Privilege Levels on page 41
  • Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
  • Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

control

Supported Platforms EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX
Can perform all control-level operations; can modify any configuration.

**Commands**
- request jnu
- request jnu role
- request jnu schema
- request jnu schema add
- request jnu schema delete

**Configuration Hierarchy Levels**
No associated CLI configuration hierarchy levels and statements.

**Related Documentation**
- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

**field**

**Supported Platforms**
EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can view field debug commands.

**Commands**
No associated CLI commands.

**Configuration Hierarchy Levels**
No associated CLI configuration hierarchy levels and statements.

**Related Documentation**
- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

**firewall**

**Supported Platforms**
EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can view the firewall filter configuration in configuration mode.
Commands

clear unified-edge
clear unified-edge ggsn-pgw
clear unified-edge ggsn-pgw aaa
clear unified-edge ggsn-pgw aaa radius
clear unified-edge ggsn-pgw aaa radius statistics
<clear-mobile-gateway-aaa-radius-statistics>
clear unified-edge ggsn-pgw aaa statistics
<clear-mobile-gateway-aaa-statistics>
clear unified-edge ggsn-pgw address-assignment
clear unified-edge ggsn-pgw address-assignment pool
<clear-mobile-gateway-sm-ippool-pool-sessions>
clear unified-edge ggsn-pgw address-assignment statistics
<clear-mobile-gateway-sm-ippool-statistics>
clear unified-edge ggsn-pgw call-admission-control
clear unified-edge ggsn-pgw call-admission-control statistics
<clear-mobile-gateway-cac-statistics>
clear unified-edge ggsn-pgw charging
clear unified-edge ggsn-pgw charging cdr
<clear-mobile-gateway-charging-clear-cdr>
clear unified-edge ggsn-pgw charging cdr wfa
<clear-mobile-gateway-charging-clear-cdr-wfa>
clear unified-edge ggsn-pgw charging local-persistent-storage
clear unified-edge ggsn-pgw charging local-persistent-storage statistics
<clear-mobile-gateway-charging-clear-lps-stats>
clear unified-edge ggsn-pgw charging path
clear unified-edge ggsn-pgw charging path statistics
<clear-mobile-gateway-charging-clear-path-stats>
clear unified-edge ggsn-pgw charging transfer
clear unified-edge ggsn-pgw charging transfer statistics
<clear-mobile-gateway-charging-clear-xfer-stats>
clear unified-edge ggsn-pgw diameter
clear unified-edge ggsn-pgw diameter dcca-gy
clear unified-edge ggsn-pgw diameter dcca-gy statistics
<clear-mobile-gateway-aaa-diam-stats-gy>
clear unified-edge ggsn-pgw diameter network-element
clear unified-edge ggsn-pgw diameter network-element statistics
<clear-mobile-gateway-aaa-diam-ne-statistics>
clear unified-edge ggsn-pgw diameter pcc-gx
clear unified-edge ggsn-pgw diameter pcc-gx statistics
<clear-mobile-gateway-aaa-diam-stats-gx>
clear unified-edge ggsn-pgw diameter peer
clear unified-edge ggsn-pgw diameter peer statistics
<clear-mobile-gateway-aaa-diam-peer-statistics>
clear unified-edge ggsn-pgw gtp
clear unified-edge ggsn-pgw gtp peer
<clear-mobile-gateway-gtp-peer-statistics>
clear unified-edge ggsn-pgw gtp statistics
<clear-mobile-gateway-gtp-statistics>
clear unified-edge ggsn-pgw ip-reassembly
clear unified-edge ggsn-pgw ip-reassembly statistics
<clear-mobile-gateways-ip-reassembly-statistics>
clear unified-edge ggsn-pgw statistics
<clear-mobile-gateway-statistics>
clear unified-edge ggsn-pgw subscribers
<clear-mobile-gateway-subscribers>
clear unified-edge ggsn-pgw subscribers bearer
clear unified-edge ggsn-pgw subscribers charging
<clear-mobile-gateway-subscribers-charging>
clear unified-edge ggsn-pgw subscribers peer
<clear-mobile-gateway-subscribers-peer>
clear unified-edge sgw
clear unified-edge sgw call-admission-control
clear unified-edge sgw call-admission-control statistics
<clear-mobile-sgw-cac-statistics>
clear unified-edge sgw charging
clear unified-edge sgw charging cdr
<clear-mobile-gateway-sgw-charging-clear-cdr>
clear unified-edge sgw charging cdr wfa
<clear-mobile-gateway-sgw-charging-clear-cdr-wfa>
clear unified-edge sgw charging local-persistent-storage
clear unified-edge sgw charging local-persistent-storage statistics
<clear-mobile-gateway-sgw-charging-clear-lps-stats>
clear unified-edge sgw charging path
clear unified-edge sgw charging path statistics
<clear-mobile-gateway-sgw-charging-clear-path-stats>
clear unified-edge sgw charging transfer
clear unified-edge sgw charging transfer statistics
<clear-mobile-gateway-sgw-charging-clear-xfer-stats>
clear unified-edge sgw gtp
clear unified-edge sgw gtp peer
clear unified-edge sgw gtp peer statistics
<clear-mobile-sgw-gtp-peer-statistics>
clear unified-edge sgw gtp statistics
<clear-mobile-sgw-gtp-statistics>
clear unified-edge sgw idle-mode-buffering
clear unified-edge sgw idle-mode-buffering statistics
<clear-mobile-gw-sgw-idle-mode-buffering-statistics>
clear unified-edge sgw ip-reassembly
clear unified-edge sgw ip-reassembly statistics
<clear-mobile-gateways-sgw-ip-reassembly-statistics-sgw>
clear unified-edge sgw statistics
<clear-mobile-sgw-statistics>
clear unified-edge sgw subscribers
<clear-mobile-sgw-subscribers>
clear unified-edge sgw subscribers charging
<clear-mobile-sgw-subscribers-charging>
clear unified-edge sgw subscribers peer
<clear-mobile-sgw-subscribers-peer>
clear unified-edge tdf
clear unified-edge tdf aaa
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius
<clear-radius-network-element-statistics>
clear unified-edge tdf aaa radius client
<clear-radius-network-element-statistics>
clear unified-edge tdf aaa radius client statistics
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius network-element
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius server
<clear-radius-server-statistics>
clear unified-edge tdf aaa radius server statistics
<clear-radius-server-statistics>
clear unified-edge tdf aaa radius snoop-segment
<clear-radius-snoop-segment-statistics>
clear unified-edge tdf aaa radius snoop-segment statistics
<clear-radius-snoop-segment-statistics>
clear unified-edge tdf aaa statistics
<clear-tdf-gateway-aaa-statistics>
clear unified-edge tdf address-assignment
<clear-mobile-gateway-tdf-sm-ippool-pool-sessions>
clear unified-edge tdf address-assignment pool
<clear-mobile-gateway-tdf-sm-ippool-pool-sessions>
clear unified-edge tdf address-assignment statistics
<clear-mobile-gateway-tdf-sm-ippool-statistics>
clear unified-edge tdf call-admission-control
Configuration

Hierarchy Levels

- [edit chassis satellite-management]
- [edit firewall]
- [edit dynamic-profiles firewall]
- [edit logical-systems firewall]
- [edit unified-edge]

Related Documentation

- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- firewall-control on page 164

firewall-control

Supported Platforms

EX Series, M Series, MX Series, SRX Series, T Series, vSRX

Can view and configure firewall filter information at the [edit dynamic-profiles firewall], [edit firewall], and [edit logical-systems firewall] hierarchy levels.

Commands

- show firewall
  <get-firewall-information>
- show firewall counter
  <get-firewall-counter-information>
- show firewall filter
  <get-firewall-filter-information>
- show firewall filter version
  <get-filter-version>
- show firewall log
  <get-firewall-log-information>
- show firewall prefix-action-stats
  <get-firewall-prefix-action-information>
- show policer
Configuration Hierarchy Levels

[edit dynamic-profiles firewall]
[edit firewall]
[edit logical-systems firewall]

Related Documentation

• Access Privilege User Permission Flags Overview on page 78
• Understanding Junos OS Access Privilege Levels on page 7
• Example: Configuring User Permissions with Access Privilege Levels on page 41
• Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
• Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
• firewall on page 160

floppy

Supported Platforms EX Series, M Series, MX Series, SRX Series, T Series, vSRX

Can read from and write to the removable media.

Commands No associated CLI commands.

Configuration Hierarchy Levels No associated CLI configuration hierarchy levels and statements.

Related Documentation

• Access Privilege User Permission Flags Overview on page 78
• Understanding Junos OS Access Privilege Levels on page 7
• Example: Configuring User Permissions with Access Privilege Levels on page 41
• Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
• Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

flow-tap

Supported Platforms M Series, MX Series, SRX Series, T Series, vSRX

Can view the flow-tap configuration in configuration mode.

Commands clear unified-edge
clear unified-edge ggsn-pgw
clear unified-edge ggsn-pgw aaa
clear unified-edge ggsn-pgw aaa radius
clear unified-edge ggsn-pgw aaa radius statistics
<clear-mobile-gateway-aaa-radius-statistics>
clear unified-edge ggsn-pgw aaa statistics
<clear-mobile-gateway-aaa-statistics>
clear unified-edge ggsn-pgw address-assignment
clear unified-edge ggsn-pgw address-assignment pool
<clear-mobile-gateway-sm-ippool-pool-sessions>
clear unified-edge ggsn-pgw address-assignment statistics
<clear-mobile-gateway-sm-ippool-statistics>
clear unified-edge ggsn-pgw call-admission-control
clear unified-edge ggsn-pgw call-admission-control statistics
<clear-mobile-gateway-cac-statistics>
clear unified-edge ggsn-pgw charging
clear unified-edge ggsn-pgw charging cdr
<clear-mobile-gateway-charging-clear-cdr-wfa>
clear unified-edge ggsn-pgw charging local-persistent-storage
clear unified-edge ggsn-pgw charging local-persistent-storage statistics
<clear-mobile-gateway-charging-clear-lps-stats>
clear unified-edge ggsn-pgw charging path
clear unified-edge ggsn-pgw charging path statistics
<clear-mobile-gateway-charging-clear-path-stats>
clear unified-edge ggsn-pgw charging transfer
clear unified-edge ggsn-pgw charging transfer statistics
<clear-mobile-gateway-charging-clear-xfer-stats>
clear unified-edge ggsn-pgw diameter
clear unified-edge ggsn-pgw diameter dcc-a-gy
clear unified-edge ggsn-pgw diameter dcc-a-gy statistics
<clear-mobile-gateway-aaa-diam-stats-gy>
clear unified-edge ggsn-pgw diameter network-element
clear unified-edge ggsn-pgw diameter network-element statistics
<clear-mobile-gateway-aaa-diam-ne-statistics>
clear unified-edge ggsn-pgw diameter pcc-gx
clear unified-edge ggsn-pgw diameter pcc-gx statistics
<clear-mobile-gateway-aaa-diam-stats-gx>
clear unified-edge ggsn-pgw diameter peer
clear unified-edge ggsn-pgw diameter peer statistics
<clear-mobile-gateway-aaa-diam-peer-statistics>
clear unified-edge ggsn-pgw gtp
clear unified-edge ggsn-pgw gtp peer
clear unified-edge ggsn-pgw gtp peer statistics
<clear-mobile-gateway-gtp-peer-statistics>
clear unified-edge ggsn-pgw gtp statistics
<clear-mobile-gateway-gtp-statistics>
clear unified-edge ggsn-pgw ip-reassembly
clear unified-edge ggsn-pgw ip-reassembly statistics
<clear-mobile-gateway-ip-reassembly-statistics>
clear unified-edge ggsn-pgw statistics
<clear-mobile-gateway-statistics>
clear unified-edge ggsn-pgw subscribers
<clear-mobile-gateway-subscribers>
clear unified-edge ggsn-pgw subscribers bearer
clear unified-edge ggsn-pgw subscribers charging
<clear-mobile-gateway-subscribers-charging>
clear unified-edge ggsn-pgw subscribers peer
<clear-mobile-gateway-subscribers-peer>
clear unified-edge sgw
clear unified-edge sgw call-admission-control
clear unified-edge sgw call-admission-control statistics
<clear-mobile-sgw-cac-statistics>
clear unified-edge sgw charging
clear unified-edge sgw charging cdr
<clear-mobile-gateway-sgw-charging-clear-cdr>
clear unified-edge sgw charging cdr wfa
<clear-mobile-gateway-sgw-charging-clear-cdr-wfa>
clear unified-edge sgw charging local-persistent-storage
clear unified-edge sgw charging local-persistent-storage statistics
<clear-mobile-gateway-sgw-charging-clear-lps-stats>
clear unified-edge sgw charging path
clear unified-edge sgw charging path statistics
<clear-mobile-gateway-sgw-charging-clear-path-stats>
clear unified-edge sgw charging transfer
clear unified-edge sgw charging transfer statistics
<clear-mobile-gateway-sgw-charging-clear-xfer-stats>
clear unified-edge sgw gtp
clear unified-edge sgw gtp peer
clear unified-edge sgw gtp peer statistics
<clear-mobile-sgw-gtp-peer-statistics>
clear unified-edge sgw gtp statistics
<clear-mobile-sgw-gtp-statistics>
clear unified-edge sgw idle-mode-buffering
clear unified-edge sgw idle-mode-buffering statistics
<clear-mobile-gw-sgw-idle-mode-buffering-statistics>
clear unified-edge sgw ip-reassembly
clear unified-edge sgw ip-reassembly statistics
<clear-mobile-gateways-sgw-ip-reassembly-statistics-sgw>
clear unified-edge sgw statistics
<clear-mobile-sgw-statistics>
clear unified-edge sgw subscribers
<clear-mobile-sgw-subscribers>
clear unified-edge sgw subscribers charging
<clear-mobile-sgw-subscribers-charging>
clear unified-edge sgw subscribers peer
<clear-mobile-sgw-subscribers-peer>
clear unified-edge tdf
clear unified-edge tdf aaa
clear unified-edge tdf aaa radius
clear unified-edge tdf aaa radius client
clear unified-edge tdf aaa radius client statistics
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius network-element
clear unified-edge tdf aaa radius network-element statistics
<clear-radius-network-element-statistics>
clear unified-edge tdf aaa radius server
clear unified-edge tdf aaa radius server statistics
<clear-radius-server-statistics>
clear unified-edge tdf aaa radius snoop-segment
clear unified-edge tdf aaa radius snoop-segment statistics
<clear-radius-snoop-segment-statistics>
clear unified-edge tdf aaa statistics
<clear-tdf-gateway-aaa-statistics>
clear unified-edge tdf address-assignment
clear unified-edge tdf address-assignment pool
<clear-mobile-gateway-tdf-sm-ippool-pool-sessions>
clear unified-edge tdf address-assignment statistics
<clear-mobile-gateway-tdf-sm-ippool-statistics>
clear unified-edge tdf call-admission-control
clear unified-edge tdf call-admission-control statistics
<clear-tdf-cac-statistics>
clear unified-edge tdf diameter
clear unified-edge tdf diameter network-element
clear unified-edge tdf diameter network-element statistics
<clear-diameter-network-element-statistics>
clear unified-edge tdf diameter pcc-gx
clear unified-edge tdf diameter pcc-gx statistics
<clear-diameter-statistics-gx>
clear unified-edge tdf diameter peer
<clear-diameter-peer-statistics>
clear unified-edge tdf statistics
<clear-tdf-statistics>
clear unified-edge tdf subscribers
<clear-mobile-tdf-subscribers>
clear unified-edge tdf subscribers peer
<clear-mobile-gateway-tdf-subscribers-peer>
request unified-edge
clear unified-edge ggsn-pgw
clear unified-edge ggsn-pgw call-trace
<monitor-mobile-gateways-call-trace-start>
clear unified-edge ggsn-pgw call-trace clear
<get-mobile-gateways-call-trace-clear>
clear unified-edge ggsn-pgw call-trace show
<get-mobile-gateways-call-trace-information>
clear unified-edge ggsn-pgw call-trace start
<get-mobile-gateways-call-trace-start-information>
clear unified-edge ggsn-pgw call-trace stop
<get-mobile-gateways-call-trace-stop-information>
clear unified-edge sgw
clear unified-edge sgw call-trace
clear unified-edge sgw call-trace clear
<get-mobile-gateways-sgw-call-trace-clear>
clear unified-edge sgw call-trace show
<get-mobile-gateways-sgw-call-trace-information>
clear unified-edge sgw call-trace start
<get-mobile-gateways-sgw-call-trace-start-information>
clear unified-edge sgw call-trace stop
<get-mobile-gateways-sgw-call-trace-stop-information>
clear unified-edge tdf
clear unified-edge tdf call-trace
clear unified-edge tdf call-trace clear
<get-mobile-gateways-tdf-call-trace-clear>
clear unified-edge tdf call-trace show
<get-mobile-gateways-tdf-call-trace-information>
clear unified-edge tdf call-trace start
<get-mobile-gateways-tdf-call-trace-start-information>
clear unified-edge tdf call-trace stop
<get-mobile-gateways-tdf-call-trace-stop-information>

Configuration
Hierarchy Levels
[edit services flow-tap]
[edit services radius-flow-tap]
[edit system services flow-tap-dtcp]
[edit unified-edge]

Related Documentation
• Access Privilege User Permission Flags Overview on page 78
• Understanding Junos OS Access Privilege Levels on page 7
  • Example: Configuring User Permissions with Access Privilege Levels on page 41
  • Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
  • Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
flow-tap-control

**Supported Platforms**  
M Series, MX Series, SRX Series, T Series, vSRX

Can view the flow-tap configuration in configuration mode and can configure flow-tap configuration information at the [edit services flow-tap], [edit services radius-flow-tap], and [edit system services flow-tap-dtcp] hierarchy levels.

**Commands**  
No associated CLI commands.

**Configuration Hierarchy Levels**
- [edit services flow-tap]
- [edit services radius-flow-tap]
- [edit system services flow-tap-dtcp]

**Related Documentation**
- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- flow-tap on page 165

flow-tap-operation

**Supported Platforms**  
M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can make flow-tap requests to the router.

**Commands**  
No associated CLI commands.

**Configuration Hierarchy Levels**  
No associated CLI configuration hierarchy levels and statements.

**Related Documentation**
- Access Privilege User Permission Flags Overview on page 78
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- Example: Configuring User Permissions with Access Privilege Levels on page 41
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• Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

**idp-profiler-operation**

**Supported Platforms** M Series, MX Series, SRX Series, T Series, vSRX

Can view profiler data.

**Commands** No associated CLI commands.

**CLI Configuration**

**Hierarchy Levels** No associated CLI configuration hierarchy levels and statements.

**interface**

**Supported Platforms** EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can view the interface configuration in configuration mode.

**Commands**

clear unified-edge
clear unified-edge ggsn-pgw
clear unified-edge ggsn-pgw aaa
clear unified-edge ggsn-pgw aaa radius
clear unified-edge ggsn-pgw aaa radius statistics
<cLEAR-MOBILE-GATEWAY-AAA-RADIUS-STATISTICS>
clear unified-edge ggsn-pgw aaa statistics
<cCLEAR-MOBILE-GATEWAY-AAA-STATISTICS>
clear unified-edge ggsn-pgw address-assignment
clear unified-edge ggsn-pgw address-assignment pool
<cCLEAR-MOBILE-GATEWAY-SM-IPPOOL-POOL-SESSIONS>
clear unified-edge ggsn-pgw address-assignment statistics
<cCLEAR-MOBILE-GATEWAY-SM-IPPOOL-STATISTICS>
clear unified-edge ggsn-pgw call-admission-control
clear unified-edge ggsn-pgw call-admission-control statistics
<cCLEAR-MOBILE-GATEWAY-CAC-STATISTICS>
clear unified-edge ggsn-pgw charging
clear unified-edge ggsn-pgw charging cdr
<cCLEAR-MOBILE-GATEWAY-CHARGING-CLEAR-CDR>
clear unified-edge ggsn-pgw charging cdr wfa
<cCLEAR-MOBILE-GATEWAY-CHARGING-CLEAR-CDR-WFA>
clear unified-edge ggsn-pgw charging local-persistent-storage
clear unified-edge ggsn-pgw charging local-persistent-storage statistics
<cCLEAR-MOBILE-GATEWAY-CHARGING-CLEAR-LPS-STATS>
clear unified-edge ggsn-pgw charging path
clear unified-edge ggsn-pgw charging path statistics
<cCLEAR-MOBILE-GATEWAY-CHARGING-CLEAR-PATH-STATS>
clear unified-edge ggsn-pgw charging transfer
clear unified-edge ggsn-pgw charging transfer statistics
<cCLEAR-MOBILE-GATEWAY-CHARGING-CLEAR-XFER-STATS>
clear unified-edge ggsn-pgw diameter
clear unified-edge ggsn-pgw diameter dccca-gy
clear unified-edge ggsn-pgw diameter dccca-gy statistics
<cCLEAR-MOBILE-GATEWAY-AAA-DIAM STATS-GY>
clear unified-edge ggsn-pgw diameter network-element
clear unified-edge ggsn-pgw diameter network-element statistics
<clear-mobile-gateway-aaa-diam-ne-statistics>
clear unified-edge ggsn-pgw diameter pcc-gx
<clear-mobile-gateway-aaa-diam-stats-gx>
clear unified-edge ggsn-pgw diameter peer
<clear-mobile-gateway-aaa-diam-peer-statistics>
clear unified-edge ggsn-pgw gtp
<clear-mobile-gateway-aaa-diam-peer-statistics>
clear unified-edge ggsn-pgw gtp peer
<clear-mobile-gateway-aaa-diam-peer-statistics>
clear unified-edge ggsn-pgw gtp peer statistics
<clear-mobile-gateway-gtp-peer-statistics>
clear unified-edge ggsn-pgw gtp statistics
<clear-mobile-gateway-gtp-statistics>
clear unified-edge ggsn-pgw ip-reassembly
<clear-mobile-gateways-ip-reassembly-statistics>
clear unified-edge ggsn-pgw ip-reassembly statistics
<clear-mobile-gateway-statistics>
clear unified-edge ggsn-pgw subscribers
<clear-mobile-gateway-subscribers>
clear unified-edge ggsn-pgw subscribers bearer
<clear-mobile-gateway-subscribers-charging>
clear unified-edge ggsn-pgw subscribers peer
<clear-mobile-gateway-subscribers-peer>
clear unified-edge sgw
<clear-mobile-sgw-charging-clear-cdr>
clear unified-edge sgw charging clear-cdr
<clear-mobile-gateway-sgw-charging-clear-cdr-wfa>
clear unified-edge sgw charging clear-cdr-wfa
<clear-mobile-gateway-sgw-charging-clear-lps-stats>
clear unified-edge sgw charging local-persistent-storage
<clear-mobile-gateway-sgw-charging-clear-path-stats>
clear unified-edge sgw charging path
<clear-mobile-gateway-sgw-charging-clear-xfer-stats>
clear unified-edge sgw charging transfer
<clear-mobile-gateway-sgw-charging-trans-stats>
clear unified-edge sgw gtp
<clear-mobile-gateway-sgw-gtp-peer-statistics>
clear unified-edge sgw gtp peer
<clear-mobile-gateway-sgw-gtp-peer-statistics>
clear unified-edge sgw gtp peer statistics
<clear-mobile-gateway-sgw-gtp-peer-statistics>
clear unified-edge sgw idle-mode-buffering
<clear-mobile-gateway-sgw-idle-mode-buffering-statistics>
clear unified-edge sgw ip-reassembly
<clear-mobile-gateways-ip-reassembly-statistics-sgw>
clear unified-edge sgw ip-reassembly statistics
<clear-mobile-gateway-statistics>
clear unified-edge sgw subscribers
<clear-mobile-gateway-subscribers>
clear unified-edge sgw subscribers charging
<clear-mobile-gateway-subscribers-charging>
clear unified-edge sgw subscribers peer
<clear-mobile-sgw-subscribers-peer>
clear unified-edge tdf
clear unified-edge tdf aaa
clear unified-edge tdf aaa radius
clear unified-edge tdf aaa radius client
clear unified-edge tdf aaa radius client statistics
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius network-element
clear unified-edge tdf aaa radius network-element statistics
<clear-radius-network-element-statistics>
clear unified-edge tdf aaa radius server
clear unified-edge tdf aaa radius server statistics
<clear-radius-server-statistics>
clear unified-edge tdf aaa radius snoop-segment
clear unified-edge tdf aaa radius snoop-segment statistics
<clear-radius-snoop-segment-statistics>
clear unified-edge tdf aaa statistics
<clear-tdf-gateway-aaa-statistics>
clear unified-edge tdf address-assignment
clear unified-edge tdf address-assignment pool
<clear-mobile-gateway-tdf-sm-ipool-pool-sessions>
clear unified-edge tdf address-assignment statistics
<clear-mobile-gateway-tdf-sm-ipool-statistics>
clear unified-edge tdf call-admission-control
clear unified-edge tdf call-admission-control statistics
<clear-tdf-cac-statistics>
clear unified-edge tdf diameter
clear unified-edge tdf diameter network-element
clear unified-edge tdf diameter network-element statistics
<clear-diameter-network-element-statistics>
clear unified-edge tdf diameter pcc-gx
clear unified-edge tdf diameter pcc-gx statistics
<clear-diameter-statistics-gx>
clear unified-edge tdf diameter peer
clear unified-edge tdf diameter peer statistics
<clear-diameter-peer-statistics>
clear unified-edge tdf statistics
<clear-tdf-statistics>
clear unified-edge tdf subscribers
<clear-mobile-tdf-subscribers>
clear unified-edge tdf subscribers peer
<clear-mobile-gateway-tdf-subscribers-peer>
request unified-edge
request unified-edge ggsn-pgw
request unified-edge ggsn-pgw call-trace
<monitor-mobile-gateways-call-trace-start>
request unified-edge ggsn-pgw call-trace clear
<get-mobile-gateways-call-trace-clear>
request unified-edge ggsn-pgw call-trace show
<get-mobile-gateways-call-trace-information>
request unified-edge ggsn-pgw call-trace start
<get-mobile-gateways-call-trace-start-information>
request unified-edge ggsn-pgw call-trace stop
<get-mobile-gateways-call-trace-stop-information>
request unified-edge sgw
request unified-edge sgw call-trace
request unified-edge sgw call-trace clear
<get-mobile-gateways-sgw-call-trace-clear>
request unified-edge sgw call-trace show
<get-mobile-gateways-sgw-call-trace-information>
Configuration

Hierarchy Levels

[edit accounting-options]
[edit chassis]
[edit class-of-service]
[edit class-of-service interfaces]
[edit dynamic-profiles class-of-service]
[edit dynamic-profiles class-of-service interfaces]
[edit dynamic-profiles interfaces]
[edit dynamic-profiles routing-instances instance system services dhcp-local-server]
[edit dynamic-profiles routing-instances instance system services static-subscribers group]
[edit forwarding-options]
[edit interfaces]
[edit jnx-example]
[edit logical-systems forwarding-options]
[edit logical-systems interfaces]
[edit logical-systems routing-instances instance system services dhcp-local-server]
[edit logical-systems routing-instances instance system services static-subscribers group]
[edit logical-systems system services dhcp-local-server]
[edit logical-systems system services static-subscribers group]
[edit logical-systems system services static-subscribers group]
[edit logical-systems system services static-subscribers group]
[edit logical-systems system services static-subscribers group]
[edit logical-systems system services static-subscribers group]
[edit logical-systems system services static-subscribers group]
[edit logical-systems system services static-subscribers group]
[edit system services logging]
[edit system services radius-flow-tap]
[edit system services radius-flow-tap interfaces]
[edit system services dhcp-local-server]
[edit system services static-subscribers group]
[edit unified-edge]

Related Documentation

- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- interface-control on page 174
interface-control

**Supported Platforms**  
EX Series, M Series, MX Series, SRX Series, T Series, vSRX

Can view chassis, class of service (CoS), groups, forwarding options, and interfaces configuration information. Can edit configuration at the [edit chassis], [edit class-of-service], [edit groups], [edit forwarding-options], and [edit interfaces] hierarchy levels.

**Commands**  
No associated CLI commands.

**Configuration Hierarchy Levels**

- [edit accounting-options]
- [edit chassis]
- [edit class-of-service]
- [edit class-of-service interfaces]
- [edit dynamic-profiles class-of-service]
- [edit dynamic-profiles class-of-service interfaces]
- [edit dynamic-profiles interfaces]
- [edit dynamic-profiles routing-instances instance system services dhcp-local-server]
- [edit dynamic-profiles routing-instances instance system services static-subscribers group]
- [edit forwarding-options]
- [edit interfaces]
- [edit jnx-example]
- [edit logical-systems forwarding-options]
- [edit logical-systems interfaces]
- [edit logical-systems routing-instances instance system services dhcp-local-server]
- [edit logical-systems routing-instances instance system services static-subscribers group]
- [edit logical-systems system services dhcp-local-server]
- [edit logical-systems system services static-subscribers group]
- [edit routing-instances instance system services dhcp-local-server]
- [edit routing-instances instance system services static-subscribers group]
- [edit services logging]
- [edit services radius-flow-tap]
- [edit services radius-flow-tap interfaces]
- [edit system services dhcp-local-server]
- [edit system services static-subscribers group]

**Related Documentation**

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- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- interface on page 170
maintenance

Supported Platforms  EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can perform system maintenance, including starting a local shell on the router and becoming the superuser in the shell, and can halt and reboot the router.

Commands

clear system commit synchronize-server pending-jobs
<clear-pending-commit-sync-jobs>
clear system reboot
<clear-reboot>
clear-system-services-reverse-information
file archive
<file-archive>
file change-owner
<file-change-owner>
<extract-file>
monitor traffic
request chassis afeb
request chassis beacon
<request-chassis-beacon>
request chassis cb
<request-chassis-cb>
request chassis ccg
<request-chassis-ccg>
request chassis cfeb
request chassis cfeb master
request chassis cip
request chassis fabric
request chassis fabric device
request chassis fabric guided-cabling
request chassis fabric plane
request chassis fabric upgrade-bandwidth
request chassis fabric upgrade-bandwidth fpc
request chassis fabric upgrade-bandwidth info
request chassis fan-tray
request chassis fab
<request-fab>
request chassis fpc
<request-chassis-fpc>
request chassis fpc optical-module
<request-fpc-optical-module>
request chassis fpc optical-module amplifier-chain
<request-fpc-optical-module-amplifier-chain>
request chassis fpc optical-module amplifier-chain ila
<request-fpc-optical-module-ila>
request chassis fpc optical-module amplifier-chain ila firmware-upgrade
<request-fpc-optical-module-ila-firmware-upgrade>
request chassis fpc optical-module amplifier-chain ila hard-reset
<request-fpc-optical-module-ila-hard-reset>
request chassis fpc optical-module amplifier-chain ila soft-reset
<request-fpc-optical-module-ila-soft-reset>
request chassis fpc optical-module firmware-upgrade
<request-fpc-optical-module-firmware-upgrade>
request chassis fpm
request chassis mcs
request chassis mic
request chassis optics
request chassis pcg
request chassis pic
:request-chassis-pic>
request chassis port-led
request chassis port-led start
:request-chassis-port-led-switch-on>
request chassis port-led stop
:request-chassis-port-led-switch-off>
request chassis redundancy
request chassis redundancy feb
:request-redundancy-feb>
request chassis routing-engine
:request-chassis-routing-engine>
request chassis routing-engine hard-disk-test
request chassis routing-engine master
request chassis satellite device-mode
request chassis satellite disable
:request-chassis-satellite-disable>
request chassis satellite enable
:request-chassis-satellite-enable>
request chassis satellite file-copy
:request-chassis-satellite-file-copy>
request chassis satellite install
:request-chassis-satellite-install>
request chassis satellite interface
request chassis satellite login
:request-chassis-satellite-login>
request chassis satellite reboot
:request-chassis-satellite-reboot>
request chassis satellite restart
:request-chassis-satellite-restart>
request chassis satellite restart process
request chassis satellite shell-command
:request-chassis-satellite-shell-command>
request chassis scg
request chassis sfb
request chassis sfm
request chassis sfm master
request chassis sib
:request-chassis-sib>
request chassis sib f13
request chassis sib f2s
request chassis sib optics
request chassis spmb
:request-chassis-spmb>
request chassis ssb
request chassis ssb master
request chassis synchronization
request chassis synchronization force
request chassis synchronization force automatic-switching
request chassis synchronization force mark-failed
request chassis synchronization force unmark-failed
request chassis synchronization switch
request chassis tfeb
request chassis vcpu
request chassis vnpu
request diagnostics
request diagnostics tdr
request diagnostics tdr abort
request diagnostics tdr abort interface
<abort-tdr-interface-diagnostics>
request diagnostics tdr start
request diagnostics tdr start interface
<request-tdr-interface-diagnostics>
request extension-service
request extension-service start
<extension-service-start>
request extension-service stop
<extension-service-stop>
request 12circuit-switchover
request mpls
request mpls lsp
request mpls lsp adjust-autobandwidth
<request-mpls-lsp-autobandwidth-adjust>
request security
request security certificate
request security certificate enroll
request security datapath-debug
request security datapath-debug action-profile
request security datapath-debug action-profile reload-all
<reload-eedebug-action-profile>
request security idp
<request-idp-security-policy-load>
request security idp security-package
request security idp security-package download
<request-idp-security-package-download>
request security idp security-package download version
<request-idp-security-package-download-version>
request security idp security-package install
<request-idp-security-package-install>
request security idp security-package offline-download
<request-idp-security-package-offline-download>
request security idp ssl-inspection
request security idp ssl-inspection key
request security idp ssl-inspection key add
<request-idp-ssl-key-add>
request security idp ssl-inspection key delete
<request-idp-ssl-key-delete>
request security idp storage-cleanup
<request-idp-storage-cleanup>
request security ike
request security key-pair
request security pki
request security pki ca-certificate
request security pki ca-certificate ca-profile-group
request security pki ca-certificate ca-profile-group load
request security pki ca-certificate enroll
request security pki local-certificate export
request security pki ca-certificate load
<load-pki-ca-certificate>
request security pki ca-certificate verify
<verify-pki-ca-certificate>
request security pki crl
request security pki crl load
  <load-pki-crl>
request security pki generate-certificate-request
  <generate-pki-certificate-request>
request security pki generate-key-pair
  <generate-pki-key-pair>
request security pki local-certificate
request security pki local-certificate enroll
request security pki local-certificate generate-self-signed
  <generate-pki-self-signed-local-certificate>
request security pki local-certificate load
  <load-pki-local-certificate>
request security pki local-certificate verify
  <verify-pki-local-certificate>
request security pki verify-integrity-status
  <verify-integrity-status>
request services fips
request services fips authorize
request services fips authorize pic
request services fips zeroize
request services fips zeroize pic
request services flow-collector
request services flow-collector change-destination
  <request-services-flow-collector-destination>
request services ggsn
request services ggsn pdp
request services ggsn pdp terminate
request services ggsn pdp terminate apn
  <request-ggsn-terminate-contexts-apn>
request services ggsn pdp terminate context
  <request-ggsn-terminate-context>
request services ggsn pdp terminate context msisdn
  <request-ggsn-terminate-msisdn-context>
request services ggsn restart
request services ggsn restart interface
  <request-ggsn-restart-interface>
request services ggsn restart node
  <request-ggsn-restart-node>
request services ggsn start
request services ggsn start interface
request services ggsn stop
request services ggsn stop interface
  <request-ggsn-stop-interface>
request services ggsn stop node
  <request-ggsn-stop-node>
request services ggsn trace
request services ggsn trace software
request services ggsn trace software update
  <request-ggsn-software-update>
request services ggsn trace start
request services ggsn trace start imsi
  <request-ggsn-start-imsi-trace>

request services ggsn trace start msisdn
  <request-ggsn-start-msisdn-trace>

request services ggsn trace stop
request services ggsn trace stop all
  <request-ggsn-stop-trace-activity>

request services ggsn trace stop imsi
  <request-ggsn-stop-imsi-trace>

request services ggsn trace stop msisdn
  <request-ggsn-stop-msisdn-trace>

request support
request support information
request system
request system boot-media
  <request-boot-media>
request system certificate
request system certificate add
request system commit
request system commit server
request system commit server pause
  <request-commit-server-pause>
request system commit server queue
request system commit server queue cleanup
  <request-commit-server-cleanup>
request system commit server start
  <request-commit-server-start>
request system configuration
request system configuration rescue
request system configuration rescue delete
  <request-delete-rescue-configuration>

request system configuration rescue save
  <request-save-rescue-configuration>
request system decrypt
  <security-decrypt-password>
request system diagnostics
request system diagnostics log-archive
  <request-log>
request system diagnostics transfer-control
  <transfer-control>
request system firmware
request system firmware downgrade
request system firmware downgrade cb
  <request-fpc-fpga-upgrade>
request system firmware downgrade cb i2c
  <request-i2c-fpga-upgrade>
request system firmware downgrade feb
request system firmware downgrade fpc
request system firmware downgrade pic
request system firmware downgrade poe
request system firmware downgrade re
request system firmware downgrade scb
request system firmware downgrade sfm
request system firmware downgrade spmb
request system firmware downgrade ssb
request system firmware downgrade vcpu
request system firmware upgrade
request system firmware upgrade cb i2c
<request-i2c-fpga-upgrade>
request system firmware upgrade feb
request system firmware upgrade fpc
request system firmware upgrade fpga
request system firmware upgrade fpga cb
<request-cb-fpga-upgrade>
request system firmware upgrade fpga fpc
request system firmware upgrade fpga fpd
<request-fpd-fpga-upgrade>
request system firmware upgrade fpga ftc
<request-ftc-fpga-upgrade>
request system firmware upgrade fpga re
<request-re-fpga-upgrade>
request system firmware upgrade fpga scb
<request-scb-fpga-upgrade>
request system firmware upgrade fpga sib
<request-sib-fpga-upgrade>
request system firmware upgrade pic
request system firmware upgrade poe
request system firmware upgrade re
request system firmware upgrade re bios
request system firmware upgrade scb
request system firmware upgrade sfm
request system firmware upgrade spmb
request system firmware upgrade ssb
request system firmware upgrade vcpu
request system halt
<request-halt>
request system keep-alive
request system license
request system license add
request system license delete
<request-license-delete>
request system license revoke-licenses
<license-revoke-licenses>
request system license save
request system license update
<request-license-update>
request system logout
request system logs
<request-system-logs-copy>
request system partition
request system partition abort
request system partition compact-flash
request system partition hard-disk
request system power-off
<request-power-off>
request system power-on
<request-power-on-other-re>
request system process
request system process terminate
<request-process-terminate>
request system reboot
<request-reboot>
request system recover

request system scripts
request system scripts add
  <request-scripts-package-add>

request system scripts convert
request system scripts convert slax-to-xslt
request system scripts convert xslt-to-slax
request system scripts delete
  <request-scripts-package-delete>

request system scripts event-scripts
request system scripts event-scripts reload
  <reload-event-scripts>

request system scripts refresh-from
  <request-script-refresh-from>

request system scripts rollback
  <request-scripts-package-rollback>

request system scripts synchronize
  <request-scripts-synchronize>

request system snapshot
  <request-snapshot>

request system software
request system software abort
request system software abort in-service-upgrade
  <abort-in-service-upgrade>

request system software add
  <request-package-add>

request system software delete
  <request-package-delete>

request system software delete-backup
  <request-package-delete-backup>

request system software in-service-upgrade
  <request-package-in-service-upgrade>

request system software nonstop-upgrade
  <request-package-nonstop-upgrade>
request system software recovery-package
request system software recovery-package add
request system software recovery-package delete
request system software recovery-package extract
request system software recovery-package extract ex-8200-package
request system software recovery-package extract ex-xre200-package
request system software rollback
  <request-package-rollback>

request system software validate
  <request-package-validate>
request system software validate in-service-upgrade
  <check-in-service-upgrade>
request system storage
request system storage cleanup
  <request-system-storage-cleanup>
request system storage cleanup qfabric
  <remove-qfabric-repository-contents>
request system storage mount
  <request-mount>
request system storage unified-edge
request system storage unified-edge charging
request system storage unified-edge charging media
request system storage unified-edge media
request system storage unified-edge media eject
request system storage unified-edge media prepare
request system storage unmount
  <request-unmount>
request system subscriber-management
request system subscriber-management new-sessions-disable
  <request-sm-new-sessions-disable>
request system subscriber-management new-sessions-enable
  <request-sm-new-sessions-enable>
request system yang enable
  <request-yang-enable>
request system yang update
  <request-yang-update>
request system yang validate
  <request-yang-validate>
request system zeroize
request vmhost
request vmhost cleanup
  <request-vmhost-file-cleanup>
request vmhost file-copy
  <request-vmhost-file-copy>
request vmhost halt
  <request-vmhost-halt>
request vmhost hard-disk-test
  <request-vmhost-hard-disk-test>
request vmhost power-off
  <request-vmhost-poweroff>
request vmhost power-on
  <request-vmhost-power-on-other-re>
request vmhost reboot
  <request-vmhost-reboot>
request vmhost snapshot
  <request-vmhost-snapshot>
request vmhost snapshot partition
  <request-vmhost-snapshot-partition>
request vmhost snapshot recovery
  <request-vmhost-snapshot-recovery>
request vmhost snapshot recovery partition
  <request-vmhost-snapshot-recovery-partition>
request vmhost software
request vmhost software abort
request vmhost software abort in-service-upgrade
  <abort-in-service-upgrade>
request vmhost software add
  <request-vmhost-package-add>
request vmhost software in-service-upgrade
  <request-vmhost-package-in-service-upgrade>
request vmhost software rollback
  <request-package-rollback>
request vmhost zeroize
<request-vmhost-zeroize>
request vpls-switchover
set date
set date ntp
show chassis usb
show chassis usb storage
<get-usb-storage-status>
show services fips
show system configuration database
show system configuration database usage
<get-database-usage>
start shell
start shell user
test access
test access profile
<get-radius-profile-access-test-result>
test access radius-server
<get-radius-server-access-test-result>
get-test-services-l2tp-tunnel-result

Configuration
Hierarchy Levels
[edit event-options]
[edit security ipsec internal]
[edit security ipsec trusted-channel]
[edit services dynamic-flow-capture traceoptions]
[edit services ggsn]
[edit system fips]
[edit services ggsn rule-space]
[edit system processes daemon-process command]
[edit system scripts]
[edit system scripts commit]
[edit system scripts op]
[edit system scripts snmp]

Related Documentation
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network

Supported Platforms
EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can access the network by using the ping, ssh, telnet, and traceroute commands.

Commands
mtrace
mtrace from-source
mtrace monitor
mtrace to-gateway
ping
  <ping>

  ping atm
  ping clns
  ping ethernet
    <request-ping-ethernet>
  ping fibre-channel
  ping mpls
  ping mpls bgp
    <request-ping-bgp-lsp>
  ping mpls 12circuit
    <request-ping-l2circuit-interface>
  ping mpls 12circuit virtual-circuit
    <request-ping-l2circuit-virtual-circuit>

  ping mpls 12vpn
  ping mpls 12vpn fec129
  ping mpls 12vpn fec129 interface
    <request-ping-12vpn-fec129-interface>
  ping mpls 12vpn instance
    <request-ping-12vpn-instance>

  ping mpls 12vpn interface
    <request-ping-l2vpn-interface>

  ping mpls 13vpn
    <request-ping-13vpn>

  ping mpls 1dp
    <request-ping-1dp-lsp>

  ping mpls 1dp p2mp
    <request-ping-1dp-p2mp-lsp>

  ping mpls lsp-end-point
    <request-ping-lsp-end-point>

  ping mpls rsvp
    <request-ping-rsvp-lsp>

  ping overlay
    <request-ping-overlay>

  ping vpls

  ping vpls instance
    <request-ping-vpls-instance>

  request routing-engine
  request routing-engine login
    <request-routing-engine-login>
  request routing-engine login other-routing-engine
    <request-login-to-other-routing-engine>
  request services flow-collector
  request services flow-collector test-file-transfer
    <request-services-flow-collector-test-file-transfer>

  show host
show interfaces level-extra descriptions
show multicast mrinfo
ssh
telnet
traceroute
  <traceroute>
traceroute clns
traceroute ethernet
  <request-traceroute-ethernet>
traceroute monitor
traceroute mpls
traceroute mpls l2vpn
  <traceroute-mpls-l2vpn>
traceroute mpls l2vpn fec129
  <traceroute-mpls-mspw>
traceroute mpls ldp
  <traceroute-mpls-ldp>
traceroute mpls rsvp
  <traceroute-mpls-rsvp>
traceroute overlay
  <request-traceroute-overlay>

Configuration
Hierarch Levels

No associated CLI configuration hierarchy levels and statements.

Related Documentation

- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
  - Example: Configuring User Permissions with Access Privilege Levels on page 41
  - Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
  - Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

pgcp-session-mirroring

Supported Platforms  M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can view session mirroring configuration by using the pgcp command.

Commands

  clear unified-edge
  clear unified-edge ggsn-pgw
  clear unified-edge ggsn-pgw aaa
  clear unified-edge ggsn-pgw aaa radius
  clear unified-edge ggsn-pgw aaa radius statistics
  <clear-mobile-gateway-aaa-radius-statistics>
  clear unified-edge ggsn-pgw aaa statistics
  <clear-mobile-gateway-aaa-statistics>
  clear unified-edge ggsn-pgw address-assignment
  clear unified-edge ggsn-pgw address-assignment pool
  <clear-mobile-gateway-sm-ippool-pool-sessions>
  clear unified-edge ggsn-pgw address-assignment statistics
clear unified-edge ggsn-pgw call-admission-control
clear unified-edge ggsn-pgw call-admission-control statistics
<clear-mobile-gateway-cac-statistics>
clear unified-edge ggsn-pgw charging
clear unified-edge ggsn-pgw charging cdr
<clear-mobile-gateway-charging-clear-cdr>
clear unified-edge ggsn-pgw charging cdr wfa
<clear-mobile-gateway-charging-clear-cdr-wfa>
clear unified-edge ggsn-pgw charging local-persistent-storage
clear unified-edge ggsn-pgw charging local-persistent-storage statistics
<clear-mobile-gateway-charging-clear-lps-stats>
clear unified-edge ggsn-pgw charging path
clear unified-edge ggsn-pgw charging path statistics
<clear-mobile-gateway-charging-clear-path-stats>
clear unified-edge ggsn-pgw charging transfer
clear unified-edge ggsn-pgw charging transfer statistics
<clear-mobile-gateway-charging-clear-xfer-stats>
clear unified-edge ggsn-pgw diameter
clear unified-edge ggsn-pgw diameter dcc-ag
clear unified-edge ggsn-pgw diameter dcc-ag statistics
<clear-mobile-gateway-aaa-diam-stats-ag>
clear unified-edge ggsn-pgw diameter network-element
clear unified-edge ggsn-pgw diameter network-element statistics
<clear-mobile-gateway-aaa-diam-ne-statistics>
clear unified-edge ggsn-pgw diameter pcc-ag
clear unified-edge ggsn-pgw diameter pcc-ag statistics
<clear-mobile-gateway-aaa-diam-stats-ag>
clear unified-edge ggsn-pgw diameter peer
clear unified-edge ggsn-pgw diameter peer statistics
<clear-mobile-gateway-aaa-diam-peer-statistics>
clear unified-edge ggsn-pgw gtp
clear unified-edge ggsn-pgw gtp peer
clear unified-edge ggsn-pgw gtp peer statistics
<clear-mobile-gateway-gtp-peer-statistics>
clear unified-edge ggsn-pgw gtp statistics
<clear-mobile-gateway-gtp-statistics>
clear unified-edge ggsn-pgw ip-reassembly
clear unified-edge ggsn-pgw ip-reassembly statistics
<clear-mobile-gateway-gtp-reassembly-statistics>
clear unified-edge ggsn-pgw statistics
<clear-mobile-gateway-statistics>
clear unified-edge ggsn-pgw subscribers
<clear-mobile-gateway-subscribers>
clear unified-edge ggsn-pgw subscribers bearer
clear unified-edge ggsn-pgw subscribers charging
<clear-mobile-gateway-subscribers-charging>
clear unified-edge ggsn-pgw subscribers peer
<clear-mobile-gateway-subscribers-peer>
clear unified-edge sgw
clear unified-edge sgw call-admission-control
clear unified-edge sgw call-admission-control statistics
<clear-mobile-sgw-cac-statistics>
clear unified-edge sgw charging
clear unified-edge sgw charging cdr
<clear-mobile-gateway-sgw-charging-clear-cdr>
clear unified-edge sgw charging cdr wfa
<clear-mobile-gateway-sgw-charging-clear-cdr-wfa>
clear unified-edge sgw charging local-persistent-storage
clear unified-edge sgw charging local-persistent-storage statistics
<clear-mobile-gateway-sgw-charging-clear-lps-stats>
clear unified-edge sgw charging path
<clear-mobile-gateway-sgw-charging-clear-path-stats>
clear unified-edge sgw charging transfer
<clear-mobile-gateway-sgw-charging-clear-xfer-stats>
clear unified-edge sgw gtp
<clear-mobile-gw-sgw-gtp-peer-statistics>
clear unified-edge sgw gtp peer
<clear-mobile-gw-sgw-gtp-peer-statistics>
clear unified-edge sgw gtp statistics
<clear-mobile-gw-sgw-gtp-statistics>
clear unified-edge sgw idle-mode-buffering
<clear-mobile-gw-sgw-idle-mode-buffering-statistics>
clear unified-edge sgw ip-reassembly
<clear-mobile-gateway-sgw-ip-reassembly-statistics-sgw>
clear unified-edge sgw statistics
<clear-mobile-sgw-statistics>
clear unified-edge sgw subscribers
<clear-mobile-sgw-subscribers>
clear unified-edge sgw subscribers charging
<clear-mobile-sgw-subscribers-charging>
clear unified-edge sgw subscribers peer
<clear-mobile-sgw-subscribers-peer>
clear unified-edge tdf
<clear-tdf-gateway-aaa-statistics>
clear unified-edge tdf aaa
<clear-tdf-gateway-aaa-statistics>
clear unified-edge tdf aaa radius
<clear-tdf-gateway-aaa-statistics>
clear unified-edge tdf aaa radius client
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius network-element
<clear-radius-network-element-statistics>
clear unified-edge tdf aaa radius server
<clear-radius-server-statistics>
clear unified-edge tdf aaa radius server statistics
<clear-radius-server-statistics>
clear unified-edge tdf aaa radius snoop-segment
<clear-radius-snoop-segment-statistics>
clear unified-edge tdf address-assignment
<clear-mobile-gateway-tdf-sm-ippool-pool-sessions>
clear unified-edge tdf address-assignment statistics
<clear-mobile-gateway-tdf-sm-ippool-statistics>
clear unified-edge tdf call-admission-control
<clear-tdf-cac-statistics>
clear unified-edge tdf call-admission-control statistics
<clear-tdf-cac-statistics>
clear unified-edge tdf diameter
<clear-diameter-statistics-gx>
clear unified-edge tdf diameter peer
<clear-diameter-peer-statistics>
clear unified-edge tdf statistics
<c>clear-tdf-statistics>
clear unified-edge tdf subscribers
<c>clear-mobile-tdf-subscribers>
clear unified-edge tdf subscribers peer
<c>clear-mobile-gateway-tdf-subscribers-peer>
request unified-edge
request unified-edge ggsn-pgw
request unified-edge ggsn-pgw call-trace
<monitor-mobile-gateways-call-trace-start>
request unified-edge ggsn-pgw call-trace clear
<get-mobile-gateways-call-trace-clear>
request unified-edge ggsn-pgw call-trace show
<get-mobile-gateways-call-trace-information>
request unified-edge ggsn-pgw call-trace start
<get-mobile-gateways-call-trace-start-information>
request unified-edge ggsn-pgw call-trace stop
<get-mobile-gateways-call-trace-stop-information>
request unified-edge sgw
request unified-edge sgw call-trace
request unified-edge sgw call-trace clear
<get-mobile-gateways-sgw-call-trace-clear>
request unified-edge sgw call-trace show
<get-mobile-gateways-sgw-call-trace-information>
request unified-edge sgw call-trace start
<get-mobile-gateways-sgw-call-trace-start-information>
request unified-edge sgw call-trace stop
<get-mobile-gateways-sgw-call-trace-stop-information>
request unified-edge tdf
request unified-edge tdf call-trace
request unified-edge tdf call-trace clear
<get-mobile-gateways-tdf-call-trace-clear>
request unified-edge tdf call-trace show
<get-mobile-gateways-tdf-call-trace-information>
request unified-edge tdf call-trace start
<get-mobile-gateways-tdf-call-trace-start-information>
request unified-edge tdf call-trace stop
<get-mobile-gateways-tdf-call-trace-stop-information>
show services pgcp gates gate-way display session-mirroring

Configuration
Hierarchy Levels
[edit services pgcp gateway session-mirroring]
[edit services pgcp session-mirroring]
[edit unified-edge]

Related Documentation
• Access Privilege User Permission Flags Overview on page 78
• Understanding Junos OS Access Privilege Levels on page 7
• Example: Configuring User Permissions with Access Privilege Levels on page 41
• Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
• Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
• pgcp-session-mirroring-control on page 189
pgcp-session-mirroring-control

**Supported Platforms**  
M Series, MX Series, SRX Series, T Series, vSRX

Can modify PGCP session mirroring configuration

**Commands**  
show services pgcp gates gate-way display session-mirroring

**Configuration Hierarchy Levels**

- [edit services pgcp gateway session-mirroring]
- [edit services pgcp session-mirroring]

**Related Documentation**
- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- pgcp-session-mirroring on page 185

reset

**Supported Platforms**  
EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can restart software processes by using the *restart* command and can configure whether software processes configured at the [edit system processes] hierarchy level are enabled or disabled.

**Commands**

- request chassis cfdb master switch
- request chassis cfdb master switch no-confirm
- request chassis routing-engine master acquire
- request chassis routing-engine master acquire force
- request chassis routing-engine master acquire force no-confirm
- request chassis routing-engine master acquire no-confirm
- request chassis routing-engine master release
- request chassis routing-engine master release no-confirm
- request chassis routing-engine master switch
- request chassis routing-engine master switch no-confirm
- request chassis satellite install no-confirm
- request chassis sfm master switch
- request chassis sfm master switch no-confirm
- request chassis ssb master switch
- request chassis ssb master switch no-confirm
- restart
- restart kernel-replication
  - <restart-kernel-replication>
- restart named-service
- restart routing
  - <routing-restart>
restart services
restart services border-signaling-gateway
<restart-border-signaling-gateway-service>
restart services pgcp
<restart-pgcp-service>
restart web-management
<restart-web-management>

Configuration Hierarchy Levels
No associated CLI configuration hierarchy levels and statements.

Related Documentation
- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
  - Example: Configuring User Permissions with Access Privilege Levels on page 41
  - Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
  - Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

rollback

Supported Platforms
EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can roll back to previous configurations.

Commands
rollback

Configuration Hierarchy Levels
[edit]

Related Documentation
- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
  - Example: Configuring User Permissions with Access Privilege Levels on page 41
  - Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
  - Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

secret

Supported Platforms
EX Series, M Series, MX Series, SRX Series, T Series, vSRX

Can view passwords and other authentication keys in the configuration.
Commands

No associated CLI commands.

clear unified-edge
clear unified-edge ggsn-pgw
clear unified-edge ggsn-pgw aaa
clear unified-edge ggsn-pgw aaa radius
clear unified-edge ggsn-pgw aaa radius statistics
<clear-mobile-gateway-aaa-radius-statistics>
clear unified-edge ggsn-pgw aaa statistics
<clear-mobile-gateway-aaa-statistics>
clear unified-edge ggsn-pgw address-assignment
clear unified-edge ggsn-pgw address-assignment pool
<clear-mobile-gateway-sm-ippool-pool-sessions>
clear unified-edge ggsn-pgw address-assignment statistics
<clear-mobile-gateway-sm-ippool-statistics>
clear unified-edge ggsn-pgw call-admission-control
clear unified-edge ggsn-pgw call-admission-control statistics
<clear-mobile-gateway-cac-statistics>
clear unified-edge ggsn-pgw charging
clear unified-edge ggsn-pgw charging cdr
<clear-mobile-gateway-charging-clear-cdr>
clear unified-edge ggsn-pgw charging cdr wfa
<clear-mobile-gateway-charging-clear-cdr-wfa>
clear unified-edge ggsn-pgw charging local-persistent-storage
clear unified-edge ggsn-pgw charging local-persistent-storage statistics
<clear-mobile-gateway-charging-clear-lps-stats>
clear unified-edge ggsn-pgw charging path
clear unified-edge ggsn-pgw charging path statistics
<clear-mobile-gateway-charging-clear-path-stats>
clear unified-edge ggsn-pgw charging transfer
clear unified-edge ggsn-pgw charging transfer statistics
<clear-mobile-gateway-charging-clear-xfer-stats>
clear unified-edge ggsn-pgw diameter
clear unified-edge ggsn-pgw diameter dcca-gy
<clear-mobile-gateway-aaa-diam-stats-gy>
clear unified-edge ggsn-pgw diameter dcca-gy statistics
<clear-mobile-gateway-aaa-diam-stats-gy-statistics>
clear unified-edge ggsn-pgw diameter network-element
clear unified-edge ggsn-pgw diameter network-element statistics
<clear-mobile-gateway-aaa-diam-ne-statistics>
clear unified-edge ggsn-pgw diameter pcc-gx
<clear-mobile-gateway-aaa-diam-ne-statistics>
clear unified-edge ggsn-pgw diameter pcc-gx statistics
<clear-mobile-gateway-aaa-diam-ne-statistics>
clear unified-edge ggsn-pgw diameter peer
clear unified-edge ggsn-pgw diameter peer statistics
<clear-mobile-gateway-aaa-diam-peer-statistics>
clear unified-edge ggsn-pgw gtp
clear unified-edge ggsn-pgw gtp peer
clear unified-edge ggsn-pgw gtp peer statistics
<clear-mobile-gateway-gtp-peer-statistics>
clear unified-edge ggsn-pgw gtp statistics
<clear-mobile-gateway-gtp-statistics>
clear unified-edge ggsn-pgw ip-reassembly
clear unified-edge ggsn-pgw ip-reassembly statistics
<clear-mobile-gateway-gtp-reassembly-statistics>
clear unified-edge ggsn-pgw statistics
<clear-mobile-gateway-statistics>
clear unified-edge ggsn-pgw subscribers
<clear-mobile-gateway-subscribers>
clear unified-edge ggsn-pgw subscribers bearer
clear unified-edge ggsn-pgw subscribers charging
<clear-mobile-gateway-subscribers-charging>
clear unified-edge ggsn-pgw subscribers peer
<clear-mobile-gateway-subscribers-peer>
clear unified-edge sgw
clear unified-edge sgw call-admission-control
clear unified-edge sgw call-admission-control statistics
<clear-mobile-sgw-cac-statistics>
clear unified-edge sgw charging
clear unified-edge sgw charging cdr
<clear-mobile-gateway-sgw-charging-clear-cdr>
clear unified-edge sgw charging cdr wfa
<clear-mobile-gateway-sgw-charging-clear-cdr-wfa>
clear unified-edge sgw charging local-persistent-storage
clear unified-edge sgw charging local-persistent-storage statistics
<clear-mobile-gateway-sgw-charging-clear-lps-stats>
clear unified-edge sgw charging path
<clear-mobile-gateway-sgw-charging-clear-path-stats>
clear unified-edge sgw charging transfer
clear unified-edge sgw charging transfer statistics
<clear-mobile-gateway-sgw-charging-clear-xfer-stats>
clear unified-edge sgw gtp
clear unified-edge sgw gtp peer
<clear-mobile-sgw-gtp-peer-statistics>
clear unified-edge sgw gtp statistics
<clear-mobile-sgw-gtp-statistics>
clear unified-edge sgw idle-mode-buffering
clear unified-edge sgw idle-mode-buffering statistics
<clear-mobile-gw-sgw-idle-mode-buffering-statistics>
clear unified-edge sgw ip-reassembly
clear unified-edge sgw ip-reassembly statistics
<clear-mobile-gateways-sgw-ip-reassembly-statistics-sgw>
clear unified-edge sgw statistics
<clear-mobile-sgw-statistics>
clear unified-edge sgw subscribers
<clear-mobile-sgw-subscribers>
clear unified-edge sgw subscribers charging
<clear-mobile-sgw-subscribers-charging>
clear unified-edge sgw subscribers peer
<clear-mobile-sgw-subscribers-peer>
clear unified-edge tdf
clear unified-edge tdf aaa
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius client
<clear-radius-client-statistics>
clear unified-edge tdf aaa radius network-element
clear unified-edge tdf aaa radius network-element statistics
<clear-radius-network-element-statistics>
clear unified-edge tdf aaa radius server
<clear-radius-server-statistics>
clear unified-edge tdf aaa radius snoop-segment
clear unified-edge tdf aaa radius snoop-segment statistics
<clear-radius-snoop-segment-statistics>
clear unified-edge tdf aaa statistics
<clear-tdf-gateway-aaa-statistics>
clear unified-edge tdf address-assignment
<clear-mobile-gateway-tdf-sm-ippool-pool-sessions>
clear unified-edge tdf address-assignment statistics
<clear-mobile-gateway-tdf-sm-ippool-statistics>
clear unified-edge tdf call-admission-control
clear unified-edge tdf call-admission-control statistics
<clear-tdf-cac-statistics>
clear unified-edge tdf diameter
clear unified-edge tdf diameter network-element
clear unified-edge tdf diameter network-element statistics
<clear-diameter-network-element-statistics>
clear unified-edge tdf diameter pcc-gx
clear unified-edge tdf diameter pcc-gx statistics
<clear-diameter-statistics-gx>
clear unified-edge tdf diameter peer
clear unified-edge tdf diameter peer statistics
<clear-diameter-peer-statistics>
clear unified-edge tdf statistics
<clear-tdf-statistics>
clear unified-edge tdf subscribers
<clear-mobile-tdf-subscribers>
clear unified-edge tdf subscribers peer
<clear-mobile-gateway-tdf-subscribers-peer>
request unified-edge
request unified-edge ggsn-pgw
clear unified-edge ggsn-pgw call-trace
<monitor-mobile-gateways-call-trace-start>
clear unified-edge ggsn-pgw call-trace clear
<get-mobile-gateways-call-trace-clear>
clear unified-edge ggsn-pgw call-trace show
<get-mobile-gateways-call-trace-information>
clear unified-edge ggsn-pgw call-trace start
<get-mobile-gateways-call-trace-start-information>
clear unified-edge ggsn-pgw call-trace stop
<get-mobile-gateways-call-trace-stop-information>
clear unified-edge sgw
request unified-edge sgw call-trace
request unified-edge sgw call-trace clear
<get-mobile-gateways-sgw-call-trace-clear>
clear unified-edge sgw call-trace show
<get-mobile-gateways-sgw-call-trace-information>
clear unified-edge sgw call-trace start
<get-mobile-gateways-sgw-call-trace-start-information>
clear unified-edge sgw call-trace stop
<get-mobile-gateways-sgw-call-trace-stop-information>
clear unified-edge tdf
clear unified-edge tdf call-trace
request unified-edge tdf call-trace clear
<get-mobile-gateways-tdf-call-trace-clear>
clear unified-edge tdf call-trace show
<get-mobile-gateways-tdf-call-trace-information>
clear unified-edge tdf call-trace start
<get-mobile-gateways-tdf-call-trace-start-information>
clear unified-edge tdf call-trace stop
<get-mobile-gateways-tdf-call-trace-stop-information>

Configuration
Hierarchy Levels
[edit access profile client chap-secret]
[edit access profile client firewall-user password]
[edit access profile client l2tp shared-secret]
[edit access profile client pap-password]
[edit access profile radius-server secret]
[edit access radius clients accounting secret]
[edit access radius snoop-segments shared-secret]
[edit access radius-disconnect preauthentication-secret]
[edit access radius-disconnect secret]
[edit access radius-server preauthentication-secret]
[edit access radius-server secret]
[edit dynamic-profiles interfaces interface ppp-options chap
default-chap-secret]
[edit dynamic-profiles interfaces interface ppp-options pap default-password]
[edit dynamic-profiles interfaces interface ppp-options pap local-password]
[edit dynamic-profiles interfaces interface unit ppp-options chap
default-chap-secret]
[edit dynamic-profiles interfaces interface unit ppp-options pap default-password]
[edit dynamic-profiles interfaces interface unit ppp-options pap local-password]
[edit interfaces interface ppp-options chap default-chap-secret]
[edit interfaces interface ppp-options pap default-password]
[edit interfaces interface ppp-options pap local-password]
[edit interfaces interface unit ppp-options chap default-chap-secret]
[edit interfaces interface unit ppp-options pap default-password]
[edit interfaces interface unit ppp-options pap local-password]
[edit logical-systems interfaces interface unit ppp-options chap]
[edit logical-systems interfaces interface unit ppp-options pap default-password]
[edit logical-systems interfaces interface unit ppp-options pap local-password]
[edit logical-systems routing-instances instance system services
static-subscribers authentication password]
[edit logical-systems routing-instances instance system services
static-subscribers group authentication password]
[edit logical-systems system services static-subscribers authentication
password]
[edit logical-systems system services static-subscribers group authentication
password]
[edit routing-instances instance system services static-subscribers
authentication password]
[edit routing-instances instance system services static-subscribers
authentication password]
[edit services ggsn apn radius accounting server secret]
[edit services ggsn apn radius authentication server secret]
[edit services ggsn radius server secret]
[edit system accounting destination radius server preauthentication-secret]
[edit system accounting destination radius server secret]
[edit system accounting destination radius server secret]
[edit system accounting destination tacplus server secret]
[edit system radius-server preauthentication-secret]
[edit system radius-server secret]
[edit system services outbound-ssh client secret]
[edit system services packet-triggered-subscribers partition-radius
accounting-shared-secret]
[edit system services static-subscribers authentication password]
[edit system services static-subscribers group authentication password]
[edit system tacplus-server secret]
[edit unified-edge]
• Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45

• Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

• secret-control on page 195

secret-control

**Supported Platforms**

EX Series, M Series, MX Series, SRX Series, T Series, vSRX

Can view passwords and other authentication keys in the configuration and can modify them in configuration mode.

**Commands**

No associated CLI commands.

**Configuration Hierarchy Levels**

[edit access profile client chap-secret]
[edit access profile client firewall-user password]
[edit access profile client l2tp shared-secret]
[edit access profile client pap-password]
[edit access profile radius-server secret]
[edit access radius-disconnect secret]
[edit dynamic-profiles interfaces interface ppp-options chap default-chap-secret]
[edit dynamic-profiles interfaces interface ppp-options pap default-password]
[edit dynamic-profiles interfaces interface ppp-options pap local-password]
[edit dynamic-profiles interfaces interface unit ppp-options chap default-chap-secret]
[edit dynamic-profiles interfaces interface unit ppp-options pap default-password]
[edit dynamic-profiles interfaces interface unit ppp-options pap local-password]
[edit interfaces interface ppp-options chap default-chap-secret]
[edit interfaces interface ppp-options pap default-password]
[edit interfaces interface unit ppp-options chap default-chap-secret]
[edit interfaces interface unit ppp-options pap default-password]
[edit interfaces interface unit ppp-options pap local-password]
[edit logical-systems interfaces interface unit ppp-options chap]
[edit logical-systems interfaces interface unit ppp-options pap default-password]
[edit logical-systems interfaces interface unit ppp-options pap local-password]
[edit logical-systems routing-instances instance system services static-subscribers authentication password]
[edit logical-systems routing-instances instance system services static-subscribers group authentication password]
[edit logical-systems system services static-subscribers group authentication password]
[edit logical-systems system services static-subscribers authentication password]
[edit routing-instances instance system services static-subscribers authentication password]
[edit routing-instances instance system services static-subscribers group authentication password]
[edit services ggsn apn radius accounting server secret]
[edit services ggsn apn radius authentication server secret]
[edit services ggsn radius server secret]
Related Documentation

- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- secret on page 190

**security**

**Supported Platforms**

EX Series, M Series, MX Series, SRX Series, T Series, vSRX

Can view security configuration.

**Commands**

clear security

clear security alarms

  <clear-security-alarm-information>

clear security idp

clear security idp application-ddos

clear security idp application-ddos cache

  <clear-idp-appddos-cache>


clear security idp application-identification

clear security idp application-identification application-system-cache

  <clear-idp-application-system-cache>


clear security idp application-statistics

  <clear-idp-applications-information>


clear security idp attack

clear security idp attack table

  <clear-idp-attack-table>


clear security idp counters

  <clear-idp-counters-by-counter-class>

clear security idp counters action

clear security idp counters application-ddos

clear security idp counters application-identification

clear security idp counters dfa

clear security idp counters flow

clear security idp counters http-decoder
clear security idp counters ips
clear security idp counters log
clear security idp counters memory
clear security idp counters packet
clear security idp counters packet-log
clear security idp counters pdf-decoder
clear security idp counters policy-manager
clear security idp counters ssl-inspection
clear security idp counters tcp-reassembler

clear security idp ssl-inspection
clear security idp ssl-inspection session-id-cache
  <clear-idp-ssl-session-cache-information>
clear security idp status
  <clear-idp-status-information>
clear security log
  <clear-security-log-information>
clear security pki
clear security pki ca-certificate
  <clear-pki-ca-certificate>
clear security pki certificate-request
  <clear-pki-certificate-request>
clear security pki crl
  <clear-pki-crl>
clear security pki key-pair
  <clear-pki-key-pair>
clear security pki local-certificate
  <clear-pki-local-certificate>
clear unified-edge
clear unified-edge ggsn-pgw
clear unified-edge ggsn-pgw aaa
clear unified-edge ggsn-pgw aaa radius
clear unified-edge ggsn-pgw aaa radius statistics
  <clear-mobile-gateway-aaa-radius-statistics>
clear unified-edge ggsn-pgw aaa statistics
  <clear-mobile-gateway-aaa-statistics>
clear unified-edge ggsn-pgw address-assignment
clear unified-edge ggsn-pgw address-assignment pool
  <clear-mobile-gateway-sm-ippool-pool-sessions>
clear unified-edge ggsn-pgw address-assignment statistics
  <clear-mobile-gateway-sm-ippool-statistics>
clear unified-edge ggsn-pgw call-admission-control
clear unified-edge ggsn-pgw call-admission-control statistics
  <clear-mobile-gateway-cac-statistics>
clear unified-edge ggsn-pgw charging
clear unified-edge ggsn-pgw charging cdr
  <clear-mobile-gateway-charging-clear-cdr>
clear unified-edge ggsn-pgw charging cdr wfa
  <clear-mobile-gateway-charging-clear-cdr-wfa>
clear unified-edge ggsn-pgw charging local-persistent-storage
clear unified-edge ggsn-pgw charging local-persistent-storage statistics
  <clear-mobile-gateway-charging-clear-lps-stats>
clear unified-edge ggsn-pgw charging path
clear unified-edge ggsn-pgw charging path statistics
  <clear-mobile-gateway-charging-clear-path-stats>
clear unified-edge ggsn-pgw charging transfer
clear unified-edge ggsn-pgw charging transfer statistics
  <clear-mobile-gateway-charging-clear-xfer-stats>
clear unified-edge ggsn-pgw diameter
clear unified-edge ggsn-pgw diameter dcca-gy
clear unified-edge ggsn-pgw diameter dcca-gy statistics
<clear-mobile-gateway-aaa-diam-stats-gy>
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<clear-mobile-gateway-aaa-diam-ne-statistics>
clear unified-edge ggsn-pgw diameter pcc-gx
<clear-mobile-gateway-aaa-diam-stats-gx>
clear unified-edge ggsn-pgw diameter peer
<clear-mobile-gateway-aaa-diam-peer-statistics>
clear unified-edge ggsn-pgw gtp
<clear-mobile-gateway-gtp-statistics>
clear unified-edge ggsn-pgw ip-reassembly
<clear-mobile-gateways-ip-reassembly-statistics>
clear unified-edge ggsn-pgw subscribers
<clear-mobile-gateway-subscribers>
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<clear-mobile-gateway-subscribers-charging>
clear unified-edge ggsn-pgw subscribers charging
<clear-mobile-gateway-subscribers-charging>
clear unified-edge ggsn-pgw subscribers peer
<clear-mobile-gateway-subscribers-peer>
clear unified-edge sgw
<clear-mobile-sgw-statistics>
clear unified-edge sgw call-admission-control
<clear-mobile-sgw-cac-statistics>
clear unified-edge sgw charging
<clear-mobile-gateway-sgw-charging-clear-cdr>
clear unified-edge sgw charging cdr wfa
<clear-mobile-gateway-sgw-charging-clear-cdr-wfa>
clear unified-edge sgw charging local-persistent-storage
<clear-mobile-gateway-sgw-charging-clear-lps-stats>
clear unified-edge sgw charging path
<clear-mobile-gateway-sgw-charging-clear-path-stats>
clear unified-edge sgw charging transfer
<clear-mobile-gateway-sgw-charging-clear-xfer-stats>
clear unified-edge sgw gtp
<clear-mobile-sgw-gtp-peer-statistics>
clear unified-edge sgw gtp peer
<clear-mobile-sgw-gtp-peer-statistics>
clear unified-edge sgw gtp statistics
<clear-mobile-sgw-gtp-statistics>
clear unified-edge sgw idle-mode-buffering
<clear-mobile-gw-sgw-idle-mode-buffering-statistics>
clear unified-edge sgw ip-reassembly
<clear-mobile-gateways-sgw-ip-reassembly-statistics-sgw>
clear unified-edge sgw statistics
<clear-mobile-sgw-statistics>
clear unified-edge sgw subscribers
<clear-mobile-sgw-subscribers>
clear unified-edge sgw subscribers charging
<clear-mobile-sgw-subscribers-charging>
clear unified-edge sgw subscribers peer
<clear-mobile-sgw-subscribers-peer>
clear unified-edge tdf
<clear-mobile-gateway-tdf>
clear unified-edge tdf aaa
<clear-mobile-gateway-tdf-aaa>
clear unified-edge tdf aaa radius
<clear-mobile-gateway-tdf-aaa-radius>
clear unified-edge tdf aaa radius client
<clear-mobile-gateway-tdf-aaa-radius-client>
clear unified-edge tdf aaa radius client statistics
<clear-mobile-gateway-tdf-aaa-radius-client-statistics>
clear unified-edge tdf aaa radius network-element
<clear-mobile-gateway-tdf-aaa-radius-network-element>
clear unified-edge tdf aaa radius network-element statistics
<clear-mobile-gateway-tdf-aaa-radius-network-element-statistics>
clear unified-edge tdf aaa radius server
<clear-mobile-gateway-tdf-aaa-radius-server>
clear unified-edge tdf aaa radius server statistics
<clear-mobile-gateway-tdf-aaa-radius-server-statistics>
clear unified-edge tdf aaa radius snoop-segment
<clear-mobile-gateway-tdf-aaa-radius-snoop-segment>
clear unified-edge tdf aaa radius snoop-segment statistics
<clear-mobile-gateway-tdf-aaa-radius-snoop-segment-statistics>
clear unified-edge tdf aaa statistics
<clear-mobile-gateway-tdf-aaa-statistics>
clear unified-edge tdf address-assignment
<clear-mobile-gateway-tdf-address-assignment>
clear unified-edge tdf address-assignment pool
<clear-mobile-gateway-tdf-sm-ip-pool-pool-sessions>
clear unified-edge tdf address-assignment statistics
<clear-mobile-gateway-tdf-sm-ip-pool-statistics>
clear unified-edge tdf call-admission-control
<clear-mobile-gateway-tdf-cac-statistics>
clear unified-edge tdf call-admission-control statistics
<clear-mobile-gateway-tdf-cac-statistics>
clear unified-edge tdf diameter
<clear-mobile-gateway-tdf-diameter>
clear unified-edge tdf diameter network-element
<clear-mobile-gateway-tdf-diameter-network-element>
clear unified-edge tdf diameter network-element statistics
<clear-mobile-gateway-tdf-diameter-network-element-statistics>
clear unified-edge tdf diameter pcc-gx
<clear-mobile-gateway-tdf-diameter-pcc-gx>
clear unified-edge tdf diameter pcc-gx statistics
<clear-mobile-gateway-tdf-diameter-pcc-gx-statistics>
clear unified-edge tdf diameter peer
<clear-mobile-gateway-tdf-diameter-peer>
clear unified-edge tdf diameter peer statistics
<clear-mobile-gateway-tdf-diameter-peer-statistics>
clear unified-edge tdf statistics
<clear-mobile-gateway-tdf-statistics>
clear unified-edge tdf subscribers
<clear-mobile-gateway-tdf-subscribers>
clear unified-edge tdf subscribers peer
<clear-mobile-gateway-tdf-subscribers-peer>
request security
request security certificate
request security certificate enroll
request security datapath-debug
request security datapath-debug action-profile
request security datapath-debug action-profile reload-all
request security idp
<request-idp-policy-load>
request security idp security-package
request security idp security-package download
<request-idp-security-package-download>

request security idp security-package download version
<request-idp-security-package-download-version>
request security idp security-package install
  <request-idp-security-package-install>

request security idp ssl-inspection
request security idp ssl-inspection key
request security idp ssl-inspection key add
  <request-idp-ssl-key-add>

request security idp ssl-inspection key delete
  <request-idp-ssl-key-delete>
request security idp storage-cleanup
  <request-idp-storage-cleanup>
request security key-pair
request security pki
request security pki ca-certificate
request security pki ca-certificate verify
  <verify-pki-ca-certificate>
request security pki ca-certificate enroll
request security pki ca-certificate load
  <load-pki-ca-certificate>
request security pki crl
request security pki crl load
  <request security pki crl load>
request security pki generate-certificate-request
  <generate-pki-certificate-request>
request security pki generate-key-pair
  <generate-pki-key-pair>
request security pki local-certificate
request security pki local-certificate verify
  <verify-pki-local-certificate>
request security pki verify-integrity-status
  <verify-integrity-status>
request security pki local-certificate enroll
request security pki local-certificate generate-self-signed
  <generate-pki-self-signed-local-certificate>
request security pki local-certificate load
  <load-pki-local-certificate>
request system set-encryption-key
request unified-edge
request unified-edge ggsn-pgw
request unified-edge ggsn-pgw call-trace
  <monitor-mobile-gateways-call-trace-start>
request unified-edge ggsn-pgw call-trace clear
  <get-mobile-gateways-call-trace-clear>
request unified-edge ggsn-pgw call-trace show
  <get-mobile-gateways-call-trace-information>
request unified-edge ggsn-pgw call-trace start
  <get-mobile-gateways-call-trace-start-information>
request unified-edge ggsn-pgw call-trace stop
  <get-mobile-gateways-call-trace-stop-information>
request unified-edge sgw
request unified-edge sgw call-trace
request unified-edge sgw call-trace clear
  <get-mobile-gateways-sgw-call-trace-clear>
request unified-edge sgw call-trace show
  <get-mobile-gateways-sgw-call-trace-information>
request unified-edge sgw call-trace start
  <get-mobile-gateways-sgw-call-trace-start-information>
request unified-edge sgw call-trace stop
  <get-mobile-gateways-sgw-call-trace-stop-information>
request unified-edge tdf
request unified-edge tdf call-trace
request unified-edge tdf call-trace clear
<get-mobile-gateway-tdf-call-trace-clear>
request unified-edge tdf call-trace show
<get-mobile-gateways-tdf-call-trace-information>
request unified-edge tdf call-trace start
<get-mobile-gateways-tdf-call-trace-start-information>
request unified-edge tdf call-trace stop
<get-mobile-gateways-tdf-call-trace-stop-information>
show security
show security alarms
<get-security-alarm-information>
show security idp
show security idp application-ddos
show security idp application-ddos application
<get-idp-addos-application-information>
show security idp application-identification
show security idp application-identification application-system-cache
<get-idp-application-system-cache>
show security idp application-statistics
<get-idp-applications-information>
show security idp attack
show security idp attack description
<get-idp-attack-description-information>
show security idp attack detail
<get-idp-attack-detail-information>
show security idp attack table
<get-idp-attack-table-information>
show security idp counters
<get-idp-counter-information>
show security idp counters action
show security idp counters application-ddos
show security idp counters application-identification
show security idp counters dfa
show security idp counters flow
show security idp counters http-decoder
show security idp counters ips
show security idp counters log
show security idp counters memory
show security idp counters packet
show security idp counters packet-log
show security idp counters pdf-decoder
show security idp counters policy-manager
show security idp counters ssl-inspection
show security idp counters tcp-reassembler
show security idp logical-system
show security idp logical-system policy-association
show security idp memory
<get-idp-memory-information>
show security idp policies
<get-idp-subscriber-policy-list>
show security idp policy-templates-list
<get-idp-policy-template-information>
<get-idp-predefined-attack-groups>
<get-idp-predefined-attack-group-filters>
<get-idp-predefined-attacks>
<get-idp-predefined-attack-filters>
<get-idp-recent-security-package-information>
show security idp policy-commit-status
<get-idp-policy-commit-status>
<get-idp-recent-security-package-information>
show security idp security-package-version
<get-idp-security-package-information>
show security idp ssl-inspection
show security idp ssl-inspection key
<get-idp-ssl-key-information>
show security idp ssl-inspection session-id-cache
<get-idp-ssl-session-cache-information>
show security idp status
<get-idp-status-information>
show security idp status detail
<get-idp-detail-status-information>
show security keychain
<get-hakr-keychain-information>
show security log
<get-security-log-information>
show security pki
show security pki ca-certificate
<get-pki-ca-certificate>
show security pki certificate-request
<get-pki-certificate-request>
show security pki crl
<get-pki-crl>
show security pki local-certificate
<get-pki-local-certificate>

## Configuration

### Hierarchy Levels

- [edit security]
- [edit security alarms]
- [edit security log]
- [edit unified-edge]

## Related Documentation

- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- security-control on page 203
**security-control**

**Supported Platforms**  
EX Series, M Series, MX Series, SRX Series, T Series, vSRX

Can view and configure security information at the [edit security] hierarchy level.

**Commands**

- `clear security`
- `clear security alarms`
  - `<clear-security-alarm-information>`
- `clear security idp`
- `clear security idp application-ddos`
  - `<clear-idp-appddos-cache>`
- `clear security idp application-identification`
  - `<clear-idp-application-system-cache>`
- `clear security idp application-statistics`
  - `<clear-idp-applications-information>`
- `clear security idp attack`
- `clear security idp attack table`
  - `<clear-idp-attack-table>`
- `clear security idp counters`
  - `<clear-idp-counters-by-counter-class>`
- `clear security idp ssl-inspection`
- `clear security idp ssl-inspection session-id-cache`
  - `<clear-idp-ssl-session-cache-information>`
- `clear security idp status`
  - `<clear-idp-status-information>`
- `clear security log`
  - `<clear-security-log-information>`
- `clear security pki`
- `clear security pki ca-certificate`
  - `<clear-pki-ca-certificate>`
- `clear security pki certificate-request`
  - `<clear-pki-certificate-request>`
- `clear security pki crl`
  - `<clear-pki-crl>`
- `clear security pki key-pair`
  - `<clear-pki-key-pair>`
- `clear security pki local-certificate`
  - `<clear-pki-local-certificate>`
- `request security`
- `request security certificate`
- `request security certificate enroll`
- `request security datapath-debug`
- `request security datapath-debug action-profile`
- `request security datapath-debug action-profile reload-all`
- `request security idp`
  - `<request-idp-policy-load>`
- `request security idp security-package`
- `request security idp security-package download`
  - `<request-idp-security-package-download>`
request security idp security-package download version
  <request-idp-security-package-download-version>

request security idp security-package install
  <request-idp-security-package-install>
request security idp security-package offline-download
  <request-idp-security-package-offline-download>
request security idp ssl-inspection
request security idp ssl-inspection key
request security idp ssl-inspection key add
  <request-idp-ssl-key-add>

request security idp ssl-inspection key delete
  <request-idp-ssl-key-delete>
request security idp storage-cleanup
  <request-idp-storage-cleanup>
request security key-pair
request security pki
request security pki ca-certificate
request security pki ca-certificate verify
  <verify-pki-ca-certificate>
request security pki ca-certificate enroll
request security pki ca-certificate load
  <load-pki-ca-certificate>
request security pki crl
request security pki crl load
  <request security pki crl load>
request security pki generate-certificate-request
  <generate-pki-certificate-request>
request security pki generate-key-pair
  <generate-pki-key-pair>
request security pki local-certificate
request security pki local-certificate verify
  <verify-pki-local-certificate>
request security pki local-certificate enroll
request security pki local-certificate generate-self-signed
  <generate-pki-self-signed-local-certificate>
request security pki local-certificate load
  <load-pki-local-certificate>
request system set-encryption-key
show security
show security alarms
  <get-security-alarm-information>
show security idp
show security idp application-ddos
show security idp application-ddos application
  <get-idp-addos-application-information>

show security idp application-identification
show security idp application-identification application-system-cache
  <get-idp-application-system-cache>

show security idp application-statistics
  <get-idp-applications-information>

show security idp attack
show security idp attack description
  <get-idp-attack-description-information>
show security idp attack detail
  <get-idp-attack-detail-information>
show security idp attack table
<get-idp-attack-table-information>
show security idp counters
    <get-idp-counter-information>
show security idp counters action
show security idp counters application-ddos
show security idp counters application-identification
show security idp counters dfa
show security idp counters flow
show security idp counters http-decoder
show security idp counters ips
show security idp counters log
show security idp counters memory
show security idp counters packet
show security idp counters packet-log
show security idp counters pdf-decoder
show security idp counters policy-manager
show security idp counters ssl-inspection
show security idp counters tcp-reassembler

show security idp logical-system
show security idp logical-system policy-association
show security idp memory
    <get-idp-memory-information>

show security idp policies
    <get-idp-subscriber-policy-list>

show security idp policy-templates-list
    <get-idp-policy-template-information>
    <get-idp-predefined-attack-groups>
    <get-idp-predefined-attack-group-filters>
    <get-idp-predefined-attacks>
    <get-idp-predefined-attack-filters>
    <get-idp-recent-security-package-information>
show security idp policy-commit-status
    <get-idp-policy-commit-status>

<get-idp-recent-security-package-information>

show security idp security-package-version
    <get-idp-security-package-information>

show security idp ssl-inspection
show security idp ssl-inspection key
    <get-idp-ssl-key-information>

show security idp ssl-inspection session-id-cache
    <get-idp-ssl-session-cache-information>

show security idp status
    <get-idp-status-information>

show security idp status detail
    <get-idp-detail-status-information>
show security keychain
    <get-hakr-keychain-information>
show security log
    <get-security-log-information>

show security pki
show security pki ca-certificate
  <get-pki-ca-certificate>
show security pki certificate-request
  <get-pki-certificate-request>
show security pki crl
  <get-pki-crl>
show security pki local-certificate
  <get-pki-local-certificate>

Configuration
Hierarchy Levels
[edit security]
[edit security alarms]
[edit security log]

Related
Documentation
- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
  - Example: Configuring User Permissions with Access Privilege Levels on page 41
  - Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
  - Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- security on page 196

shell

Supported Platforms EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can start a local shell on the router.

Commands
  start shell
  start shell user

Configuration
Hierarchy Levels
No associated CLI configuration hierarchy levels and statements.

Related
Documentation
- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
  - Example: Configuring User Permissions with Access Privilege Levels on page 41
  - Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
  - Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

snmp

Supported Platforms EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX
Can view Simple Network Management Protocol (SNMP) configuration.

**Commands**
- `clear unified-edge`
- `clear unified-edge ggsn-pgw`
- `clear unified-edge ggsn-pgw aaa`
- `clear unified-edge ggsn-pgw aaa radius`
- `clear unified-edge ggsn-pgw aaa radius statistics`
- `<clear-mobile-gateway-aaa-radius-statistics>`
- `clear unified-edge ggsn-pgw aaa statistics`
- `<clear-mobile-gateway-aaa-statistics>`
- `clear unified-edge ggsn-pgw address-assignment`
- `clear unified-edge ggsn-pgw address-assignment pool`
- `<clear-mobile-gateway-sm-ippool-pool-sessions>`
- `clear unified-edge ggsn-pgw address-assignment statistics`
- `<clear-mobile-gateway-sm-ippool-statistics>`
- `clear unified-edge ggsn-pgw call-admission-control`
- `clear unified-edge ggsn-pgw call-admission-control statistics`
- `<clear-mobile-gateway-cac-statistics>`
- `clear unified-edge ggsn-pgw charging`
- `clear unified-edge ggsn-pgw charging cdr`
- `<clear-mobile-gateway-charging-clear-cdr>`
- `clear unified-edge ggsn-pgw charging cdr wfa`
- `<clear-mobile-gateway-charging-clear-cdr-wfa>`
- `clear unified-edge ggsn-pgw charging local-persistent-storage`
- `clear unified-edge ggsn-pgw charging local-persistent-storage statistics`
- `<clear-mobile-gateway-charging-clear-lps-stats>`
- `clear unified-edge ggsn-pgw charging path`
- `clear unified-edge ggsn-pgw charging path statistics`
- `<clear-mobile-gateway-charging-clear-path-stats>`
- `clear unified-edge ggsn-pgw charging transfer`
- `clear unified-edge ggsn-pgw charging transfer statistics`
- `<clear-mobile-gateway-charging-clear-xfer-stats>`
- `clear unified-edge ggsn-pgw diameter`
- `clear unified-edge ggsn-pgw diameter dcca-gy`
- `clear unified-edge ggsn-pgw diameter dcca-gy statistics`
- `<clear-mobile-gateway-aaa-diam-stats-gy>`
- `clear unified-edge ggsn-pgw diameter network-element`
- `clear unified-edge ggsn-pgw diameter network-element statistics`
- `<clear-mobile-gateway-aaa-diam-ne-statistics>`
- `clear unified-edge ggsn-pgw diameter pcc-gx`
- `clear unified-edge ggsn-pgw diameter pcc-gx statistics`
- `<clear-mobile-gateway-aaa-diam-stats-gx>`
- `clear unified-edge ggsn-pgw diameter peer`
- `clear unified-edge ggsn-pgw diameter peer statistics`
- `<clear-mobile-gateway-aaa-diam-peer-statistics>`
- `clear unified-edge ggsn-pgw gtp`
- `clear unified-edge ggsn-pgw gtp peer`
- `clear unified-edge ggsn-pgw gtp peer statistics`
- `<clear-mobile-gateway-gtp-peer-statistics>`
- `clear unified-edge ggsn-pgw gtp statistics`
- `<clear-mobile-gateway-gtp-statistics>`
- `clear unified-edge ggsn-pgw ip-reassembly`
- `clear unified-edge ggsn-pgw ip-reassembly statistics`
- `<clear-mobile-gateways-ip-reassembly-statistics>`
- `clear unified-edge ggsn-pgw statistics`
- `<clear-mobile-gateway-statistics>`
- `clear unified-edge ggsn-pgw subscribers`
- `<clear-mobile-gateway-subscribers>`
- `clear unified-edge ggsn-pgw subscribers bearer`
- `clear unified-edge ggsn-pgw subscribers charging`
- `<clear-mobile-gateway-subscribers-charging>`
clear unified-edge ggsn-pgw subscribers peer
<clear-mobile-gateway-subscribers-peer>
clear unified-edge sgw
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clear unified-edge sgw idle-mode-buffering statistics
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request unified-edge
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request unified-edge ggsn-pgw call-trace
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request unified-edge ggsn-pgw call-trace show
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request unified-edge ggsn-pgw call-trace start
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request unified-edge sgw call-trace clear
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request unified-edge sgw call-trace stop
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request unified-edge tdf
request unified-edge tdf call-trace
request unified-edge tdf call-trace clear
<get-mobile-gateways-tdf-call-trace-clear>
request unified-edge tdf call-trace show
<get-mobile-gateways-tdf-call-trace-information>
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<get-mobile-gateways-tdf-call-trace-start-information>
request unified-edge tdf call-trace stop
<get-mobile-gateways-tdf-call-trace-stop-information>

Configuration
Hierarchy Levels
[edit snmp]
[edit unified-edge]

Related Documentation
• Access Privilege User Permission Flags Overview on page 78
• Understanding Junos OS Access Privilege Levels on page 7
Example: Configuring User Permissions with Access Privilege Levels on page 41

Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45

Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55

**system**

**Supported Platforms**  
EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can view system-level configuration information.

**Commands**

- clear unified-edge
- clear unified-edge ggsn-pgw
- clear unified-edge ggsn-pgw aaa
- clear unified-edge ggsn-pgw aaa radius
- clear unified-edge ggsn-pgw aaa radius statistics
- clear unified-edge ggsn-pgw aaa statistics
- clear unified-edge ggsn-pgw address-assignment
- clear unified-edge ggsn-pgw address-assignment pool
- clear unified-edge ggsn-pgw address-assignment statistics
- clear unified-edge ggsn-pgw call-admission-control
- clear unified-edge ggsn-pgw call-admission-control statistics
- clear unified-edge ggsn-pgw charging
- clear unified-edge ggsn-pgw charging cdr
- clear unified-edge ggsn-pgw charging cdr wfa
- clear unified-edge ggsn-pgw charging local-persistent-storage
- clear unified-edge ggsn-pgw charging local-persistent-storage statistics
- clear unified-edge ggsn-pgw charging path
- clear unified-edge ggsn-pgw charging path statistics
- clear unified-edge ggsn-pgw charging transfer
- clear unified-edge ggsn-pgw charging transfer statistics
- clear unified-edge ggsn-pgw diameter
- clear unified-edge ggsn-pgw diameter dcca-gy
- clear unified-edge ggsn-pgw diameter dcca-gy statistics
- clear unified-edge ggsn-pgw diameter network-element
- clear unified-edge ggsn-pgw diameter network-element statistics
- clear unified-edge ggsn-pgw diameter pcc-gx
- clear unified-edge ggsn-pgw diameter pcc-gx statistics
- clear unified-edge ggsn-pgw diameter peer
- clear unified-edge ggsn-pgw diameter peer statistics
- clear unified-edge ggsn-pgw gtp
clear unified-edge ggsn-pgw gtp peer
<clear-mobile-gateway-gtp-peer> statistics
clear unified-edge ggsn-pgw gtp statistics
<clear-mobile-gateway-gtp> statistics
clear unified-edge ggsn-pgw ip-reassembly
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clear unified-edge ggsn-pgw ip-reassembly statistics
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clear unified-edge ggsn-pgw subscribers
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clear unified-edge ggsn-pgw subscribers bearer
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clear unified-edge ggsn-pgw subscribers charging
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clear unified-edge ggsn-pgw subscribers peer
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clear unified-edge sgw
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request chassis synchronization
request chassis synchronization force
request chassis synchronization force automatic-switching
request chassis synchronization force mark-failed
request chassis synchronization force unmark-failed
request chassis synchronization switch
request path-computation-client retry-delegation
<request-path-computation-retry-delegation>
request unified-edge
request unified-edge ggsn-pgw
request unified-edge ggsn-pgw call-trace
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request unified-edge ggsn-pgw call-trace clear
<get-mobile-gateways-call-trace-clear>
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request unified-edge sgw call-trace stop
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request unified-edge tdf call-trace stop
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request virtual-chassis
request virtual-chassis device-reachability
<get-virtual-chassis-diagnostic-information>
request virtual-chassis member-id
request virtual-chassis member-id delete
delete-virtual-chassis-member-id
request virtual-chassis member-id set
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request virtual-chassis mode
request virtual-chassis mode mixed
<request-virtual-chassis-mode-mixed>
request virtual-chassis reactivate
<request-virtual-chassis-reactivate>
request virtual-chassis recycle
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request virtual-chassis routing-engine master switch
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request virtual-chassis vc-port delete pic-slot
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request virtual-chassis vc-port set fpc-slot
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request virtual-chassis vc-port set interface
<request-virtual-chassis-vc-port-set-interface>
request virtual-chassis vc-port set pic-slot
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Configuration
Hierarchy Levels
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[edit chassis system-domains]
[edit dynamic-profiles routing-instances instance forwarding-options helpers tftp]
[edit dynamic-profiles routing-instances instance routing-options fate-sharing]
[edit ethernet-switching-options]
[edit fabric virtual-chassis]
[edit forwarding-options helpers bootp]
[edit forwarding-options helpers domain]
[edit forwarding-options helpers port]
[edit forwarding-options helpers tftp]
[edit logical-systems]
[edit logical-systems protocols uplink-failure-detection]
[edit logical-systems routing-instances instance forwarding-options helpers bootp]
[edit logical-systems routing-instances instance forwarding-options helpers domain]
[edit logical-systems routing-instances instance forwarding-options helpers port]
[edit logical-systems routing-instances instance forwarding-options helpers tftp]
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[edit logical-systems routing-options fate-sharing]
[edit logical-systems system syslog]
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[edit system archival]
[edit system backup-router]
[edit system boot loader authentication]
[edit system compress-configuration-files]
[edit system default-address-selection]
[edit system domain-name]
[edit system domain-search]
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[edit system no-redirects-ipv6]
[edit system name-server]
[edit no-hidden-commands system]
[edit system no-multicast-echo]
[edit system no-neighbor-learn]
[edit system no-redirects]
system-control

Related Documentation

- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- system-control on page 215

Supported Platforms

EX Series, M Series, MX Series, SRX Series, T Series, vSRX

Can view system-level configuration information and configure it at the [edit system] hierarchy level.

Configuration Hierarchy Levels

[edit applications]
[edit chassis system-domains]
[edit dynamic-profiles routing-instances instance forwarding-options helpers tftp]
[edit dynamic-profiles routing-instances instance routing-options fate-sharing]
[edit ethernet-switching-options]
[edit forwarding-options helpers bootp]
[edit forwarding-options helpers domain]
[edit forwarding-options helpers port]
[edit forwarding-options helpers tftp]
[edit logical-systems]
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[edit logical-systems routing-instances instance forwarding-options helpers domain]
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[edit logical-systems routing-instances instance forwarding-options helpers tftp]
[edit logical-systems routing-instances instance routing-options fate-sharing]
[edit logical-systems routing-options fate-sharing]
[edit logical-systems system]
[edit poe]
[edit routing-instances instance forwarding-options helpers bootp]
[edit routing-instances instance forwarding-options helpers domain]
[edit routing-instances instance forwarding-options helpers port]
[edit routing-instances instance forwarding-options helpers tftp]
[edit routing-instances instance routing-options fate-sharing]
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[edit services]
[edit services ggsn charging charging-log traceoptions]
[edit system]
  [edit system archival]
  [edit system backup-router]
  [edit system compress-configuration-files]
  [edit system default-address-selection]
  [edit system dgasp-in]
  [edit system dgasp-usb]
  [edit system domain-name]
  [edit system domain-search]
  [edit system encrypt-configuration-files]
  [edit system host-name]
    [edit system inet6-backup-router]
    [edit system internet-options gre-path-mtu-discovery]
    [edit system internet-options ipip-path-mtu-discovery]
    [edit system internet-options ipv6-path-mtu-discovery]
    [edit system internet-options ipv6-path-mtu-discovery-timeout]
    [edit system internet-options ipv6-reject-zero-hop-limit]
    [edit system internet-options no-tcp-reset]
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    [edit system internet-options path-mtu-discovery]
    [edit system internet-options source-port upper-limit]
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    [edit system internet-options tcp-drop-synfin-set]
    [edit system internet-options tcp-mss]
    [edit system license]
    [edit system max-configuration-rollback]
    [edit system max-configurations-on-flash]
    [edit system mirror-flash-on-disk]
    [edit system name-server]
    [edit system no-multicast-echo]
    [edit system no-neighbor-learn]
    [edit system no-redirects]
    [edit system ports auxiliary log-out-on-disconnect]
    [edit system ports auxiliary port-type]
    [edit system ports console log-out-on-disconnect]
    [edit system ports console port-type]
    [edit system processes]
    [edit system saved-core-context]
    [edit system saved-core-files]
    [edit system services]
    [edit system services web-management]
    [edit system static-host-mapping]
    [edit system syslog]
    [edit system time-zone]
    [edit virtual-chassis]
    [edit vlans]
Related Documentation

- Access Privilege User Permission Flags Overview on page 78
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- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- system on page 210

trace

Supported Platforms  EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can view trace file settings and configure trace file properties.

Commands

```
clear log
  <clear-log>
clear log satellite
  <clear-log-satellite>
clear unified-edge
clear unified-edge ggsn-pgw
clear unified-edge ggsn-pgw aaa
clear unified-edge ggsn-pgw aaa radius
clear unified-edge ggsn-pgw aaa radius statistics
  <clear-mobile-gateway-aaa-radius-statistics>
clear unified-edge ggsn-pgw aaa statistics
  <clear-mobile-gateway-aaa-statistics>
clear unified-edge ggsn-pgw address-assignment
clear unified-edge ggsn-pgw address-assignment pool
  <clear-mobile-gateway-sm-ippool-pool-sessions>
clear unified-edge ggsn-pgw address-assignment statistics
  <clear-mobile-gateway-sm-ippool-statistics>
clear unified-edge ggsn-pgw call-admission-control
clear unified-edge ggsn-pgw call-admission-control statistics
  <clear-mobile-gateway-cac-statistics>
clear unified-edge ggsn-pgw charging
clear unified-edge ggsn-pgw charging cdr
  <clear-mobile-gateway-charging-clear-cdr>
clear unified-edge ggsn-pgw charging cdr wfa
  <clear-mobile-gateway-charging-clear-cdr-wfa>
clear unified-edge ggsn-pgw charging local-persistent-storage
  <clear-mobile-gateway-charging-clear-lps-stats>
clear unified-edge ggsn-pgw charging local-persistent-storage statistics
  <clear-mobile-gateway-charging-clear-lps-stats>
clear unified-edge ggsn-pgw charging path
  <clear-mobile-gateway-charging-clear-path-stats>
clear unified-edge ggsn-pgw charging transfer
  <clear-mobile-gateway-charging-clear-xfer-stats>
clear unified-edge ggsn-pgw diameter
clear unified-edge ggsn-pgw diameter dcca-gy
  <clear-mobile-gateway-aaa-diam-stats-gy>
```
clear unified-edge ggsn-pgw diameter network-element
clear unified-edge ggsn-pgw diameter network-element statistics
<clear-mobile-gateway-aaa-diam-ne-statistics>
clear unified-edge ggsn-pgw diameter pcc-gx
clear unified-edge ggsn-pgw diameter pcc-gx statistics
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clear unified-edge ggsn-pgw diameter peer
clear unified-edge ggsn-pgw diameter peer statistics
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clear unified-edge ggsn-pgw gtp
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clear unified-edge ggsn-pgw statistics
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clear unified-edge ggsn-pgw subscribers
clear unified-edge ggsn-pgw subscribers bearer
clear unified-edge ggsn-pgw subscribers charging
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clear unified-edge ggsn-pgw subscribers peer
<clear-mobile-gateway-subscribers-peer>
clear unified-edge sgw
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clear unified-edge sgw charging
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clear unified-edge sgw charging path
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clear unified-edge sgw charging transfer
clear unified-edge sgw charging transfer statistics
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clear unified-edge sgw gtp
clear unified-edge sgw gtp peer
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Configuration

Hierarchy Levels

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Related Documentation
- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Privileges with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
- trace-control on page 225

**trace-control**

**Supported Platforms**
EX Series, M Series, MX Series, SRX Series, T Series, vSRX

Can modify trace file settings and configure trace file properties.

**Configuration Hierarchy Levels**
- [edit vlans domain forwarding-options dhcp-relay interface-traceoptions]
- [edit vlans domain forwarding-options dhcp-relay traceoptions]
- [edit vlans domain multicast-snooping-options traceoptions]
- [edit vlans domain protocols igmp-snooping traceoptions]
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- [edit dynamic-profiles protocols igmp traceoptions]
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- [edit dynamic-profiles protocols oam ethernet link-fault-management traceoptions]
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Chapter 4: Permissions Flags for User Access Privileges

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Related Documentation

- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
view

Supported Platforms  EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Can view current system-wide, routing table, and protocol-specific values and statistics.

Commands

clear ipv6 router-advertisement
<clear-ipv6-router-advertisement-information>
clear l2circuit auto-sensing
<clear-l2ckt-pw-auto-sensing>
clear services redundancy-group
<clear-services-redundancy-group>
clear services redundancy-group statistics
<clear-services-redundancy-group-statistics>
clear services redundancy-set
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clear services service-sets statistics ids
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clear services traffic-load-balance
<clear-services-traffic-load-balance>
clear services traffic-load-balance statistics
<clear-services-traffic-load-balance-statistics>
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show
show access-cac interface-set
<get-access-cac-iflset>
show access-security
show access-security router-advertisement-guard
<show-as-router-advertisement-guard>
show access-security router-advertisement-guard entries
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show access-security router-advertisement-guard state
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show access-security router-advertisement-guard statistics
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show access-security router-advertisement-guard statistics interface
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show accounting

show accounting profile
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show accounting records
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show ancp cos pending-update
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show ancp neighbor
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show ancp statistics
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show ancp subscriber
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show ancp subscriber ip-address
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show ancp subscriber system-name
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show app-engine
show app-engine information
show app-engine packages
show app-engine packages remote
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show app-engine packages system
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show app-engine processes
show app-engine resource-usage
show app-engine route-table
show app-engine routing-instance
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show app-engine routing-instance virtual-machines
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show app-engine virtual-machine package
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show application-monitor probe measurements
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show application-monitor probe mirrors
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show app-engine virtual-machine vm-instance
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show aps group
<get-aps-group-information>
show aps interface
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show as-path
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show as-path domain
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show backup-selection instance
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show bgp neighbor output-queue
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display bridge domain
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show bridge evpn nd-table
  <get-bridge-evpn-nd-table>
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show bridge flood event-queue
  <get-bridge-domain-event-queue-information>
show bridge flood next-hops
show bridge flood next-hops satellite
  <get-satellite-control-composite-next-hop>
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show bridge flood route all-ve-flood
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show bridge flood route re-flood
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show bridge flood satellite
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show bridge mac-table satellite
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show bridge satellite summary
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show chassis environment sfm
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show chassis environment sib f2s
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show chassis ethernet-switch temperature
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show chassis fabric degraded-fabric-reachability
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show chassis fabric connectivity
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show chassis fabric degradation
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show chassis fabric summary
    <get-fm-state-information>

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show chassis synchronization backup
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show chassis synchronization master
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show class-of-service application-traffic-control rate-limiters rl-name
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show class-of-service application-traffic-control rate-limiters summary
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show class-of-service bind-point routing-instance
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show class-of-service fabric statistics detail
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show class-of-service forwarding-table classifier mapping
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  <get-cos-forwarding-class-map-interface-table-information>

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show class-of-service forwarding-table policy-map mapping
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show ddos-protection protocols amtv4 statistics
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show ddos-protection protocols amtv6
show ddos-protection protocols amtv6 aggregate
show ddos-protection protocols amtv6 aggregate culprit-flows
show ddos-protection protocols amtv6 culprit-flows
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show ddos-protection protocols atm statistics
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show ddos-protection protocols dhcpv4 no-message-type
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Chapter 4: Permissions Flags for User Access Privileges

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<get-sfw-application-protocol-statistics>
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show services subscriber bandwidth client-id
  <get-services-subscriber-bandwidth-by-session-id>
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  <get-services-subscriber-bandwidth-by-interface>
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  <get-service-tdf-hcm-sessions-stats>
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  <get-traffic-load-balance-statistics>
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  <get-uac-auth-table>
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  <get-uac-policies>
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  <get-service-video-monitoring-mdi-errors-information>
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show snmp health-monitor logs
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show snmp health-monitor routing-engine
show snmp health-monitor routing-engine history
  get-health-monitor-routing-engine-history
show snmp health-monitor routing-engine history cpu
  get-routing-engine-cpu-history
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  get-routing-engine-memory-history
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  get-routing-engine-fd-history
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  get-snmp-inform-statistics
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show snmp v3 community  
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  <get-snmp-v3-group-information>

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  <get-snmp-v3-notify-filter-information>

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  <get-snmp-v3-target-information>

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show snmp v3 target parameters  
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  <get-commit-information>
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  <get-license-summary-information>

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show system login lockout
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<show system processes
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  <get-process-health-information>
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show system processes host-processes detail
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show system processes resource-limits
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show system queues
show system reboot
show system resource-cleanup
show system resource-cleanup processes
  <get-system-resource-cleanup-processes-information>
  <get-resource-monitor-fpc-information>
  <get-resource-monitor-fpc-slot-information>
show system rollback
  <get-rollback-information>
show system services
show system services dhcp
show system services dhcp binding
  <get-dhcp-binding-information>
show system services dhcp conflict
  <get-dhcp-conflict-information>
show system services dhcp global
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show system software backup
  <get-package-backup-information>
<get-software-installation-status>
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<show-package-rollback>

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show system statistics bridge
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show system statistics vpls
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<get-system-storage>
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<get-system-storage-partitions>
show system storage satellite
<get-system-storage-satellite>
show system subscriber-management
show system subscriber-management arp
<get-subscriber-management-arp>
show system subscriber-management arp address
<get-subscriber-management-arp-address>
show system subscriber-management arp interface
<get-subscriber-management-arp-interface>
show system subscriber-management ipv6-neighbors
<get-subscriber-management-ipv6-neighbors>
show system subscriber-management ipv6-neighbors address
<get-subscriber-management-ipv6-neighbor-address>
show system subscriber-management ipv6-neighbors interface
<get-subscriber-management-ipv6-neighbor-interface>
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<get-subscriber-management-route>
show system subscriber-management route next-hop
<get-subscriber-management-route-nh>
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show system yang package
<get-system-yang-package>
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show ted link
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show unified-edge ggsn-pgw aaa network-element
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show unified-edge ggsn-pgw address-assignment
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show unified-edge ggsn-pgw charging global
show unified-edge ggsn-pgw charging global statistics
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show unified-edge ggsn-pgw charging local-persistent-storage statistics
show unified-edge ggsn-pgw charging path
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show unified-edge ggsn-pgw gtp peer history
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show unified-edge ggsn-pgw ip-reassemble
show unified-edge ggsn-pgw ip-reassemble statistics
show unified-edge ggsn-pgw resource-manager
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show unified-edge ggsn-pgw service-mode
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show unified-edge sgw ip-reassembly
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show unified-edge sgw status gtp-peer
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show unified-edge sgw system
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show unified-edge tdf
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show unified-edge tdf aaa radius
show unified-edge tdf aaa radius client
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show unified-edge tdf system
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<get-tdf-interfaces-information>
show unified-edge tdf system interfaces service-mode
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show version
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show virtual-chassis active-topology
<get-virtual-chassis-active-topology>
show virtual-chassis device-topology
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<get-virtual-chassis-fast-failover>
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<get-virtual-chassis-login>
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show virtual-chassis protocol database
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show virtual-chassis protocol interface
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<get-virtual-chassis-route-information>
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<get-virtual-chassis-information>
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<get-virtual-chassis-packet-path>
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show virtual-chassis vc-port diagnostics
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<get-virtual-chassis-optics-diagnostics>
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<get-operational-vlan-instance-information>
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<get-satellite-control-bridge-domain>
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<get-vmhost-status>
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show vplses connections
<get-vplses-connection-information>

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<get-vplses-event-queue-information>

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show vplses flood route all-ce-flood
<get-vplses-all-ce-flood-route-information>

show vplses flood route all-flood
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show vplses flood route alt-root-flood
<get-vplses-alt-root-flood-route-information>

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<get-vplses-ce-flood-route-information>

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<get-vplses-mlp-flood-route-information>

show vplses flood route re-flood
<get-vplses-re-flood-route-information>

show vplses mac-table
<get-vplses-mac-table>

show vplses mac-table interface
<get-vplses-interface-mac-table>

show vplses statistics
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show vrrp
show vrrp interface
show vrrp track
test interface
test interface fdl-line-loop
test interface fdl-line-loop ansi
  test interface fdl-line-loop ansi initiate
  test interface fdl-line-loop ansi terminate
  test interface fdl-line-loop bellcore
  test interface fdl-line-loop bellcore initiate
  test interface fdl-line-loop bellcore terminate
  test interface fdl-payload-loop
  test interface fdl-payload-loop ansi
  test interface fdl-payload-loop ansi initiate
  test interface fdl-payload-loop ansi terminate
  test interface fdl-payload-loop bellcore
  test interface fdl-payload-loop bellcore initiate
  test interface fdl-payload-loop bellcore terminate
  test interface inband-line-loop
  test interface inband-line-loop ansi
  test interface inband-line-loop ansi initiate
  test interface inband-line-loop ansi terminate
  test interface inband-line-loop bellcore
  test interface inband-line-loop bellcore initiate
  test interface inband-line-loop bellcore terminate
  test interface inband-line-loop initiate
  test interface inband-line-loop terminate
  test interface inband-payload-loop
  test interface inband-payload-loop ansi
  test interface inband-payload-loop ansi initiate
  test interface inband-payload-loop ansi terminate
  test interface inband-payload-loop bellcore
  test interface inband-payload-loop bellcore initiate
  test interface inband-payload-loop bellcore terminate
  test msdp
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<

Configuration
Hierarchy Levels

Related
Documentation

• Access Privilege User Permission Flags Overview on page 78
• Understanding Junos OS Access Privilege Levels on page 7
• Example: Configuring User Permissions with Access Privilege Levels on page 41
• Example: Configuring User Permissions with Access Privileges for Operational Mode
  Commands on page 45
• Example: Configuring User Permissions with Access Privileges for Configuration
  Statements and Hierarchies on page 55

view-configuration

Supported Platforms

EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX
Can view all of the configuration (not including secrets).

**Commands**

No associated CLI commands.

**Configuration Hierarchy Levels**

No associated CLI configuration hierarchy levels and statements.

**Related Documentation**

- Access Privilege User Permission Flags Overview on page 78
- Understanding Junos OS Access Privilege Levels on page 7
- Example: Configuring User Permissions with Access Privilege Levels on page 41
- Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 45
- Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 55
CHAPTER 5

Configuring Authentication Methods

- Configuring RADIUS Server Authentication on page 335
- Example: Configuring a RADIUS Server for System Authentication on page 338
- Configuring TACACS+ Authentication on page 341
- Example: Configuring a TACACS+ Server for System Authentication on page 344
- Example: Configuring Authentication Order on page 347

Configuring RADIUS Server Authentication

Supported Platforms  SRX Series

RADIUS authentication is a method of authenticating users who attempt to access the router or switch.

NOTE: This feature is supported on SRX1500, SRX5400, SRX5600, and SRX5800 devices.

The Junos OS supports two protocols for central authentication of users on multiple routers: RADIUS and TACACS+. We recommend RADIUS because it is a multivendor IETF standard, and its features are more widely accepted than those of TACACS+ or other proprietary systems. In addition, we recommend using a one-time-password system for increased security, and that all vendors of these systems support RADIUS.

You should use RADIUS when your priorities are interoperability and performance:

- Interoperability—RADIUS is more interoperable than TACACS+, primarily because of the proprietary nature of TACACS+. While TACACS+ supports more protocols, RADIUS is universally supported.

- Performance—RADIUS is much lighter on your routers and switches and for this reason, network engineers generally prefer RADIUS over TACACS+.

To use RADIUS authentication on the device, configure information about one or more RADIUS servers on the network by including one radius-server statement at the [edit system] hierarchy level for each RADIUS server.
Because remote authentication is configured on multiple devices, it is commonly configured inside of a configuration group. As such, the steps shown here are in a configuration group called `global`. Using a configuration group is optional.

To configure authentication by a RADIUS server:

1. Add an IPv4 or IPv6 server address.
   - Configure an IPv4 source address and server address:
     ```
     [edit groups global]
     user@host# set system radius-server server-address source-address source-address
     ```
     For example:
     ```
     [edit groups global]
     user@host# set system radius-server 192.168.17.28 source-address 192.168.17.1
     ```
   - Configure an IPv6 source address and server address:
     ```
     [edit groups global system radius-server server-address]
     user@host# set server-address secret "secretkey" source-address source-address
     ```
     For example:
     ```
     [edit groups global system radius-server ::17.22.22.162]
     user@host# set secret $9$ABC123 source-address ::17.22.22.1
     ```

2. Include a shared secret password.
   You must specify a password in the `secret password` statement. If the password contains spaces, enclose it in quotation marks. The secret password used by the local router or switch must match that used by the server. The secret password configures the password that the Junos OS device uses to access the RADIUS server.
   ```
   [edit groups global system radius-server server-address]
   user@host# set secret password
   ```
   For example:
   ```
   [edit groups global system radius-server 192.168.69.162]
   user@host# set secret S9SABC123ABC123
   ```

3. If necessary, specify a port on which to contact the RADIUS server.
   By default, port number 1812 is used (as specified in RFC 2865).
NOTE: You can also specify an accounting port to send accounting packets with the accounting-port statement. The default is 1813 (as specified in RFC 2866).

[edit groups global system radius-server server-address]
user@host# set port port-number

For example:

[edit groups global system radius-server 192.168.69.162]
user@host# set port 1845

4. Specify the order in which Junos OS attempts authentication.

You must include the authentication-order statement in your remote authentication configuration.

The example assumes your network includes both RADIUS and TACACS+ servers. In this example, whenever a user attempts to log in, Junos OS begins by querying the RADIUS server for authentication. If it fails, it next attempts authentication with locally configured user accounts. Finally the TACACS+ server is tried.

[edit groups global system]
user@host# set authentication-order [ authentication-methods ]

For example:

[edit groups global system]
user@host# set authentication-order [ radius password tacplus ]

5. Assign a login class to RADIUS-authenticated users.

You can assign different user templates and login classes to RADIUS-authenticated users. This allows RADIUS-authenticated users to be granted different administrative permissions on the Junos OS device. By default, RADIUS-authenticated users use the remote user template and are assigned to the associated class, which is specified in the remote user template, if the remote user template is configured. The username remote is a special case in Junos OS. It acts as a template for users who are authenticated by a remote server, but do not have a locally-configured user account on the device. In this method, Junos OS applies the permissions of the remote template to those authenticated users without a locally defined account. All users mapped to the remote template are of the same login class.

In the Junos OS configuration, a user template is configured in the same way as a regular local user account, except that no local authentication password is configured because the authentication is remotely performed on the RADIUS server.

- To use the same permissions for all RADIUS-authenticated users:

  [edit groups global system login]
  user@host# set user remote class class
For example:

```
[edit groups global system login]
user@host# set user remote class super-user
```

- To have different login classes be used for different RADIUS-authenticated users, granting them different permissions:

  a. Create multiple user templates in the Junos OS configuration.

     Every user template can be assigned a different login class.

     For example:

     ```
     [edit groups global system login]
     set user RO class read-only
     set user OP class operator
     set user SU class super-user
     set user remote full-name "default remote access user template"
     set user remote class read-only
     ```

  b. Have the RADIUS server specify the name of the user template to be applied to the authenticated user.

     For a RADIUS server to indicate which user template is to be applied, it needs to include the Juniper-Local-User-Name attribute (Vendor 2636, type 1, string) Juniper VSA (vendor-specific attribute) in the RADIUS Access-Accept message. The string value in the Juniper-Local-User-Name must correspond to the name of a configured user template on the device. For a list of relevant Juniper RADIUS VSAs, see Juniper Networks Vendor-Specific RADIUS Attributes.

     If the Juniper-Local-User-Name is not included in the Access-Accept message or the string contains a user template name that does not exist on the device, the user is assigned to the remote user template, if configured. If it is not configured, authentication fails for the user.

     After logging in, the remotely authenticated user retains the same username that was used to log in. However, the user inherits the user class from the assigned user template.

     In a RADIUS server, users can be assigned a Juniper-Local-User-Name string, which indicates the user template to be used in the Junos OS device. From the previous example, the string would be RO, OP, or SU.

     Configuration of the RADIUS server depends on the server being used. For instructions for the Juniper Steel-Belted Radius server, see Steel-Belted Radius (SBR) Enterprise. For information on using FreeRADIUS, see http://kb.juniper.net/InfoCenter/index?page=content&id=KB19446.

---

**Example: Configuring a RADIUS Server for System Authentication**

**Supported Platforms**  
SRX Series, vSRX
This example shows how to configure a RADIUS server for system authentication.

- Requirements on page 339
- Overview on page 339
- Configuration on page 339
- Verification on page 341

Requirements

Before you begin:

- Perform the initial device configuration. See the Getting Started Guide for your device.
- Configure at least one RADIUS server. For more details, see RADIUS Authentication and Accounting Servers Configuration Overview.

Overview

In this example, you add a new RADIUS server with an IP address of 172.16.98.1 and specify the shared secret password of the RADIUS server as Radiussecret1. The secret is stored as an encrypted value in the configuration database. Finally, you specify the source address to be included in the RADIUS server requests by the device. In most cases you can use the loopback address of the device, which in this example is 10.0.0.1.

Configuration

**CLI Quick Configuration**

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter `commit` from configuration mode.

```
set system radius-server address 172.16.98.1
set system radius-server 172.16.98.1 secret Radiussecret1
set system radius-server 172.16.98.1 source-address 10.0.0.1
```

**GUI Step-by-Step Procedure**

To configure a RADIUS server for system authentication:

1. In the J-Web user interface, select Configure>System Properties>User Management.

2. Click Edit. The Edit User Management dialog box appears.

3. Select the Authentication Method and Order tab.

4. In the RADIUS section, click Add. The Add Radius Server dialog box appears.

5. In the IP Address box, type the server’s 32–bit IP address.

6. In the Password and Confirm Password boxes, type the secret password for the server and verify your entry.
7. In the Server Port box, type the appropriate port.

8. In the Source Address box, type the source IP address of the server.

9. In the Retry Attempts box, specify the number of times that the server should try to verify the user’s credentials.

10. In the Time Out box, specify the amount of time (in seconds) the device should wait for a response from the server.

11. Click OK to check your configuration and save it as a candidate configuration.

12. If you are done configuring the device, click Commit Options>Commit.

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To configure a RADIUS server for system authentication:

1. Add a new RADIUS server and set its IP address.

   [edit system]
   user@host# set radius-server address 172.16.98.1

2. Specify the shared secret (password) of the RADIUS server.

   [edit system]
   user@host# set radius-server 172.16.98.1 secret Radiussecret1

3. Specify the device’s loopback address source address.

   [edit system]
   user@host# set radius-server 172.16.98.1 source-address 10.0.0.1

Results

From configuration mode, confirm your configuration by entering the show system radius-server command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

   [edit]
   user@host# show system radius-server
   radius-server 172.16.98.1 { 
    secret Radiussecret1;
    source-address 10.0.0.1;
   }

If you are done configuring the device, enter commit from configuration mode.
NOTE: To completely set up RADIUS authentication, you must create user template accounts and specify a system authentication order. Do one of the following tasks:

- Configure a system authentication order. See “Example: Configuring Authentication Order” on page 347.
- Configure a user. See “Example: Configuring New Users” on page 19.
- Configure local user template accounts. See “Example: Creating Template Accounts” on page 23.

Verification

Confirm that the configuration is working properly.

Verifying the RADIUS Server System Authentication Configuration

Purpose
Verify that the RADIUS server has been configured for system authentication.

Action
From operational mode, enter the `show system radius-server` command.

Related Documentation
- Understanding User Authentication Methods on page 12
- Understanding User Accounts on page 6
- Example: Configuring a TACACS+ Server for System Authentication on page 344
- Understanding Login Classes on page 3

Configuring TACACS+ Authentication

Supported Platforms M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

TACACS+ authentication is a method of authenticating users who attempt to access the router or switch. Tasks to configure TACACS+ configuration are:

- Configuring TACACS+ Server Details on page 341
- Specifying a Source Address for the Junos OS to Access External TACACS+ Servers on page 342
- Configuring the Same Authentication Service for Multiple TACACS+ Servers on page 343
- Configuring Juniper Networks Vendor-Specific TACACS+ Attributes on page 343

Configuring TACACS+ Server Details

Supported Platforms
To use TACACS+ authentication on the router or switch, configure information about one or more TACACS+ servers on the network by including the `tacplus-server` statement at the `[edit system]` hierarchy level:

```
[edit system]
tacplus-server server-address {
  port port-number;
  secret password;
  single-connection;
  timeout seconds;
}
```

`server-address` is the address of the TACACS+ server.

`port-number` is the TACACS+ server port number.

You must specify a secret (password) that the local router or switch passes to the TACACS+ client by including the `secret` statement. If the password included spaces, enclose the password in quotation marks. The secret used by the local router or switch must match that used by the server.

Optionally, you can specify the length of time that the local router or switch waits to receive a response from a TACACS+ server by including the `timeout` statement. By default, the router or switch waits 3 seconds. You can configure this to be a value in the range from 1 through 90 seconds.

Optionally, you can have the software maintain one open Transmission Control Protocol (TCP) connection to the server for multiple requests, rather than opening a connection for each connection attempt by including the `single-connection` statement.

---

**NOTE:** Early versions of the TACACS+ server do not support the `single-connection` option. If you specify this option and the server does not support it, the Junos OS will be unable to communicate with that TACACS+ server.

To configure multiple TACACS+ servers, include multiple `tacplus-server` statements.

To configure a set of users that share a single account for authorization purposes, you create a template user. To do this, include the `user` statement at the `[edit system login]` hierarchy level, as described in Overview of Template Accounts for RADIUS and TACACS+ Authentication.

Specifying a Source Address for the Junos OS to Access External TACACS+ Servers

**Supported Platforms**

You can specify which source address the Junos OS uses when accessing your network to contact an external TACACS+ server for authentication. You can also specify which source address the Junos OS uses when contacting a TACACS+ server for sending accounting information.
To specify a source address for a TACACS+ server for authentication, include the `source-address` statement at the [edit system tacplus-server server-address] hierarchy level:

```
[edit system tacplus-server server-address]
source-address source-address;
```

`source-address` is a valid IP address configured on one of the router or switch interfaces.

To specify a source address for a TACACS+ server for system accounting, include the `source-address` statement at the [edit system accounting destination tacplus server server-address] hierarchy level:

```
[edit system accounting destination tacplus server server-address]
source-address source-address;
```

`source-address` is a valid IP address configured on one of the router or switch interfaces.

### Configuring the Same Authentication Service for Multiple TACACS+ Servers

**Supported Platforms** SRX Series, vSRX

To configure the same authentication service for multiple TACACS+ servers, include statements at the [edit system tacplus-server] and [edit system tacplus-options] hierarchy levels. For information about how to configure a TACACS+ server at the [edit system tacplus-server] hierarchy level, see “Configuring TACACS+ Authentication” on page 341.

To assign the same authentication service to multiple TACACS+ servers, include the `service-name` statement at the [edit system tacplus-options] hierarchy level:

```
[edit system tacplus-options]
service-name service-name;
```

`service-name` is the name of the authentication service. By default, the service name is set to `junos-exec`.

The following example shows how to configure the same authentication service for multiple TACACS+ servers:

```
[edit system]
tacplus-server {
  10.2.2.2 secret "$ABC123"; ## SECRET-DATA
  10.3.3.3 secret "$ABC123";## SECRET-DATA
}
tacplus-options {
  service-name bob;
}
```

### Configuring Juniper Networks Vendor-Specific TACACS+ Attributes

**Supported Platforms** SRX Series, vSRX

The Juniper Networks Vendor-Specific TACACS+ Attributes enable you to configure access privileges for users on a TACACS+ server. They are specified in the TACACS+ server configuration file on a per-user basis. The Junos OS retrieves these attributes...
through an authorization request of the TACACS+ server after authenticating a user. You do not need to configure these attributes to run the Junos OS with TACACS+

To specify these attributes, include a service statement of the following form in the TACACS+ server configuration file:

```plaintext
service = junos-exec { 
  local-user-name = <username-local-to-router>
  allow-commands = "<allow-commands-regex>"
  allow-configuration-regexps = "<allow-configuration-regex>"
  deny-commands = "<deny-commands-regex>"
  deny-configuration-regexps = "<deny-configuration-regex>"
}
```

This service statement can appear in a user or group statement.

Related Documentation
- Example: Configuring a TACACS+ Server for System Authentication on page 344

Example: Configuring a TACACS+ Server for System Authentication

Supported Platforms  
SRX Series, vSRX

This example shows how to configure a TACACS+ server for system authentication.

- Requirements on page 344
- Overview on page 344
- Configuration on page 344
- Verification on page 346

Requirements

Before you begin:

- Perform the initial device configuration. See the Getting Started Guide for your device.
- Configure at least one TACACS+ server.

Overview

In this example, you set the IP address to 172.16.98.24 and the shared secret password of the TACACS+ server to Tacacssecret1. The secret password is stored as an encrypted value in the configuration database. You then set the loopback source address as 10.0.0.1

Configuration

CLI Quick Configuration
To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter commit from configuration mode.

```plaintext
set system tacplus-server address 172.16.98.24
set system tacplus-server 172.16.98.24 secret Tacacssecret1
```
set system tacplus-server 172.16.98.24 source-address 10.0.0.1

GUI Step-by-Step Procedure
To configure a TACACS+ server for system authentication:
1. In the J-Web user interface, select Configure > System Properties > User Management.
2. Click Edit. The Edit User Management dialog box appears.
3. Select the Authentication Method and Order tab.
4. In the TACACS section, click Add. The Add TACACS Server dialog box appears.
5. In the IP Address box, type the server’s 32-bit IP address.
6. In the Password and Confirm Password boxes, type the secret password for the server and verify your entry.
7. In the Server Port box, type the appropriate port.
8. In the Source Address box, type the locally configured interface address, which is used as the source address for TACACS+ packets.
   
   NOTE: The Source Address box can accept either a hostname or an IP address.

9. In the Retry Attempts box, specify the number of times that the server should try to verify the user’s credentials.
10. In the Time Out box, specify the amount of time (in seconds) the device should wait for a response from the server.
11. Click OK to check your configuration and save it as a candidate configuration.
12. If you are done configuring the device, click Commit Options > Commit.

Step-by-Step Procedure
The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To configure a TACACS+ server for system authentication:
1. Add a new TACACS+ server and set its IP address.
2. Specify the shared secret (password) of the TACACS+ server.
   
   [edit system]
   user@host# set tacplus-server address 172.16.98.24

   [edit system]
   user@host# set tacplus-server 172.16.98.24 secret Tacacssecret1

3. Specify the device’s loopback address as the source address.

   [edit system]
   user@host# set tacplus-server 172.16.98.24 source-address 10.0.0.1

Results

From configuration mode, confirm your configuration by entering the `show system tacplus-server` command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show system tacplus-server
Tacplus-server 172.16.98.24 {
  secret Tacacssecret1;
  source-address 10.0.0.1;
}
```

If you are done configuring the device, enter `commit` from configuration mode.

---

**NOTE:** To completely set up TACACS+ authentication, you must create user template accounts and specify a system authentication order. Do one of the following tasks:

- Configure a system authentication order. See “Example: Configuring Authentication Order” on page 347.
- Configure a user. See “Example: Configuring New Users” on page 19.
- Configure local user template accounts. See “Example: Creating Template Accounts” on page 23.

---

**Verification**

Confirm that the configuration is working properly.

**Verifying the TACACS+ Server System Authentication Configuration**

**Purpose**

Verify that the TACACS+ server has been configured for system authentication.

**Action**

From configuration mode, enter the `show system tacplus-server` command.
**Example: Configuring Authentication Order**

**Supported Platforms**  
SRX Series, vSRX

This example shows how to configure authentication order.

- Requirements on page 347
- Overview on page 347
- Configuration on page 347
- Verification on page 349

**Requirements**

Before you begin, perform the initial device configuration. See the Getting Started Guide for your device.

**Overview**

You can configure the authentication methods that the device uses to verify that a user can gain access. For each login attempt, the device tries the authentication methods in order, starting with the first one, until the password matches. If you do not configure system authentication, users are verified based on their configured local passwords.

This example configures the device to attempt user authentication with the local password first, then with the RADIUS server, and finally with the TACACS+ server.

**Configuration**

**CLI Quick Configuration**

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter commit from configuration mode.

```
insert system authentication-order radius after password  
insert system authentication-order tacplus after radius
```

**GUI Step-by-Step Procedure**

To configure authentication order:

1. In the J-Web user interface, select Configure > System Properties > User Management.

2. Click Edit. The Edit User Management dialog box appears.

3. Select the Authentication Method and Order tab.
4. Under Available Methods, select the authentication method the device should use to authenticate users, and use the arrow button to move the item to the Selected Methods list. Available methods include:
   - RADIUS
   - TACACS+
   - Local Password

   If you want to use multiple methods to authenticate users, repeat this step to add the additional methods to the Selected Methods list.

5. Under Selected Methods, use the Up Arrow and Down Arrow to specify the order in which the device should execute the authentication methods.

6. Click OK to check your configuration and save it as a candidate configuration.

7. If you are done configuring the device, click Commit Options>Commit.

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To configure authentication order:

1. Add RADIUS authentication to the authentication order.
   
   ```
   [edit]
   user@host# insert system authentication-order radius after password
   ```

2. Add TACACS+ authentication to the authentication order.
   
   ```
   [edit]
   user@host# insert system authentication-order tacplus after radius
   ```

Results

From configuration mode, confirm your configuration by entering the `show system authentication-order` command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

   ```
   [edit]
   user@host# show system authentication-order
   authentication-order [password, radius, tacplus];
   ```

   If you are done configuring the device, enter commit from configuration mode.
NOTE: To completely set up RADIUS or TACACS+ authentication, you must configure at least one RADIUS or TACACS+ server and create user template accounts. Do one of the following tasks:

- Configure a user. See “Example: Configuring New Users” on page 19.
- Configure template accounts. See “Example: Creating Template Accounts” on page 23.

Verification

Confirm that the configuration is working properly.

**Verifying the Authentication Order Configuration**

**Purpose**
Verify that the authentication order has been configured.

**Action**
From operational mode, enter the `show system authentication-order` command.

**Related Documentation**
- Understanding User Authentication Methods on page 12
- Understanding User Accounts on page 6
- Understanding Login Classes on page 3
PART 2

Configuring Remote Access to an SRX Series Appliances

- Securing Console Port Access on page 353
- Configuring Secure Web Access on page 355
- Setting up USB Modems for Remote Management on page 363
- Configuring Telnet and SSH Access to an SRX Series Appliance on page 383
Securing Console Port Access

Configuration Guidelines for Securing Console Port Access on page 353

**Supported Platforms**

SRX Series, vSRX

You can use the console port on the device to connect to the device through an RJ-45 serial cable. From the console port, you can use the CLI to configure the device. By default, the console port is enabled. To secure the console port, you can configure the device to take the following actions:

- Log out of the console session when you unplug the serial cable connected to the console port.
- Disable root login connections to the console. This action prevents a non-root user from performing password recovery operation using the console.
- Disable the console port. We recommend disabling the console port to prevent unauthorized access to the device, especially when the device is used as customer premises equipment (CPE) and is forwarding sensitive traffic.

**NOTE:** It is not always possible to disable the console port, because console access is important during operations such as software upgrades.

To secure the console port:

1. Do one of the following:
   - Disable the console port. Enter
     
     [edit system ports console]
     user@host# set disable
   - Disable root login connections to the console. Enter
     
     [edit system ports console]
     user@host# set insecure
NOTE: After configuring the console port as insecure, if a user tries to perform password recovery operation by booting in single-user mode, the device will prompt for the root password. This way, the user will be unable to log in to single-user mode for password recovery unless the root password is known.

- Log out the console session when the serial cable connected to the console port is unplugged. Enter
  
  [edit system ports console]
  user@host# set log-out-on-disconnect

2. If you are done configuring the device, enter `commit` from configuration mode.

Related Documentation
- The telnet Command on page 393
- `ssh` on page 395
- Configuring Password Retry Limits for Telnet and SSH Access on page 383
- Configuring Reverse Telnet and Reverse SSH
Secure Web Access Overview

Supported Platforms  SRX Series, vSRX

You can manage a Juniper Networks device remotely through the J-Web interface. To communicate with the device, the J-Web interface uses the Hypertext Transfer Protocol (HTTP). HTTP allows easy Web access but no encryption. The data that is transmitted between the Web browser and the device by means of HTTP is vulnerable to interception and attack. To enable secure Web access, the Juniper Networks devices support HTTP over Secure Sockets Layer (HTTPS). You can enable HTTP or HTTPS access on specific interfaces and ports as needed.

The Juniper Networks device uses the Secure Sockets Layer (SSL) protocol to provide secure device management through the Web interface. SSL uses public-private key technology that requires a paired private key and an authentication certificate for providing the SSL service. SSL encrypts communication between your device and the Web browser with a session key negotiated by the SSL server certificate.

An SSL certificate includes identifying information such as a public key and a signature made by a certificate authority (CA). When you access the device through HTTPS, an SSL handshake authenticates the server and the client and begins a secure session. If the information does not match or the certificate has expired, you cannot access the device through HTTPS.

Without SSL encryption, communication between your device and the browser is sent in the open and can be intercepted. We recommend that you enable HTTPS access on your WAN interfaces.
HTTP access is enabled by default on the built-in management interfaces. By default, HTTPS access is supported on any interface with an SSL server certificate.

### Related Documentation
- Generating an SSL Certificate Using the `openssl` Command on page 356
- Generating a Self-Signed SSL Certificate on page 356
- Configuring Device Addresses on page 358
- Example: Configuring Secure Web Access on page 359

### Generating an SSL Certificate Using the `openssl` Command

**Supported Platforms**: SRX Series, vSRX

To generate an SSL certificate using the `openssl` command:

1. Enter `openssl` in the CLI. The `openssl` command generates a self-signed SSL certificate in privacy-enhanced mail (PEM) format. It writes the certificate and an unencrypted 1024-bit RSA private key to the specified file.

   ```
   % openssl req -x509 -nodes -newkey rsa:1024 -keyout filename.pem -out 
   filename.pem
   ```

   Replace `filename` with the name of a file in which you want the SSL certificate to be written—for example, `new.pem`.

   **NOTE**: Run this command on a LINUX or UNIX device because Juniper Networks Services Gateways do not support the `openssl` command.

2. When prompted, type the appropriate information in the identification form. For example, type `US` for the country name.

3. Display the contents of the file `new.pem`.

   ```
   cat new.pem
   ```

   Copy the contents of this file for installing the SSL certificate.

### Generating a Self-Signed SSL Certificate

**Supported Platforms**: SRX Series, vSRX

To generate a self-signed SSL certificate on Juniper Networks devices:

1. Establish basic connectivity.
2. Reboot the system. The self-signed certificate is automatically generated at bootup time.

   user@host> request system reboot
   Reboot the system? [yes,no] yes

3. Specify system-generated-certificate under HTTPS Web management.

   [edit]
   user@host# show system services web-management https
   system-generated-certificate

Related Documentation

- Generating an SSL Certificate Using the openssl Command on page 356

Manually Generating Self-Signed SSL Certificates

Supported Platforms

- SRX Series, vSRX

To manually generate a self-signed SSL certificate on Juniper Networks devices:

1. Establish basic connectivity.

2. If you have root login access, you can manually generate the self-signed certificate by using the following commands:

   root@host> request security pki generate-size 512 certificate-id certname

   Generated key pair sslcert, key size 512 bits

   root@host> request security pki local-certificate generate-self-signed certificate-id cert-name email domain-name domain-name ip-address ip-address subject "DC= Domain name, CN= Common-Name, OU= Organizational-Unit-name, O= Organization-Name, ST= state, C= Country"

   Self-signed certificate generated and loaded successfully

   NOTE: When generating the certificate, you must specify the subject, e-mail address, and either domain-name or ip-address.

3. Specify local-certificate under HTTPS Web management.

   [edit]
   root@host# show system services web-management https local-certificate certname

Related Documentation

- Generating a Self-Signed SSL Certificate on page 356
Configuring Device Addresses

**Supported Platforms**  
SRX Series, vSRX

You can use the Management tab to configure IPv4 and loopback addresses on the device.

To configure IPv4 and loopback addresses:

1. In the J-Web user interface, select **Configure > System Properties > Management Access**.

2. Click **Edit**. The Edit Management Access dialog box appears.

3. Select the **Management** tab.

4. If you want to enable a loopback address for the device, enter an address and corresponding subnet mask in the **Loopback address** section.

5. If you want to enable an IPv4 address for the device, select **IPv4 address** and enter a corresponding management port, subnet mask, and default gateway.

6. Click **OK** to save the configuration or **Cancel** to clear it.

**Related Documentation**

- Enabling Access Services on page 358

---

Enabling Access Services

**Supported Platforms**  
SRX Series, vSRX

You can use the Services tab to specify the type of connections that users can make to the device. For instance, you can enable secure HTTPS sessions to the device or enable access to the Junos XML protocol XML scripting API.

To enable access services:

1. In the J-Web user interface, select **Configure > System Properties > Management Access**.

2. Click **Edit**. The Edit Management Access dialog box appears.

3. Select the **Services** tab.

4. If you want to enable users to create secure Telnet or secure SSH connections to the device, select **Enable Telnet** or **Enable SSH**.
5. If you want to enable access to the Junos XML protocol XML scripting API, select Enable Junos XML protocol over clear text or Enable Junos XML protocol over SSL. If you enable Junos XML protocol over SSL, select the certificate you want to use for encryption from the Junos XML protocol certificate drop-down list.

6. Select Enable HTTP if you want users to connect to device interfaces over an HTTP connection. Then specify the interfaces that should use the HTTP connection:
   - Enable on all interfaces—Select this option if you want to enable HTTP on all device interfaces.
   - Selected interfaces—Use the arrow buttons to populate this list with individual interfaces if you want to enable HTTP on only some of the device interfaces.

7. If you want users to connect to device interfaces over a secure HTTPS connection, select Enable HTTPS. Then select which certificate you want to use to secure the connection from the HTTPS certificates list and specify the interfaces that should use the HTTPS connection:
   - Enable on all interfaces—Select this option if you want to enable HTTPS on all device interfaces.
   - Selected interfaces—Use the arrow buttons to populate this list with individual interfaces if you want to enable HTTPS on only some of the device interfaces.

8. Click OK to save the configuration or Cancel to clear it.

To verify that Web access is enabled correctly, connect to the device using one of the following methods:

- For HTTP access—in your Web browser, type http://URL or http://IP address.
- For HTTPS access—in your Web browser, type https://URL or https://IP address.
- For SSL Junos XML protocol access—a Junos XML protocol client such as Junos Scope is required.

Related Documentation
- Configuring Device Addresses on page 358

Example: Configuring Secure Web Access

Supported Platforms  SRX Series, vSRX

This example shows how to configure secure Web access on your device:

- Requirements on page 360
- Overview on page 360
- Configuration on page 360
- Verification on page 361
Requirements

No special configuration beyond device initialization is required before configuring this feature.

NOTE: You can enable HTTPS access on specified interfaces. If you enable HTTPS without specifying an interface, HTTPS is enabled on all interfaces.

Overview

In this example, you import the SSL certificate that you have generated as a new and private key in PEM format. You then enable HTTPS access and specify the SSL certificate to be used for authentication. Finally, you specify the port as 8443 on which HTTPS access is to be enabled.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter commit from configuration mode.

```
set security certificates local new load-key-file /var/tmp/new.pem
set system services web-management https local-certificate new port 8443
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To configure secure Web access on your device:

1. Import the SSL certificate and private key.
   
   ```
   [edit security]
   user@host# set certificates local new load-key-file /var/tmp/new.pem
   ```

2. Enable HTTPS access and specify the SSL certificate and port.
   
   ```
   [edit system]
   user@host# set services web-management https local-certificate new port 8443
   ```

Results

From configuration mode, confirm your configuration by entering the show security command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show security certificates {
   local {
```
new {
  "-----BEGIN RSA PRIVATE KEY-----
  MIICXQIBAAKBgQC/C5UI4frNqbi
pWbTiOkJvqoDw2YgYseOZ5zzVjLYErGg954Tb7nEuHM67Ck8hAOrCnbOYO+S
Y5rCXLf4+2s8k9EypLrYRw/Ts66DzoXl4/viqE7H558\n5sQw/UDB1w7/MJ+Opa
...KYiFf4C6B6j1MJOH fanaticWi6f6SvBslONkzdX+FTni95ddGmL6iRnArE64VFCRh+
eIQd4pUj2y7XuzDx4Z\n-----END RSA PRIVATE KEY-----
  -----BEGIN CERTIFICATE-----
  MIIDjDCCAvWgAwIBAgIBADANBgkqhkiG9w0BAQh
FADCBkTELMAkGA1UEBhMCdXMx
CzAJBgNVBAgTAmNhMRIwEAYDVQQHEwlzdW5ue
HB1YhmsYWOH
  -----END CERTIFICATE-----
}
}

If you are done configuring the device, enter commit from configuration mode.

**Verification**

Confirm that the configuration is working properly.

- Verifying an SSL Certificate Configuration on page 361
- Verifying a Secure Access Configuration on page 361

**Verifying an SSL Certificate Configuration**

**Purpose**

Verify the SSL certificate configuration.

**Action**

From operational mode, enter the `show security` command.

**Verifying a Secure Access Configuration**

**Purpose**

Verify the secure access configuration.

**Action**

From operational mode, enter the `show system services` command. The following sample output displays the sample values for secure Web access:

```
[edit]
user@host# show system services
web-management {
  http;
  https {
    port 8443;
    local-certificate new;
  }
}
```

**Related Documentation**

- Secure Web Access Overview on page 355
- Generating an SSL Certificate Using the openssl Command on page 356
- Generating a Self-Signed SSL Certificate on page 356
Adding, Editing, and Deleting Certificates on the Device

Supported Platforms  SRX Series, vSRX

You can use the Certificates tab to upload SSL certificates to the device, edit existing certificates on the device, or delete certificates from the device. You can use the certificates to secure HTTPS and Junos XML protocol sessions.

To add, edit, or delete a certificate:

1. In the J-Web user interface, select Configure > System Properties > Management Access.

2. Click Edit. The Edit Management Access dialog box appears.

3. Select the Certificates tab.

4. Choose one of the following options:
   - If you want to add a new certificate, click Add. The Add Certificate section is expanded.
   - If you want to edit the information for an existing certificate, select it and click Edit. The Edit Certificate section is expanded.
   - If you want to delete an existing certificate, select it and click Delete. (You can skip the remaining steps in this section.)

5. In the Certificate Name box, type a name—for example, new.

6. In the Certificate content box, paste the generated certificate and RSA private key.

7. Click Save.

8. Click OK to save the configuration or Cancel to clear it.

Related Documentation  • Generating an SSL Certificate Using the openssl Command on page 356
CHAPTER 8

Setting up USB Modems for Remote Management

- USB Modem Interface Overview on page 363
- USB Modem Configuration Overview on page 366
- Example: Configuring a USB Modem Interface on page 369
- Example: Configuring a Dialer Interface on page 372
- Example: Configuring a Dialer Interface for USB Modem Dial-In on page 376
- Configuring a Dial-Up Modern Connection Remotely on page 378
- Connecting to the Device Remotely on page 379
- Modifying USB Modem Initialization Commands on page 380
- Resetting USB Modems on page 381

USB Modem Interface Overview

Supported Platforms  SRX Series

Juniper Networks SRX Series devices support the use of USB modems for remote management. You can use Telnet or SSH to connect to the device from a remote location through two modems over a telephone network. The USB modem is connected to the USB port on the device, and a second modem is connected to a remote management device such as a PC or laptop computer.

NOTE: Starting with Junos OS Release 15.1X49-D10 and Junos OS Release 17.3R1, USB modems are no longer supported for dial backup on SRX300, SRX320, SRX340, SRX345, SRX550HM devices.

You can configure your device to fail over to a USB modem connection when the primary Internet connection experiences interruption.

A USB modem connects to a device through modem interfaces that you configure. The device applies its own modem AT commands to initialize the attached modem. Modern setup requires that you connect and configure the USB modem at the device and the modem at the user end of the network.
You use either the J-Web configuration editor or CLI configuration editor to configure the USB modem and its supporting dialer interfaces.

**NOTE:** Low-latency traffic such as VoIP traffic is not supported over USB modem connections.

**NOTE:** We recommend using a USRobotics USB 56k V.92 Modem, model number USR Model 5637.

### USB Modem Interfaces

You configure two types of interfaces for USB modem connectivity:

- A physical interface which uses the naming convention `umd0`. The device creates this interface when a USB modem is connected to the USB port.

- A logical interface called the dialer interface. You use the dialer interface, `dln`, to configure dialing properties for USB modem connections. The dialer interface can be configured using Point-to-Point Protocol (PPP) encapsulation. You can also configure the dialer interface to support authentication protocols—PPP Challenge Handshake (CHAP) or Password Authentication Protocol (PAP). You can configure multiple dialer interfaces for different functions on the device. After configuring the dialer interface, you must configure a backup method such as a dialer backup, a dialer filter, or a dialer watch.

The USB modem provides a dial-in remote management interface, and supports dialer interface features by sharing the same dial pool as a dialer interface. The dial pool allows the logical dialer interface and the physical interface to be bound together dynamically on a per-call basis. You can configure the USB modem to operate either as a dial-in console for management or as a dial-in WAN backup interface. Dialer pool priority has a range from 1 to 255, with 1 designating the lowest priority interfaces and 255 designating the highest priority interfaces.

### Dialer Interface Rules

The following rules apply when you configure dialer interfaces for USB modem connections:

- The dialer interface must be configured to use PPP encapsulation. You cannot configure Cisco High-Level Data Link Control (HDLC) or Multilink PPP (MLPPP) encapsulation on dialer interfaces.

- The dialer interface cannot be configured as a constituent link in a multilink bundle.

- The dialer interface can perform backup, dialer filter, and dialer watch functions, but these operations are mutually exclusive. You can configure a single dialer interface to operate in only one of the following ways:
  - As a backup interface—for one primary interface
• As a dialer filter
• As a dialer watch interface

The backup dialer interfaces are activated only when the primary interface fails. USB modem backup connectivity is supported on all interfaces except lsq-0/0/0.

The dial-on-demand routing backup method allows a USB modem connection to be activated only when network traffic configured as an “interesting packet” arrives on the network. Once the network traffic is sent, an inactivity timer is triggered and the connection is closed. You define an interesting packet using the dialer filter feature of the device. To configure dial-on-demand routing backup using a dialer filter, you first configure the dialer filter and then apply the filter to the dialer interface.

Dialer watch is a backup method that integrates backup dialing with routing capabilities and provides reliable connectivity without relying on a dialer filter to trigger outgoing USB modem connections. With dialer watch, the device monitors the existence of a specified route. If the route disappears, the dialer interface initiates the USB modem connection as a backup connection.

How the Device Initializes USB Modems

When you connect the USB modem to the USB port on the device, the device applies the modem AT commands configured in the init-command-string command to the initialization commands on the modem.

If you do not configure modem AT commands for the init-command-string command, the device applies the following default sequence of initialization commands to the modem: AT S7=45 S0=0 V1 X4 &C1 E0 Q0 &Q8 %C0. Table 8 on page 365 describes the commands. For more information about these commands, see the documentation for your modem.

Table 8: Default Modem Initialization Commands

<table>
<thead>
<tr>
<th>Modem Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT</td>
<td>Attention. Informs the modem that a command follows.</td>
</tr>
<tr>
<td>S7=45</td>
<td>Instructs the modem to wait 45 seconds for a telecommunications service provider (carrier) signal before terminating the call.</td>
</tr>
<tr>
<td>S0=0</td>
<td>Disables the auto answer feature, whereby the modem automatically answers calls.</td>
</tr>
<tr>
<td>VI</td>
<td>Displays result codes as words.</td>
</tr>
<tr>
<td>&amp;C1</td>
<td>Disables reset of the modem when it loses the carrier signal.</td>
</tr>
<tr>
<td>E0</td>
<td>Disables the display on the local terminal of commands issued to the modem from the local terminal.</td>
</tr>
<tr>
<td>Q0</td>
<td>Enables the display of result codes.</td>
</tr>
</tbody>
</table>
Table 8: Default Modem Initialization Commands (continued)

<table>
<thead>
<tr>
<th>Modem Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&amp;Q8</td>
<td>Enables Microcom Networking Protocol (MNP) error control mode.</td>
</tr>
<tr>
<td>%C0</td>
<td>Disables data compression.</td>
</tr>
</tbody>
</table>

When the device applies the modem AT commands in the `init-command-string` command or the default sequence of initialization commands to the modem, it compares them to the initialization commands already configured on the modem and makes the following changes:

- If the commands are the same, the device overrides existing modem values that do not match. For example, if the initialization commands on the modem include `SO=0` and the device’s `init-command-string` command includes `SO=2`, the device applies `SO=2`.

- If the initialization commands on the modem do not include a command in the device’s `init-command-string` command, the device adds it. For example, if the `init-command-string` command includes the command `L2`, but the modem commands do not include it, the device adds `L2` to the initialization commands configured on the modem.

**NOTE:** On SRX210 devices, the USB modem interface can handle bidirectional traffic of up to 19 Kbps. On oversubscription of this amount (that is, bidirectional traffic of 20 Kbps or above), keepalives do not get exchanged, and the interface goes down. (Platform support depends on the Junos OS release in your installation.)

**Release History Table**

<table>
<thead>
<tr>
<th>Release</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1X49-D10</td>
<td>Starting with Junos OS Release 15.1X49-D10 and Junos OS Release 17.3R1, USB modems are no longer supported for dial backup on SRX300, SRX320, SRX340, SRX345, SRX550HM devices.</td>
</tr>
</tbody>
</table>

**Related Documentation**

- USB Modem Configuration Overview on page 366
- Example: Configuring a USB Modem Interface on page 369
- Example: Configuring a Dialer Interface for USB Modem Dial-In on page 376

**USB Modem Configuration Overview**

**Supported Platforms**

SRX Series
NOTE: Starting with Junos OS Release 15.1X49-D10 and Junos OS Release 17.3R1, USB modems are no longer supported for dial backup on SRX300, SRX320, SRX340, and SRX345 devices.

Before you begin:

1. Install device hardware. For more information, see the Getting Started Guide for your device.

2. Establish basic connectivity. For more information, see the Getting Started Guide for your device.

3. Order a US Robotics USB 56k V.92 Modem, model number USR Model 5637 (http://www.usr.com/).

4. Order a public switched telephone network (PSTN) line from your telecommunications service provider. Contact your service provider for more information.

5. Connect the USB modem to the device's USB port.

NOTE: When you connect the USB modem to the USB port on the device, the USB modem is initialized with the modem initialization string configured for the USB modem interface on the device.

   a. Plug the modem into the USB port.

   b. Connect the modem to your telephone network.

Suppose you have a branch office router and a head office router each with a USB modem interface and a dialer interface. This example shows you how to establish a backup connection between the branch office and head office routers. See Table 9 on page 368 for a summarized description of the procedure.
Table 9: Configuring Branch Office and Head Office Routers for USB Modem Backup Connectivity

<table>
<thead>
<tr>
<th>Router Location</th>
<th>Configuration Requirement</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Branch Office</td>
<td>Configure the logical dialer interface on the branch office router for USB modem dial backup.</td>
<td>To configure the logical dialer interface, see “Example: Configuring a USB Modem Interface” on page 369.</td>
</tr>
<tr>
<td></td>
<td>Configure the dialer interface dl0 on the branch office router using one of the following backup methods:</td>
<td>Configure the dialer interface using one of the following backup methods:</td>
</tr>
<tr>
<td></td>
<td>• Configure the dialer interface dl0 as the backup interface on the branch office router’s primary T1 interface t1-1/0/0.</td>
<td>• To configure dl0 as a backup for t1-1/0/0 see Example: Configuring Dialer Interfaces and Backup Methods for USB Modem Dial Backup.</td>
</tr>
<tr>
<td></td>
<td>• Configure a dialer filter on the branch office router’s dialer interface.</td>
<td>• To configure a dialer filter on dl0, see Example: Configuring Dialer Interfaces and Backup Methods for USB Modem Dial Backup.</td>
</tr>
<tr>
<td></td>
<td>• Configure a dialer watch on the branch office router’s dialer interface.</td>
<td>• To configure a dialer watch on dl0, see Example: Configuring Dialer Interfaces and Backup Methods for USB Modem Dial Backup.</td>
</tr>
<tr>
<td>Head Office</td>
<td>Configure dial-in on the dialer interface dl0 on the head office router.</td>
<td>To configure dial-in on the head office router, see “Example: Configuring a Dialer Interface for USB Modem Dial-In” on page 376.</td>
</tr>
</tbody>
</table>

If the dialer interface is configured to accept only calls from a specific caller ID, the device matches the incoming call’s caller ID against the caller IDs configured on its dialer interfaces. If an exact match is not found and the incoming call’s caller ID has more digits than the configured caller IDs, the device performs a right-to-left match of the incoming call’s caller ID with the configured caller IDs and accepts the incoming call if a match is found. For example, if the incoming call’s caller ID is 4085321091 and the caller ID configured on a dialer interface is 5321091, the incoming call is accepted. Each dialer interface accepts calls from only callers whose caller IDs are configured on it.

See Table 10 on page 368 for a list of available incoming map options.

Table 10: Incoming Map Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>accept-all</td>
<td>Dialer interface accepts all incoming calls.</td>
</tr>
</tbody>
</table>

You can configure the **accept-all** option for only one of the dialer interfaces associated with a USB modem physical interface. The dialer interface with the **accept-all** option configured is used only if the incoming call’s caller ID does not match the caller IDs configured on other dialer interfaces.
Table 10: Incoming Map Options (continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>caller</td>
<td>Dialer interface accepts calls from a specific caller ID. You can configure a maximum of 15 caller IDs per dialer interface. The same caller ID must not be configured on different dialer interfaces. However, you can configure caller IDs with more or fewer digits on different dialer interfaces. For example, you can configure the caller IDs 14085551515, 4085551515, and 5551515 on different dialer interfaces.</td>
</tr>
</tbody>
</table>

You configure dialer interfaces to support PAP. PAP allows a simple method for a peer to establish its identity using a two-way handshake during initial link establishment. After the link is established, an ID and password pair are repeatedly sent by the peer to the authenticator until authentication is acknowledged or the connection is terminated.

Release History Table

<table>
<thead>
<tr>
<th>Release</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1X49-D10</td>
<td>Starting with Junos OS Release 15.1X49-D10 and Junos OS Release 17.3R1, USB modems are no longer supported for dial backup on SRX300, SRX320, SRX340, and SRX345 devices.</td>
</tr>
</tbody>
</table>

Related Documentation

- USB Modem Interface Overview on page 363
- Example: Configuring a USB Modem Interface on page 369

Example: Configuring a USB Modem Interface

Supported Platforms

SRX Series

This example shows how to configure a USB modem interface for dial backup.

NOTE: Starting with Junos OS Release 15.1X49-D10 and Junos OS Release 17.3R1, USB modems are no longer supported for dial backup on SRX300, SRX320, SRX340, and SRX345 devices.

- Requirements on page 369
- Overview on page 370
- Configuration on page 370
- Verification on page 371

Requirements

No special configuration beyond device initialization is required before configuring this feature.
Overview

In this example, you create an interface called as umd0 for USB modem connectivity and set the dialer pool priority to 25. You also configure a modem initialization string to autoanswer after a specified number of rings. The default modem initialization string is `AT S7=45 S0=0 V1 X4 &C1 EQ Q0 &Q8 %C0`. The modem command `S0=0` disables the modem from autoanswering the calls. Finally, you set the modem to act as a dial-in WAN backup interface.

Configuration

**CLI Quick Configuration**

To quickly configure this example, copy the following command, paste it into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the command into the CLI at the `[edit]` hierarchy level, and then enter `commit` from configuration mode.

```
set interfaces umd0 dialer-options pool usb-modem-dialer-pool priority 25
set modem-options init-command-string "ATS0=2 \n"
dialin routable
```

**Step-by-Step Procedure**

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a USB modem interface for dial backup:

1. Create an interface.
   ```
   [edit]
   user@host# edit interfaces umd0
   ```

2. Set the dialer options and priority.
   ```
   [edit interfaces umd0]
   user@host# set dialer-options pool usb-modem-dialer-pool priority 25
   ```

3. Specify the modem options.
   ```
   [edit interfaces umd0]
   user@host# set modem-options init-command-string "ATS0=2 \n"
   ```

4. Set the modem to act as a dial-in WAN backup interface.
   ```
   [edit interfaces umd0]
   user@host# set modem-options dialin routable
   ```

**Results**

From configuration mode, confirm your configuration by entering the `show interface umd0` command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show interface umd0
```
modem-options{
    init-command-string "ATS0=2\n";
    dialin-routable;
}
dialer-options{
    pool usb-modem-dialer-pool priority 25;
}

If you are done configuring the device, enter commit from configuration mode.

Verification

Confirm that the configuration is working properly.

Verifying the Configuration

**Purpose**
Verify a USB modem interface for dial backup.

**Action**
From configuration mode, enter the `show interfaces umd0 extensive` command. The output shows a summary of interface information and displays the modem status.

```
Physical interface:   umd0, Enabled, Physical link is Up
Interface index:      64, SNMP ifIndex: 33, Generation: 1
Type: Async-Serial, Link-level type: PPP-Subordinate, MTU: 1504,
Clocking: Unspecified, Speed: MODEM
Device flags : Present Running
Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
Link flags    : None
Hold-times    : Up 0 ms, Down 0 ms
Last flapped  : Never
Statistics last cleared: Never
Traffic statistics:
Input  bytes  :                21672
Output bytes :                22558
Input  packets:                 1782
Output packets:                 1832
Input errors:
   Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0, Policed discards: 0,
Resource errors: 0
Output errors:
   Carrier transitions: 63, Errors: 0, Drops: 0, MTU errors: 0, Resource errors: 0
MODEM status:
   Modem type             : LT V.92 1.0 MT5634ZBA-USB-V92 Data/Fax Modem
(Dual Config) Version 2.27m
   Initialization command string : ATS0=2
   Initialization status        : Ok
   Call status                 : Connected to 4085551515
   Call duration               : 13429 seconds
   Call direction              : Dialin
   Baud rate                   : 33600 bps
   Most recent error code      : NO CARRIER
```
Logical interface umd0.0 (Index 2) (SNMP ifIndex 34) (Generation 1)
Flags: Point-To-Point SNMP-Traps Encapsulation: PPP-Subordinate

Release History Table

<table>
<thead>
<tr>
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</tr>
</tbody>
</table>

Related Documentation
- USB Modem Configuration Overview on page 366
- USB Modem Interface Overview on page 363
- Example: Configuring a Dialer Interface for USB Modem Dial-In on page 376

Example: Configuring a Dialer Interface

Supported Platforms
- SRX Series, vSRX

This example shows how to configure a logical dialer interface for an SRX300, SRX320, SRX340, or SRX345 device.
- Requirements on page 372
- Overview on page 372
- Configuration on page 373
- Verification on page 374

Requirements

Before you begin:
- Install device hardware and establish basic connectivity. See the Getting Started Guide for your device.
- Order a US Robotics USB 56k V.92 Modem, model number USR Model 5637, from US Robotics (http://www.usr.com/).
- Order a dial-up modem for the PC or laptop computer at the remote location from where you want to connect to the device.
- Order a PSTN line from your telecommunications service provider. Contact your service provider.

Overview

In this example, you configure a logical dialer interface called dl0 to establish USB connectivity. You can configure multiple dialer interfaces for different functions on the device. You add a description to differentiate among different dialer interfaces. For example, this modem is called USB-modem-remote-management. Configure PPP
encapsulation and set the logical unit as 0. You then specify the name of the dialer pool as usb-modem-dialer-pool and set the source and destination IP addresses as 172.20.10.2, and 172.20.10.1, respectively.

**NOTE:** You cannot configure Cisco High-Level Data Link Control (HDLC) or Multilink PPP (MLPPP) encapsulation on dialer interfaces used in USB modem connections.

**NOTE:** If you configure multiple dialer interfaces, ensure that the same IP subnet address is not configured on different dialer interfaces. Configuring the same IP subnet address on multiple dialer interfaces can result in inconsistency in the route and packet loss. The device might route packets through another dialer interface with the IP subnet address instead of through the dialer interface to which the USB modem call is mapped.

**Configuration**

**CLI Quick Configuration**
To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter `commit` from configuration mode.

```plaintext
set interfaces d10 description USB-modem-remote-management encapsulation ppp
set interfaces d10 unit 0 dialer-options pool usb-modem-dialer-pool
set interfaces d10 unit 0 family inet address 172.20.10.2 destination 172.20.10.1
```

**Step-by-Step Procedure**
The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the CLI User Guide.

To configure a logical dialer interface for the device:

1. Create an interface.
   ```plaintext
   [edit]
   user@host# set interfaces d10
   ```

2. Add a description and configure PPP encapsulation.
   ```plaintext
   [edit interfaces d10]
   user@host# set description USB-modem-remote-management
   user@host# set encapsulation ppp
   ```

3. Create the logical unit.

**NOTE:** The logical unit number must be 0.
4. Configure the name of the dialer pool to use for USB modem connectivity.

   [edit interfaces dl0 unit 0]
   user@host# set dialer-options pool usb-modem-dialer-pool

5. Configure source and destination IP addresses for the dialer interface.

   [edit interfaces dl0 unit 0]
   user@host# set family inet address 172.20.10.2 destination 172.20.10.1

Results

From configuration mode, confirm your configuration by entering the `show interfaces dl0` command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

   [edit]
   user@host# show interfaces dl0
   description USB-modem-remote-management;
   encapsulation ppp;
   unit 0 {
     family inet {
       address 172.20.10.2/32 {
         destination 172.20.10.1;
       }
     }
     dialer-options {
       pool usb-modem-dialer-pool;
     }
   }

If you are done configuring the device, enter `commit` from configuration mode.

Verification

Confirm that the configuration is working properly.

Verifying a Dialer Interface

Purpose

Verify that the dialer interface has been configured.

Action

From configuration mode, enter the `show interfaces dl0 extensive` command. The output shows a summary of dialer interface information.

Physical interface: dl0, Enabled, Physical link is Up
   Interface index: 128, SNMP ifIndex: 24, Generation: 129
   Type: 27, Link-level type: PPP, MTU: 1504, Clocking: Unspecified, Speed: Unspecified
   Device flags : Present Running
   Interface flags: SNMP-Traps
   Link type : Full-Duplex
Link flags : Keepalives
Physical info : Unspecified
Hold-times : Up 0 ms, Down 0 ms
Current address: Unspecified, Hardware address: Unspecified
Alternate link address: Unspecified
Last flapped : Never
Statistics last cleared: Never
Traffic statistics:
Input bytes : 13859 0 bps
Output bytes : 0 0 bps
Input packets: 317 0 pps
Output packets: 0 0 pps
Input errors:
Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0, Policed discards: 0
Resource errors: 0
Output errors:
Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0, Resource errors: 0
Logical interface dl0.0 (Index 70) (SNMP ifIndex 75) (Generation 146)
Description: USB-modem-remote-management
Flags: Point-To-Point SNMP-Traps 0x4000 LinkAddress 23-0 Encapsulation: PPP
Dialer:
State: Active, Dial pool: usb-modem-dialer-pool
Dial strings: 220
Subordinate interfaces: umd0 (Index 64)
Activation delay: 0, Deactivation delay: 0
Initial route check delay: 120
Redial delay: 3
Callback wait period: 5
Load threshold: 0, Load interval: 60
Bandwidth: 115200
Traffic statistics:
Input bytes : 24839
Output bytes : 17792
Input packets: 489
Output packets: 340
Local statistics:
Input bytes : 10980
Output bytes : 17792
Input packets: 172
Output packets: 340
Transit statistics:
Input bytes : 13859 0 bps
Output bytes : 0 0 bps
Input packets: 317 0 pps
Output packets: 0 0 pps
LCP state: Opened
CHAP state: Success
Protocol inet, MTU: 1500, Generation: 136, Route table: 0
Flags: None
Addresses, Flags: Is-Preferred Is-Primary
Destination: 172.20.10.1, Local: 172.20.10.2, Broadcast: Unspecified, Generation: 134
Example: Configuring a Dialer Interface for USB Modem Dial-In

Supported Platforms

SRX Series

This example shows how to configure a dialer interface for USB modem dial-in.

NOTE: Starting with Junos OS Release 15.1X49-D10 and Junos OS Release 17.3R1, USB modems are no longer supported for dial-in to a dialer interface on SRX300, SRX320, SRX340, and SRX345 devices.

Requirements

No special configuration beyond device initialization is required before configuring this feature.

Overview

To enable connections to the USB modem from a remote location, you must configure the dialer interfaces set up for USB modem use to accept incoming calls. You can configure a dialer interface to accept all incoming calls or accept only calls from one or more caller IDs.

If the dialer interface is configured to accept only calls from a specific caller ID, the system matches the incoming call’s caller ID against the caller IDs configured on its dialer interfaces. If an exact match is not found and the incoming call’s caller ID has more digits than the configured caller IDs, the system performs a right-to-left match of the incoming call’s caller ID with the configured caller IDs and accepts the incoming call if a match is found. For example, if the incoming call’s caller ID is 4085550115 and the caller ID configured on a dialer interface is 5550115, the incoming call is accepted. Each dialer interface accepts calls from only callers whose caller IDs are configured on it.

You can configure the following incoming map options for the dialer interface:

- **accept-all**—Dialer interface accepts all incoming calls.

You can configure the **accept-all** option for only one of the dialer interfaces associated with a USB modem physical interface. The device uses the dialer interface with the
accept-all option configured only if the incoming call's caller ID does not match the caller IDs configured on other dialer interfaces.

- caller—Dialer interface accepts calls from a specific caller ID—for example, 4085550115. You can configure a maximum of 15 caller IDs per dialer interface.

The same caller ID must not be configured on different dialer interfaces. However, you can configure caller IDs with more or fewer digits on different dialer interfaces. For example, you can configure the caller IDs 14085550115, 4085550115, and 5550115 on different dialer interfaces.

In this example, you configure the incoming map option as caller 4085550115 for dialer interface dl0.

Configuration

**CLI Quick Configuration**

To quickly configure this example, copy the following command, paste it into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the command into the CLI at the [edit] hierarchy level, and then enter commit from configuration mode.

```
set interfaces dl0 unit 0 dialer-options incoming-map caller 4085550115
```

**Step-by-Step Procedure**

To configure a dialer interface for USB modem dial-in:

1. Select a dialer interface.
   ```
   [edit]
   user@host# edit interfaces dl0
   ```

2. Configure the incoming map options.
   ```
   [edit]
   user@host# edit unit 0 dialer-options incoming-map caller 4085550115
   ```

3. If you are done configuring the device, commit the configuration.
   ```
   [edit]
   user@host# commit
   ```

Verification

To verify the configuration is working properly, enter the `show interface dl0` command.
Starting with Junos OS Release 15.1X49-D10 and Junos OS Release 17.3R1, USB modems are no longer supported for dial-in to a dialer interface on SRX300, SRX320, SRX340, and SRX345 devices.

**Related Documentation**
- USB Modem Configuration Overview on page 366
- Example: Configuring a USB Modem Interface on page 369

### Configuring a Dial-Up Modem Connection Remotely

**Supported Platforms** SRX Series, vSRX

To remotely connect to the USB modem connected to the USB port on the device, you must configure a dial-up modem connection on the PC or laptop computer at your remote location. Configure the dial-up modem connection properties to disable IP header compression.

To configure a dial-up modem connection remotely:

1. At your remote location, connect a modem to a management device such as a PC or laptop computer.

2. Connect the modem to your telephone network.


4. Click `Create a new connection`. The New Connection Wizard appears.

5. Click `Next`. The New Connection Wizard: Network Connection Type page appears.

6. Select `Connect to the network at my workplace`, and then click `Next`. The New Connection Wizard: Network Connection page appears.

7. Select `Dial-up connection`, and then click `Next`. The New Connection Wizard: Connection Name page appears.

8. In the Company Name box, type the dial-up connection name, for example `USB-modem-connect`. Then, click `Next`. The New Connection Wizard: Phone Number to Dial page appears.

9. In the Phone number box, type the telephone number of the PSTN line connected to the USB modem at the device end.
10. Click **Next** twice, and then click **Finish**. The Connect USB-modem-connect page appears.

11. If CHAP is configured on the dialer interface used for the USB modem interface at the device end, type the username and password configured in the CHAP configuration in the User name and Password boxes.

12. Click **Properties**. The USB-modem-connect Properties page appears.

13. In the Networking tab, select **Internet Protocol (TCP/IP)**, and then click **Properties**. The Internet Protocol (TCP/IP) Properties page appears.

14. Click **Advanced**. The Advanced TCP/IP Settings page appears.

15. Clear the **Use IP header compression** check box.

### Related Documentation
- USB Modem Interface Overview on page 363
- USB Modem Configuration Overview on page 366
- Connecting to the Device Remotely on page 379

### Connecting to the Device Remotely

**Supported Platforms**

SRX Series, vSRX

To remotely connect to the device through a USB modem connected to the USB port on the device:

1. On the PC or laptop computer at your remote location, select **Start > Settings > Control Panel > Network Connections**. The Network Connections page appears.

2. Double-click the **USB-modem-connect** dial-up connection. The Connect USB-modem-connect page appears.

3. Click **Dial** to connect to the Juniper Networks device.

   When the connection is complete, you can use Telnet or SSH to connect to the device.

### Related Documentation
- USB Modem Interface Overview on page 363
- USB Modem Configuration Overview on page 366
- Configuring a Dial-Up Modem Connection Remotely on page 378
Modifying USB Modem Initialization Commands

**Supported Platforms**  
SRX Series

**NOTE:** These instructions use Hayes-compatible modem commands to configure the modem. If your modem is not Hayes-compatible, see the documentation for your modem and enter equivalent modem commands. Applies to SRX300, SRX320, SRX340, SRX345 devices.

You can use the CLI configuration editor to override the value of an initialization command configured on the USB modem or configure additional commands for initializing USB modems.

**NOTE:** If you modify modem initialization commands when a call is in progress, the new initialization sequence is applied on the modem only when the call ends.

You can configure the following modem AT commands to initialize the USB modem:

- The command `S0=2` configures the modem to automatically answer calls on the second ring.
- The command `L2` configures medium speaker volume on the modem.

You can insert spaces between commands.

When you configure modem commands in the CLI configuration editor, you must follow these conventions:

- Use the newline character `\n` to indicate the end of a command sequence.
- Enclose the command string in double quotation marks.

You can override the value of the `S0=0` command in the initialization sequence configured on the modem and add the `L2` command.

To modify the initialization commands on a USB modem:

1. Configure the modem AT commands to initialize the USB modem.
   ```
   [edit interfaces umd0]
   user@host# set modem-options init-command-string "AT S0=2 L2 \n"
   ```

2. If you are done configuring the device, enter `commit` from configuration mode.

**Related Documentation**

- USB Modem Interface Overview on page 363
- USB Modem Configuration Overview on page 366
Resetting USB Modems

**Supported Platforms**
SRX Series

For SRX300, SRX320, SRX340, and SRX345 devices, if the USB modem does not respond, you can reset the modem.

**CAUTION:** If you reset the modem when a call is in progress, the call is terminated.

To reset the USB modem, in operational mode, enter the following command:

```
user@host> request interface modem reset umd0
```

**Related Documentation**
- USB Modem Interface Overview on page 363
- USB Modem Configuration Overview on page 366
- Modifying USB Modem Initialization Commands on page 380
Configuring Telnet and SSH Access to an SRX Series Appliance

- Configuring Password Retry Limits for Telnet and SSH Access on page 383
- Example: Controlling Management Access on SRX Series Devices on page 384
- Example: Configuring a Filter to Block Telnet and SSH Access on page 388
- The telnet Command on page 393
- ssh on page 395
- Configuring Outbound SSH Service on page 396

Configuring Password Retry Limits for Telnet and SSH Access

Supported Platforms

<table>
<thead>
<tr>
<th>Supported Platforms</th>
<th>SRX Series, vSRX</th>
</tr>
</thead>
</table>

To prevent brute force and dictionary attacks, the device performs the following actions for Telnet or SSH sessions by default:

- Disconnects a session after a maximum of 10 consecutive password retries.
- After the second password retry, introduces a delay in multiples of 5 seconds between subsequent password retries.

For example, the device introduces a delay of 5 seconds between the third and fourth password retry, a delay of 10 seconds between the fourth and fifth password retry, and so on.

- Enforces a minimum session time of 20 seconds during which a session cannot be disconnected. Configuring the minimum session time prevents malicious users from disconnecting sessions before the password retry delay goes into effect, and attempting brute force and dictionary attacks with multiple logins.

You can configure the password retry limits for Telnet and SSH access. In this example, you configure the device to take the following actions for Telnet and SSH sessions:

- Allow a maximum of four consecutive password retries before disconnecting a session.
- Introduce a delay in multiples of 5 seconds between password retries that occur after the second password retry.
- Enforce a minimum session time of 40 seconds during which a session cannot be disconnected.

To configure password retry limits for Telnet and SSH access:

1. Set the maximum number of consecutive password retries before a Telnet or SSH or telnet session is disconnected. The default number is 10, but you can set a number from 1 through 10.
   ```
   [edit system login retry-options]
   user@host# set tries-before-disconnect 4
   ```

2. Set the threshold number of password retries after which a delay is introduced between two consecutive password retries. The default number is 2, but you can specify a value from 1 through 3.
   ```
   [edit system login retry-options]
   user@host# set backoff-threshold 2
   ```

3. Set the delay (in seconds) between consecutive password retries after the threshold number of password retries. The default delay is in multiples of 5 seconds, but you can specify a value from 5 through 10 seconds.
   ```
   [edit system login retry-options]
   user@host# set backoff-factor 5
   ```

4. Set the minimum length of time (in seconds) during which a Telnet or SSH session cannot be disconnected. The default is 20 seconds, but you can specify an interval from 20 through 60 seconds.
   ```
   [edit system login retry-options]
   user@host# set minimum-time 40
   ```

5. If you are done configuring the device, enter `commit` from configuration mode.

Related Documentation
- The telnet Command on page 393
- ssh on page 395
- Configuring Reverse Telnet and Reverse SSH

Example: Controlling Management Access on SRX Series Devices

Supported Platforms  SRX Series, vSRX

This example shows how to control management access on SRX Series devices.

- Requirements on page 385
- Overview on page 385
Requirements

No special configuration beyond device initialization is required before configuring this feature.

Overview

By default, any host on the trusted interface can manage a security device. To limit the IP addresses that can manage a device, you can configure a firewall filter to deny all, with the exception of the IP address or addresses to which you want to grant management access. This example shows how to limit management access to a specific IP addresses to allow it to manage SRX Series devices.

Configuration

• Configuration on page 385
• Verification on page 387

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter commit from configuration mode.

```
set policy-options prefix-list manager-ip 192.168.4.254/32
set policy-options prefix-list manager-ip 10.0.0.0/8
set firewall filter manager-ip term block_non_manager from source-address 0.0.0.0/0
except
set firewall filter manager-ip term block_non_manager from source-prefix-list manager-ip
set firewall filter manager-ip term block_non_manager from protocol tcp
set firewall filter manager-ip term block_non_manager from destination-port ssh
set firewall filter manager-ip term block_non_manager from destination-port https
set firewall filter manager-ip term block_non_manager from destination-port telnet
set firewall filter manager-ip term block_non_manager from destination-port http
set firewall filter manager-ip term block_non_manager then discard
set firewall filter manager-ip term accept_everything_else then accept
set interfaces lo0 unit 0 family inet filter input manager-ip
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

1. Define a set of host addresses, called "manager-ip", that are allowed to manage the device.

```
[edit policy-options]
user@host# set prefix-list manager-ip 192.168.4.254/32
user@host# set prefix-list manager-ip 10.0.0.0/8
```
NOTE: The configured list is referenced in the actual filter, where you can change your defined set of addresses.

2. Configure a firewall filter to deny traffic from all IP addresses except the IP addresses defined in the "manager-ip" list. Management traffic that uses any of the listed destination ports is rejected when the traffic comes from an address in the list.

    [edit firewall filter]
    user@host# set manager-ip term block_non_manager from source-address 0.0.0.0/0
    user@host# set manager-ip term block_non_manager from source-prefix-list manager-ip except
    user@host# set manager-ip term block_non_manager from protocol tcp
    user@host# set manager-ip term block_non_manager from destination-port ssh
    user@host# set manager-ip term block_non_manager from destination-port https
    user@host# set manager-ip term block_non_manager from destination-port telnet
    user@host# set manager-ip term block_non_manager from destination-port http
    user@host# set manager-ip term block_non_manager then discard
    user@host# set manager-ip term accept_everything_else then accept

3. Apply stateless firewall filters to the loopback interface to filter the packets originating from the hosts to which you are granting management access.

    [edit interfaces lo0 unit 0]
    user@host# set family inet filter input manager-ip

NOTE: This configuration applies to traffic that terminates at the device. For traffic that terminates at the device interface (such as IPsec, OSPF, RIP, or BGP), you must also include the management IP addresses in the manager-ip prefix-list.

Results From configuration mode, confirm your configuration by entering show configuration command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

    user@host# show configuration policy-options
    prefix-list manager-ip {
      10.0.0.0/8;
      192.168.4.254/32;
    }

    user@host# show configuration firewall
    filter manager-ip {
      term block_non_manager {
        from {
          source-address {
            0.0.0.0/0;
          }
        }
      }
    }
Verification

Confirm that the configuration is working properly.

Verifying Interfaces

**Purpose** Verify if the interfaces are configured correctly.

**Action** From operational mode, enter the following commands:

- show policy-options
- show firewall
- show interfaces
Example: Configuring a Filter to Block Telnet and SSH Access

Supported Platforms
SRX Series, vSRX
- Requirements on page 388
- Overview on page 388
- Configuration on page 388
- Verification on page 391

Requirements
You must have access to a remote host that has network connectivity with this device.

Overview
In this example, you create an IPv4 stateless firewall filter that logs and rejects Telnet or SSH access packets unless the packet is destined for or originates from the 192.168.1.0/24 subnet.

- To match packets destined for or originating from the address 192.168.1.0/24 subnet, you use the source-address 192.168.1.0/24 IPv4 match condition.
- To match packets destined for or originating from a TCP port, Telnet port, or SSH port, you use the protocol tcp, port telnet, and telnet ssh IPv4 match conditions.

Configuration
The following example requires you to navigate various levels in the configuration hierarchy. For information about navigating the CLI, see Using the CLI Editor in Configuration Mode.

To configure this example, perform the following tasks:
- Configure the Stateless Firewall Filter on page 389
- Apply the Firewall Filter to the Loopback Interface on page 389
- Confirm and Commit Your Candidate Configuration on page 390

CLI Quick Configuration
To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter commit from configuration mode.

```
set firewall family inet filter local_acl term terminal_access from source-address 192.168.1.0/24
set firewall family inet filter local_acl term terminal_access from protocol tcp
set firewall family inet filter local_acl term terminal_access from port ssh
set firewall family inet filter local_acl term terminal_access from port telnet
set firewall family inet filter local_acl term terminal_access then accept
set firewall family inet filter local_acl term terminal_access_denied from protocol tcp
```
Configure the Stateless Firewall Filter

Step-by-Step Procedure
To configure the stateless firewall filter that selectively blocks Telnet and SSH access:

1. Create the stateless firewall filter `local_acl`.
   ```
   [edit]
   user@myhost# edit firewall family inet filter local_acl
   ```

2. Define the filter term `terminal_access`.
   ```
   [edit firewall family inet filter local_acl]
   user@myhost# set term terminal_access from source-address 192.168.1.0/24
   user@myhost# set term terminal_access from protocol tcp
   user@myhost# set term terminal_access from port ssh
   user@myhost# set term terminal_access from port telnet
   user@myhost# set term terminal_access then accept
   ```

3. Define the filter term `terminal_access_denied`.
   ```
   [edit firewall family inet filter local_acl]
   user@myhost# set term terminal_access_denied from protocol tcp
   user@myhost# set term terminal_access_denied from port ssh
   user@myhost# set term terminal_access_denied from port telnet
   user@myhost# set term terminal_access_denied then log
   user@myhost# set term terminal_access_denied then reject
   user@myhost# set term default-term then accept
   ```

Apply the Firewall Filter to the Loopback Interface

Step-by-Step Procedure
To apply the firewall filter to the loopback interface:

```
[edit]
user@myhost# set interfaces lo0 unit 0 family inet filter input local_acl
user@myhost# set interfaces lo0 unit 0 family inet address 127.0.0.1/32
```
To confirm and then commit your candidate configuration:

1. Confirm the configuration of the stateless firewall filter by entering the `show firewall` configuration mode command. If the command output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

   ```
   [edit]
   user@myhost# show firewall
   family inet {
     filter local_acl {
       term terminal_access {
         from {
           source-address {
             192.168.1.0/24;
           }
           protocol tcp;
           port [ssh telnet];
         }
         then accept;
       }
       term terminal_access_denied {
         from {
           protocol tcp;
           port [ssh telnet];
         }
         then {
           log;
           reject;
         }
       }
       term default-term {
         then accept;
       }
     }
   }
   ```

2. Confirm the configuration of the interface by entering the `show interfaces` configuration mode command. If the command output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

   ```
   [edit]
   user@myhost# show interfaces
   lo0 {
     unit 0 {
       family inet {
         filter {
           input local_acl;
         }
         source-address 127.0.0.1/32;
       }
     }
   }
   ```
3. If you are done configuring the device, commit your candidate configuration.

```bash
[edit]
user@myhost# commit
```

### Verification

Confirm that the configuration is working properly.

- Verifying Accepted Packets on page 391
- Verifying Logged and Rejected Packets on page 392

#### Verifying Accepted Packets

**Purpose**
Verify that the actions of the firewall filter terms are taken.

**Action**

1. Clear the firewall log on your router or switch.

```bash
user@myhost> clear firewall log
```

2. From a host at an IP address within the 192.168.1.0/24 subnet, use the `ssh hostname` command to verify that you can log in to the device using only SSH. This packet should be accepted, and the packet header information for this packet should not be logged in the firewall filter log buffer in the Packet Forwarding Engine.

```bash
user@host-A> ssh myhost
user@myhost’s password:
--- JUNOS 11.1-20101102.0 built 2010-11-02 04:48:46 UTC
% cli
user@myhost>
```

3. From a host at an IP address within the 192.168.1.0/24 subnet, use the `telnet hostname` command to verify that you can log in to your router or switch using only Telnet. This packet should be accepted, and the packet header information for this packet should not be logged in the firewall filter log buffer in the Packet Forwarding Engine.

```bash
user@host-A> telnet myhost
Trying 192.168.249.71...
Connected to myhost-fxp0.example.net.
Escape character is '^]'.

host (ttyp0)
login: user
Password:

--- JUNOS 11.1-20101102.0 built 2010-11-02 04:48:46 UTC
% cli
user@myhost>
```
4. Use the `show firewall log` command to verify that the routing table on the device does not contain any entries with a source address in the 192.168.1.0/24 subnet.

```
user@myhost> show firewall log
```

**Verifying Logged and Rejected Packets**

**Purpose**
Verify that the actions of the firewall filter terms are taken.
1. Clear the firewall log on your router or switch.

   user@myhost> clear firewall log

2. From a host at an IP address outside of the 192.168.1.0/24 subnet, use the `ssh hostname` command to verify that you cannot log in to the device using only SSH. This packet should be rejected, and the packet header information for this packet should be logged in the firewall filter log buffer in the Packet Forwarding Engine.

   user@host-B ssh myhost
   ssh: connect to host sugar port 22: Connection refused
   --- JUNOS 11.1-20101102.0 built 2010-11-02 04:48:46 UTC

3. From a host at an IP address outside of the 192.168.1.0/24 subnet, use the `telnet hostname` command to verify that you can log in to the device using only Telnet. This packet should be rejected, and the packet header information for this packet should be logged in the firewall filter log buffer in the PFE.

   user@host-B> telnet myhost
   Trying 192.168.249.71...
   telnet: connect to address 192.168.187.3: Connection refused
telnet: Unable to connect to remote host

4. Use the `show firewall log` command to verify that the routing table on the device does not contain any entries with a source address in the 192.168.1.0/24 subnet.

   user@myhost> show firewall log

   Time    Filter   Action Interface Protocol Src Addr       Dest Addr
   18:41:25 local_acl R      fxp0.0    TCP      192.168.187.5  192.168.187.1
   18:41:25 local_acl R      fxp0.0    TCP      192.168.187.5  192.168.187.1
   18:41:25 local_acl R      fxp0.0    TCP      192.168.187.5  192.168.187.1
   ...    18:43:06 local_acl R      fxp0.0    TCP      192.168.187.5  192.168.187.1
   18:43:06 local_acl R      fxp0.0    TCP      192.168.187.5  192.168.187.1
   18:43:06 local_acl R      fxp0.0    TCP      192.168.187.5  192.168.187.1
   ...    18:43:06 local_acl R      fxp0.0    TCP      192.168.187.5  192.168.187.1

The `telnet` Command

Supported Platforms  SRX Series, vSRX

You can use the CLI `telnet host` command to open a Telnet session to a remote device:

   user@host> telnet host <8bit> <bypass-routing> <inet> <interface interface-name> <no-resolve> <port port> <routing-instance routing-instance-name> <source address>
NOTE: On SRX100, SRX210, SRX220, SRX240, SRX300, SRX320, SRX340, SRX345, and SRX1500 devices, the maximum number of concurrent Telnet sessions is indicated in the following table. Platform support depends on the Junos OS release in your installation.

<table>
<thead>
<tr>
<th></th>
<th>SRX100</th>
<th>SRX210</th>
<th>SRX220</th>
<th>SRX240</th>
<th>SRX300</th>
<th>SRX320</th>
<th>SRX340</th>
<th>SRX345</th>
<th>SRX1500</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To exit the Telnet session and return to the Telnet command prompt, press Ctrl-].

To exit the Telnet session and return to the CLI command prompt, enter quit.

Table 11 on page 394 describes the telnet command options.

Table 11: CLI telnet Command Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8bit</td>
<td>Use an 8-bit data path.</td>
</tr>
<tr>
<td>bypass-routing</td>
<td>Bypass the routing tables and open a Telnet session only to hosts on directly attached interfaces. If the host is not on a directly attached interface, an error message is returned.</td>
</tr>
<tr>
<td>host</td>
<td>Open a Telnet session to the specified hostname or IP address.</td>
</tr>
<tr>
<td>inet</td>
<td>Force the Telnet session to an IPv4 destination.</td>
</tr>
<tr>
<td>interface source-interface</td>
<td>Open a Telnet session to a host on the specified interface. If you do not include this option, all interfaces are used.</td>
</tr>
<tr>
<td>no-resolve</td>
<td>Suppress the display of symbolic names.</td>
</tr>
<tr>
<td>port port</td>
<td>Specify the port number or service name on the host.</td>
</tr>
<tr>
<td>routing-instance routing-instance-name</td>
<td>Use the specified routing instance for the Telnet session.</td>
</tr>
<tr>
<td>source address</td>
<td>Use the specified source address for the Telnet session.</td>
</tr>
</tbody>
</table>

Related Documentation
- ssh on page 395
- Configuring Password Retry Limits for Telnet and SSH Access on page 383
- Configuring Reverse Telnet and Reverse SSH
You can use the CLI `ssh` command to use the secure shell (SSH) program to open a connection to a remote device:

```
user@host> ssh host <bypass-routing> <inet> <interface interface-name> <routing-instance routing-instance-name> <source address> <v1> <v2>
```

**NOTE:** On SRX100, SRX210, SRX220, SRX240, SRX300, SRX320, SRX340, SRX345, and SRX1500 devices, the maximum number of concurrent SSH sessions is indicated in the following table. Platform support depends on the Junos OS release in your installation.

<table>
<thead>
<tr>
<th></th>
<th>SRX100</th>
<th>SRX210</th>
<th>SRX220</th>
<th>SRX240</th>
<th>SRX300</th>
<th>SRX320</th>
<th>SRX340</th>
<th>SRX345</th>
<th>SRX1500</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 12 on page 395 describes the `ssh` command options.

**Table 12: CLI ssh Command Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bypass-routing</td>
<td>Bypass the routing tables and open an SSH connection only to hosts on directly attached interfaces. If the host is not on a directly attached interface, an error message is returned.</td>
</tr>
<tr>
<td>host</td>
<td>Open an SSH connection to the specified hostname or IP address.</td>
</tr>
<tr>
<td>inet</td>
<td>Force the SSH connection to an IPv4 destination.</td>
</tr>
<tr>
<td>interface source-interface</td>
<td>Open an SSH connection to a host on the specified interface. If you do not include this option, all interfaces are used.</td>
</tr>
<tr>
<td>routing-instance routing-instance-name</td>
<td>Use the specified routing instance for the SSH connection.</td>
</tr>
<tr>
<td>source address</td>
<td>Use the specified source address for the SSH connection.</td>
</tr>
<tr>
<td>v1</td>
<td>Force SSH to use version 1 for the connection.</td>
</tr>
<tr>
<td>v2</td>
<td>Force SSH to use version 2 for the connection.</td>
</tr>
</tbody>
</table>

Related Documentation

- The telnet Command on page 393
- Configuring Password Retry Limits for Telnet and SSH Access on page 383
• Configuring Reverse Telnet and Reverse SSH

Configuring Outbound SSH Service

Supported Platforms  SRX Series

You can configure a device running the Junos OS to initiate a TCP/IP connection with a client management application that would be blocked if the client attempted to initiate the connection (for example, if the device is behind a firewall). The `outbound-ssh` command instructs the device to create a TCP/IP connection with the client management application and to forward the identity of the device. Once the connection is established, the management application acts as the client and initiates the SSH sequence, and the device acts as the server and authenticates the client.

NOTE: There is no initiation command with outbound SSH. Once outbound SSH is configured and committed, the device begins to initiate an outbound SSH connection based on the committed configuration. The device repeatedly attempts to create this connection until successful. If the connection between the device and the client management application is dropped, the device again attempts to create a new outbound SSH connection until successful. This connection is maintained until the outbound SSH stanza is removed from the configuration.

To configure the device for outbound SSH connections, include the `outbound-ssh` statement at the `[edit system services]` hierarchy level:

```
[edit system services outbound-ssh]
```

The following topics describe the tasks for configuring the outbound SSH service:

• Configuring the Device Identifier for Outbound SSH Connections on page 396
• Sending the Public SSH Host Key to the Outbound SSH Client on page 397
• Configuring Keepalive Messages for Outbound SSH Connections on page 398
• Configuring a New Outbound SSH Connection on page 398
• Configuring the Outbound SSH Client to Accept NETCONF as an Available Service on page 398
• Configuring Outbound SSH Clients on page 399

Configuring the Device Identifier for Outbound SSH Connections

Each time the device establishes an outbound SSH connection, it first sends an initiation sequence to the management client. This sequence identifies the device to the management client. Within this transmission is the value of `device-id`.

To configure the device identifier of the device, include the `device-id` statement at the `[edit system services outbound-ssh client client-id]` hierarchy level:
[edit system services outbound-ssh client client-id]
device-id device-id;

The initiation sequence when secret is not configured:

MSG-ID: DEVICE-CONN-INFO\r\nMSG-VER: V1\r\nDEVICE-ID: <device-id>\r\n
Sending the Public SSH Host Key to the Outbound SSH Client

Each time the router or switch establishes an outbound SSH connection, it first sends an initiation sequence to the management client. This sequence identifies the router or switch to the management client. Within this transmission is the value of device-id.

To configure the device identifier of the router or switch, include the device-id statement at the [edit system services outbound-ssh client client-id] hierarchy level:

[edit system services outbound-ssh client client-id]
device-id device-id;

The initiation sequence when secret is not configured:

MSG-ID: DEVICE-CONN-INFO\r\nMSG-VER: V1\r\nDEVICE-ID: <device-id>\r\n
During the initialization of an SSH connection, the client authenticates the identity of the device using the public SSH host key of the device. Therefore, before the client can initiate the SSH sequence, it needs the public SSH key of the device. When you configure the secret statement, the device passes its public SSH key as part of the outbound SSH connection initiation sequence.

When the secret statement is set and the device establishes an outbound SSH connection, the device communicates its device ID, its public SSH key, and an SHA1 hash derived in part from the secret statement. The value of the secret statement is shared between the device and the management client. The client uses the shared secret to authenticate the public SSH host key it is receiving to determine whether the public key is from the device identified by the device-id statement.

Using the secret statement to transport the public SSH host key is optional. You can manually transport and install the public key onto the client system.

NOTE: Including the secret statement means that the device sends its public SSH host key every time it establishes a connection to the client. It is then up to the client to decide what to do with the SSH host key if it already has one for that device. We recommend that you replace the client’s copy with the new key. Host keys can change for various reasons and by replacing the key each time a connection is established, you ensure that the client has the latest key.
To send the router’s or switch’s public SSH host key when the device connects to the client, include the `secret` statement at the `edit system services outbound-ssh client client-id` hierarchy level:

```plaintext
[edit system services outbound-ssh client client-id]
secret password;
```

The following message is sent by the device when the `secret` attribute is configured:

```plaintext
MSG-ID: DEVICE-CONN-INFO
MSG-VER: V1
DEVICE-ID: <device-id>
HOST-KEY: <public-SSH-host-key>
HMAC: <HMAC(pub-SSH-host-key, <secret>>>
```

**Configuring Keepalive Messages for Outbound SSH Connections**

Once the client application has the router’s or switch’s public SSH host key, it can then initiate the SSH sequence as if it had created the TCP/IP connection and can authenticate the device using its copy of the router’s or switch’s public host SSH key as part of that sequence. The device authenticates the client user through the mechanisms supported in the Junos OS (RSA/DSA public string or password authentication).

To enable the device to send SSH protocol keepalive messages to the client application, configure the `keep-alive` statement at the `edit system services outbound-ssh client client-id` hierarchy level:

```plaintext
[edit system services outbound-ssh client client-id]
keep-alive{
  retry number;
  timeout seconds;
}
```

**Configuring a New Outbound SSH Connection**

When disconnected, the device begins to initiate a new outbound SSH connection. To specify how the device reconnects to the server after a connection is dropped, include the `reconnect-strategy` statement at the `edit system services outbound-ssh client client-id` hierarchy level:

```plaintext
[edit system services outbound-ssh client client-id]
reconnect-strategy (sticky | in-order);
```

You can also specify the number of retry attempts and set the amount of time before the reconnection attempts stop. See “Configuring Keepalive Messages for Outbound SSH Connections” on page 398.

**Configuring the Outbound SSH Client to Accept NETCONF as an Available Service**

To configure the application to accept NETCONF as an available service, include the `services netconf` statement at the `edit system services outbound-ssh client client-id` hierarchy level:

```plaintext
[edit system services outbound-ssh client client-id]
services {
  netconf;
}
Configuring Outbound SSH Clients

To configure the clients available for this outbound SSH connection, list each client with a separate address statement at the `[edit system services outbound-ssh client client-id]` hierarchy level:

```plaintext
[edit system services outbound-ssh client client-id]
address address {
  retry number;
  timeout seconds;
  port port-number;
}
```

**NOTE:** Outbound SSH connections support IPv4 and IPv6 address formats.
PART 3

Configuring DNS

- Configuring DNS Server Caching, DNSSEC, and DNS Proxy on page 403
CHAPTER 10

Configuring DNS Server Caching, DNSSEC, and DNS Proxy

- DNS Overview on page 403
- Example: Configuring the TTL Value for DNS Server Caching on page 404
- DNSSEC Overview on page 405
- Example: Configuring DNSSEC on page 405
- Example: Configuring Keys for DNSSEC on page 406
- Example: Configuring Secure Domains and Trusted Keys for DNSSEC on page 406
- DNS Proxy Overview on page 408
- Configuring the Device as a DNS Proxy on page 413

DNS Overview

Supported Platforms

SRX Series, vSRX

A Domain Name System (DNS) is a distributed hierarchical system that converts hostnames to IP addresses. The DNS is divided into sections called zones. Each zone has name servers that respond to the queries belonging to their zones.

This topic includes the following sections:

- DNS Components on page 403
- DNS Server Caching on page 404

DNS Components

DNS includes three main components:

- DNS resolver — Resides on the client side of the DNS. When a user sends a hostname request, the resolver sends a DNS query request to the name servers to request the hostname's IP address.
- Name servers — Processes the DNS query requests received from the DNS resolver and returns the IP address to the resolver.
- Resource records — Data elements that define the basic structure and content of the DNS.
DNS Server Caching

DNS name servers are responsible for providing the hostname IP address to users. The TTL field in the resource record defines the period for which DNS query results are cached. When the TTL value expires, the name server sends a fresh DNS query and updates the cache.

Related Documentation
- Example: Configuring the TTL Value for DNS Server Caching on page 404
- DNSSEC Overview on page 405

Example: Configuring the TTL Value for DNS Server Caching

Supported Platforms
SRX Series, vSRX

This example shows how to configure the TTL value for a DNS server cache to define the period for which DNS query results are cached.

- Requirements on page 404
- Overview on page 404
- Configuration on page 404
- Verification on page 405

Requirements
No special configuration beyond device initialization is required before performing this task.

Overview
The DNS name server stores DNS query responses in its cache for the TTL period specified in the TTL field of the resource record. When the TTL value expires, the name server sends a fresh DNS query and updates the cache. You can configure the TTL value from 0 to 604,800 seconds. You can also configure the TTL value for cached negative responses. Negative caching is the storing of the record that a value does not exist. In this example, you set the maximum TTL value for cached (and negative cached) responses to 86,400 seconds.

Configuration

Step-by-Step Procedure
To configure the TTL value for a DNS server cache:

1. Specify the maximum TTL value for cached responses, in seconds.
   
   ```
   [edit]
   user@host# set system services dns max-cache-ttl 86400
   ```

2. Specify the maximum TTL value for negative cached responses, in seconds.
   
   ```
   [edit]
   user@host# set system services dns max-ncache-ttl 86400
   ```
3. If you are done configuring the device, commit the configuration.

    [edit]
    user@host# commit

Verification

To verify the configuration is working properly, enter the show system services command.

Related Documentation

- DNS Overview on page 403

DNSSEC Overview

Supported Platforms: SRX Series, vSRX

Junos OS devices support the domain name service security extensions (DNSSEC) standard. DNSSEC is an extension of DNS that provides authentication and integrity verification of data by using public-key based signatures.

In DNSSEC, all the resource records in a DNS are signed with the private key of the zone owner. The DNS resolver uses the public key of the owner to validate the signature. The zone owner generates a private key to encrypt the hash of a set of resource records. The private key is stored in RRSIG record. The corresponding public key is stored in the DNSKEY record. The resolver uses the public key to decrypt the RRSIG and compares the result with the hash of the resource record to verify that it has not been altered.

Similarly, the hash of the public DNSKEY is stored in a DS record in a parent zone. The zone owner generates a private key to encrypt the hash of the public key. The private key is stored in the RRSIG record. The resolver retrieves the DS record and its corresponding RRSIG record and public key. Using the public key, the resolver decrypts the RRSIG record and compares the result with the hash of the public DNSKEY to verify that it has not been altered. This establishes a chain of trust between the resolver and the name servers.

Example: Configuring DNSSEC

Supported Platforms: SRX Series, vSRX

DNS-enabled devices run a DNS resolver (proxy) that listens on loopback address 127.0.0.1 or ::1. The DNS resolver performs a hostname resolution for DNSSEC. Users need to set name server IP address to 127.0.0.1 or ::1 so the DNS resolver forwards all DNS queries to DNSSEC instead of DNS. If the name server IP address is not set, DNS will handle all queries instead of DNSSEC.

The following example shows how to set the server IP address to 127.0.0.1:
The DNSSEC feature is enabled by default. You can disable DNSSEC in the server by using the following CLI command:

```
[edit]
user@host# set system name-server 127.0.0.1
```

You can load a public key from a file or you can copy and paste the key file from a terminal. In both cases, you must save the keys to the configuration instead of to a file. The following example shows how to load a key from a file:

```
[edit system services dns dnssec trusted-keys]
#load-key filename
```

The following example explains how to load the key from a terminal:

```
[edit system services dns dnssec trusted-keys]
# set key "...pasted-text..."
```

If you are done loading the keys from the file or terminal, click commit in the CLI editor.

---

**Example: Configuring Secure Domains and Trusted Keys for DNSSEC**

**Supported Platforms** SRX Series, vSRX

This example shows how to configure secure domains and trusted keys for DNSSEC.

- Requirements on page 406
- Overview on page 406
- Configuration on page 407

**Requirements**

Set the name server IP address so the DNS resolver forwards all DNS queries to DNSSEC instead of DNS. See “Example: Configuring DNSSEC” on page 405 for more information.

**Overview**

You can configure secure domains and assign trusted keys to the domains. Both signed and unsigned responses can be validated when DNSSEC is enabled.
When you configure a domain as a secure domain and if DNSSEC is enabled, all unsigned responses to that domain are ignored and the server returns a SERVFAIL error code to the client for the unsigned responses. If the domain is not configured as a secure domain, unsigned responses will be accepted.

When the server receives a signed response, it checks if the DNSKEY in the response matches any of the trusted keys that are configured. If it finds a match, the server accepts the signed response.

You can also attach a DNS root zone as a trusted anchor to a secure domain to validate the signed responses. When the server receives a signed response, it queries the DNS root zone for a DS record. When it receives the DS record, it checks if the DNSKEY in the DS record matches the DNSKEY in the signed response. If it finds a match, the server accepts the signed response.

**Configuration**

**CLI Quick Configuration** To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter commit from configuration mode.

```plaintext
set system services dns dnssec secure-domains domain1.net
set system services dns dnssec secure-domains domain2.net
set system services dns dnssec trusted-keys key domain1.net.ABC123ABCh
set system services dns dnssec dlv domain domain2.net trusted-anchor dlv.isc.org
```

**Step-by-Step Procedure** To configure secure domains and trusted keys for DNSSEC:

1. Configure domain1.net and domain2.net as secure domains.
   ```
   [edit]
   user@host# set system services dns dnssec secure-domains domain1.net
   user@host# set system services dns dnssec secure-domains domain2.net
   ```

2. Configure trusted keys to domain1.net.
   ```
   [edit]
   user@host# set system services dns dnssec trusted-keys key
   "domain1.net.ABC123ABCh"
   ```

3. Attach a root zone dlv.isc.org as a trusted anchor to a secure domain.
   ```
   [edit]
   user@host# set system services dns dnssec dlv domain domain2.net trusted-anchor dlv.isc.org
   ```

**Results** From configuration mode, confirm your configuration by entering the `show system services` command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```plaintext
dns {
```
If you are done configuring the device, enter `commit` from configuration mode.

Related Documentation

- DNSSEC Overview on page 405
- Example: Configuring Keys for DNSSEC on page 406

DNS Proxy Overview

Supported Platforms  SRX Series, vSRX

A dynamic name system (DNS) proxy allows clients to use an SRX300, SRX320, SRX340, SRX345, SRX550M, or SRX1500 device as a DNS proxy server. A DNS proxy improves domain lookup performance by caching previous lookups. A typical DNS proxy processes DNS queries by issuing a new DNS resolution query to each nameserver that it has detected until the hostname is resolved.

- DNS Proxy Cache on page 408
- DNS Proxy with Split DNS on page 409
- Dynamic Domain Name System Client on page 411

DNS Proxy Cache

When a DNS query is resolved by a DNS proxy, the result is stored in the device’s DNS cache. This stored cache helps the device to resolve subsequent queries from the same domain and avoid network latency delay.

NOTE: If the proxy cache is not available, the device sends the query to the configured DNS server, which results in network latency delays.

DNS proxy maintains a cache entry for each resolved DNS query. These entries have a time-to-live (TTL) timer so the device purges each entry from the cache as it reaches its TTL and expires. You can clear a cache by using the `clear cache` command, or the cache will automatically expire along with TTL when it goes to zero.
DNS Proxy with Split DNS

The split DNS proxy feature allows you to configure your proxy server to split the DNS query based on both the interface and the domain name. You can also configure a set of name servers and associate them with a given domain name. When you query that domain name, the device sends the DNS queries to only those name servers that are configured for that domain name to ensure localization of DNS queries.

You can configure the transport method used to resolve a given domain name—for example, when the device connects to the corporate network through an IPsec VPN or any other secure tunnel. When you configure a secure VPN tunnel to transport the domain names belonging to the corporate network, the DNS resolution queries are not leaked to the ISP DNS server and are contained within the corporate network.

You can also configure a set of default domain (* ) and name servers under the default domain to resolve the DNS queries for a domain for which a name server is not configured.

Each DNS proxy must be associated with an interface. If an interface has no DNS proxy configuration, all the DNS queries received on that interface are dropped.

Figure 5 on page 410 shows how the split DNS proxy works in a corporate network.
In the corporate network shown in Figure 5 on page 410, a PC client that points to the SRX Series device as its DNS server makes two queries—to www.your-isp.com and to www.intranet.com. The DNS proxy redirects the www.intranet.com query to the www.intranet.com DNS server (203.0.113.253), while the www.your-isp.com query is redirected to the ISP DNS server (209.100.3.130). Although the query for www.your-isp.com is sent to the ISP DNS server as a regular DNS query using clear text protocols (TCP/UDP), the query for the www.intranet.com domain goes to the intranet’s DNS servers over a secure VPN tunnel.

A split DNS proxy has the following advantages:
• Domain lookups are usually more efficient. For example, DNS queries meant for a corporate domain (such as acme.com) can go to the corporate DNS server exclusively, while all others go to the ISP DNS server. Splitting DNS lookups reduces the load on the corporate server and can also prevent corporate domain information from leaking onto the Internet.

• A DNS proxy allows you to transmit selected DNS queries through a tunnel interface, which prevents malicious users from learning about the internal configuration of a network. For example, DNS queries bound for the corporate server can pass through a tunnel interface to use security features such as authentication and encryption.

**Dynamic Domain Name System Client**

Dynamic DNS (DDNS) allows clients to dynamically update IP addresses for registered domain names. This feature is useful when an ISP uses Point-to-Point Protocol (PPP), Dynamic Host Configuration Protocol (DHCP), or external authentication (XAuth) to dynamically change the IP address for a customer premises equipment (CPE) router (such as a security device) that protects a Web server. Internet clients can reach the Web server by using a domain name even if the IP address of the security device has previously changed dynamically.

A DDNS server maintains a list of the dynamically changed addresses and their associated domain names. The device updates these DDNS servers with this information periodically or in response to IP address changes. The Junos OS DDNS client supports popular DDNS servers such as dyndns.org and ddo.jp.

*Figure 6 on page 412 illustrates how the DDNS client works.*
The IP address of the internal Web server is translated by Network Address Translation (NAT) to the IP address of the untrust zone interface on the device. The hostname

Figure 6: Dynamic DNS

The IP address of the internal Web server is translated by Network Address Translation (NAT) to the IP address of the untrust zone interface on the device. The hostname...
abc-host.com is registered with the DDNS server and is associated with the IP address of the device's untrust zone interface, which is monitored by the DDNS client on the device. When the IP address of abc-host.com is changed, the DDNS server is informed of the new address.

If a client in the network shown in Figure 6 on page 412 needs to access abc-host.com, the client queries the DNS servers on the Internet. When the query reaches the DDNS server, it resolves the request and provides the client with the latest IP address of abc-host.com.

### Related Documentation
- [Configuring the Device as a DNS Proxy on page 413](#)

### Configuring the Device as a DNS Proxy

#### Supported Platforms
- SRX Series, vSRX

The Junos operating system (Junos OS) incorporates domain name system (DNS) support, which allows you to use domain names as well as IP addresses for identifying locations. A DNS server keeps a table of the IP addresses associated with domain names. Using DNS enables an SRX300, SRX320, SRX340, SRX345, SRX550M, or SRX1500 device to reference locations by domain name (such as www.example.net) in addition to using the routable IP address.

DNS features include:

- **DNS proxy cache**—The device proxies hostname resolution requests on behalf of the clients behind the SRX Series device. DNS proxy improves domain lookup performance by using caching.
- **Split DNS**—The device redirects DNS queries over a secure connection to a specified DNS server in the private network. Split DNS prevents malicious users from learning the network configuration, and thus also prevents domain information leaks. Once configured, split DNS operates transparently.
- **Dynamic DNS (DDNS) client**—Servers protected by the device remain accessible despite dynamic IP address changes. For example, a protected Web server continues to be accessible with the same hostname, even after the dynamic IP address is changed because of address reassignment by the Dynamic Host Configuration Protocol (DHCP) or Point-to-Point Protocol (PPP) by Internet service provider (ISP).
To configure the device as a DNS proxy, you enable DNS on a logical interface and configure DNS proxy servers. Configuring a static cache enables branch office and corporate devices to use hostnames to communicate. Configuring dynamic DNS (DDNS) clients allows IP address changes.

Perform the following procedure to configure the device as a DNS proxy server by enabling DNS proxy on a logical interface—for example, ge-2/0/0.0—and configuring a set of name servers that are to be used for resolving the specified domain names. You can specify a default domain name by using an asterisk (*) and then configure a set of name servers for resolution. Use this approach when you need global name servers to resolve domain name entries that do not have a specific name server configured.

1. DNS proxy with split dns configuration
   - Enable DNS proxy on a logical interface.
     ```
     [edit system services]
     user@host# set dns dns-proxy interface ge-2/0/0.0
     ```
   - Configure view for split DNS, specify the internal IP interface to handle the DNS query and view the logical subnet address.
     ```
     [edit system services]
     user@host# system services dns dns-proxy view internal match-clients 1.1.1.0/24
     ```
   - Set a default internal domain name, and specify IP server for forwarding the DNS query according to their IP addresses.
     ```
     [edit system services]
     user@host# set system services dns dns-proxy view internal domain aa.internal.com forwarders 1.1.1.1
     user@host# set system services dns dns-proxy view internal domain bb.internal.com forwarders 2.2.2.2
     ```
   - Configure view for split DNS, specify the external IP interface to handle the DNS query and view the logical subnet address.
     ```
     [edit system services]
     user@host# system services dns dns-proxy view external match-clients 11.1.1.0/24
     ```
   - Set a default external domain name, and specify IP server for forwarding the DNS query according to their IP addresses.
     ```
     [edit system services]
     user@host# system services dns dns-proxy view external domain aa.external.com forwarders 3.3.3.3
     user@host# system services dns dns-proxy view external domain bb.external.com forwarders 4.4.4.4
     ```
   - If you are done configuring the device, commit the configuration.
     ```
     [edit]
     user@host# commit
     ```
   To verify if the configuration is working properly, execute the show command.
   ```
   user@host> show system services dns dns-proxy
   ```

2. DNS proxy cache configuration
• Configure the dns proxy static cache entries to specify the host's IPv4 address.

[edit system services]
user@host# set system services dns dns-proxy cache aa.example.net inet 10.10.10.10
user@host# set system services dns dns-proxy cache bb.example.net inet 20.20.20.20

• If you are done configuring the device, commit the configuration.

[edit]
user@host# commit

To verify if the configuration is working properly, execute the show command.

user@host> show system services dns dns-proxy

3. Dynamic DNS proxy configuration

• Enable client.

[edit system services]
user@host# set dynamic-dns client abc.com agent juniper interface ge-2/0/0.0
username test password test123

• If you are done configuring the device, commit the configuration.

[edit]
user@host# commit

To verify if the configuration is working properly

user@host> show system services dynamic-dns

Related Documentation
• Configuring the Device as a DNS Proxy on page 413
PART 4

Configuring DHCP Access Service for IP Address Management

- Understanding DHCP Services on page 419
- Configuring a DHCP Local Server on page 447
- Configuring a DHCP Client on page 461
- Configuring a DHCP Relay Agent on page 471
- Configuring a DHCPv6 Local Server on page 481
- Configuring a DHCPv6 Client on page 493
- Configuring DHCP in Cluster Mode on page 503
CHAPTER 11

Understanding DHCP Services

- DHCP Overview on page 419
- DHCP Server, Client, and Relay Agent Overview on page 423
- DHCP Settings and Restrictions Overview on page 424
- Understanding Cascaded DHCPv6 Prefix Delegating on page 425
- Example - Configuring DHCPv6 Prefix Delegation (PD) over Point-to-Point Protocol over Ethernet (PPPoE) on page 426

DHCP Overview

Supported Platforms
SRX Series, vSRX

The Dynamic Host Configuration Protocol (DHCP) can serve as a DHCP local server, a DHCP client, or a DHCP relay agent.

DHCP Local Server

You can enable an SRX Series device to function as a DHCP local server, and then configure its options on the device. The DHCP local server provides an IP address and other configuration information in response to a client request.

To configure the DHCP local server on the device, include the dhcp-local-server statement at the [edit system services] hierarchy level.

NOTE: You cannot configure the DHCP local server and the DHCP relay agent on the same interface.

DHCP Client, DHCP Local Server, and Address-Assignment Pool Interaction

In a typical branch network configuration, the DHCP client is on the subscriber’s computer, and the DHCP local server is configured on the device. The following steps provide a
high-level description of the interaction among the DHCP client, DHCP local server, and address-assignment pools.

1. The DHCP client sends a discover packet to one or more DHCP local servers in the network to obtain configuration parameters and an IP address for the subscriber.

2. Each DHCP local server that receives the discover packet then searches its address-assignment pool for the client address and configuration options. Each local server creates an entry in its internal client table to keep track of the client state, then sends a DHCP offer packet to the client.

3. On receipt of the offer packet, the DHCP client selects the DHCP local server from which to obtain configuration information and sends a request packet indicating the DHCP local server selected to grant the address and configuration information.

4. The selected DHCP local server sends an acknowledgement packet to the client that contains the client address lease and configuration parameters. The server and client installs the host route and ARP entry, and then monitors the lease state.

**DHCP Local Server and Address-Assignment Pools**

In a DHCP local server operation, the client address and configuration information reside in centralized address-assignment pools, that are managed independently from the DHCP local server and they can be shared by different client applications.

Configuring a DHCP environment that includes a DHCP local server requires two independent configuration operations, which you can complete in any order. In one operation, you configure the DHCP local server on the device and specify how the DHCP local server determines which address-assignment pool to use. In the other operation, you configure the address-assignment pools used by the DHCP local server. The address-assignment pools contain the IP addresses, named address ranges, and configuration information for DHCP clients.

---

**NOTE:** The DHCP local server and the address-assignment pools used by the server must be configured in the same routing instance.

---

**DHCP Client**

DHCP configuration consists of configuring DHCP clients and a DHCP local server. A client configuration determines how clients send a message requesting an IP address, while a server configuration enables the server to send an IP address back to the client.

For the device to operate as a DHCP client, you configure a logical interface on the device to obtain an IP address from the DHCP local server in the network. You set the vendor class ID, lease time, DHCP server address, retransmission attempts, and retry interval.
DHCP Relay Agent

You can configure DHCP relay options on the device and enable the device to function as a DHCP relay agent. A DHCP relay agent forwards DHCP request and reply packets between a DHCP client and a DHCP local server.

To configure the DHCP relay agent on the router, include the `dhcp-relay` statement at the `[edit forwarding-options]` hierarchy level.

You can also include the `dhcp-relay` statement at the following hierarchy level:

```
[edit routing-instances routing-instance-name forwarding-options]
```

DHCP Client, DHCP Relay Agent, and DHCP Local Servers

In a typical branch network configuration, the DHCP client is on the subscriber's computer, and the DHCP relay agent is configured on the device between the DHCP client and one or more DHCP local servers.

The following steps describe, at a high level, how the DHCP client, DHCP relay agent, and DHCP local server interact in a configuration that includes two DHCP local servers.

1. The DHCP client sends a discover packet to find a DHCP local server in the network from which to obtain configuration parameters for the subscriber, including an IP address.

2. The DHCP relay agent receives the discover packet and forwards copies to each of the two DHCP local servers. The DHCP relay agent then creates an entry in its internal client table to keep track of the client's state.

3. In response to receiving the discover packet, each DHCP local server sends an offer packet to the client. The DHCP relay agent receives the offer packets and forwards them to the DHCP client.

4. On receipt of the offer packets, the DHCP client selects the DHCP local server from which to obtain configuration information. Typically, the client selects the server that offers the longest lease time on the IP address.

5. The DHCP client sends a request packet that specifies the DHCP local server from which to obtain configuration information.

6. The DHCP local server requested by the client sends an acknowledgement (ACK) packet that contains the client's configuration parameters.

7. The DHCP relay agent receives the ACK packet and forwards it to the client.

8. The DHCP client receives the ACK packet and stores the configuration information.
9. If configured to do so, the DHCP relay agent installs a host route and Address Resolution Protocol (ARP) entry for this client.

10. After establishing the initial lease on the IP address, the DHCP client and the DHCP local server use unicast transmission to negotiate lease renewal or release.

Considerations

The following considerations apply when you enable a DHCP local server, DHCP relay agent, or DHCP client in a routing instance:

- The DHCP local server, DHCP relay agent, and DHCP client can be configured in one routing instance, but the functionality is mutually exclusive on one interface. If the DHCP client is enabled on one interface, the DHCP local server or the DHCP relay agent cannot be enabled on that interface.
- The DHCP client, DHCP relay agent and DHCP local server services act independently in their respective routing instance. The following features can function simultaneously on a device:
  - DHCP client and DHCP local server
  - DHCP client and DHCP relay agent
  - Multiple routing instances. Each instance can have a DHCP local server, DHCP relay agent, or DHCP client, or each routing instance can have a DHCP client and DHCP local server or a DHCP client and DHCP relay agent.

- In Junos Release 12.1X46, autoinstallation is not compatible with jDHCPd:

  ```
  version 12.1X46-D40.2;
  system {
    /* not compatible with jDHCPd */
    autoinstallation {
      usb {
        disable;
      }
    }
  }
  ```

  **NOTE:** Before you enable DHCP services in a routing instance, you must remove all the configuration related to DHCP services that does not include routing instance support. If you do not do this, the old default routing instance configuration will override the new routing instance configuration.

  **NOTE:** On all SRX Series devices, logical systems and routing instances are not supported for a DHCP client in chassis cluster mode.

Related Documentation

- Understanding DHCP Server Operation on page 447
A Dynamic Host Configuration Protocol (DHCP) server can automatically allocate IP addresses and also deliver configuration settings to client hosts on a subnet. DHCP lets network administrators centrally manage a pool of IP addresses among hosts and automate the assignment of IP addresses in a network. An IP address can be leased to a host for a limited period of time, allowing the DHCP server to share a limited number of IP addresses among a group of hosts that do not need permanent IP addresses.

The Juniper Networks device acts as the DHCP server, providing IP addresses and settings to hosts, such as PCs, that are connected to device interfaces. The DHCP server is compatible with the DHCP servers of other vendors on the network.

The device can also operate as a DHCP client and DHCP relay agent.

DHCP is based on BOOTP, a bootstrap protocol that allows a client to discover its own IP address, the IP address of a server host, and the name of a bootstrap file. DHCP servers can handle requests from BOOTP clients, but provide additional capabilities beyond BOOTP, such as the automatic allocation of reusable IP addresses and additional configuration options.

NOTE: Although a Juniper Networks device can act as a DHCP server, a DHCP client, or DHCP relay agent at the same time, you cannot configure more than one DHCP role on a single interface.

DHCP provides two primary functions:

- Allocate temporary or permanent IP addresses to clients.
- Store, manage, and provide client configuration parameters.

NOTE: On all SRX Series devices, DHCPv4 is supported only in Layer 3 mode; the DHCP server and DHCP client are not supported in Layer 2 transparent mode.

Related Documentation:

- DHCP Server Configuration Overview on page 448
- Understanding DHCP Server Operation on page 447
- Understanding DHCP Client Operation on page 461
- Understanding DHCP Relay Agent Operation on page 471
DHCP Settings and Restrictions Overview

Supported Platforms

SRX Series, vSRX

This section contains the following topics:

- Propagation of TCP/IP Settings for DHCP on page 424
- DHCP Conflict Detection and Resolution on page 424
- DHCP Interface Restrictions on page 424

Propagation of TCP/IP Settings for DHCP

The Juniper Networks device can operate simultaneously as a client of the DHCP server in the untrust zone and a DHCP server to the clients in the trust zone. The device takes the TCP/IP settings that it receives as a DHCP client and forwards them as a DHCP server to the clients in the trust zone. The device interface in the untrust zone operates as the DHCP client, receiving IP addresses dynamically from an Internet service provider (ISP) on the external network.

During the DHCP protocol exchange, the device receives TCP/IP settings from the external network on its DHCP client interface. Settings include the address of the ISP's DHCP name server and other server addresses. These settings are propagated to the DHCP server pools configured on the device to fulfill host requests for IP addresses on the device's internal network.

DHCP Conflict Detection and Resolution

A client that receives an IP address from the device operating as a DHCP server performs a series of Address Resolution Protocol (ARP) tests to verify that the address is available and no conflicts exist. If the client detects an address conflict, it informs the DHCP server about the conflict and can request another IP address from the DHCP server.

The device maintains a log of all client-detected conflicts and removes addresses with conflicts from the DHCP address pool. To display the conflicts list, you use the `show system services dhcp conflict` command. The addresses in the conflicts list remain excluded until you use the `clear system services dhcp conflict` command to manually clear the list.

DHCP Interface Restrictions

The device supports DHCP client requests received on any Ethernet interface. DHCP requests received from a relay agent are supported on all interface types.

DHCP is not supported on interfaces that are part of a virtual private network (VPN).

Related Documentation

- DHCP Server, Client, and Relay Agent Overview on page 423
- Understanding DHCP Server Operation on page 447
- Understanding DHCP Client Operation on page 461
Understanding Cascaded DHCPv6 Prefix Delegating

**Supported Platforms**  
SRX Series

You can use DHCPv6 client prefix delegation to automate the delegation of IPv6 prefixes to the customer premises equipment (CPE). With prefix delegation, a delegating device delegates IPv6 prefixes to a requesting device. The requesting device then uses the prefixes to assign global IPv6 addresses to the devices on the subscriber LAN. The requesting device can also assign subnet addresses to subnets on the LAN.

With cascaded prefix delegation, the IPv6 address block is delegated to a DHCPv6 client that is running on the WAN interface of a customer edge device. The identity association (IA) for the client is used for the identity association for prefix delegation (IA_PD). The CE device requests, through DHCPv6, an IPv6 address with the IA type of nontemporary addresses (IA_NA). Both IA_PD and IA_NA are requesting in the same DHCPv6 exchange.

**Figure 7: IPv6 Prefix Delegation**

The topology in Figure 7 on page 425 shows an SRX Series device acting as the CPE. The WAN interface links to the provider edge (PE) device and the LAN interfaces link to the customer networks. The service provider delegates a prefix (delegated-prefix) and an IPv6 address (cpe-wan-ipv6-address) to a DHCPv6 client. When a requesting device receives that IPv6 address through the DHCPv6 client, the device must install the IPv6 address on its WAN interface. The DHCPv6 client then divides the delegated prefix into sub-prefixes and subsequently assigns them to the connected LAN interfaces of the CPE device, making some subset of the remaining space available for sub-prefix delegation.

A CPE assigns sub-prefixes to its LAN interfaces and broadcasts the sub-prefixes through device advertisement. In this scenario, the CPE acts as a sub-PE and delegates sub-prefixes and assigns them to sub-CPEs.

**NOTE:** The requirements of sub-prefix delegation are the same as for the prefix delegation defined in RFC 3769.
There can be multi-level sub prefix delegations, see Figure 8 on page 426. The top level CPE gets a delegated prefix from the PE and delegates the sub prefixes to second level sub-CPEs, then to the third level sub-CPEs, and finally to the end levels. The end level sub-CPEs assign the IPv6 address to end hosts through SLAAC, stateless DHCPv6 or stateful DHCPv6. This is called cascaded prefix delegating.

**Example - Configuring DHCPv6 Prefix Delegation (PD) over Point-to-Point Protocol over Ethernet (PPPoE)**

**Supported Platforms**

SRX300, SRX320, SRX340, SRX345, SRX550M

This example shows how to configure DHCPv6 PD over PPPoE on SRX Series devices.

- Requirements on page 426
- Overview on page 426
- Configuration on page 427
- Verification on page 441

**Requirements**

No special configuration beyond the device initialization is required before configuring this feature.

**Overview**

The example uses SRX550M devices for configuring DHCPv6 PD over PPPoE. Before you begin, configure DHCPv6 server to permit in host-inbound traffic and receive DHCPv6 packet. Provide a host-name to establish PPPoE session. To enable IPv6, chassis reboot is required.

Configuring DHCPv6 PD over PPPoE involves the following configurations:

- Configuring DHCPv6 Server
- DHCPv6 Client (PD)
- DHCPv6 Client (Auto)
Topology

The following illustration describes DHCPv6 PD over PPPoE topology which provide a configuration suite using SRX Series devices.

Figure 9 on page 427 shows the topology used in this example.

Figure 9: Configuring SRX Series Devices for DHCPv6 PD over PPPoE

---

Configuration

**CLI Quick Configuration**

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter commit from configuration mode.

Quick configuration for DHCPv6 Server:

- DHCPv6 server configuration
  
  ```
  set interfaces ge-0/0/2 unit 0 family inet6
  set system services dhcp-local-server dhcpv6 overrides interface-client-limit 100
  set system services dhcp-local-server dhcpv6 group my-group overrides interface-client-limit 200
  set system services dhcp-local-server dhcpv6 group my-group overrides delegated-pool v6-pd-pool
  set system services dhcp-local-server dhcpv6 group my-group interface pp0.0
  ```

- PPPoE configuration
  
  ```
  set system host-name SRX550M
  set interfaces ge-0/0/1 unit 0 encapsulation ppp-over-ether
  set interfaces pp0 unit 0 ppp-options chap access-profile prof-ge001
  set interfaces pp0 unit 0 pppoe-options underlying-interface ge-0/0/1.0
  set interfaces pp0 unit 0 pppoe-options server
  set interfaces pp0 unit 0 family inet6 address 3000::1/64
  ```

- Router advertisement configuration
  
  ```
  set protocols router-advertisement interface pp0.0 max-advertisement-interval 20
  set protocols router-advertisement interface pp0.0 min-advertisement-interval 10
  set protocols router-advertisement interface pp0.0 managed-configuration
  set protocols router-advertisement interface pp0.0 other-stateful-configuration
  set protocols router-advertisement interface pp0.0 prefix 3000::/64
  ```

- Enable IPv6
  
  ```
  set security forwarding-options family inet6 mode flow-based
  ```

- PPPoE profile configuration

---

**Copyright © 2017, Juniper Networks, Inc.**
set access profile prof-ge001 client test_user chap-secret test

- PD address pool configuration
  set access address-assignment pool v6-pd-pool family inet6 prefix 2001:1::/48
  set access address-assignment pool v6-pd-pool family inet6 range vp-pd prefix-length 48
  set access address-assignment pool v6-pd-pool family inet6 dhcp-attributes dns-server 3000::1

- Security zone configuration
  set security zones security-zone trust interface pp0.0 host-inbound-traffic system-services dhcpv6

Quick configuration for DHCPv6 Client (PD):

- DHCPv6 server configuration for autoconfig device
  set interfaces ge-0/0/2 unit 0 family inet6
  set system services dhcp-local-server dhcpv6 overrides interface-client-limit 10
  set system services dhcp-local-server dhcpv6 overrides process-inform pool p1
  set system services dhcp-local-server dhcpv6 group ipv6 interface ge-0/0/2.0

- PPPoE configuration
  set system host-name SRX550M
  set interfaces ge-0/0/1 unit 0 encapsulation ppp-over-ether
  set interfaces pp0 unit 0 ppp-options chap default-chap-secret test
  set interfaces pp0 unit 0 ppp-options chap local-name test_user
  set interfaces pp0 unit 0 ppp-options chap passive
  set interfaces pp0 unit 0 pppoe-options underlying-interface ge-0/0/1.0
  set interfaces pp0 unit 0 pppoe-options client

- DHCPv6 client configuration
  set interfaces pp0 unit 0 family inet6 dhcpv6-client client-type statefull
  set interfaces pp0 unit 0 family inet6 dhcpv6-client client-ia-type ia-pd
  set interfaces pp0 unit 0 family inet6 dhcpv6-client update-router-advertisement interface ge-0/0/2.0 other-stateful-configuration
  set interfaces pp0 unit 0 family inet6 dhcpv6-client update-router-advertisement interface ge-0/0/2.0 max-advertisement-interval 10
  set interfaces pp0 unit 0 family inet6 dhcpv6-client update-router-advertisement interface ge-0/0/2.0 min-advertisement-interval 5
  set interfaces pp0 unit 0 family inet6 dhcpv6-client interface-id duid-type duid-ll
  set interfaces pp0 unit 0 family inet6 dhcpv6-client req-option dns-server
  set interfaces pp0 unit 0 family inet6 dhcpv6-client update-server
  set protocols router-advertisement interface pp0.0

- Enable IPv6
  set security forwarding-options family inet6 mode flow-based

- DHCPv6 server propagate configuration
  set access address-assignment pool p1 family inet6 prefix 2001::/16
  set access address-assignment pool p1 family inet6 dhcp-attributes propagate-settings pp0.0

- Security zone configuration
set security zones security-zone untrust interface pp0.0 host-inbound-traffic
system-services dhcpv6
set security zones security-zone trust interface ge-0/0/2.0 host-inbound-traffic
system-services dhcpv6

Quick configuration for DHCPv6 Client (Auto):

- DHCPv6 client configuration
  set interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client client-type autoconfig
  set interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client client-ia-type ia-na
  set interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client client-identifier duid-type
  duid-ll
  set interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client req-option dns-server

- Router advertisement configuration
  set protocols router-advertisement interface fe-0/0/0.0

- Enable IPv6
  set security forwarding-options family inet6 mode flow-based

- Security zone configuration
  set security zones security-zone trust interface fe-0/0/0.0 host-inbound-traffic
  system-services dhcpv6
Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

1. To configure DHCPv6 server on SRX550M device:
   a. Set the interface.
      ```
      [edit]
      user@host# set interfaces ge-0/0/2 unit 0 family inet6
      ```
   b. Configure a DHCP local server.
      ```
      [edit]
      user@host# set system services dhcp-local-server dhcpv6
      ```
   c. Set a default limit for all DHCPv6 groups.
      ```
      [edit system services dhcp-local-server dhcpv6]
      user@host# set overrides interface-client-limit 100
      ```
   d. Set a custom client limit for the group.
      ```
      [edit system services dhcp-local-server dhcpv6]
      user@host# set group my-group overrides interface-client-limit 200
      ```
   e. Specify delegated pool name.
      ```
      [edit system services dhcp-local-server dhcpv6]
      user@host# set group my-group overrides delegated-pool v6-pd-pool
      ```
   f. Create a group called my-group that contains pp0 interface.
      ```
      [edit system services dhcp-local-server dhcpv6]
      user@host# set group my-group interface pp0.0
      ```

2. Configuring PPPoE:
   a. Set interface to encapsulate PPPoE.
      ```
      [edit]
      user@host# set interfaces ge-0/0/1 unit 0 encapsulation ppp-over-ether
      ```
   b. Set chap access profile value.
      ```
      [edit system interface]
      user@host# set interface pp0 unit 0 ppp-options chap access-profile prof-ge001
      ```
   c. Set underlying interface name.
      ```
      [edit system interface]
      user@host# set interface pp0 unit 0 pppoe-options underlying-interface ge-0/0/1.0
      ```
   d. Set PPPoE-options server.
      ```
      [edit system interface]
      user@host# set interface pp0 unit 0 pppoe-options server
      ```
   e. Set family name and address.
      ```
      [edit system interface]
      user@host# set interface pp0 unit 0 family inet6 address 3000::1/64
      ```
3. Configuring Router advertisement:
   a. Set max advertisement interval limit.
      
      ```
      [edit system protocol]
      user@host# set protocols router-advertisement interface pp0.0
      max-advertisement-interval 20
      ```
   b. Set minimum advertisement interval limit.
      
      ```
      [edit system protocol]
      user@host# set protocols router-advertisement interface pp0.0
      min-advertisement-interval 10
      ```
   c. Set the configuration state to managed configuration.
      
      ```
      [edit system protocol]
      user@host# set protocols router-advertisement interface pp0.0
      managed-configuration
      ```
   d. Set the configuration state to other stateful configuration.
      
      ```
      [edit system protocol]
      user@host# set protocols router-advertisement interface pp0.0
      other-stateful-configuration
      ```
   e. Set the prefix value.
      
      ```
      [edit system protocol]
      user@host# set protocols router-advertisement interface pp0.0 prefix 3000::1/64
      ```

4. Enable IPv6:
   a. Set the family name and mode to enable IPv6.
      
      ```
      [edit]
      user@host# set security forwarding-options family inet6 mode flow-based
      ```

5. Configuring PPPoE profile:
   a. Set access profile name, client name and chap secret.
      
      ```
      [edit]
      user@host# set access profile prof-ge001 client test_user chap-secret test
      ```

6. Configuring PD address pool:
   a. Set address-assignment pool name, family name and prefix.
      
      ```
      [edit]
      user@host# set access address-assignment pool v6-pd-pool family inet6 prefix 2001::1::/48
      ```
   b. Set range and prefix length.
      
      ```
      [edit]
      user@host# set access address-assignment pool v6-pd-pool family inet6 range vp-pd prefix-length 48
      ```
   c. Set dhcp attributes with dns server value.
      
      ```
      [edit]
      ```
7. Configuring Security zone:
   a. Set the zone name, interface and host-inbound-traffic system-services.

```
[edit]
user@host# set security zones security-zone trust interface pp0.0
host-inbound-traffic system-services dhcpv6
```

---

**Step-by-Step Procedure**

1. To configure DHCPv6 client (PD) on SRX550M device:
   a. Set the interface.

```
[edit]
user@host# set interfaces ge-0/0/2 unit 0 family inet6
```

   b. Set DHCPv6 local server to override the interface client limit.

```
[edit]
user@host# set system services dhcp-local-server dhcpv6 overrides interface-client-limit 10
```

   c. Set the process-inform pool name.

```
[edit]
user@host# set system services dhcp-local-server dhcpv6 overrides process-inform pool p1
```

   d. Set group name and interface.

```
[edit]
user@host# set system services dhcp-local-server dhcpv6 group ipv6 interface ge-0/0/2.0
```

2. Configuring PPPoE:
   a. Set the interface to encapsulate ppp over ethernet.

```
[edit system interface]
user@host# set interface ge-0/0/1 unit 0 encapsulation ppp-over-ether
```

   b. Set default chap secret.

```
[edit system interface]
user@host# set interfaces pp0 unit 0 ppp-options chap default-chap-secret test
```

   c. Set chap local name.

```
[edit system interface]
user@host# set interfaces pp0 unit 0 ppp-options chap local-name test_user
```

   d. Set PPP options chap state.

```
[edit system interface]
user@host# set interfaces pp0 unit 0 ppp-options chap passive
```

   e. Set underlying-interface.

```
[edit system interface]
```
user@host# set interfaces pp0 unit 0 pppoe-options underlying-interface ge-0/0/1.0

f. Set pppoe-options.

[edit system interface]
user@host# set interfaces pp0 unit 0 pppoe-options client

3. Configuring DHCPv6 client:

a. Set the family name and dhcpv6 client type.

[edit]
user@host# set interfaces pp0 unit 0 family inet6 dhcpv6-client client-type statefull

b. Set the dhcpv6 client identity association type.

[edit]
user@host# set interfaces pp0 unit 0 family inet6 dhcpv6-client client-ia-type ia-pd

c. Set update-router-advertisement interface and other stateful-configuration.

[edit]
user@host# set interfaces pp0 unit 0 family inet6 dhcpv6-client
update-router-advertisement interface ge-0/0/2.0 other-stateful-configuration

d. Set maximum advertisement interval value.

[edit]
user@host# set interfaces pp0 unit 0 family inet6 dhcpv6-client
update-router-advertisement interface ge-0/0/2.0 max-advertisement-interval
10

e. Set minimum advertisement interval value.

[edit]
user@host# set interfaces pp0 unit 0 family inet6 dhcpv6-client
update-router-advertisement interface ge-0/0/2.0 min-advertisement-interval
5

f. Set client-identifier duid type.

[edit]
user@host# set interfaces pp0 unit 0 family inet6 dhcpv6-client client-identifier duid-type duid-11

g. Set requested option for DHCPv6 client.

[edit]
user@host# set interfaces pp0 unit 0 family inet6 dhcpv6-client req-option dns-server

h. Update the server.

[edit]
user@host# set interfaces pp0 unit 0 family inet6 dhcpv6-client update-server

i. Set the protocols and the interface.

[edit]
user@host# set protocols router-advertisement interface pp0.0
4. Enable IPv6
   a. Set the family name and mode to enable IPv6.
      
      [edit]
      user@host# set security forwarding-options family inet6 mode flow-based

5. Configuring DHCPv6 server to propagate DNS server information to end device:
   a. Set address assignment pool name, family name and prefix.
      
      [edit]
      user@host# set access address-assignment pool p1 family inet6 prefix 2001::/16
   
   b. Set the interface name for propagating TCP/IP settings to pool.
      
      [edit]
      user@host# set access address-assignment pool p1 family inet6 dhcp-attributes propagate-settings pp0.0

6. Configuring security zone:
   a. Set the zone name, untrust interface and system services.
      
      [edit]
      user@host# set security zones security-zone trust interface pp0.0 host-inbound-traffic system-services dhcpv6
   
   b. Set the trust interface.
      
      [edit]
      user@host# set security zones security-zone trust interface ge-0/0/2.0 host-inbound-traffic system-services dhcpv6

   **Step-by-Step Procedure**

1. To configure DHCPv6 client (Auto) on SRX550M device:
   a. Set the interface, unit value, family name and DHCPv6 client type.
      
      [edit system interface]
      user@host# set interfaces fe-0/0/0 unit 0 family inet6 dhcpv6-client client-type autoconfig
   
   b. Set Dhcpv6 client identity association type.
      
      [edit system interface]
      user@host# set interfaces fe-0/0/0 unit 0 family inet6 dhcpv6-client client-ia-type ia-na
   
   c. Set client-identifier type.
      
      [edit system interface]
      user@host# set interfaces fe-0/0/0 unit 0 family inet6 dhcpv6-client client-identifier duid-type duid-11
   
   d. Set DHCPV6 client requested option.
      
      [edit system interface]
      user@host# set interfaces fe-0/0/0 unit 0 family inet6 dhcpv6-client req-option dns-server

2. Configuring router advertisement:
   a. Set the protocol and interface.
   a. Set family name and mode.
      
      [edit]
      user@host# set security forwarding-options family inet6 mode flow-based

4. Configuring security zone:

5. Set the zone name, trust interface and system services.
   
   [edit]
   user@host# set security zones security-zone trust interface pp0.0
   host-inbound-traffic system-services dhcpv6

Results

• Result for DHCPv6 Server:

From configuration mode, confirm your configuration by entering the `show system services dhcp-local-server`, `show interfaces`, `show protocols`, `show security forwarding-options`, `show access profile prof-ge001`, `show access address-assignment pool`, and `show security zones` commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

   [edit]
   user@host# show system services dhcp-local-server
dhcpv6 {
   overrides {
      interface-client-limit 100;
   }
   group my-group {
      overrides {
         interface-client-limit 200;
         delegated-pool v6-pd-pool;
      }
      interface pp0.0 set;
      interface pp0.0;
   }
   }

   ...
pp0 {
  unit 0 {
    ppp-options {
      chap {
        default-chap-secret "$ABC123"; ## SECRET-DATA
      }
    }
  }
}
ge-0/0/1 {
  unit 0 {
    encapsulation ppp-over-ether;
  }
}
pt-1/0/0 {
  vdsl-options {
    vdsl-profile auto;
  }
}
pp0 {
  unit 0 {
    ppp-options {
      chap {
        default-chap-secret "$ABC123"; ## SECRET-DATA
      }
    }
  }
}
...
[edit]
user@host# show protocols
interface pp0.0 {
  max-advertisement-interval 20;
  min-advertisement-interval 10;
  managed-configuration;
  other-stateful-configuration;
  prefix 3000::1/64;
}
...
[edit]
user@host# show security forwarding-options
family {
  inet6 {
    mode flow-based;
  }
}
...
[edit]
user@host# show access address-assignment
pool v6-pd-pool {
  family inet6 {
    prefix 2001:1:1::/48;
    range vp-pd prefix-length 48;
    dhcp-attributes {
      dns-server {

3000::1;

```
...[edit]
user@host# show security zones
security-zone Host {
    host-inbound-traffic {
        system-services {
            all;
        }
    }
    interfaces {
        ge-0/0/0.0;
    }
}
security-zone trust {
    interfaces {
        pp0.0 {
            host-inbound-traffic {
                system-services {
                    dhcpv6;
                }
            }
        }
    }
}
```

- Result for DHCPv6 Client (PD):

```
...[edit]
user@host# show system services dhcp-local-server
dhcpv6 {
    overrides {
        interface-client-limit 10;
        process-inform {
            pool p1;
        }
    }
    group my-group {
        overrides {
            interface-client-limit 200;
            delegated-pool v6-pd-pool;
        }
        interface pp0.0;
    }
    group ipv6 {
        interface ge-0/0/2.0;
    }
}
...[edit]
user@host# show interfaces
ge-0/0/1 {
```
unit 0 {
    encapsulation ppp-over-ether;
}
}
pt-1/0/0 {
    vdsl-options {
        vdsl-profile auto;
    }
}
}
pp0 {
    unit 0 {
        ppp-options {
            chap {
                default-chap-secret "$ABC123"; ## SECRET-DATA
                local-name test_user;
                passive;
            }
        }
        pppoe-options {
            underlying-interface ge-0/0/1.0;
            client;
        }
    }
}
...
[edit]
user@host# show interfaces pp0
unit 0 {
    ppp-options {
        chap {
            default-chap-secret "$ABC123"; ## SECRET-DATA
            local-name test_user;
            passive;
        }
    }
    pppoe-options {
        underlying-interface ge-0/0/1.0;
        client;
    }
}
family inet6 {
    dhcpv6-client {
        client-type statefull;
        client-ia-type ia-pd;
        update-router-advertisement {
            interface ge-0/0/2.0 {
                other-stateful-configuration;
                max-advertisement-interval 10;
                min-advertisement-interval 5;
            }
        }
        client-identifier duid-type duid-ll;
        req-option dns-server;
    }
}
}
[edit]
user@host# show security forwarding-options
  family {
    inet6 {
      mode flow-based;
    }
  }
...
[edit]
user@host# show access address-assignment
pool v6-pd-pool {
  family inet6 {
    prefix 2001::/48;
    range vp-pd prefix-length 48;
    dhcp-attributes {
      dns-server {
        3000::1;
      }
    }
  }
}
pool p1 {
  family inet6 {
    prefix 2001::/16;
    dhcp-attributes {
      propagate-settings pp0.0;
    }
  }
}
...
[edit]
user@host# show access address-assignment
security-zone Host {
  host-inbound-traffic {
    system-services {
      all;
    }
  }
} interfaces {
  ge-0/0/0.0;
}
}
security-zone trust {
  interfaces {
    pp0.0 {
      host-inbound-traffic {
        system-services {
          dhcpv6;
        }
      }
    }
    ge-0/0/2.0 {
      host-inbound-traffic {
        system-services {
          dhcpv6;
        }
      }
    }
  }
}
security-zone untrust {
  interfaces {
    pp0.0 {
      host-inbound-traffic {
        system-services {
          dhcpv6;
        }
      }
    }
  }
}

• Result for DHCPv6 Client (Auto):

[edit]
user@host# show interfaces ge-0/0/0
unit 0 {
  family inet6 {
    dhcpv6-client {
      client-type autoconfig;
      client-ia-type ia-na;
      req-option dns-server;
    }
  }
}
...

[edit]
user@host# show protocols
router-advertisement {
  interface pp0.0 {
    max-advertisement-interval 20;
    min-advertisement-interval 10;
    managed-configuration;
    other-stateful-configuration;
    prefix 3000::1/64;
  }
  interface fe-0/0/0.0;
}
...

[edit]
user@host# show security forwarding-options
family {
  inet6 {
    mode flow-based;
  }
}
...

[edit]
user@host# show security zones
security-zone Host {
  host-inbound-traffic {
    system-services {

Verification

Confirm that the configuration is working properly.

Verifying DHCPv6 Server Configuration

Purpose

Verify that the DHCPv6 Server has been configured.

Action

- From operational mode, enter the `show dhcpv6 server binding` command.
The following output shows the options for the `show dhcpv6 server binding` command.

```
[edit]
user@host> show dhcpv6 server binding detail
Session Id: 75
  Client IPv6 Prefix: 2001:1:1::/48
  Client DUID: LL0x1-3c:94:d5:98:90:01
  State: BOUND(DHCPV6_LOCAL_SERVER_STATE_BOUND)
  Lease Expires: 2016-03-26 10:12:37 JST
  Lease Expires in: 86213 seconds
  Lease Start: 2016-03-25 10:12:37 JST
  Last Packet Received: 2016-03-25 10:12:50 JST
  Incoming Client Interface: pp0.0
  Server Ip Address: 0.0.0.0
  Client Prefix Pool Name: v6-pd-pool
  Client Id Length: 10
  Client Id: /0x00030001/0x3c94d598/0x9001
```

- From operational mode, enter the `show route table inet6.0` command.

The following output shows the options for the `show route table inet6.0` command.

```
[edit]
user@host> show route table inet6.0
inet6.0: 4 destinations, 4 routes (4 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
2001:1:1::/48 *[Access/13] 00:03:45 <<<<<< Route for end device
    00:03:45 to fe80::3e94:d50f:fc98:8600 via pp0.0
    will be automatically generated
3000::/64 *[Direct/0] 00:04:04
    > via pp0.0
3000::1/128 *[Local/0] 19:53:18
    Local via pp0.0
fe80::b2c6:9a0f:fc7d:6900/128 *[Local/0] 19:53:18
    Local via pp0.0
```

- From operational mode, enter the `show interfaces pp0.0 terse` command.

The following output shows the options for the `show interfaces pp0.0 terse` command.

```
[edit]
user@host> show interfaces pp0.0 terse
Interface Admin Link Proto  Local Remote
pp0.0 up up inet6 3000:1/64
    3000::1/64
fe80::b2c6:9a0f:fc7d:6900/64
    3000::1/64
```

Verifying DHCPv6 Client (PD) Configuration

**Purpose**
Verify that the DHCPv6 Client (PD) has been configured.

**Action**
- From operational mode, enter the `show dhcpv6 client binding detail` command.

The following output shows the options for the `show dhcpv6 client binding detail` command.

```
[edit]
```
### show dhcpv6 client binding detail

- **Client Interface:** pp0.0
- **Hardware Address:** 3c:94:d5:98:86:01
- **State:** BOUND(DHCPV6_CLIENT_STATE_BOUND)
- **SRX is bound to prefix via pp0.0**
- **ClientType:** STATEFUL
- **Lease Expires:** 2016-03-26 10:12:50 JST
- **Lease Expires in:** 86232 seconds
- **Lease Start:** 2016-03-25 10:12:50 JST
- **Bind Type:** IA_PD
- **Client DUID:** LL0x29-3c:94:d5:98:86:01
- **Rapid Commit:** Off
- **Server Ip Address:** fe80::b2c6:9a0f:fc7d:6900
- **Update Server:** Yes
- **Client IP Prefix:** 2001:1:1::/48
- **DHCP options:**
  - **Name:** server-identifier, **Value:** VENDOR0x00000583-0x41453530
  - **Name:** dns-recursive-server, **Value:** 3000::1

  - From operational mode, enter the `show dhcpv6 server binding detail` command.

The following output shows the options for the `show dhcpv6 server binding detail` command.

```
[edit]
user@host>show dhcpv6 server binding detail
Session Id: 75
Client IPv6 Prefix: 2001:1:1::/48
Client DUID: LL0x1-3c:94:d5:98:90:01
State: BOUND(DHCPV6_LOCAL_SERVER_STATE_BOUND)
Lease Expires: 2016-03-26 10:12:37 JST
Lease Expires in: 86213 seconds
Lease Start: 2016-03-25 10:12:37 JST
Last Packet Received: 2016-03-25 10:12:50 JST
Incoming Client Interface: pp0.0
Server Ip Address: 0.0.0.0
Client Prefix Pool Name: v6-pd-pool
Client Id Length: 10
Client Id: /0x00030001/0x3c94d598/0x9001
```

- From operational mode, enter the `show route table inet6.0` command.

The following output shows the options for the `show route table inet6.0` command.

```
[edit]
user@host>show route table inet6.0
inet6.0: 7 destinations, 7 routes (7 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
::/0  *[Access-internal/12] 00:03:35
    > to fe80::b2c6:9a0f:fc7d:6900 via pp0.0
2001:1:1::/64  *[Direct/0] 00:03:48
    > via ge-0/0/2.0
2001:1:1:1::128  *[Local/0] 00:03:48  <<<<< IPv6 address allocated by Prefix delegation
    Local via ge-0/0/2.0
3000::/64  *[Access-internal/12] 00:03:35
    > to fe80::b2c6:9a0f:fc7d:6900 via pp0.0
fe80::/64  *[Direct/0] 00:03:48
    > via ge-0/0/2.0
fe80::3e94:d50f:fc98:8600/128
```
• From operational mode, enter the `show interfaces pp0.0 terse` command.

The following output shows the options for the `show interfaces pp0.0 terse` command.

```plaintext
[edit]
user@host> show interfaces pp0.0 terse
Interface              Admin Link Proto    Local                 Remote
pp0.0                   up    up   inet6    fe80::3e94:d5ff:fe98:8602/64
```

• From operational mode, enter the `show interfaces ge-0/0/2.0 terse` command.

The following output shows the options for the `show interfaces ge-0/0/2.0 terse` command.

```plaintext
[edit]
user@host> show interfaces ge-0/0/2.0 terse
Interface              Admin Link Proto    Local                 Remote
ge-0/0/2.0              up    up   inet6    2000:1:1:1::1/64         
                       fe80::3e94:d5ff:fe98:8602/64
```

• From operational mode, enter the `show ipv6 router-advertisement` command.

The following output shows the options for the `show ipv6 router-advertisement` command.

```plaintext
[edit]
user@host> show ipv6 router-advertisement
Interface: pp0.0
Advertisements sent: 3, last sent 00:01:56 ago
Solicits received: 0
Advertisements received: 10
Advertisement from fe80::b2c6:9a0f:fc7d:6900, heard 00:00:08 ago
    Managed: 1 [0]
    Other configuration: 1 [0]
    Reachable time: 0 ms
    Default lifetime: 60 sec [1800 sec]
    Retransmit timer: 0 ms
    Current hop limit: 64
    Prefix: 3000::/64
    Valid lifetime: 2592000 sec
    Preferred lifetime: 604800 sec
    On link: 1
    Autonomous: 1
Interface: ge-0/0/2.0
Advertisements sent: 24, last sent 00:00:03 ago
Solicits received: 0
Advertisements received: 0
```

**Verifying DHCPv6 client (Auto) Configuration**

**Purpose** Verify that the DHCPv6 client (Auto) has been configured.
Action  • From operational mode, enter the `show dhcppv6 client binding detail` command.

The following output shows the options for the `show dhcppv6 client binding detail` command.

```
[edit]
user@host> show dhcppv6 client binding detail
Client Interface: fe-0/0/0.0
  Hardware Address: 00:26:88:38:b5:00
  State: BOUND(DHCPV6_CLIENT_STATE_BOUND)
  ClientType: AUTO
  Lease Expires: 2016-03-26 10:15:35 JST
  Lease Expires in: 86395 seconds
  Lease Start: 2016-03-25 10:15:35 JST
  Bind Type: IA_NA
  Client DUID: LL0x3-00:26:88:38:b5:00
  Rapid Commit: Off
  Server Ip Address: fe80::3e94:d5ff:fe98:8602
  Client IP Prefix: 2001:1:1:1::/64

DHCP options:
  Name: server-identifier, Value: VENDOR0x00000583-0x414c3131
```

• From operational mode, enter the `show routetable inet6.0` command.

The following output shows the options for the `show routetable inet6.0` command.

```
[edit]
user@host> show routetable inet6.0
inet6.0: 5 destinations, 6 routes (5 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
  ::/0  *[Access-internal/12] 00:02:36
    > to fe80::3e94:d5ff:fe98:8602 via fe-0/0/0.0
    2001:1:1:1::64  *[Access-internal/12] 00:02:36
      > to fe80::3e94:d5ff:fe98:8602 via fe-0/0/0.0
      > via fe-0/0/0.0
      Local via fe-0/0/0.0
    fe80::/64  *[Direct/0] 1w3d 15:51:19
      > via fe-0/0/0.0
    fe80::226:88ff:fe38:b500/128  *[Local/0] 1w3d 15:51:19
      Local via fe-0/0/0.0
```

• From operational mode, enter the `show ipv6 router-advertisement` command.

The following output shows the options for the `show ipv6 router-advertisement` command.

```
[edit]
user@host> show ipv6 router-advertisement
Interface: fe-0/0/0.0
  Advertisements sent: 1, last sent 00:02:45 ago
  Solicits received: 0
  Advertisements received: 8
  Advertisement from fe80::3e94:d5ff:fe98:8602, heard 00:00:02 ago
    Managed: 0
    Other configuration: 1 [0]
```
Reachable time: 0 ms
Default lifetime: 30 sec [1800 sec]
Retransmit timer: 0 ms
Current hop limit: 64
Prefix: 2001:1:1:1::/64
  Valid lifetime: 86400 sec
  Preferred lifetime: 86400 sec
On link: 1
Autonomous: 1
CHAPTER 12

Configuring a DHCP Local Server

- Understanding DHCP Server Operation on page 447
- DHCP Server Configuration Overview on page 448
- Minimum DHCP Local Server Configuration on page 449
- Configuring Address-Assignment Pools on page 450
- Configuring an Address-Assignment Pool Name and Addresses on page 451
- Configuring a Named Address Range for Dynamic Address Assignment on page 451
- Configuring Static Address Assignments on page 452
- Enabling TCP/IP Propagation on a DHCP Local Server on page 453
- Verifying and Managing DHCP Local Server Configuration on page 454
- Example: Configuring the Device as a DHCP Server on page 454

Understanding DHCP Server Operation

**Supported Platforms**

SRX Series, vSRX

As a DHCP server, a Juniper Networks device can provide temporary IP addresses from an IP address pool to all clients on a specified subnet, a process known as dynamic binding. Juniper Networks devices can also perform static binding, assigning permanent IP addresses to specific clients based on their media access control (MAC) addresses. Static bindings take precedence over dynamic bindings.

This section contains the following topics:

- DHCP Options on page 447
- Compatibility with Autoinstallation on page 448
- Chassis Cluster Support on page 448

DHCP Options

In addition to its primary DHCP server functions, you can also configure the device to send configuration settings like the following to clients through DHCP:

- IP address of the DHCP server (Juniper Networks device)
- List of Domain Name System (DNS) and NetBIOS servers
• List of gateway routers
• IP address of the boot server and the filename of the boot file to use
• DHCP options defined in RFC 2132, *DHCP Options and BOOTP Vendor Extensions*

**Compatibility with Autoinstallation**

The functions of a Juniper Networks device acting as a DHCP server are compatible with the autoinstallation feature. The DHCP server automatically checks any autoinstallation settings for conflicts and gives the autoinstallation settings priority over corresponding DHCP settings. For example, an IP address set by autoinstallation takes precedence over an IP address set by the DHCP server.

**Chassis Cluster Support**

DHCP server operations are supported on all SRX Series devices in chassis cluster mode.

**Related Documentation**

- DHCP Server, Client, and Relay Agent Overview on page 423
- Example: Configuring the Device as a DHCP Server on page 454
- Understanding DHCP Client Operation on page 461
- Understanding DHCP Relay Agent Operation on page 471

**DHCP Server Configuration Overview**

**Supported Platforms**  
SRX Series, vSRX

A typical DHCP server configuration provides the following configuration settings for a particular subnet on a device interface:

- An IP address pool, with one address excluded from the pool.
- Default and maximum lease times.
- Domain search suffixes. These suffixes specify the domain search list used by a client when resolving hostnames with DNS.
- A DNS name server.
- Device solicitation address option (option 32). The IP address excluded from the IP address pool is reserved for this option.

In addition, the DHCP server might assign a static address to at least one client on the subnet. Table 13 on page 448 provides the settings and values for the sample DHCP server configuration.

**Table 13: Sample DHCP Server Configuration Settings**

<table>
<thead>
<tr>
<th>Setting</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHCP Subnet Configuration</td>
<td></td>
</tr>
<tr>
<td>Address pool subnet address</td>
<td>192.168.2.0/24</td>
</tr>
</tbody>
</table>
Table 13: Sample DHCP Server Configuration Settings (continued)

<table>
<thead>
<tr>
<th>Setting</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>High address in the pool range</td>
<td>192.168.2.254</td>
</tr>
<tr>
<td>Low address in the pool range</td>
<td>192.168.2.2</td>
</tr>
<tr>
<td>Address pool default lease time, in seconds</td>
<td>1,209,600 (14 days)</td>
</tr>
<tr>
<td>Address pool maximum lease time, in seconds</td>
<td>2,419,200 (28 days)</td>
</tr>
<tr>
<td>Domain search suffixes</td>
<td>mycompany.net</td>
</tr>
<tr>
<td>Address to exclude from the pool</td>
<td>mylab.net</td>
</tr>
<tr>
<td>DNS server address</td>
<td>192.168.2.33</td>
</tr>
<tr>
<td>Identifier code for router solicitation address option</td>
<td>32</td>
</tr>
<tr>
<td>Type choice for router solicitation address option</td>
<td>ip address</td>
</tr>
<tr>
<td>IP address for router solicitation address option</td>
<td>192.168.2.33</td>
</tr>
<tr>
<td>DHCP MAC Address Configuration</td>
<td></td>
</tr>
<tr>
<td>Static binding MAC address</td>
<td>01:03:05:07:09:0B</td>
</tr>
<tr>
<td>Fixed address</td>
<td>192.168.2.50</td>
</tr>
</tbody>
</table>

Related Documentation
- DHCP Server, Client, and Relay Agent Overview on page 423
- Understanding DHCP Server Operation on page 447
- Understanding DHCP Client Operation on page 461
- Understanding DHCP Relay Agent Operation on page 471
- RFC 3397, Dynamic Host Configuration Protocol (DHCP) Domain Search Option

Minimum DHCP Local Server Configuration

**Supported Platforms**  
SRX Series, vSRX

The following sample output shows the minimum configuration you must use to configure an SRX300, SRX320, SRX340, SRX345, SRX550M, or SRX1500 device as a DHCP local server. In this output, the server group is named mobileusers, and the DHCP local server is enabled on interface ge-1/0/1.0 within the group.

```plaintext
[edit access]
address-assignment {
```
pool acmenetwork family inet {
    network 192.168.1.0/24;
}
}
editsystem services
dhcp-local-server {
    group mobileusers {
        interface ge-1/0/1.0
    }
}
editinterfaces ge-1/0/1 unit 0
family {
    inet {
        address 192.168.1.1/24
    }
}

NOTE: You can configure the DHCP local server in a routing instance by using the dhcp-local server, interface, and address-assignment statements in the [edit routing-instances] hierarchy level.

Related Documentation
- Configuring Address-Assignment Pools on page 450

Configuring Address-Assignment Pools

Supported Platforms SRX Series, vSRX

The address-assignment pool feature for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices enables you to create address pools that can be shared by different client applications such as DHCPv4 or DHCPv6.

To configure an address-assignment pool:

1. Configure the address-assignment pool name and specify the addresses for the pool.
   See “Configuring an Address-Assignment Pool Name and Addresses” on page 451.

2. (Optional) Configure named ranges (subsets) of addresses.
   See "Configuring a Named Address Range for Dynamic Address Assignment" on page 451.

3. (Optional;IPv4 only) Create static address bindings.
   See “Configuring Static Address Assignments” on page 452.

4. (Optional) Configure attributes for DHCP clients.
When configuring an address-assignment pool on SRX300, SRX320, SRX340, SRX345, SRX1500, and SRX550M devices, you must specify the name of the pool and its addresses.

To configure an IPv4 address-assignment pool:

1. Configure the name of the pool and specify the IPv4 family.
   ```
   [edit access]
   user@host# edit address-assignment pool blr-pool family inet
   ```

2. Configure the network address and the prefix length of the addresses in the pool.
   ```
   [edit access address-assignment pool blr-pool family inet]
   user@host# set network 192.168.0.0/16
   ```

   **NOTE:** You can configure an IPv4 address-assignment pool in a routing instance by configuring the address-assignment statements in the [edit routing-instances] hierarchy level.

You can optionally configure multiple named ranges, or subsets, of addresses within an address-assignment pool. During a dynamic address assignment, a client can be assigned an address from a specific named range. To create a named range, you specify a name for the range and define the address range.

**NOTE:** Supported only on SRX300, SRX320, SRX340, SRX345, SRX1500, and SRX550M devices.
2. Configure the name of the range and the lower and upper boundaries of the addresses in the range.

   ```
   [edit access address-assignment pool isp_1 family inet]
   user@host# set range southeast low 192.168.102.2 high 192.168.102.254
   ```

**NOTE:** To configure named address ranges in a routing instance, configure the address-assignment statements in the [edit routing-instances] hierarchy level.

---

### Configuring Static Address Assignments

#### Supported Platforms

**SRX Series, vSRX**

You can optionally create a static IPv4 address binding by reserving a specific address for a particular client. The address is removed from the address-assignment pool so that it is not assigned to another client. When you reserve an address, you identify the client host and create a binding between the client MAC address and the assigned IP address.

**NOTE:** This feature is supported on SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

To configure a static IPv4 address binding:

1. Specify the name of the IPv4 address-assignment pool containing the IP address you want to reserve for the client.

   ```
   [edit access]
   user@host# edit address-assignment pool blr-pool family inet
   ```

2. Specify the name of the client for the static binding, the client MAC address, and the IP address to reserve for the client. This configuration specifies that the client with MAC address 01:03:05:07:09:0b is always assigned IP address 192.168.10.2.

   ```
   [edit access address-assignment pool blr-pool family inet]
   user@host# set host svale6_boston_net hardware-address 01:03:05:07:09:0b ip-address 192.168.10.2
   ```
To configure static binding for an IPv4 address in a routing instance, configure the address-assignment statements in the [edit routing-instances] hierarchy.

**Related Documentation**
- Configuring Address-Assignment Pools on page 450

---

## Enabling TCP/IP Propagation on a DHCP Local Server

### Supported Platforms
SRX Series, vSRX

This topic describes how to configure TCP/IP settings on a DHCP local server, which includes a DHCP client and a DHCP local server.

**NOTE:** This feature is supported on SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

To enable TCP/IP setting propagation on a DHCP local server:

1. Configure the `update-server` option on the DHCP client.
   ```
   [edit interfaces ge-0/0/1 unit 0 family inet]
   dhcp-client {
   update-server;
   }
   ```

2. Configure the address pool to specify the interface (where `update-server` is configured) from which TCP/IP settings can be propagated.
   ```
   [edit access]
   address-assignment {
   pool sprint family inet {
   network 192.168.2.0/24;
   dhcp-attributes {
   propagate-settings ge-0/0/1.0;
   }
   }
   }
   ```

3. Configure the DHCP local server.
   ```
   edit system services
dhcp-local-server {
   group bob {
   interface ge-1/0/1.0
   }
   }
   ```
Verifying and Managing DHCP Local Server Configuration

**Supported Platforms** SRX Series, vSRX

**Purpose** View or clear information about client address bindings and statistics for the DHCP local server.

**NOTE:** This feature is supported on SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Action**
- To display the address bindings in the client table on the DHCP local server:
  ```
  user@host> show dhcp server binding
  ```
- To display DHCP local server statistics:
  ```
  user@host> show dhcp server statistics
  ```
- To clear the binding state of a DHCP client from the client table on the DHCP local server:
  ```
  user@host> clear dhcp server binding
  ```
- To clear all DHCP local server statistics:
  ```
  user@host> clear dhcp server statistics
  ```

**NOTE:** To clear or view information about client bindings and statistics in a routing instance, run the following commands:

```
- show dhcp server binding routing instance <routing-instance name>
- show dhcp server statistics routing instance <routing-instance name>
- clear dhcp server binding routing instance <routing-instance name>
- clear dhcp server statistics routing instance <routing-instance name>
```

**Example: Configuring the Device as a DHCP Server**

**Supported Platforms** SRX Series, vSRX

This example shows how to configure the device as a DHCP server.
For information on how to configure JDHCP in a routing instance, see https://kb.juniper.net/InfoCenter/index?page=content=KB26897=search=true.

- Requirements on page 455
- Overview on page 455
- Configuration on page 455
- Verification on page 458

Requirements

Before you begin:

- Determine the IP address pools and the lease durations to use for each subnet.
- Obtain the MAC addresses of the clients that require permanent IP addresses. Determine the IP addresses to use for these clients.
- List the IP addresses that are available for the servers and devices on your network; for example, DNS, NetBIOS servers, boot servers, and gateway devices. See the Understanding Management Predefined Policy Applications.
- Determine the DHCP options required by the subnets and clients in your network.

Overview

In this example, you configure the device as a DHCP server. You specify the IP address pool as 192.168.2.0/24 and from a low range of 192.168.2.2 to a high range of 192.168.2.254. You set the maximum-lease-time to 2,419,200. Then you specify the DNS server IP address as 192.168.10.2.

---

**WARNING:** Starting with Junos OS Release 15.1X49-D60 and Junos OS Release 17.3R1, the legacy DHCPD (DHCP daemon) configuration on all SRX Series devices is being deprecated. and only the new JDHCP CLI is supported. When you upgrade to Junos OS Release 15.1X49-D60 and later releases on a device that already has the DHCPD configuration, the following warning messages are displayed:

**WARNING:** The DHCP configuration command used will be deprecated in future Junos releases.

**WARNING:** Please see documentation for updated commands.

---

Configuration

**CLI Quick Configuration**

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the set access hierarchy level, and then enter commit from configuration mode.

```
set interfaces ge-0/0/2 unit 0 family inet address 192.168.21/24
```
GUI Step-by-Step Procedure

To configure the device as a DHCP server, specify the DHCP pool information, server information, lease time, and option information:

1. In the J-Web interface, select Configure > DHCP > DHCP Services.

2. Select DHCP Pools. Click Add.

3. Specify the IP address that is used as the source address the DHCP server includes in IP packets when communicating with clients. The address is included in the DHCP packet in option 54.

4. Specify the subnet information for the IPv4 address-assignment pool. Type 192.168.2.0/24.

5. In the Address Range Low, type 192.168.2.2.

6. In the Address Range High, type 192.168.2.254.

7. In the Exclude Addresses box, type the addresses you want excluded from a DHCP address pool. Type 192.168.0.20

8. Specify the server identifier to assign to any DHCP clients in this address pool. The identifier can be used to identify a DHCP server in a DHCP message.

9. Specify the domain name to assign to any DHCP clients in this address pool.

10. Specify the next server that DHCP clients need to contact. Type 192.168.10.2

11. Define the maximum amount of time (in seconds) that DHCP should lease an address. Type 2419200.

12. Define DHCP option 32, the device solicitation address option. You must enter a numeric value for option code. Select the option type from the list that corresponds to the option code.
13. Click **OK**.

14. If you are done configuring the device, click **Commit > Commit**.

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure the device as a DHCP server:

1. Configure an interface with an IP address on which the DHCP server will be reachable.
   
   ```
   [edit]
   user@host# set interfaces ge-0/0/2 unit 0 family inet address 192.168.2.1/24
   ```

2. Configure the DHCP server.
   
   ```
   [edit]
   user@host# set system services dhcp-local-server group g1 interface ge-0/0/2.0
   ```

3. Create an address pool for IPv4 addresses that can be assigned to clients. The addresses in the pool must be on the subnet in which the DHCP clients reside. Do not include addresses that are already in use on the network.
   
   ```
   [edit]
   user@host# set access address-assignment pool p1 family inet network 192.168.2.0/24
   ```

4. (Optional) Specify the IP address pool range. Define a range of addresses in the address-assignment pool. The range is a subset of addresses within the pool that can be assigned to clients. If no range is specified, then all addresses within the pool are available for assignment. Configure the name of the range and the lower and upper boundaries of the addresses in the range.
   
   ```
   [edit]
   user@host# set access address-assignment pool p1 family inet dhcp-attributes router 192.168.2.3
   ```

5. (Optional) Configure one or more routers as the default gateway on the client's subnet.
   
   ```
   [edit]
   user@host# set access address-assignment pool p1 family inet dhcp-attributes router 192.168.10.3
   ```

6. (Optional) Configure the IP address that is used as the source address for the DHCP server in messages exchanged with the client. Clients use this information to distinguish between lease offers.
   
   ```
   [edit]
   ```
    user@host# set access address-assignment pool pool1 family inet dhcp-attributes server-identifier 192.168.10.1

7.  (Optional) Specify the maximum time period, in seconds, that a client holds the lease for an assigned IP address if the client does not renew the lease.

    [edit]
    user@host# set access address-assignment pool pool1 family inet dhcp-attributes maximum-lease-time 2419200

8.  (Optional) Specify user-defined options to be included in DHCP packets

    [edit]
    user@host# set access address-assignment pool pool1 family inet dhcp-attributes option 98 string test98

9.  Assign a fixed IP address with the MAC address of the client.

    [edit]
    user@host# set system services static-binding 01:03:05:07:09:0B fixed-address 192.168.2.50

Results  From configuration mode, confirm your configuration by entering the show system services dhcp-local-server command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

    [edit]
    user@host# show system services dhcp-local-server pool 192.168.2.0/24 {  
         address-range low 192.168.2.2 high 192.168.2.254;  
         maximum-lease-time 2419200;  
         name-server {  
              192.168.10.2;  
         }  
         option 32 ip-address 192.168.2.33;  
      }  
    static-binding 01:03:05:07:09:0B {  
         fixed-address {  
              192.168.2.50;  
         }  
      }

If you are done configuring the device, enter commit from configuration mode.

Verification

Confirm that the configuration is working properly.

- Verifying the DHCP Binding Database on page 459
- Verifying DHCP Server Operation on page 459
Verifying the DHCP Binding Database

**Purpose**
Verify that the DHCP binding database reflects the DHCP server configuration.

**Action**
From operational mode, enter these commands:

- `show dhcp server binding` command to display all active bindings in the database.
- `show dhcp server binding address detail` command (where `address` is the IP address of the client) to display more information about a client.

These commands produce following sample output:

```
user@host> show dhcp server binding
IP Address   Hardware Address   Type          Lease expires at

user@host> show dhcp server binding address detail
IP address     192.0.2.2
Hardware address 00:a0:12:00:13:02
Pool            192.0.2.0/24
Interface  fe-0/0/0, relayed by 192.0.2.200
Lease information:
  Type            DHCP
  Obtained at     2004-05-02 13:01:42 PDT
  Expires at      2004-05-03 13:01:42 PDT
  State           active
DHCP options:
  Name: name-server, Value: { 6.6.6.6, 6.6.6.7 }
  Name: domain-name, Value: mydomain.tld
  Code: 32, Type: ip-address, Value: 192.0.2.33
```

Verifying DHCP Server Operation

**Purpose**
Verify that the DHCP server operation has been configured.

**Action**
From operational mode, enter the following command:

- `show dhcp server statistics` command to verify the DHCP server statistics.

```
user@host> show dhcp server statistics
Packets dropped: Total 0
Messages received:
  BOOTREQUEST  45
  DHCPDECLINE  0
  DHCPDISCOVER 1
```
DHCPINFORM 39
DHCPRELEASE 0
DHCPREQUEST 5
DHCPLEASEQUERY 0
DHCPBULKLEASEQUERY 0

Messages sent:
BOOTREPLY 6
DHCPOFFER 1
DHCPACK 3
DHCPNAK 2
DHCPPRORCERENEW 0
DHCPLEASEUNASSIGNED 0
DHCPLEASEUNKNOWN 0
DHCPLEASEACTIVE 0
DHCPLEASEQUERYDONE 0

Release History Table

<table>
<thead>
<tr>
<th>Release</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1X49-D60</td>
<td>Starting with Junos OS Release 15.1X49-D60 and Junos OS Release 17.3R1, the legacy DHCPD (DHCP daemon) configuration on all SRX Series devices is being deprecated. and only the new JDHCP CLI is supported.</td>
</tr>
</tbody>
</table>

Related Documentation
- DHCP Server, Client, and Relay Agent Overview on page 423
- Understanding DHCP Server Operation on page 447
- Understanding DHCP Relay Agent Operation on page 471
- DHCP Settings and Restrictions Overview on page 424
CHAPTER 13

Configuring a DHCP Client

- Understanding DHCP Client Operation on page 461
- Minimum DHCP Client Configuration on page 461
- Configuring DHCP Client-Specific Attributes for Address-Assignment Pools on page 462
- Configuring Optional DHCP Client Attributes on page 463
- Verifying and Managing DHCP Client Configuration on page 464
- Example: Configuring the Device as a DHCP Client on page 465

Understanding DHCP Client Operation

Supported Platforms  SRX Series, vSRX

A Juniper Networks device can act as a DHCP client, receiving its TCP/IP settings and the IP address for any physical interface in any security zone from an external DHCP server. The device can also act as a DHCP server, providing TCP/IP settings and IP addresses to clients in any zone. When the device operates as a DHCP client and a DHCP server simultaneously, it can transfer the TCP/IP settings learned through its DHCP client module to its default DHCP server module. For the device to operate as a DHCP client, you configure a logical interface on the device to obtain an IP address from the DHCP server in the network. You set the vendor class ID, lease time, DHCP server address, retransmission attempts, and retry interval. You can renew DHCP client releases.

DHCP client operations are supported on all SRX Series devices in chassis cluster mode.

Related Documentation
- DHCP Server, Client, and Relay Agent Overview on page 423
- Understanding DHCP Relay Agent Operation on page 471
- DHCP Settings and Restrictions Overview on page 424

Minimum DHCP Client Configuration

Supported Platforms  SRX Series, vSRX
The following sample output shows the minimum configuration you must use to configure an SRX300, SRX320, SRX340, SRX345, SRX550M, or SRX1500 device as a DHCP client. In this output, the interface is ge-0/0/0 and the logical unit is 0.

```plaintext
[edit interfaces]
ge-0/0/0 {
  unit 0 {
    family inet {
      dhcp-client
    }
  }
}
```

**NOTE:** To configure a DHCP client in a routing instance, add the interface in a routing instance using the [edit routing-instances] hierarchy.

### Related Documentation
- Configuring Optional DHCP Client Attributes on page 463

---

## Configuring DHCP Client-Specific Attributes for Address-Assignment Pools

### Supported Platforms
SRX Series, vSRX

You use the address-assignment pool feature to include application-specific attributes when clients obtain an address. The client application, such as DHCP, uses the attributes to determine how addresses are assigned and to provide optional application-specific characteristics to the client. For example, the DHCP application might specify that a client that matches certain prerequisite information is dynamically assigned an address from a particular named range. Based on which named range is used, DHCP specifies additional DHCP attributes such as the boot file that the client uses, the DNS server, and the maximum lease time.

**NOTE:** This feature is supported on SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

You use the `dhcp-attributes` statement to configure DHCP client-specific attributes for address-assignment pools.

To configure address-assignment pool attributes for DHCP clients:

1. Specify the name of the address-assignment pool.

   ```plaintext
   [edit access]
   user@host# edit address-assignment pool blr-pool family inet
   ```

2. Configure optional DHCP client attributes.

   ```plaintext
   [edit access address-assignment pool blr-pool family inet]
   user@host# set dhcp-attributes maximum-lease-time 2419200
   ```
NOTE: To configure DHCP client-specific attributes in a routing instance, configure the dhcp-attributes statements in the [edit routing-instances] hierarchy.

Related Documentation

- Configuring Address-Assignment Pools on page 450

Configuring Optional DHCP Client Attributes

**Supported Platforms**

SRX Series, vSRX

For the device to operate as a DHCP client, you configure a logical interface on the device to obtain an IP address from the DHCP local server in the network. You can then set the client-identifier, options no-hostname, lease time, retransmission attempts, retry interval, preferred DHCP local server address, and vendor class ID.

To configure optional DHCP client attributes on SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices:

1. Configure the DHCP client identifier prefix as the routing instance name.
   
   ```
   [edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
   user@host# set client-identifier prefix host
   ```

2. Configure the DHCP options no-hostname if you do not want the client to send hostname (RFC option code 12) in the packets.
   
   ```
   [edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
   user@host# set options no-hostname
   ```

3. Set the DHCP lease time.
   
   ```
   [edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
   user@host# set lease-time 86400
   ```

4. Set the number of attempts allowed to retransmit a DHCP packet.
   
   ```
   [edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
   user@host# set retransmission-attempt 6
   ```

5. Set the interval (in seconds) allowed between retransmission attempts. The range is 4 through 64. The default is 4 seconds.
   
   ```
   [edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
   user@host# set retransmission-interval 5
   ```
6. Set the IPv4 address of the preferred DHCP local server.

```bash
[edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
user@host# set server-address 10.1.1.1
```

7. Set the vendor class ID for the DHCP client.

```bash
[edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
user@host# set vendor-id ether
```

**NOTE:** To configure the DHCP client in a routing instance, configure the interface in the `[edit routing-instances]` hierarchy.

---

**Related Documentation**

- [Minimum DHCP Client Configuration on page 461](#)

---

### Verifying and Managing DHCP Client Configuration

**Supported Platforms**  
SRX Series, vSRX

**Purpose**  
View or clear information about client address bindings and statistics for the DHCP client on SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.

**Action**  
- To display the address bindings in the client table on the DHCP client:
  ```bash
  user@host> show dhcp client binding
  ```

- To display DHCP client statistics:
  ```bash
  user@host> show dhcp client statistics
  ```

- To clear the binding state of a DHCP client from the client table on the DHCP client:
  ```bash
  user@host> clear dhcp client binding
  ```

- To clear all DHCP client statistics:
  ```bash
  user@host> clear dhcp client statistics
  ```

**NOTE:** To clear or view information about client bindings and statistics in a routing instance, run the following commands:

- `show dhcp client binding routing instance <routing-instance name>`
- `show dhcp client statistics routing instance <routing-instance name>`
- `clear dhcp client binding routing instance <routing-instance name>`
- `clear dhcp client statistics routing instance <routing-instance name>`
Example: Configuring the Device as a DHCP Client

Supported Platforms

SRX Series, vSRX

This example shows how to configure the device as a DHCP client.

- Requirements on page 465
- Overview on page 465
- Configuration on page 466
- Verification on page 468

Requirements

Before you begin:

- Determine the IP address pools and the lease durations to use for each subnet. You can use the `show system services dhcp pool` CLI command to view information on DHCP address pools.

- Obtain the MAC addresses of the clients that require permanent IP addresses. Determine the IP addresses to use for these clients.

- List the IP addresses that are available for the servers and devices on your network; for example, DNS, NetBIOS servers, boot servers, and gateway devices. See the *Understanding Management Predefined Policy Applications*.

- Determine the DHCP options required by the subnets and clients in your network. See *Creating User-Defined DHCP Options Not Included in the Default Junos Implementation of the DHCP Server*.

Overview

In this example, you configure the device as a DHCP client. You specify the interface as ge-0/0/2, set the logical unit as 0, and create a DHCP inet family. You then specify the DHCP client identifier as 00:0a:12:00:12:12 in hexadecimal. You use hexadecimal if the client identifier is a MAC address. You set the options no-hostname if you do not want the DHCP client to send the hostname with the packets. You set the DHCP lease time as 86,400 seconds. The range is from 60 through 2,147,483,647 seconds.

Then you set the number of retransmission attempts to 6. The range is from 0 through 6, and the default is 4. You set the retransmission interval to 5 seconds. The range is from 4 through 64, and the default is 4 seconds. Finally, you set the IPv4 address of the preferred DHCP server to 10.1.1.1 and the vendor class ID to ether.

**WARNING:** Starting with Junos OS Release 15.1X49-D60 and Junos OS Release 17.3R1, the legacy DHCPD (DHCP daemon) configuration on all SRX Series devices is being deprecated and only the new JDHCP CLI is supported.
When you upgrade to Junos OS Release 15.1X49-D60 and later releases on a device that already has the DHCPD configuration, the following warning messages are displayed:

WARNING: The DHCP configuration command used will be deprecated in future Junos releases.

WARNING: Please see documentation for updated commands.

Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter commit from configuration mode.

set interfaces ge-0/0/2 unit 0 family inet dhcp-client client-identifier prefix host-name
set interfaces ge-0/0/2 unit 0 family inet dhcp-client lease-time 86400
set interfaces ge-0/0/2 unit 0 family inet dhcp-client retransmission-attempt 6
set interfaces ge-0/0/2 unit 0 family inet dhcp-client retransmission-interval 5
set interfaces ge-0/0/2 unit 0 family inet dhcp-client server-address 192.168.2.1
set interfaces ge-0/0/2 unit 0 family inet dhcp-client vendor-id ether
set interfaces ge-0/0/2 unit 0 family inet dhcp-client options no-hostname

GUI Step-by-Step Procedure

To configure the device as a DHCP client:

1. In the J-Web interface, select Configure > Services > DHCP > DHCP Client.

2. Under Interfaces, add ge-0/0/2.0.

3. Configure the DHCP client identifier as either an ASCII or hexadecimal value.

4. From the Client identifier choice list, select hexadecimal.

5. In the Hexadecimal box, type the client identifier—00:0a:12:00:12:12.

6. Set the DHCP lease time in seconds. This is the lease time in seconds requested in a DHCP client protocol packet; the range is 60 through 2,147,483,647. Type 86400.

7. Set the retransmission number of attempts to 6. This is the number of attempts to retransmit the DHCP client protocol packet. The range is 0 through 6.

8. Set the retransmission interval in seconds to 5. This is the number of seconds between successive transmissions. The range is 4 through 64. The default is 4 seconds.

9. Set the IPv4 address of the preferred DHCP server. Type 192.168.2.1.
10. Set the vendor class ID. This is the vendor class identification for the DHCP client. Type `ether`.

11. Configure options no-hostname if you do not want the client to send hostname in the packets (RFC option code 12).

12. Click OK.

13. If you are done configuring the device, click Commit >.

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To configure the device as a DHCP client:

1. Specify the DHCP client interface.
   
   ```
   [edit]
   user@host# edit interfaces ge-0/0/2 unit 0 family inet dhcp-client
   ```

2. Configure the DHCP client identifier as a hexadecimal value.
   
   ```
   [edit interfaces ge-0/0/2 unit 0 family inet dhcp-client]
   user@host# set client-identifier prefix host
   ```

3. Set the DHCP lease time.
   
   ```
   [edit interfaces ge-0/0/2 unit 0 family inet dhcp-client]
   user@host# set lease-time 86400
   ```

4. Set the number of attempts allowed to retransmit a DHCP packet.
   
   ```
   [edit interfaces ge-0/0/2 unit 0 family inet dhcp-client]
   user@host# set retransmission-attempt 6
   ```

5. Set the interval (in seconds) allowed between retransmission attempts. The range is 4 through 64. The default is 4 seconds.
   
   ```
   [edit interfaces ge-0/0/2 unit 0 family inet dhcp-client]
   user@host# set retransmission-interval 5
   ```

6. Set the IPv4 address of the preferred DHCP server.
   
   ```
   [edit interfaces ge-0/0/2 unit 0 family inet dhcp-client]
   user@host# set server-address 192.168.2.1
   ```

7. Set the vendor class ID for the DHCP client.
   
   ```
   [edit interfaces ge-0/0/2 unit 0 family inet dhcp-client]
   ```
8. Configure options no-hostname if you do not want the client to send the hostname in packets.

   [edit interfaces ge-0/0/2 unit 0 family inet dhcp-client]
   user@host# set options no-hostname

Results  From configuration mode, confirm your configuration by entering the **show interfaces ge-0/0/2 unit 0 family inet** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

   [edit]
   user@host# show interfaces ge-0/0/2 unit 0 family inet
dhcp-client {
   client-identifier hexadecimal 00:0a:12:00:12:12;
   options no-hostname;
   lease-time 86400;
   retransmission-attempt 6;
   retransmission-interval 5;
   server-address 192.168.2.1;
   update-server;
   vendor-id ether;
}

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- Verifying the DHCP Client on page 468

Verifying the DHCP Client

Purpose  Verify that the DHCP client information has been configured.

Action  From operational mode, enter these commands:

- **show dhcp client binding** command to display the binding state of a Dynamic Host Configuration Protocol (DHCP) client.
- **show dhcp client statistics** command to display client statistics.

These commands produce the following sample output:

   user@host> show dhcp client binding

<table>
<thead>
<tr>
<th>IP address</th>
<th>Hardware address</th>
<th>Expires</th>
<th>State</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>192.168.2.2</td>
<td>88:a2:5e:0a:d6:03</td>
<td>2419093</td>
<td>BOUND</td>
<td>ge-0/0/2</td>
</tr>
</tbody>
</table>
user@host> show dhcp client statistics

Packets dropped:
  Total                      2
  Send error                 2

Messages received:
  BOOTREPLY                  6
  DHCPoffer                  4
  DHCPack                    2
  DHCPNAK                    0
  DHCPFORCERENEW             0

Messages sent:
  BOOTREQUEST                39
  DHCPDECLINE                0
  DHCPDISCOVER               23
  DHCPREQUEST                16
  DHCPINFORM                 0
  DHCPRELEASE                0
  DHCPRENEW                  0
  DHCPREBIND                 0

### Release History Table

<table>
<thead>
<tr>
<th>Release</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1X49-D60</td>
<td>Starting with Junos OS Release 15.1X49-D60 and Junos OS Release 17.3R1, the legacy DHCPD (DHCP daemon) configuration on all SRX Series devices is being deprecated and only the new JDHCP CLI is supported.</td>
</tr>
</tbody>
</table>

### Related Documentation
- [DHCP Server, Client, and Relay Agent Overview on page 423](#)
- [Understanding DHCP Server Operation on page 447](#)
- [Understanding DHCP Client Operation on page 461](#)
- [DHCP Settings and Restrictions Overview on page 424](#)
CHAPTER 14

Configuring a DHCP Relay Agent

- Understanding DHCP Relay Agent Operation on page 471
- Minimum DHCP Relay Agent Configuration on page 471
- Verifying and Managing DHCP Relay Configuration on page 472
- Example: Configuring the Device as a BOOTP or DHCP Relay Agent on page 473

Understanding DHCP Relay Agent Operation

**Supported Platforms**

SRX Series, vSRX

A Juniper Networks device operating as a DHCP relay agent forwards incoming requests from BOOTP and DHCP clients to a specified BOOTP or DHCP server. Client requests can pass through virtual private network (VPN) tunnels.

You cannot configure a single device interface to operate as both a DHCP client and a DHCP relay.

---

**NOTE:** The DHCP requests received on an interface are associated to a DHCP pool that is in the same subnet as the primary IP address/subnet on an interface. If an interface is associated with multiple IP addresses/subnets, the device uses the lowest numerically assigned IP address as the primary IP address/subnet for the interface. To change the IP address/subnet that is listed as the primary address on an interface, use the `set interfaces <interface name> unit 0 family inet xxx.xxx.xxx.xxx/yy primary` command and commit the change.

---

**Related Documentation**

- DHCP Server, Client, and Relay Agent Overview on page 423
- Understanding DHCP Server Operation on page 447
- DHCP Settings and Restrictions Overview on page 424

Minimum DHCP Relay Agent Configuration

**Supported Platforms**

SRX Series, vSRX
The following sample output shows the minimum configuration you must use to configure an SRX Series device as a DHCP relay agent. In this output, the active server group is named server-1 and its IP address is 203.0.113.1. The DHCP relay agent configuration is applied to a group named bob. Within this group, the DHCP relay agent is enabled on interface ge-1/0/1.0.

```plaintext
[edit forwarding-options]
dhcp-relay {
    server-group {
        server-1 {
            203.0.113.1;
        }
    }
    active-server-group server-1;
    group bob {
        interface ge-1/0/1.0;
    }
}
```

**NOTE:** To configure the DHCP relay agent in a routing instance, configure the dhcp-relay statements in the [edit routing-instances] hierarchy level.

**Related Documentation**
- Verifying and Managing DHCP Relay Configuration on page 472

**Verifying and Managing DHCP Relay Configuration**

**Supported Platforms**
- SRX Series, vSRX

**Purpose**
View or clear address bindings or statistics for DHCP relay agent clients.

**Action**
- To display the address bindings for DHCP relay agent clients:
  ```plaintext
  user@host> show dhcp relay binding
  ```
- To display DHCP relay agent statistics:
  ```plaintext
  user@host> show dhcp relay statistics
  ```
- To clear the binding state of DHCP relay agent clients:
  ```plaintext
  user@host> clear dhcp relay binding
  ```
- To clear all DHCP relay agent statistics:
  ```plaintext
  user@host> clear dhcp relay statistics
  ```

To clear or view information about client bindings and statistics in a routing instance, run the following commands:

- `show dhcp relay binding routing instance <routing-instance name>`
- `show dhcp relay statistics routing instance <routing-instance name>`
## Example: Configuring the Device as a BOOTP or DHCP Relay Agent

### Supported Platforms

SRX Series, vSRX

This example shows how to configure the device as a BOOTP or DHCP relay agent.

- **Requirements** on page 473
- **Overview** on page 473
- **Configuration** on page 474
- **Verification** on page 478

### Requirements

No special configuration beyond device initialization is required before configuring this feature.

### Overview

In this example, you enable the DHCP relay agent to relay BOOTP or DHCP messages to a BOOTP server. You enable VPN encryption to allow client requests to pass through the VPN tunnel. You specify the IP time-to-live value to be set in responses to the client as 20. The range is from 1 through 255. You then set the maximum number of hops allowed per packet to 10. The range is from 1 through 16.

Then you specify the minimum number of seconds before requests are forwarded as 300. The range is from 0 through 30,000 seconds. You set the description of the server (the value is a string), and you specify a valid server name or address to the server to forward (the value is an IPv4 address). You define the routing instance, whose value is a nonreserved text string of 128 or fewer characters. You then specify the incoming BOOTP or DHCP request forwarding interface as ge-0/0/0. You enable the broadcast option if the Layer 2 interface is unknown.

You then specify the IP time-to-live value to be set in responses to the client as 30. The range is from 1 through 255. You set the description of the server as text and the DHCP option as 82. You set the maximum number of hops allowed per packet to 16 and specify the minimum number of seconds as 400 before requests are forwarded. You enable the

### Related Documentation

- Minimum DHCP Relay Agent Configuration on page 471

### Notes

On all SRX Series devices, DHCP relay is unable to update the binding status based on DHCP_RENEW and DHCP_RELEASE messages.
Finally, you enable VPN encryption to allow client requests to pass through the VPN tunnel.

**WARNING:** Starting with Junos OS Release 15.1X49-D60 and Junos OS Release 17.3R1, the legacy DHCPD (DHCP daemon) configuration on all SRX Series devices is being deprecated and only the new JDHCP CLI is supported. When you upgrade to Junos OS Release 15.1X49-D60 and later releases on a device that already has the DHCPD configuration, the following warning messages are displayed:

- **WARNING:** The DHCP configuration command used will be deprecated in future Junos releases.
- **WARNING:** Please see documentation for updated commands.

### Configuration

**CLI Quick Configuration**

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the `[edit]` hierarchy level, and then enter `commit` from configuration mode.

```plaintext
set forwarding-options helpers bootp relay agent-option
set forwarding-options helpers bootp vpn
set forwarding-options helpers bootp client-response-ttl 20
set forwarding-options helpers bootp maximum-hop-count 10
set forwarding-options helpers bootp minimum-wait-time 300
set forwarding-options helpers bootp description text
set forwarding-options helpers bootp server 198.51.110.2
set forwarding-options helpers bootp server 198.51.110.2 routing instance rt-i-1
set forwarding-options helpers bootp interface ge-0/0/0
set forwarding-options helpers bootp interface ge-0/0/0 broadcast
set forwarding-options helpers bootp interface ge-0/0/0 client-response-ttl 30
set forwarding-options helpers bootp interface ge-0/0/0 description text
set forwarding-options helpers bootp interface ge-0/0/0 dhcp-option82
set forwarding-options helpers bootp interface ge-0/0/0 maximum-hop-count 16
set forwarding-options helpers bootp interface ge-0/0/0 minimum-wait-time 400
set forwarding-options helpers bootp interface ge-0/0/0 no-listen
set forwarding-options helpers bootp interface ge-0/0/0 vpn
```

**GUI Step-by-Step Procedure**

To configure the device as a BOOTP/DHCP relay agent:

1. In the J-Web user interface, select `Configure>Services>DHCP>Boot DHCP Relay`.

2. Select the DHCP relay agent check box to enable the BOOTP/DHCP relay agent.

3. Select the VPN encryption check box.

4. In the Client response TTL box, type 20.
5. In the Maximum hop count box, type 10.

6. In the Minimum wait time box, type 300.

7. In the Description box, type the description of the server.


9. Next to the Name box, type 198.51.110.2.

10. Define the routing instance. Next to Routing instance, click Add new entry.

11. In the Name box, type rt-i-1 and click OK. A routing instance is optional.


13. In the Interface name box, type the interface name. For example, type ge-0/0/0.


15. In the Description box, type the description of the server.

16. Select the Dhcp option 82 check box.

17. In the Maximum hop count box, type 16.

18. In the Minimum wait time box, type 400.

19. Select the No listen check box.

20. Select the VPN encryption check box.

21. Click OK until you return to the Configuration page.

22. Click OK to check your configuration and save it as a candidate configuration.

23. If you are done configuring the device, click Commit Options>Commit.
The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To configure the device as a BOOTP or DHCP relay agent:

1. Set the DHCP relay agent.
   
   ```
   [edit]
   user@host# edit forwarding-options helpers bootp
   user@host# set relay-agent-option
   ```

2. Enable VPN encryption to allow client requests to pass through VPN tunnel.
   
   ```
   [edit forwarding-options helpers bootp]
   user@host# set vpn
   ```

   **NOTE:** Starting with Junos OS Release 15.1X49-D10 and Junos OS Release 17.3R1, VPN option is supported only on SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices and vSRX instances.

3. Set the IP time-to-live value.
   
   ```
   [edit forwarding-options helpers bootp]
   user@host# set client-response-ttl 20
   ```

4. Set the maximum number of hops allowed per packet.
   
   ```
   [edit forwarding-options helpers bootp]
   user@host# set maximum-hop-count 10
   ```

5. Set the minimum wait time in seconds.
   
   ```
   [edit forwarding-options helpers bootp]
   user@host# set minimum-wait-time 300
   ```

6. Specify the description of the server.
   
   ```
   [edit forwarding-options helpers bootp]
   user@host# set description text
   ```

7. Add a new server.
   
   ```
   [edit forwarding-options helpers bootp]
   user@host# set server 198.51.110.2
   ```

8. Define the routing instance.
   
   ```
   [edit forwarding-options helpers bootp]
   user@host# set server 198.51.110.2 routing-instance rt-i-1
   ```
9. Define the incoming BootP request forwarding interface.

    [edit forwarding-options helpers bootp]
    user@host# set interface ge-0/0/0

10. Enable broadcast option.

    [edit forwarding-options helpers bootp interface ge-0/0/0]
    user@host# set broadcast

11. Define the IP time-to-live value.

    [edit forwarding-options helpers bootp interface ge-0/0/0]
    user@host# set client-response-ttl 30

12. Specify the description of the server.

    [edit forwarding-options helpers bootp interface ge-0/0/0]
    user@host# set description text

13. Set the DHCP option 82.

    [edit forwarding-options helpers bootp interface ge-0/0/0]
    user@host# set dhcp-option82

14. Specify the maximum number of hops allowed per packet.

    [edit forwarding-options helpers bootp interface ge-0/0/0]
    user@host# set forwarding-options helpers bootp interface ge-0/0/0
                maximum-hop-count 16

15. Set the minimum wait time.

    [edit forwarding-options helpers bootp interface ge-0/0/0]
    user@host# set minimum-wait-time 400

16. Set the no listen option.

    [edit forwarding-options helpers bootp interface ge-0/0/0]
    user@host# set no-listen

17. Enable VPN encryption to allow client requests to pass through the VPN tunnel.

    [edit forwarding-options helpers bootp interface ge-0/0/0]
    user@host# set vpn

---

**NOTE:** Starting with Junos OS Release 15.1X49-D10 and Junos OS Release 17.3R1, VPN option is supported only on SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices and vSRX instances.
Results  From configuration mode, confirm your configuration by entering the `show forwarding-options` command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show forwarding-options
helpers {
  bootp {
    relay-agent-option;
    description text;
    server 198.51.110.2 routing-instance rt-i-1;
    maximum-hop-count 10;
    minimum-wait-time 300;
    client-response-ttl 20;
    vpn;
    interface {
      ge-0/0/0 {
        no-listen;
        broadcast;
        description text;
        maximum-hop-count 16;
        minimum-wait-time 400;
        client-response-ttl 30;
        vpn;
        dhcp-option82;
      }
    }
  }
}
```

If you are done configuring the device, enter `commit` from configuration mode.

Verification

Confirm that the configuration is working properly.

**Verifying DHCP Relay Statistics**

**Purpose**  Verify that the DHCP Relay statistics have been configured.

**Action**  From operational mode, enter the `show system services dhcp relay-statistics` command.

```
user@host> show system services dhcp relay-statistics
Received Packets:  4  Forwarded Packets:  4  Dropped Packets:  0
4  Due to missing interface in relay database:  0  Due to missing matching routing instance:  0  Due to an error during packet read:  0  Due to an error during packet send:  0  Due to invalid server address:  0  Due to missing valid local address:  0  Due to missing route to server/client:  0
```
Starting with Junos OS Release 15.1X49-D60 and Junos OS Release 17.3R1, the legacy DHCPD (DHCP daemon) configuration on all SRX Series devices is being deprecated and only the new JDHCP CLI is supported.

<table>
<thead>
<tr>
<th>Release</th>
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<tr>
<td>15.1X49-D60</td>
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- DHCP Server, Client, and Relay Agent Overview on page 423
- Understanding DHCP Relay Agent Operation on page 471
- DHCP Settings and Restrictions Overview on page 424
CHAPTER 15

Configuring a DHCPv6 Local Server

- DHCPv6 Server Overview on page 481
- Creating a Security Policy for DHCPv6 on page 482
- Example: Configuring DHCPv6 Server Options on page 483
- Example: Configuring an Address-Assignment Pool on page 486
- Configuring a Named Address Range for Dynamic Address Assignment on page 488
- Configuring Address-Assignment Pool Linking on page 489
- Configuring DHCP Client-Specific Attributes on page 490
- Configuring an Address-Assignment Pool for Router Advertisement on page 491
- Understanding DHCPv6 Client and Server Identification on page 491

DHCPv6 Server Overview

**Supported Platforms** SRX Series

A Dynamic Host Configuration Protocol version 6 (DHCPv6) server can automatically allocate IP addresses to IP version 6 (IPv6) clients and deliver configuration settings to client hosts on a subnet or to requesting devices that need an IPv6 prefix. A DHCPv6 server lets network administrators centrally manage a pool of IP addresses among hosts and automate the assignment of IP addresses in a network. Supported on SRX1500, SRX5400, SRX5600, and SRX5800 devices only.

**NOTE:** SRX Series devices do not support DHCP client authentication. In a DHCPv6 deployment, security policies control access through the device for any DHCP client that has received an address and other attributes from the DHCPv6 server.

Some features include:

- Configuration for a specific interface or a group of interfaces
- Stateless address autoconfiguration (SLAAC)
- Prefix delegation, including access-internal route installation
- DHCPv6 server groups
The DHCPv6 server configuration usually consists of DHCPv6 options for clients, an IPv6 prefix, an address pool that contains IPv6 address ranges and options, and a security policy to allow DHCPv6 traffic. In a typical setup the provider Juniper Networks device is configured as an IPv6 prefix delegation server that assigns addresses to the customer edge device. The customer’s edge router then provides addresses to internal devices.

To configure DHCPv6 local server on a device, you include the DHCPv6 statement at the [edit system services dhcp-local-server] hierarchy level. You then create an address assignment pool for DHCPv6 that is configured in the [edit access address-assignment pool] hierarchy level using the family inet6 statement.

You can also include the dhcpv6 statement at the [edit routing-instances routing-instance-name system services dhcp-local-server] hierarchy.

NOTE: Existing DHCPv4 configurations in the [edit system services dhcp] hierarchy are not affected when you upgrade to Junos OS Release 10.4 from an earlier version or enable DHCPv6 server.

### Related Documentation
- Example: Configuring DHCPv6 Server Options on page 483
- Example: Configuring an Address-Assignment Pool on page 486
- Configuring a Named Address Range for Dynamic Address Assignment on page 488
- Creating a Security Policy for DHCPv6 on page 482

## Creating a Security Policy for DHCPv6

### Supported Platforms
SRX Series

For the DHCPv6 server to allow DHCPv6 requests, you must create a security policy to enable DHCPv6 traffic. In this example, the zone my-zone allows DHCPv6 traffic from the zone untrust, and the ge-0/0/3.0 interface is configured with the IPv6 address 2001:db8:3001::1.

To create a security zone policy to allow DHCPv6 on SRX1500, SRX5400, SRX5600, and SRX5800 devices:

1. Create the zone and add an interface to that zone.
   ```
   [edit security zones]
   user@host# edit security-zone my-zone interfaces ge-0/0/3.0
   ```

2. Configure host inbound traffic system services to allow DHCPv6.
   ```
   [edit security zones security-zone my-zone interfaces ge-0/0/3.0]
   user@host# set host-inbound-traffic system-services dhcpv6
   ```

3. If you are done configuring the device, enter commit from configuration mode.
Example: Configuring DHCPv6 Server Options

Supported Platforms

SRX Series

This example shows how to configure DHCPv6 server options on SRX1500, SRX5400, SRX5600, and SRX5800 devices.

• Requirements on page 483
• Overview on page 483
• Configuration on page 483
• Verification on page 485

Requirements

Before you begin:

• Determine the IPv6 address pool range.
• Determine the IPv6 prefix. See the Understanding Address Books.
• Determine the grace period, maximum lease time, or any custom options that should be applied to clients.
• List the IP addresses that are available for the devices on your network; for example, DNS and SIP servers.

Overview

In this example, you set a default client limit as 100 for all DHCPv6 groups. You then create a group called my-group that contains at least one interface. In this case, the interface is ge-0/0/3.0. You set a range of interfaces using the upto command and set a custom client limit as 200 for group my-group that overrides the default limit. Finally, you configure interface ge-0/0/3.0 with IPv6 address 2001:db8:3001::1/64 and set router advertisement for interface ge-0/0/3.0. Starting with Junos OS Release 15.4.9-D70 and Junos OS Release 17.3R1, you can add the option dynamic-server to dynamically support prefix and attributes that are updated by the WAN server.

NOTE: A DHCPv6 group must contain at least one interface.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network
configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter **commit** from configuration mode.

```plaintext
set system services dhcp-local-server dhcpv6 overrides interface-client-limit 100
set system services dhcp-local-server dhcpv6 dynamic-server
set system services dhcp-local-server dhcpv6 group my-group interface ge-0/0/3.0
set system services dhcp-local-server dhcpv6 group my-group interface ge-0/0/3.0 upto ge-0/0/6.0
set system services dhcp-local-server dhcpv6 group my-group overrides interface-client-limit 200
set interfaces ge-0/0/3 unit 0 family inet6 address 2001:db8:3000::1/64
set protocols router-advertisement interface ge-0/0/3.0 prefix 2001:db8:3000::/64
```

### Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To configure DHCPv6 server options:

1. **Configure a DHCP local server.**
   
   ```plaintext
   [edit]
   user@host# edit system services dhcp-local-server dhcpv6
   ```

2. **Set a default limit for all DHCPv6 groups.**
   
   ```plaintext
   [edit system services dhcp-local-server dhcpv6]
   user@host# set overrides interface-client-limit 100
   ```

3. **Add a dynamic server that automatically adds prefix and attributes that are updated by the WAN server.**
   
   ```plaintext
   [edit]
   user@host# edit system services dhcp-local-server dhcpv6 dynamic-server
   ```

4. **Specify a group name and interface.**
   
   ```plaintext
   [edit system services dhcp-local-server dhcpv6]
   user@host# set group my-group interface ge-0/0/3.0
   ```

5. **Set a range of interfaces.**
   
   ```plaintext
   [edit system services dhcp-local-server dhcpv6]
   user@host# set group my-group interface ge-0/0/3.0 upto ge-0/0/6.0
   ```

6. **Set a custom client limit for the group.**
   
   ```plaintext
   [edit system services dhcp-local-server dhcpv6]
   user@host# set group my-group overrides interface-client-limit 200
   ```

7. **Configure an interface with an IPv6 address.**
   
   ```plaintext
   [edit interfaces]
   user@host# set ge-0/0/3 unit 0 family inet6 address 2001:db8:3000::1/64
   ```
8. Set router advertisement for the interface.

```
[edit protocols]
user@host# set router-advertisement interface ge-0/0/3.0 prefix 2001:db8:3000::/64
```

**Results** From configuration mode, confirm your configuration by entering the `show system services dhcp-local-server`, `show interfaces ge-0/0/3`, and `show protocols` commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show system services dhcp-local-server
dhcpv6 {
  dynamic-server
  overrides {
    interface-client-limit 100;
  }
  group my-group {
    overrides {
      interface-client-limit 200;
    }
    interface ge-0/0/3.0 {
      upto ge-0/0/6.0;
    }
  }
}
[edit]
user@host# show interfaces ge-0/0/3
unit 0 {
  family inet6 {
    address 2001:db8:3000::1/64;
  }
}
[edit]
user@host# show protocols
router-advertisement {
  interface ge-0/0/3.0 {
    prefix 2001:db8:3000::1/64;
  }
}
```

If you are done configuring the device, enter `commit` from configuration mode.

**Verification**

Confirm that the configuration is working properly.

**Verifying DHCPv6 Local Server Configuration**

**Purpose** Verify that the client address bindings and statistics for the DHCPv6 local server have been configured
Action  From operational mode, enter these commands:

- `show dhcpv6 server binding` command to display the address bindings in the client table on the DHCPv6 local server.
- `show dhcpv6 server statistics` command to display the DHCPv6 local server statistics.
- `clear dhcpv6 server bindings all` command to clear all DHCPv6 local server bindings.
  You can clear all bindings or clear a specific interface, or routing instance.
- `clear dhcpv6 server statistics` command to clear all DHCPv6 local server statistics.

Release History Table

<table>
<thead>
<tr>
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</thead>
<tbody>
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<td>Starting with Junos OS Release 15.1X49-D70 and Junos OS Release 17.3R1, you can add the option dynamic-server to dynamically support prefix and attributes that are updated by the WAN server.</td>
</tr>
</tbody>
</table>

Related Documentation

- DHCPv6 Server Overview on page 481
- Example: Configuring an Address-Assignment Pool on page 486
- Configuring a Named Address Range for Dynamic Address Assignment on page 488
- Creating a Security Policy for DHCPv6 on page 482

Example: Configuring an Address-Assignment Pool

Supported Platforms  SRX Series

This example shows how to configure an address-assignment pool on SRX1500, SRX5400, SRX5600, and SRX5800 devices.

- Requirements on page 486
- Overview on page 486
- Configuration on page 487
- Verification on page 488

Requirements

Before you begin:

- Specify the name of the address-assignment pool and configure addresses for the pool.
- Set DHCPv6 attributes for the address-assignment pool.

Overview

In this example, you configure an address-pool called my-pool and specify the IPv6 family as inet6. You configure the IPv6 prefix as 2001:db8:3000::/64, the range name as range1,
and the IPv6 range for DHCPv6 clients from a low of 2001:db8:3000:1::/64 to a high of
2001:db8:3000:200::/64. You can define the range based on the lower and upper
boundaries of the prefixes in the range or based on the length of the prefixes in the range.
Finally, you specify the DHCPv6 attribute for the DNS server as 2001:db8:3001::1, the
grace period as 3600, and the maximum lease time as 120.

Configuration

CLI Quick
Configuration

To quickly configure this example, copy the following commands, paste them into a text
file, remove any line breaks, change any details necessary to match your network
configuration, copy and paste the commands into the CLI at the [edit] hierarchy level,
and then enter commit from configuration mode.

set access address-assignment pool my-pool family inet6 prefix 2001:db8:3000:1::/64
set access address-assignment pool my-pool family inet6 range range1 low
2001:db8:3000:1::/64 high 2001:db8:3000:200::/64
set access address-assignment pool my-pool family inet6 dhcp-attributes dns-server
2001:db8:3001::1
set access address-assignment pool my-pool family inet6 dhcp-attributes grace-period
3600
set access address-assignment pool my-pool family inet6 dhcp-attributes
maximum-lease-time 120

Step-by-Step
Procedure

The following example requires you to navigate various levels in the configuration
hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration
Mode in the CLI User Guide.

To configure an IPv6 address-assignment pool:

1. Configure an address-pool and specify the IPv6 family.
   [edit access]
   user@host# edit address-assignment pool my-pool family inet6

2. Configure the IPv6 prefix, the range name, and IPv6 range for DHCPv6 clients.
   [edit access address-assignment pool my-pool family inet6]
   user@host# set prefix 2001:db8:3000:1::/64
   user@host# set range range1 low 2001:db8:3000:1::/64 high
   2001:db8:3000:200::/64

3. Configure the DHCPv6 attribute for the DNS server for the address pool.
   [edit access address-assignment pool my-pool family inet6]
   user@host# set dhcp-attributes dns-server 2001:db8:3001::1

4. Configure the DHCPv6 attribute for the grace period.
   [edit access address-assignment pool my-pool family inet6]
   user@host# set dhcp-attributes grace-period 3600

5. Configure the DHCPv6 attribute for the maximum lease time.
[edit access address-assignment pool my-pool family inet6]
user@host# set dhcp-attributes maximum-lease-time 120

Results From configuration mode, confirm your configuration by entering the show access address-assignment command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

[edit]
user@host# show access address-assignment
pool my-pool {
  family inet6 {
    prefix 2001:db8:3000:1::/64;
    range range1 {
      low 2001:db8:3000:1::/64;
      high 2001:db8:3000:200::/64;
    }
    dhcp-attributes {
      maximum-lease-time 120;
      grace-period 3600;
      dns-server {
        2001:db8:3001::1;
      }
    }
  }
}

If you are done configuring the device, enter commit from configuration mode.

Verification

Confirm that the configuration is working properly.

Verifying Configuration

Purpose Verify that the address-assignment pool has been configured.

Action From operational mode, enter the show access address-assignment command.

Related Documentation
  • DHCPv6 Server Overview on page 481
  • Example: Configuring DHCPv6 Server Options on page 483
  • Configuring a Named Address Range for Dynamic Address Assignment on page 488
  • Creating a Security Policy for DHCPv6 on page 482

Configuring a Named Address Range for Dynamic Address Assignment

Supported Platforms  SRX Series
You can optionally configure multiple named ranges, or subsets of addresses, within an address-assignment pool. During dynamic address assignment, a client can be assigned an address from a specific named range. To create a named range, you specify a name for the range and define the address range and DHCPv6 attributes.

**NOTE:** Supported only on SRX1500, SRX5400, SRX5600, and SRX5800 devices.

To configure a named address range for dynamic address assignment:

1. Specify the name of the address-assignment pool and the IPv6 family.
   
   ```
   [edit access]
   user@host# edit address-assignment pool my-pool2 family inet6
   ```

2. Configure the IPv6 prefix and then define the range name and IPv6 range for DHCPv6 clients. You can define the range based on the lower and upper boundaries of the prefixes in the range, or based on the length of the prefixes in the range.
   
   ```
   [edit access address-assignment pool my-pool2 family inet6]
   user@host# set prefix 2001:db8:3000:5::/64
   user@host# set range range2 low 2001:db8:3000:2::/64 high 2001:db8:3000:300::/64
   ```

3. Configure DHCPv6 attributes for the address pool.
   
   ```
   [edit access address-assignment pool my-pool2 family inet6]
   user@host# set dhcp-attributes dns-server 2001:db8:18:: grace-period 3600 maximum-lease-time 120
   ```

4. If you are done configuring the device, enter `commit` from configuration mode.

### Related Documentation
- Configuring Address-Assignment Pool Linking on page 489

### Configuring Address-Assignment Pool Linking

**Supported Platforms**

SRX Series

Address-assignment pool linking enables you to specify a secondary address pool for the device to use when the primary address-assignment pool is fully allocated. When the primary pool has no available addresses remaining, the device automatically switches over to the linked secondary pool and begins allocating addresses from that pool. The device uses a secondary pool only when the primary address-assignment pool is fully allocated.

You can create a chain of multiple linked pools. For example, you can link pool A to pool B, and link pool B to pool C. When pool A has no available addresses, the device switches to pool B for addresses. When pool B is exhausted, the device switches to pool C. There is no limit to the number of linked pools in a chain. However, you cannot create multiple
links to or from the same pool—a pool can be linked to only one secondary pool, and a secondary pool can be linked from only one primary pool.

To link a primary address-assignment pool named pool1 to a secondary pool named pool2 on SRX1500, SRX5400, SRX5600, or SRX5800 devices:

```
[edit access address-assignment]
user@host# set pool pool1 link pool2
```

### Related Documentation
- Configuring a Named Address Range for Dynamic Address Assignment on page 451

## Configuring DHCP Client-Specific Attributes

### Supported Platforms
SRX Series

You use the address-assignment pool feature to include application-specific attributes when clients obtain an address. A client application, such as DHCPv6, uses the attributes to determine how addresses are assigned and to provide optional application-specific characteristics to the client. For example, the DHCPv6 application might specify that a client that matches certain prerequisite information is dynamically assigned an address from a particular named range. Based on which named range is used, DHCPv6 specifies additional DHCPv6 attributes such as the DNS server or the maximum lease time for clients.

**NOTE:** For SRX1500, SRX5400, SRX5600, and SRX5800 devices only.

You use the `dhcp-attributes` statement to configure DHCPv6 client-specific attributes for address-assignment pools at the `[edit access address-assignment pool pool-name family inet6]` hierarchy.

Table 14 on page 490 describes the DHCPv6 client attributes for configuring IPv6 address-assignment pools.

### Table 14: DHCPv6 Attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
<th>DHCPv6 Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>dns-server</td>
<td>IPv6 address of DNS server to which clients can send DNS queries</td>
<td>23</td>
</tr>
<tr>
<td>grace-period</td>
<td>Grace period offered with the lease</td>
<td>–</td>
</tr>
<tr>
<td>maximum-lease-time</td>
<td>Maximum lease time allowed by the DHCPv6 server</td>
<td>–</td>
</tr>
<tr>
<td>option</td>
<td>User-defined options</td>
<td>–</td>
</tr>
<tr>
<td>sip-server-address</td>
<td>IPv6 address of SIP outbound proxy server</td>
<td>22</td>
</tr>
</tbody>
</table>
Table 14: DHCPv6 Attributes (continued)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>sip-server-domain-name</td>
<td>Domain name of the SIP outbound proxy server</td>
<td>21</td>
</tr>
</tbody>
</table>

Related Documentation

- Configuring a Named Address Range for Dynamic Address Assignment on page 488

Configuring an Address-Assignment Pool for Router Advertisement

Supported Platforms

SRX Series

For SRX1500, SRX5400, SRX5600, and SRX5800 devices, you can create an address-assignment pool that is explicitly used for router advertisement address assignment. You populate the address-assignment pool using the standard procedure, but you additionally specify that the pool is used for router advertisement.

To configure an address-assignment pool that is used for router advertisement:

1. Create the IPv6 address-assignment pool.

2. Specify that the address-assignment pool is used for router advertisement.

   ```
   [edit access address-assignment]
   user@host# set neighbor-discovery-router-advertisement router1
   ```

3. If you are done configuring the device, enter `commit` from configuration mode.

Related Documentation

- Configuring a Named Address Range for Dynamic Address Assignment on page 488

Understanding DHCPv6 Client and Server Identification

Supported Platforms

SRX Series

Each DHCPv6 client and server is identified by a DHCP unique identifier (DUID). The DUID is unique across all DHCPv6 clients and servers, and it is stable for any specific client or server. DHCPv6 clients use DUIDs to identify a server in messages where a server needs to be identified. DHCPv6 servers use DUIDs to determine the configuration parameters to be used for clients and in the association of addresses with clients.

NOTE: This feature is supported on SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.

The DUID is a 2-octet type code represented in network byte order, followed by a variable number of octets that make up the actual identifier; for example,
00:02:00:01:02:03:04:05:07:a0. A DUID can be up to 128 octets in length (excluding the type code). The following types are currently defined for the DUID parameter:

- Type 1—Link Layer address plus time (duid-llt)
- Type 2—Vendor-assigned unique ID based on enterprise number (vendor)
- Type 3—Link Layer address (duid-l)

The duid-llt DUID consists of a 2-octet type field that contains the value 1, a 2-octet hardware type code, 4 octets that signify a time value, followed by the Link Layer address of any one network interface that is connected to the DHCP device at the time that the DUID is generated.

The vendor DUID is assigned by the vendor to the device and contains the vendor’s registered private enterprise number as maintained by the identity association for nontemporary addresses (IA_NA) assignment, followed by a unique identifier assigned by the vendor.

The duid-l DUID contains a 2-octet type field that stores the value 3, and a 2-octet network hardware type code, followed by the Link Layer address of any one network interface that is permanently connected to the client or server device.

Related Documentation
- DHCPv6 Client Overview on page 493
CHAPTER 16

Configuring a DHCPv6 Client

- DHCPv6 Client Overview on page 493
- Minimum DHCPv6 Client Configuration on page 494
- Configuring Optional DHCPv6 Client Attributes on page 496
- Configuring Non-temporary Address Assignment on page 497
- Configuring Identity Associations for Non-temporary Addresses and Prefix Delegation on page 498
- Configuring Auto-Prefix Delegation on page 498
- Configuring the DHCPv6 Client Rapid Commit Option on page 499
- Configuring a DHCPv6 Client in Autoconfig Mode on page 500
- Configuring TCP/IP Propagation on a DHCPv6 Client on page 501

DHCPv6 Client Overview

Supported Platforms  SRX Series
A Juniper Networks device can act as a Dynamic Host Configuration Protocol version 6 (DHCPv6) client, receiving its TCP/IP settings and the IPv6 address for any physical interface in any security zone from an external DHCPv6 server. When the device operates as a DHCPv6 client and a DHCPv6 server simultaneously, it can transfer the TCP/IP settings learned through its DHCPv6 client module to its default DHCPv6 server module. For the device to operate as a DHCPv6 client, you configure a logical interface on the device to obtain an IPv6 address from the DHCPv6 server in the network.

DHCPv6 client support for Juniper Networks devices includes the following features:

- Identity association for nontemporary addresses (IA_NA)
- Identity association for prefix delegation (IA_PD)
- Rapid commit
- TCP/IP propagation
- Auto-prefix delegation
- Autoconfig mode (stateful and stateless)

To configure the DHCPv6 client on the device, include the dhcpv6-client statement at the [edit interfaces] hierarchy level.

NOTE: To configure a DHCPv6 client in a routing instance, add the interface in a routing instance using the [edit routing-instances] hierarchy.

NOTE: On all SRX Series devices, DHCPv6 client authentication is not supported.

NOTE: On SRX300, SRX320, SRX340, SRX345, and SRX550M devices, DHCPv6 client does not support:

- Temporary addresses
- Reconfigure messages
- Multiple identity association for nontemporary addresses (IA_NA)
- Multiple prefixes in a single identity association for prefix delegation (IA_PD)
- Multiple prefixes in a single router advertisement

Related Documentation
- Minimum DHCPv6 Client Configuration on page 494

Minimum DHCPv6 Client Configuration

Supported Platforms  SRX Series
This topic describes the minimum configuration you must use to configure an SRX300, SRX320, SRX340, SRX345, SRX550M, or SRX1500 device as a DHCPv6 client.

To configure the device as a DHCPv6 client:

1. Specify the DHCPv6 client interface.

   [edit]
   user@host# set interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client

2. Configure the DHCPv6 client type. The client type can be autoconfig or statefull.

   • To enable DHCPv6 auto configuration mode, configure the client type as autoconfig.
     [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
     user@host# set client-type autoconfig

   • For stateful address assignment, configure the client type as statefull.
     [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
     user@host# set client-type statefull

3. Specify the identity association type.

   • To configure identity association for nontemporary address (IA_NA) assignment, specify the client-ia-type as ia-na.
     [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
     user@host# set client-ia-type ia-na

   • To configure identity association for prefix delegation (IA_PD), specify the client-ia-type as ia-pd.
     [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
     user@host# set client-ia-type ia-pd

4. Configure the DHCPv6 client identifier by specifying the DHCP unique identifier (DUID) type. The following DUID types are supported:

   • Link Layer address (duid-ll)
   • Link Layer address plus time (duid-llt)
   • Vendor-assigned unique ID based on enterprise number (vendor)

   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set client-identifier duid-type duid-ll

---

**NOTE:** To configure a DHCPv6 client in a routing instance, add the interface to a routing instance using the [edit routing-instances] hierarchy.

---

**Related Documentation**

- DHCPv6 Client Overview on page 493
Configuring Optional DHCPv6 Client Attributes

Supported Platforms  SRX Series

To enable a device to operate as a DHCPv6 client, you configure a logical interface on the device to obtain an IPv6 address from the DHCPv6 local server in the network. You can then specify the retransmission attempts, client requested configuration options, interface used to delegate prefixes, rapid commit, and update server options.

To configure optional DHCPv6 client attributes:

1. Specify one of the following DHCPv6 client requested configuration options:
   - dns-server
   - domain
   - ntp-server
   - sip-domain
   - sip-server

   For example, to specify the DHCPv6 client requested option as dns-server:
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set req-option dns-server
   ```

2. Set the number of attempts allowed to retransmit a DHCPv6 client protocol packet.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set retransmission-attempt 6
   ```

3. Configure the update-server option on the DHCPv6 client.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set update-server
   ```

4. Specify the interface used to delegate prefixes.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set update-router-advertisement interface ge-0/0/0
   ```

5. Configure the two-message (rapid commit) exchange option for address assignment.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set rapid-commit
   ```

**NOTE:** To configure a DHCPv6 client in a routing instance, add the interface to a routing instance using the [edit routing-instances] hierarchy.
NOTE: On all SRX Series devices, DHCPv6 client authentication is not supported.

NOTE: On SRX300, SRX320, SRX340, and SRX345, and SRX550M devices, DHCPv6 client does not support:

- Temporary addresses
- Reconfigure messages
- Multiple identity association for nontemporary addresses (IA_NA)
- Multiple prefixes in a single identity association for prefix delegation (IA_PD)
- Multiple prefixes in a single router advertisement

Related Documentation
- Minimum DHCPv6 Client Configuration on page 494

Configuring Nontemporary Address Assignment

Supported Platforms
SRX Series

Nontemporary address assignment is also known as stateful address assignment. In the stateful address assignment mode, the DHCPv6 client requests global addresses from the DHCPv6 server. Based on the DHCPv6 server’s response, the DHCPv6 client assigns the global addresses to interfaces and sets a lease time for all valid responses. When the lease time expires, the DHCPv6 client renews the lease from the DHCPv6 server.

NOTE: This feature is supported on SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.

To configure nontemporary (stateful) address assignment:

1. Specify the DHCPv6 client interface.

   ```
   [edit]
   user@host# set interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client
   ```

2. Configure the client type as statefull.

   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set client-type statefull
   ```

3. Specify the IA_NA assignment.

   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set client-ia-type ia-na
   ```
Configuring Identity Associations for Nontemporary Addresses and Prefix Delegation

Supported Platforms  SRX Series

The DHCPv6 client requests IPv6 addresses and prefixes from the DHCPv6 server. Based on the DHCPv6 server’s response, the DHCPv6 client assigns the IPv6 addresses to interfaces and sets a lease time for all valid responses. When the lease time expires, the DHCPv6 client renews the lease from the DHCPv6 server.

To configure identity association for nontemporary addresses (IA_NA) and identity association for prefix delegation (IA_PD) on SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices:

1. Specify the DHCPv6 client interface.
   ```
   [edit]
   user@host# set interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client
   ```

2. Configure the client type as `statefull`.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set client-type statefull
   ```

3. Specify the IA_NA.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set client-ia-type ia-na
   ```

4. Specify the IA_PD.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set client-ia-type ia-pd
   ```

Configuring Auto-Prefix Delegation

Supported Platforms  SRX Series

Related Documentation  • Minimum DHCPv6 Client Configuration on page 494
You can use DHCPv6 client prefix delegation to automate the delegation of IPv6 prefixes to the customer premises equipment (CPE). With prefix delegation, a delegating router delegates IPv6 prefixes to a requesting router. The requesting router then uses the prefixes to assign global IPv6 addresses to the devices on the subscriber LAN. The requesting router can also assign subnet addresses to subnets on the LAN.

To configure auto-prefix delegation for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices:

1. Configure the DHCPv6 client type as **statefull**.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set client-type statefull
   ```

2. Specify the identity association type as **ia-na** for nontemporary addresses.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set client-ia-type ia-na
   ```

3. Specify the identity association type as **ia-pd** for prefix delegation.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set client-ia-type ia-pd
   ```

4. Configure the DHCPv6 client identifier by specifying the DUID type.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set client-identifier duid-type duid-ll
   ```

5. Specify the interface used to delegate prefixes.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set update-router-advertisement interface ge-0/0/0
   ```

**Related Documentation**
- Minimum DHCPv6 Client Configuration on page 494
- Configuring Optional DHCPv6 Client Attributes on page 496

**Configuring the DHCPv6 Client Rapid Commit Option**

**Supported Platforms** SRX Series
The DHCPv6 client can obtain configuration parameters from a DHCPv6 server through a rapid two-message exchange (solicit and reply). When the rapid commit option is enabled by both the DHCPv6 client and the DHCPv6 server, the two-message exchange is used, rather than the default four-method exchange (solicit, advertise, request, and reply). The two-message exchange provides faster client configuration and is beneficial in environments in which networks are under a heavy load.

To configure the DHCPv6 client to support the DHCPv6 rapid commit option on SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices:

1. Specify the DHCPv6 client interface.
   ```
   [edit]
   user@host# set interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client
   ```

2. Configure the two-message exchange option for address assignment.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set rapid-commit
   ```

---

**Related Documentation**

- [DHCPv6 Client Overview](#)

---

**Configuring a DHCPv6 Client in Autoconfig Mode**

### Supported Platforms

**SRX Series**

A DHCPv6 client configured in autoconfig mode acts as a stateful client, a stateless client (DHCPv6 server is required for TCP/IP configuration), and stateless—no DHCP client, based on the managed (M) and other configuration (O) bits in the received router advertisement messages.

If the managed bit is 1 and the other configuration bit is 0, the DHCPv6 client acts as a stateful client. In stateful mode, the client receives IPv6 addresses from the DHCPv6 server, based on the identity association for nontemporary addresses (IA_NA) assignment.

If the managed bit is 0 and the other configuration bit is 1, the DHCPv6 client acts as a stateless client. In stateless mode, the addresses are automatically configured, based on the prefixes in the router advertisement messages received from the router. The stateless client receives configuration parameters from the DHCPv6 server.

If the managed bit is 0 and the other configuration bit is also 0, the DHCPv6 client acts as a stateless—no DHCP client. In the stateless—no DHCP mode, the client receives IPv6 addresses from the router advertisement messages.

To configure DHCPv6 client in autoconfig mode on SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices:

1. Configure the DHCPv6 client type as autoconfig.
   ```
   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set client-type autoconfig
   ```
2. Specify the identity association type as ia-na for noncontemporary addresses.

   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set client-ia-type ia-na

3. Specify the interface on which to configure router advertisement.

   [edit protocols router-advertisement]
   user@host# set interface ge-0/0/0

---

**Configuring TCP/IP Propagation on a DHCPv6 Client**

**Supported Platforms**  
SRX Series

You can enable or disable the propagation of TCP/IP settings received on the device acting as a DHCPv6 client. The settings can be propagated to the server pool running on the device. This topic describes how to configure TCP/IP settings on a DHCPv6 client, where both the DHCPv6 client and DHCPv6 server are on the same device.

**NOTE:** This feature is supported on SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.

To configure TCP/IP setting propagation on a DHCPv6 client:

1. Configure the `update-server` option on the DHCPv6 client.

   [edit interfaces ge-0/0/0 unit 0 family inet6 dhcpv6-client]
   user@host# set update-server

2. Configure the address pool to specify the interface (where `update-server` is configured) from which TCP/IP settings can be propagated.

   [edit access]
   user@host# set address-assignment pool 2 family inet6 dhcp-attributes propagate-settings ge-0/0/0

---

**Related Documentation**

- Minimum DHCPv6 Client Configuration on page 494
- Configuring Optional DHCPv6 Client Attributes on page 496
- DHCPv6 Client Overview on page 493
- Minimum DHCPv6 Client Configuration on page 494
CHAPTER 17

Configuring DHCP in Cluster Mode

- Example: Configuring the Device as a DHCP Server in Chassis Cluster Mode on page 503
- Example: Configuring the Device as a DHCP Client in Chassis Cluster Mode on page 509

Example: Configuring the Device as a DHCP Server in Chassis Cluster Mode

**Supported Platforms**  
SRX Series, vSRX

This example shows how to configure a DHCP server in chassis cluster mode.

- Requirements on page 503
- Overview on page 503
- Configuration on page 504
- Verification on page 508

**Requirements**

This example uses the following hardware and software components:

- Two SRX Series devices as DHCP servers
- One SRX Series device as DHCP client
- Junos OS Release 12.1X47-D10 or later for SRX Series Services Gateways

Before you begin:

- Determine the IP address pools and the lease durations to use for each subnet.
- Obtain the MAC addresses of the clients that require permanent IP addresses. Determine the IP addresses to use for these clients.
- List the IP addresses that are available for the servers and devices on your network; for example, DNS, NetBIOS servers, boot servers, and gateway devices.
- Determine the DHCP options required by the subnets and clients in your network.

**Overview**

In this example, you configure two SRX Series devices as DHCP servers and a third SRX Series device as a DHCP client. Configure the two DHCP servers in chassis cluster mode.
For the DHCP server, configure the SRX Series device as a DHCP local server with minimum DHCP local server configurations. You specify the server group as g1 and enable the DHCP local server on interface reth1.

For the DHCP client, you specify the interface as ge-0/0/1, set the logical unit as 0, and create a DHCP inet family. You then specify the DHCP client identifier as 00:0a:12:00:12:12 in hexadecimal. You use hexadecimal if the client identifier is a MAC address. You set the DHCP lease time as 86,400 seconds. The range is from 60 through 2,147,483,647 seconds.

You set the number of retransmission attempts to 6. The range is from 0 through 6, and the default is 4. You set the retransmission interval to 5 seconds. The range is from 4 through 64, and the default is 4 seconds. Finally, you set the IPv4 address of the preferred DHCP server to 10.1.1.1 and the vendor class ID to ether.

WARNING: Starting with Junos OS Release 15.1X49-D60 and Junos OS Release 17.3R1, the legacy DHCPD (DHCP daemon) configuration on all SRX Series devices has been deprecated and only the new DHCP CLI is supported. When you upgrade to Junos OS Release 15.1X49-D60 and later releases on a device that already has the DHCPD configuration, the following warning messages are displayed:

WARNING: The DHCP configuration command used will be deprecated in future Junos releases.

WARNING: Please see documentation for updated commands.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter commit from configuration mode.

Configure DHCP Server 1 and Server 2:

```
set system services dhcp-local-server group g1 interface reth1
set access address-assignment pool p1 family inet network 203.0.113.1/10
set access address-assignment pool p1 family inet range r1 low 203.0.113.5
set access address-assignment pool p1 family inet range r1 high 203.0.113.20
```

Configure chassis cluster on DHCP Server 1 and DHCP Server 2:

```
set chassis cluster reth-count 4
set chassis cluster control-link-recovery
set chassis cluster heartbeat-interval 2000
set chassis cluster redundancy-group 0 node 0 priority 200
set chassis cluster redundancy-group 0 node 1 priority 1
set interfaces ge-0/0/1 gigether-options redundant-parent reth1
set interfaces ge-6/0/1 gigether-options redundant-parent reth1
set interfaces reth1 redundant-ether-options redundancy-group 1
```
Configure the DHCP client:

```
set interfaces reth1 unit 0 family inet address 10.1.1.1/24
```

```
set interfaces ge-0/0/1 unit 0 family inet dhcp-client
set interfaces ge-0/0/1 unit 0 family inet dhcp-client client-identifier user-id ascii 00:0a:12:00:12:12
set interfaces ge-0/0/1 unit 0 family inet dhcp-client lease-time 86400
set interfaces ge-0/0/1 unit 0 family inet dhcp-client retransmission-attempt 6
set interfaces ge-0/0/1 unit 0 family inet dhcp-client retransmission-interval 5
set interfaces ge-0/0/1 unit 0 family inet dhcp-client server-address 10.1.1.1
set interfaces ge-0/0/1 unit 0 family inet dhcp-client vendor-id ether
```

**Step-by-Step Procedure**

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see Using the CLI Editor in Configuration Mode in the CLI User Guide.

To configure the devices as DHCP servers:

1. Configure the DHCP local server.
   
   `[edit system services]
   user@host# set dhcp-local-server group g1 interface reth1`

2. Configure an address pool.
   
   `[edit access]
   user@host# set address-assignment pool p1 family inet network 203.0.113.1/10
   user@host# set address-assignment pool p1 family inet range r1 low 203.0.113.5
   user@host# set address-assignment pool p1 family inet range r1 high 203.0.113.20`

**Step-by-Step Procedure**

To configure the DHCP servers in chassis cluster mode:

1. Specify the number of redundant Ethernet interfaces for the chassis cluster.
   
   `[primary:node0][edit]
   user@host# set chassis cluster reth-count 4`

2. Enable control link recovery.
   
   `[primary:node0][edit]
   user@host# set chassis cluster control-link-recovery`

3. Configure heartbeat settings.
   
   `[primary:node0][edit]
   user@host# set chassis cluster heartbeat-interval 2000`

4. Configure the redundancy groups.
   
   `[primary:node0][edit]
   user@host# set chassis cluster redundancy-group 0 node 0 priority 200
   user@host# set chassis cluster redundancy-group 0 node 1 priority 1`
5. Configure redundant Ethernet interfaces.

   [primary:node0][edit]
   user@host# set interfaces ge-0/0/1 gigether-options redundant-parent reth1
   user@host# set interfaces ge-6/0/1 gigether-options redundant-parent reth1
   user@host# set interfaces reth1 redundant-ether-options redundancy-group 1
   user@host# set interfaces reth1 unit 0 family inet address 10.1.1.1/24

Step-by-Step Procedure

To configure the device as DHCP client:

1. Specify the DHCP client interface.

   [edit]
   user@host# edit interfaces ge-0/0/1 unit 0 family inet dhcp-client

2. Configure the DHCP client identifier as a hexadecimal value.

   [edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
   user@host# set client-identifier user-id ascii 00:0a:12:00:12:12

3. Set the DHCP lease time.

   [edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
   user@host# set lease-time 86400

4. Set the number of attempts allowed to retransmit a DHCP packet.

   [edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
   user@host# set retransmission-attempt 6

5. Set the interval (in seconds) allowed between retransmission attempts. The range is 4 through 64. The default is 4 seconds.

   [edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
   user@host# set retransmission-interval 5

6. Set the IPv4 address of the preferred DHCP server.

   [edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
   user@host# set server-address 10.1.1.1

7. Set the vendor class ID for the DHCP client.

   [edit interfaces ge-0/0/1 unit 0 family inet dhcp-client]
   user@host# set vendor-id ether

Results

From configuration mode, confirm your configuration by entering the show commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

   [edit]
user@host# show system services
dhcp-local-server {
    group g1 {
        interface reth1.0;
    }
}
[edit]
user@host# show access address-assignment
pool p1 {
    family inet {
        network 203.0.113.1/10;
        range r1 {
            low 203.0.113.5;
            high 203.0.113.20;
        }
    }
}
[edit]
user@host# show chassis cluster
control-link-recovery;
reth-count 4;
heartbeat-interval 2000;
redundancy-group 0 {
    node 0 priority 200;
    node 1 priority 1;
}
[edit]
user@host# show interfaces reth1
redundant-ether-options {
    redundancy-ether-group 1;
}
unit 0 {
    family inet {
        address 10.1.1.24;
    }
}
[edit]
user@host# show interfaces ge-0/0/1 unit 0 family inet
dhcp-client {
    client-identifier user-id ascii 00:0a:12:00:12:12;
    lease-time 86400;
    retransmission-attempt 6;
    retransmission-interval 5;
    server-address 10.1.1.1;
    vendor-id ether;
}

If you are done configuring the device, enter commit from configuration mode.
Verification

Verifying the DHCP Server in Chassis Cluster Mode

Purpose
Verify that the DHCP server is working in chassis cluster mode.

Action
From operational mode, enter the `show dhcp server binding` and `show dhcp server statistics` commands.

```
user@host> show dhcp server binding
IP address     Session Id  Hardware address      Expires    State   Interface
10.1.1.1        1         64:87:88:79:a3:81     81855      BOUND    reth1

user@host> show dhcp server statistics
Packets dropped:
Total                       0
  dhcp-service total         0
Messages received:
  BOOTREQUEST                2
  DHCPDECLINE                0
  DHCPDISCOVER               1
  DHCPINFORM                 0
  DHCPRELEASE                0
  DHCPREQUEST                1
Messages sent:
  BOOTREPLY                  2
  DHCPOFFER                  1
  DHCPACK                    0
  DHCPNAK                    0
  DHCPFORCERENEW             0
```

Meaning
The sample output shows that DHCP servers configured in the example work in a chassis cluster.

Release History Table

<table>
<thead>
<tr>
<th>Release</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1X49-D60</td>
<td>Starting with Junos OS Release 15.1X49-D60 and Junos OS Release 17.3R1, the legacy DHCPD (DHCP daemon) configuration on all SRX Series devices has been deprecated and only the new DHCP CLI is supported.</td>
</tr>
</tbody>
</table>

Related Documentation
- Understanding DHCP Server Operation on page 447
Example: Configuring the Device as a DHCP Client in Chassis Cluster Mode

Supported Platforms

SRX Series, vSRX

This example shows how to configure the device as a DHCP client in chassis cluster mode.

- Requirements on page 509
- Overview on page 509
- Configuration on page 510
- Verification on page 513

Requirements

This example uses the following hardware and software components:

- Two SRX Series devices as DHCP client
- One SRX Series device as DHCP server
- Junos OS Release 12.1X47-D10 or later for SRX Series Services Gateways

Before you begin:

- Determine the IP address pools and the lease durations to use for each subnet.
- Obtain the MAC addresses of the clients that require permanent IP addresses. Determine the IP addresses to use for these clients.
- List the IP addresses that are available for the servers and devices on your network; for example, DNS, NetBIOS servers, boot servers, and gateway devices.
- Determine the DHCP options required by the subnets and clients in your network.

Overview

In this example, you configure two SRX Series devices as DHCP clients and a third SRX Series device as a DHCP server. Configure the two DHCP clients in chassis cluster mode.

For DHCP clients, you specify the interface as reth1, set the logical unit as 0, and create a DHCP inet family. You then specify the DHCP client identifier as 00:0a:12:00:12:12 in hexadecimal. You use hexadecimal if the client identifier is a MAC address. You set the options no-hostname if you do not want the DHCP client to send the hostname with the packets. You set the DHCP lease time as 86,400 seconds. The range is from 60 through 2,147,483,647 seconds. You set the number of retransmission attempts to 6. The range is from 0 through 6, and the default is 4. You set the retransmission interval to 5 seconds. The range is from 4 through 64, and the default is 4 seconds. Finally, you set the IPv4 address of the preferred DHCP server to 203.0.113.1 and the vendor class ID to ether.

For the DHCP server, configure the SRX Series device as a DHCP local server with minimum DHCP local server configurations. You specify the server group as g1 and enable the DHCP local server on interface ge-0/0/2.0.
Configuration

**CLI Quick Configuration**

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter `commit` from configuration mode.

Configure DHCP Client 1 and Client 2:

- set interfaces reth1 unit 0 family inet dhcp-client
- set interfaces reth1 unit 0 family inet dhcp-client client-identifier user-id ascii 00:0a:12:00:12:12
- set interfaces reth1 unit 0 family inet dhcp-client options no-hostname
- set interfaces reth1 unit 0 family inet dhcp-client lease-time 86400
- set interfaces reth1 unit 0 family inet dhcp-client retransmission-attempt 6
- set interfaces reth1 unit 0 family inet dhcp-client retransmission-interval 5
- set interfaces reth1 unit 0 family inet dhcp-client server-address 203.0.113.1
- set interfaces reth1 unit 0 family inet dhcp-client vendor-id ether

Configure chassis cluster on Client 1 and Client 2:

- set chassis cluster reth-count 2
- set chassis cluster control-link-recovery
- set chassis cluster heartbeat-interval 1000
- set chassis cluster redundancy-group 1 node 0 priority 100
- set chassis cluster redundancy-group 1 node 1 priority 1
- set chassis cluster redundancy-group 0 node 0 priority 100
- set chassis cluster redundancy-group 0 node 1 priority 1
- set interfaces ge-0/0/1 gigether-options redundant-parent reth1
- set interfaces ge-4/0/1 gigether-options redundant-parent reth1
- set interfaces reth1 redundant-ether-options redundancy-group 1

Configure the DHCP server:

- set system service dhcp-local-server group g1 interface ge-0/0/2.0
- set interfaces ge-0/0/2 unit 0 family inet address 203.0.113.1/24
- set access address-assignment pool p1 family inet network 203.0.113.0/24
- set access address-assignment pool p1 family inet range r1 low 203.0.113.5
- set access address-assignment pool p1 family inet range r1 high 203.0.113.20

**Step-by-Step Procedure**

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure the devices as DHCP clients:

1. Specify the DHCP client interface.
   ```
   [edit]
   user@host# edit interfaces reth1 unit 0 family inet dhcp-client
   ```

2. Configure the DHCP client identifier as a hexadecimal value.
   ```
   [edit interfaces reth1 unit 0 family inet dhcp-client]
   user@host# set client-identifier user-id ascii 00:0a:12:00:12:12
   ```
3. Set the hostname if you do not want the DHCP client to send hostname in the packets (RFC option code 12).
   
   ```
   [edit interfaces reth1 unit 0 family inet dhcp-client]
   user@host# set options no-hostname
   ```

4. Set the DHCP lease time.
   
   ```
   [edit interfaces reth1 unit 0 family inet dhcp-client]
   user@host# set lease-time 86400
   ```

5. Set the number of attempts allowed to retransmit a DHCP packet.
   
   ```
   [edit interfaces reth1 unit 0 family inet dhcp-client]
   user@host# set retransmission-attempt 6
   ```

6. Set the interval (in seconds) allowed between retransmission attempts. The range is 4 through 64. The default is 4 seconds.
   
   ```
   [edit interfaces reth1 unit 0 family inet dhcp-client]
   user@host# set retransmission-interval 5
   ```

7. Set the IPv4 address of the preferred DHCP server.
   
   ```
   [edit interfaces reth1 unit 0 family inet dhcp-client]
   user@host# set server-address 203.0.113.1
   ```

8. Set the vendor class ID for the DHCP client.
   
   ```
   [edit interfaces reth1 unit 0 family inet dhcp-client]
   user@host# set vendor-id ether
   ```

**Step-by-Step Procedure**

To configure the DHCP clients in chassis cluster mode:

1. Specify the number of redundant Ethernet interfaces for the chassis cluster.
   
   ```
   [primary:node0][edit]
   user@host# set chassis cluster reth-count 2
   ```

2. Enable control link recovery.
   
   ```
   [primary:node0][edit]
   user@host# set chassis cluster control-link-recovery
   ```

3. Configure heartbeat settings.
   
   ```
   [primary:node0][edit]
   user@host# set chassis cluster heartbeat-interval 1000
   ```

4. Configure the redundancy groups.
   
   ```
   [primary:node0][edit]
   user@host# set chassis cluster redundancy-group 1 node 0 priority 100
   ```
user@host# set chassis cluster redundancy-group 1 node 1 priority 1
user@host# set chassis cluster redundancy-group 0 node 0 priority 100
user@host# set chassis cluster redundancy-group 0 node 1 priority 1

5. Configure redundant Ethernet interfaces.
   {primary:node0}[edit]
   user@host# set interfaces ge-0/0/1 gigether-options redundant-parent reth1
   user@host# set interfaces reth1 redundant-ether-options redundancy-group 1

Step-by-Step Procedure

To configure the device as DHCP server:

1. Configure the DHCP local server.
   [edit system services]
   user@host# set dhcp-local-server group g1 interface ge-0/0/2.0

2. Configure IP address of the server.
   [edit interfaces]
   user@host# set interfaces ge-0/0/2 unit 0 family inet address 203.0.113.1/24

3. Configure an address pool.
   [edit access]
   user@host# set address-assignment pool p1 family inet network 203.0.113.0/24
   user@host# set address-assignment pool p1 family inet range r1 low 203.0.113.5
   user@host# set address-assignment pool p1 family inet range r1 high 203.0.113.20

Results

From configuration mode, confirm your configuration by entering the `show` commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

[edit]
user@host# show interfaces reth1 unit 0 family inet
dhcp-client {
  client-identifier user-id ascii 00:0a:12:00:12:12;
  options no-hostname;
  lease-time 86400;
  retransmission-attempt 6;
  retransmission-interval 5;
  server-address 203.0.113.1;
  vendor-id ether;
}
[edit]
user@host# show chassis cluster
control-link-recovery;
reth-count 2;
heartbeat-interval 1000;
redundancy-group 0 {
  node 0 priority 100;

node1 priority 1;
}
redundancy-group 1{
    node0 priority 100;
    node1 priority 1;
}

[edit]
user@host# show interfaces reth1
redundant-ether-options {
    redundancy-group 1;
}

[edit]
user@host# show access address-assignment
pool p1 {
    family inet {
        network 203.0.113.0/24;
        range r1 {
            low 203.0.113.5;
            high 203.0.113.20;
        }
    }
}

If you are done configuring the device, enter commit from configuration mode.

Verification

Confirm that the configuration is working properly.

Verifying the DHCP Client in Chassis Cluster Mode

Purpose  Verify that the DHCP client is working in chassis cluster mode.

Action  From operational mode, enter the show dhcp client binding, show dhcp client statistics
        and show dhcp client binding interface reth1 detail commands.

        user@host> show dhcp client binding

        IP address     Hardware address   Expires     State      Interface
        203.0.113.14    00:1f:12:e3:34:01  84587       BOUND      reth1.0

        user@host> show dhcp client statistics

        Packets dropped:
        Total                           4
        Send error                      4

        Messages received:
        BOOTREPLY                       3
        DHCP OFFER                      1
        DHCP ACK                        2
        DHCP NAK                        0
        DHCP FORCERENEW                 0
user@host> show dhcp client binding interface reth1 detail

Client Interface: reth1.0
Hardware Address: 00:10:db:ff:10:01
State: BOUND(LOCAL_CLIENT_STATE_BOUND)
Lease Expires: 2013-12-18 10:15:36 CST
Lease Expires in: 30 seconds
Lease Start: 2013-12-17 10:15:36 CST
Server Identifier: 203.0.113.1
Client IP Address: 10.1.1.14
Update Server No

DHCP options:
Name: dhcp-lease-time, Value: 1 day
Name: server-identifier, Value: 10.1.1.1
Name: subnet-mask, Value: 255.255.255.0

Meaning  The sample output shows that DHCP clients configured in the example work in a chassis cluster.

Related Documentation  Understanding DHCP Client Operation on page 461
PART 5

Managing System Files

• Performing File Management Tasks on page 517
Performing File Management Tasks

- File Management Overview on page 517
- Decrypting Configuration Files on page 518
- Encrypting Configuration Files on page 518
- Modifying the Encryption Key on page 520
- Cleaning Up Files in J-Web on page 520
- Cleaning Up Files with the CLI on page 521
- Deleting Files on page 522
- Deleting the Backup Software Image on page 523
- Downloading Files on page 524
- Configuring RADIUS System Accounting on page 525
- Managing Accounting Files on page 528

File Management Overview

Supported Platforms
SRX Series, vSRX

You can use the J-Web user interface and the CLI to perform routine file management operations such as archiving log files and deleting unused log files, cleaning up temporary files and crash files, and downloading log files from the routing platform to your computer. You can also encrypt the configuration files with the CLI to prevent unauthorized users from viewing sensitive configuration information.

Before you perform any file management tasks, you must perform the initial device configuration described in the Getting Started Guide for your device.

Related Documentation
- Cleaning Up Files in J-Web on page 520
- Cleaning Up Files with the CLI on page 521
- Managing Accounting Files on page 528
- Encrypting Configuration Files on page 518
- Decrypting Configuration Files on page 518
Decrypting Configuration Files

Supported Platforms: SRX Series, vSRX

To disable the encryption of configuration files on a device and make them readable to all:

1. Enter operational mode in the CLI.

2. Verify your permission to decrypt configuration files on this device by entering the encryption key for the device.
   
   ```
   user@host > request system set-encryption-key
   Enter EEPROM stored encryption key:
   Verifying EEPROM stored encryption key:
   ```

3. At the second prompt, reenter the encryption key.

4. Enter configuration mode in the CLI.

5. Enable configuration file decryption.
   
   ```
   [edit]
   user@host# edit system
   user@host# set no-encrypt-configuration-files
   ```

6. Begin the decryption process by committing the configuration.
   
   ```
   [edit]
   user@host# commit
   commit complete
   ```

Related Documentation

- Encrypting Configuration Files on page 518

Encrypting Configuration Files

Supported Platforms: SRX Series, vSRX

To configure an encryption key in EEPROM and determine the encryption process, enter one of the `request system set-encryption-key` commands in operational mode described in Table 15 on page 519.

**NOTE:** The `request system set-encryption-key` command is not supported on SRX5400, SRX5600, and SRX5800 devices; therefore, this task does not apply to such devices.
Table 15: request system set-encryption-key Commands

<table>
<thead>
<tr>
<th>CLI Command</th>
<th>Description</th>
</tr>
</thead>
</table>
| request system set-encryption-key | Sets the encryption key and enables default configuration file encryption:  
- AES encryption for the Canada and U.S. version of Junos OS  
- DES encryption for the international version of Junos OS |
| request system set-encryption-key algorithm des | Sets the encryption key and specifies configuration file encryption by DES. |
| request system set-encryption-key unique | Sets the encryption key and enables default configuration file encryption with a unique encryption key that includes the chassis serial number of the device.  
Configuration files encrypted with the unique key can be decrypted only on the current device. You cannot copy such configuration files to another device and decrypt them. |
| request system set-encryption-key des unique | Sets the encryption key and specifies configuration file encryption by DES with a unique encryption key. |

To encrypt configuration files on a device:

1. Enter operational mode in the CLI.

2. Configure an encryption key in EEPROM and determine the encryption process; for example, enter the request system set-encryption-key command.

   ```
   user@host> request system set-encryption-key
   Enter EEPROM stored encryption key: 
   ```

3. At the prompt, enter the encryption key. The encryption key must have at least six characters.

   ```
   Enter EEPROM stored encryption key:juniper1
   Verifying EEPROM stored encryption key: 
   ```

4. At the second prompt, reenter the encryption key.

5. Enter configuration mode in the CLI.

6. Enable configuration file encryption to take place.

   ```
   [edit]
   user@host# edit system
   user@host# set encrypt-configuration-files
   ```

7. Begin the encryption process by committing the configuration.

   ```
   [edit]
   ```
Related Documentation

- Managing Accounting Files on page 528
- Decrypting Configuration Files on page 518

Modifying the Encryption Key

Supported Platforms  
SRX Series, vSRX

When you modify the encryption key, the configuration files are decrypted and then reencrypted with the new encryption key.

To modify the encryption key:

1. Enter operational mode in the CLI.

2. Configure a new encryption key in EEPROM and determine the encryption process; for example, enter the `request system set-encryption-key` command.

   ```
   user@host# request system set-encryption-key
   Enter EEPROM stored encryption key:
   ```

3. At the prompt, enter the new encryption key. The encryption key must have at least six characters.

   ```
   Enter EEPROM stored encryption key:juniperone
   Verifying EEPROM stored encryption key:
   ```

4. At the second prompt, reenter the new encryption key.

Related Documentation

- Managing Accounting Files on page 528
- Encrypting Configuration Files on page 518
- Decrypting Configuration Files on page 518

Cleaning Up Files in J-Web

Supported Platforms  
SRX Series, vSRX

You can use the J-Web user interface to rotate log files and delete unnecessary files on the device. If you are running low on storage space, the file cleanup procedure quickly identifies files that can be deleted.

The file cleanup procedure performs the following tasks:
• Rotates log files—Archives all information in the current log files and creates fresh log files.
• Deletes log files in `/var/log`—Deletes any files that are not currently being written to.
• Deletes temporary files in `/var/tmp`—Deletes any files that have not been accessed within two days.
• Deletes all crash files in `/var/crash`—Deletes any core files that the device has written during an error.
• Deletes all software images (`*.tgz` files) in `/var/sw/pkg`—Deletes any software images copied to this directory during software upgrades.

To rotate log files and delete unnecessary files with the J-Web user interface:

1. In the J-Web user interface, select `Maintain > Files`.

2. In the Clean Up Files section, click `Clean Up Files`. The device rotates log files and identifies the files that can be safely deleted.
   
   The J-Web user interface displays the files that you can delete and the amount of space that will be freed on the file system.

3. Click one of the following buttons on the confirmation page:

   • To delete the files and return to the Files page, click `OK`.
   • To cancel your entries and return to the list of files in the directory, click `Cancel`.

Related Documentation

• Managing Accounting Files on page 528
• Encrypting Configuration Files on page 518
• Decrypting Configuration Files on page 518
• Cleaning Up Files with the CLI on page 521

Cleaning Up Files with the CLI

Supported Platforms **SRX Series, vSRX**

You can use the CLI `request system storage cleanup` command to rotate log files and delete unnecessary files on the device. If you are running low on storage space, the file cleanup procedure quickly identifies files that can be deleted.

The file cleanup procedure performs the following tasks:

• Rotates log files—Archives all information in the current log files, deletes old archives, and creates fresh log files.
• Deletes log files in `/var/log`—Deletes any files that are not currently being written to.
Deletes temporary files in /var/tmp—Deletes any files that have not been accessed within two days.

Deletes all crash files in /var/crash—Deletes any core files that the device has written during an error.

Deletes all software images (*.tgz files) in /var/sw/pkg—Deletes any software images copied to this directory during software upgrades.

To rotate log files and delete unnecessary files with the CLI:

1. Enter operational mode in the CLI.
2. Rotate log files and identify the files that can be safely deleted.
   
   ```bash
   user@host> request system storage cleanup
   ```
   
   The device rotates log files and displays the files that you can delete.

3. Enter yes at the prompt to delete the files.

**NOTE:** You can issue the `request system storage cleanup dry-run` command to review the list of files that can be deleted with the `request system storage cleanup` command, without actually deleting the files.

**NOTE:**
On SRX Series devices, the /var hierarchy is hosted in a separate partition (instead of the root partition). If Junos OS installation fails as a result of insufficient space:

- Use the `request system storage cleanup` command to delete temporary files.
- Delete any user-created files in both the root partition and under the /var hierarchy.

---

**Related Documentation**
- Cleaning Up Files in J-Web on page 520
- Managing Accounting Files on page 528
- Encrypting Configuration Files on page 518
- Decrypting Configuration Files on page 518

**Deleting Files**

**Supported Platforms**

SRX Series, vSRX
You can use the J-Web user interface to delete an individual file from the device. When you delete the file, it is permanently removed from the file system.

**CAUTION:** If you are unsure whether to delete a file from the device, we recommend using the Cleanup Files tool. This tool determines which files can be safely deleted from the file system.

To delete files with the J-Web user interface:

1. In the J-Web user interface, select **Maintain>Files**.

2. In the Download and Delete Files section, click one of the following file types:
   - **Log Files**—Lists the log files located in the `/var/log` directory on the device.
   - **Temporary Files**—Lists the temporary files located in the `/var/tmp` directory on the device.
   - **Old Junos OS**—Lists the software images in the `(*tgz)` files in the `/var/sw/pkg` directory on the device.
   - **Crash (Core) Files**—Lists the core files located in the `/var/crash` directory on the device.

   The J-Web user interface displays the files located in the directory.

3. Check the box next to each file you plan to delete.

4. Click **Delete**.

   The J-Web user interface displays the files you can delete and the amount of space that will be freed on the file system.

5. Click one of the following buttons on the confirmation page:
   - To delete the files and return to the Files page, click **OK**.
   - To cancel your entries and return to the list of files in the directory, click **Cancel**.

**Deleting the Backup Software Image**

**Supported Platforms**

| SRX Series, vSRX |

Junos OS keeps a backup image of the software that was previously installed so that you can downgrade to that version of the software if necessary. You can use the J-Web user interface to delete this backup image. If you delete this image, you cannot downgrade to this particular version of the software.
To delete the backup software image:

1. In the J-Web user interface, select **Maintain > Files**.

2. Review the backup image information listed in the Delete Backup Junos Package section.

3. Click the **Delete backup Junos package** link to delete the backup image.

4. Click one of the following buttons on the confirmation page:
   - To delete the backup image and return to the Files page, click **OK**.
   - To cancel the deletion of the backup image and return to the Files page, click **Cancel**.

**Related Documentation**

- Deleting Files on page 522

---

**Downloading Files**

**Supported Platforms**

SRX Series, vSRX

You can use the J-Web user interface to download a copy of an individual file from the device. When you download a file, it is not deleted from the file system.

To download files with the J-Web user interface:

1. In the J-Web user interface, select **Maintain > Files**.

2. In the Download and Delete Files section, click one of the following file types:
   - **Log Files**—Lists the log files located in the `/var/log` directory on the device.
   - **Temporary Files**—Lists the temporary files located in the `/var/tmp` directory on the device.
   - **Old Junos OS**—Lists the software images located in the (*.tgz files) in the `/var/sw/pkg` directory on the device.
   - **Crash (Core) Files**—Lists the core files located in the `/var/crash` directory on the device.

   The J-Web user interface displays the files located in the directory.

3. Click **Download** to download an individual file.

4. Choose a location for the browser to save the file.

   The file is downloaded.

**Related Documentation**

- Managing Accounting Files on page 528
Configuring RADIUS System Accounting

Supported Platforms

EX Series, M Series, MX Series, OCX1100, PTX Series, QFX Series, SRX Series, T Series

With RADIUS accounting enabled, Juniper Networks routers or switches, acting as RADIUS clients, can notify the RADIUS server about user activities such as software logins, configuration changes, and interactive commands. The framework for RADIUS accounting is described in RFC 2866.

NOTE: Supported on SRX1500, SRX5400, SRX5600, and SRX5800 devices only.

Tasks for configuring RADIUS system accounting are:

1. Configuring Auditing of User Events on a RADIUS Server on page 525
2. Specifying RADIUS Server Accounting and Auditing Events on page 525
3. Configuring RADIUS Server Accounting on page 526

Configuring Auditing of User Events on a RADIUS Server

To audit user events, include the following statements at the [edit system accounting] hierarchy level:

```
[edit system accounting]
  events [ events ];
  destination {
    radius {
      server {
        server-address {
          accounting-port port-number;
          secret password;
          source-address address;
          retry number;
          timeout seconds;
        }
      }
    }
  }
```

Specifying RADIUS Server Accounting and Auditing Events

To specify the events you want to audit when using a RADIUS server for authentication, include the events statement at the [edit system accounting] hierarchy level:

```
[edit system accounting]
  events [ events ];
  events is one or more of the following:
  • login—Audit logins
  • change-log—Audit configuration changes
```
Configuring RADIUS Server Accounting

To configure RADIUS server accounting, include the `server` statement at the `[edit system accounting destination radius]` hierarchy level:

```junos
server {
    server-address [ accounting-port port-number; secret password; source-address address; retry number; timeout seconds; ]
}
```

- `server-address` specifies the address of the RADIUS server. To configure multiple RADIUS servers, include multiple `server` statements.

- **NOTE:** If no RADIUS servers are configured at the `[edit system accounting destination radius]` statement hierarchy level, the Junos OS uses the RADIUS servers configured at the `[edit system radius-server]` hierarchy level.

- `accounting-port port-number` specifies the RADIUS server accounting port number.

  The default port number is 1813.

- **NOTE:** If you enable RADIUS accounting at the `[edit access profile profile-name accounting-order]` hierarchy level, accounting is triggered on the default port of 1813 even if you do not specify a value for the `accounting-port` statement.

You must specify a secret (password) that the local router or switch passes to the RADIUS client by including the `secret` statement. If the password contains spaces, enclose the entire password in quotation marks (" ").

In the `source-address` statement, specify a source address for the RADIUS server. Each RADIUS request sent to a RADIUS server uses the specified source address. The source address is a valid IPv4 address (in case if radius-server address is IPv4) or IPv6 address (in case if radius-server address is IPv6) configured on one of the router or switch interfaces.

Optionally, you can specify the number of times that the router or switch attempts to contact a RADIUS authentication server by including the `retry` statement. By default, the router or switch retries three times. You can configure the router or switch to retry from 1 through 10 times.

Optionally, you can specify the length of time that the local router or switch waits to receive a response from a RADIUS server by including the `timeout` statement. By default,
the router or switch waits 3 seconds. You can configure the timeout to be from 1 through 90 seconds.

Starting with Junos OS Release 14.1 and Junos OS Release 17.3R1, you can configure the `enhanced-accounting` statement to view the attribute values of a logged in user. If you use the `enhanced-accounting` statement at the `[edit system radius-options]` hierarchy level, the RADIUS attributes such as access method, remote port, and access privileges can be audited. You can limit the number of attribute values to be displayed for auditing by using the `enhanced-avs-max <number>` statement at the `[edit system accounting]` hierarchy level.

```plaintext
[edit system radius-options]
enhanced-accounting;

[edit system accounting]
enhanced-avs-max <number>;
```

When a Juniper Networks router or switch is configured with RADIUS accounting, it sends `Accounting-Start` and `Accounting-Stop` messages to the RADIUS server. These messages contain information about user activities such as software logins, configuration changes, and interactive commands. This information is typically used for monitoring a network, collecting usage statistics, and ensuring that users are billed properly.

The following example shows three servers (10.5.5.5, 10.6.6.6, and 10.7.7.7) configured for RADIUS accounting:

```plaintext
system {
  accounting {
    events [ login change-log interactive-commands ];
    destination {
      radius {
        server {
          10.5.5.5 {
            accounting-port 3333;
            secret $ABC123;
            source-address 10.1.1.1;
            retry 3;
            timeout 3;
          }
          10.6.6.6 secret $ABC123;
          10.7.7.7 secret $ABC123;
        }
      }
    }
  }
}
```
Starting with Junos OS Release 14.1 and Junos OS Release 17.3R1, you can configure the `enhanced-accounting` statement to view the attribute values of a logged in user.

### Managing Accounting Files

**Supported Platforms**  
SRX Series, vSRX

If you configure your SRX300, SRX320, SRX340, SRX345, SRX550M, or SRX1500 devices to capture accounting data in log files, set the location for your accounting files to the DRAM.

The default location for accounting files is the `cfs/var/log` directory on the CompactFlash (CF) card. The `nonpersistent` option minimizes the read/write traffic to your CF card. We recommend that you use the `nonpersistent` option for all accounting files configured on your system.

To store accounting log files in DRAM instead of the CF card:

1. Enter configuration mode in the CLI.

2. Create an accounting data log file in DRAM and replace `filename` with the name of the file.

   ```
   [edit]
   user@host# edit accounting-options file filename
   ```


   ```
   [edit]
   user@host# set file filename nonpersistent
   ```

---

**CAUTION:** If log files for accounting data are stored on DRAM, these files are lost when the device reboots. Therefore, we recommend that you back up these files periodically.

---

**Related Documentation**  
- *Accounting Options Overview*
PART 6

Working with Junos OS Licenses

- Managing Junos OS Licenses on page 531
Managing Junos OS Licenses

- Junos OS Feature License Keys on page 531
- Software Feature Licenses for SRX Series Devices on page 533
- Displaying License Keys in J-Web on page 533
- Downloading License Keys on page 534
- Generating a License Key on page 534
- Saving License Keys on page 535
- Updating License Keys (CLI) on page 535
- Example: Adding a New License Key on page 536
- Example: Deleting a License Key on page 540

Junos OS Feature License Keys

**Supported Platforms**  SRX Series, vSRX

This section contains the following topics:

- License Key Components on page 531
- License Management Fields Summary on page 532

License Key Components

A license key consists of two parts:

- License ID—Alphanumeric string that uniquely identifies the license key. When a license is generated, it is given a license ID.

- License data—Block of binary data that defines and stores all license key objects.

For example, in the following typical license key, the string XXXXXXXXXX is the license ID, and the trailing block of data is the license data:

```
XXXXXXXX XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
    XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
    XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
    XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
    XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
    XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
    XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
    XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
    XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
    XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
    XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
    XXXXXX XXXXXX XXXXXX XXXXXX XXXXXX
```
The license data defines the device ID for which the license is valid and the version of the license.

**License Management Fields Summary**

The Licenses page displays a summary of licensed features that are configured on the device and a list of licenses that are installed on the device. The information on the license management page is summarized in Table 16 on page 532.

### Table 16: Summary of License Management Fields

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Feature Summary</strong></td>
<td></td>
</tr>
<tr>
<td>Feature</td>
<td>Name of the licensed feature:</td>
</tr>
<tr>
<td></td>
<td>• <strong>Features</strong>—Software feature licenses.</td>
</tr>
<tr>
<td></td>
<td>• <strong>All features</strong>—All-inclusive licenses</td>
</tr>
<tr>
<td>Licenses Used</td>
<td>Number of licenses currently being used on the device. Usage is determined by the configuration on the device. If a feature license exists and that feature is configured, the license is considered used.</td>
</tr>
<tr>
<td>Licenses Installed</td>
<td>Number of licenses installed on the device for the particular feature.</td>
</tr>
<tr>
<td>Licenses Needed</td>
<td>Number of licenses required for legal use of the feature. Usage is determined by the configuration on the device: If a feature is configured and the license for that feature is not installed, a single license is needed.</td>
</tr>
<tr>
<td><strong>Installed Licenses</strong></td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>Unique alphanumeric ID of the license.</td>
</tr>
<tr>
<td>State</td>
<td><strong>Valid</strong>—The installed license key is valid.</td>
</tr>
<tr>
<td></td>
<td><strong>Invalid</strong>—The installed license key is not valid.</td>
</tr>
<tr>
<td>Version</td>
<td>Numeric version number of the license key.</td>
</tr>
<tr>
<td>Group</td>
<td>If the license defines a group license, this field displays the group definition.</td>
</tr>
<tr>
<td></td>
<td>If the license requires a group license, this field displays the required group definition.</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> Because group licenses are currently unsupported, this field is always blank.</td>
</tr>
<tr>
<td>Enabled Features</td>
<td>Name of the feature that is enabled with the particular license.</td>
</tr>
<tr>
<td>Expiry</td>
<td>Verify that the expiration information for the license is correct.</td>
</tr>
<tr>
<td></td>
<td>For Junos OS, only permanent licenses are supported. If a license has expired, it is shown as invalid.</td>
</tr>
</tbody>
</table>

**Related Documentation**

- Generating a License Key on page 534
Software Feature Licenses for SRX Series Devices

Supported Platforms

SRX Series, vSRX

For information about how to purchase a software license, contact your Juniper Networks sales representative at http://www.juniper.net/in/en/contact-us/. Platform support depends on the Junos OS release in your installation.

Each feature license is tied to exactly one software feature, and that license is valid for exactly one device.

NOTE: For the most up-to-date license models available, contact your Juniper account team.

Displaying License Keys in J-Web

Supported Platforms

SRX Series, vSRX

To display license keys installed on the device:

1. In the J-Web interface, select Maintain>Licenses.

2. Under Installed Licenses, click Display Keys to display all the license keys installed on the device.

A screen displaying the license keys in text format appears. Multiple licenses are separated by a blank line.

Related Documentation

- Junos OS Feature License Keys on page 531
- Generating a License Key on page 534
- Example: Adding a New License Key on page 536
- Example: Deleting a License Key on page 540
- Downloading License Keys on page 534
**Downloading License Keys**

**Supported Platforms** SRX Series, vSRX

To download license keys installed on the device:

1. In the J-Web interface, select **Maintain>Licenses**.

2. Under Installed Licenses, click **Download Keys** to download all the license keys installed on the device to a single file.

3. Select **Save it to disk** and specify the file to which the license keys are to be written.

**Related Documentation**
- Junos OS Feature License Keys on page 531
- Generating a License Key on page 534
- Example: Adding a New License Key on page 536
- Example: Deleting a License Key on page 540

---

**Generating a License Key**

**Supported Platforms** SRX Series, vSRX

To generate a license key:

1. Gather the authorization code that you received when you purchased your license as well as your device serial number.

2. Go to the Juniper Networks licensing page at:

   https://www.juniper.net/lcrs/generateLicense.do

3. Enter the device serial number and authorization code in the webpage and click **Generate**. Depending on the type of license you purchased, you will receive one of the following responses:

   - License key—If you purchased a perpetual license, you will receive a license key from the licensing management system. You can enter this key directly into the system to activate the feature on your device.
   - License key entitlement—If you purchased a subscription-based license, you will receive a license key entitlement from the licensing management system. You can use this entitlement to validate your license on the Juniper Networks licensing server and download the feature license from the server to your device.

**Related Documentation**
- Example: Adding a New License Key on page 536
Saving License Keys

Supported Platforms: SRX Series, vSRX

To save license keys installed on the device:

1. From operational mode, save the installed license keys to a file or URL.

   ```
   user@host> request system license save filename | url
   ```

   For example, the following command saves the installed license keys to a file named `license.config`:

   ```
   request system license save ftp://user@host/license.conf
   ```

Related Documentation:
- Junos OS Feature License Keys on page 531
- Generating a License Key on page 534
- Example: Adding a New License Key on page 536
- Example: Deleting a License Key on page 540
- Downloading License Keys on page 534

Updating License Keys (CLI)

Supported Platforms: SRX Series, vSRX

Use this task to update a subscription license or a trial license. You can do immediate update from command mode or set up automatic updates using the CLI.

You can set up a proxy server to allow indirect access to the Juniper Networks License Management System (LMS). To set up a proxy server for license updates, see Example: Configuring a Proxy Server for License Updates.
To do immediate update of a license key from command mode:

1. From operational mode, do one of the following tasks:
   - Update the license keys immediately from the LMS server. You can only use this command to update subscription-based licenses (such as UTM).
     
     ```
     user@host> request system license update
     ```

     **NOTE:** The `request system license update` command always uses the default Juniper license server: `https://ae1.juniper.net`.

   - Update the trial license keys immediately from the LMS server.
     
     ```
     user@host> request system license update trial
     ```

To enable automatic license updates from the CLI:

1. Contact your account team or Juniper Networks Customer Care to extend the validity period of existing license keys and obtain the URL for a valid update server.

2. Once you have successfully extended your license key and received the update server URL, configure the auto-update parameter:

   ```
   user@host> set system license autoupdate url https://ae1.juniper.net/
   ```

3. (Optional) Configure renew options. The following sample allows the device to contact the license server 30 days before the current license expires and sends an automatic update request every 6 hours.

   ```
   user@host> set system license renew before-expiration 30
   user@host> set system license renew interval 6
   ```

Related Documentation

- Example: Configuring a Proxy Server for License Updates
- Verifying Junos OS License Installation (CLI)
- Adding New Licenses (CLI Procedure)

Example: Adding a New License Key

**Supported Platforms**

SRX Series, vSRX

This example shows how to add a new license key.

- Requirements on page 537
- Overview on page 537
- Configuration on page 537
- Verification on page 539
Requirements

Before you begin, confirm that your Junos OS feature requires you to purchase, install, and manage a separate software license.

Overview

You can add a license key from a file or URL, from a terminal, or from the J-Web user interface. Use the filename option to activate a perpetual license directly on the device. (Most feature licenses are perpetual.) Use the url to send a subscription-based license key entitlement (such as UTM) to the Juniper Networks licensing server for authorization. If authorized, the server downloads the license to the device and activates it.

In this example, the file name is bgp-reflection.

Configuration

**CLI Quick Configuration**

To quickly configure this section of the example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter commit from configuration mode.

From operational mode, you can add a license key in either way:

- From a file or URL:
  
  ```
  user@hostname> request system license add bgp-reflection
  ```

- From the terminal:
  
  ```
  user@hostname> request system license add terminal
  ```

**GUI Step-by-Step Procedure**

To add a new license key:

1. In the J-Web user interface, select Maintain>Licenses.

2. Under Installed Licenses, click Add to add a new license key.

3. Do one of the following, using a blank line to separate multiple license keys:
   
   - In the License File URL box, type the full URL to the destination file containing the license key to be added.
   
   - In the License Key Text box, paste the license key text, in plain-text format, for the license to be added.

4. Click OK to add the license key.

**NOTE:** If you added the SRX100 Memory Upgrade license, the device reboots immediately and comes back up as a high-memory device.
5. Click OK to check your configuration and save it as a candidate configuration.

6. If you are done configuring the device, click Commit Options>Commit.

**Step-by-Step Procedure**

To add a new license key:

1. From operational mode, add a license key in either way:
   - From a file or URL:
     ```
     user@host> request system license add bgp-reflection
     ```
   - From the terminal:
     ```
     user@host> request system license add terminal
     ```

2. When prompted, enter the license key, separating multiple license keys with a blank line. If the license key you enter is invalid, an error is generated when you press Ctrl-D to exit license entry mode.

**NOTE:** If you added the SRX100 Memory Upgrade license, the device reboots immediately and comes back up as a high-memory device.

**Results**

From operational mode, confirm your configuration by entering the `show system license` command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@hostname> show system license
```

**License usage:**

<table>
<thead>
<tr>
<th>Feature name</th>
<th>Licenses used</th>
<th>Licenses installed</th>
<th>Licenses needed</th>
<th>Expiry</th>
</tr>
</thead>
<tbody>
<tr>
<td>bgp-reflection</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>permanent</td>
</tr>
</tbody>
</table>

**Licenses installed:**

- License identifier: G0300000xxxx
- License version: 2
- Valid for device: JN001875AB
- Features:
  - bgp-reflection - Border Gateway Protocol route reflection permanent

- License identifier: G0300000xxxx
- License version: 2
- Valid for device: JN001875AB

If you are done configuring the device, enter commit from configuration mode.
Verification

Confirm that the configuration is working properly.

**Verifying Installed Licenses**

**Purpose**  Verify that the expected licenses have been installed and are active on the device.

**Action**  From operational mode, enter the `show system license` command.

The output shows a list of the licenses used and a list of the licenses installed on the device and when they expire.

**Verifying License Usage**

**Purpose**  Verify that the licenses fully cover the feature configuration on the device.

**Action**  From operational mode, enter the `show system license usage` command.

```
user@hostname> show system license usage

Feature name | Licenses used | Licenses installed | Licenses needed | Expiry
-------------|--------------|--------------------|----------------|-------
bgp-reflection | 1 | 1 | 0 | permanent
```

The output shows a list of the licenses installed on the device and how they are used.

**Verifying Installed License Keys**

**Purpose**  Verify that the license keys were installed on the device.

**Action**  From operational mode, enter the `show system license keys` command.

```
user@hostname> show system license keys

XXXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX
       XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX
       XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX
       XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX XXXXX
```

The output shows a list of the license keys installed on the device. Verify that each expected license key is present.

**Related Documentation**

- Junos OS Feature License Keys on page 531
Example: Deleting a License Key

Supported Platforms

**SRX Series, vSRX**

This example shows how to delete a license key.

- **Requirements on page 540**
- **Overview on page 540**
- **Configuration on page 540**
- **Verification on page 541**

Requirements

Before you delete a license key, confirm that it is no longer needed.

Overview

You can delete a license key from the CLI or J-Web user interface. In this example, the license ID is G0300000xxxx.

Configuration

**CLI Quick Configuration**

To quickly configure this section of the example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the [edit] hierarchy level, and then enter commit from configuration mode.

```
user@host> request system license delete G0300000xxxx
```

**GUI Step-by-Step Procedure**

To delete a license key:

1. In the J-Web user interface, select **Maintain > Licenses**.

2. Select the check box of the license or licenses you want to delete.

3. Click **Delete**.

---

**NOTE:** If you deleted the SRX100 Memory Upgrade license, the device reboots immediately and comes back up as a low-memory device.
4. Click OK to check your configuration and save it as a candidate configuration.

5. If you are done configuring the device, click **Commit Options > Commit**.

**Step-by-Step Procedure**

To delete a license key:

1. From operational mode, for each license, enter the following command and specify the license ID. You can delete only one license at a time.

   ```
   user@host> request system license delete G0300000xxxx
   ```

   **NOTE:** If you deleted the SRX100 Memory Upgrade license, the device reboots immediately and comes back up as a low-memory device.

**Results**

From configuration mode, confirm your deletion by entering the `show system license` command. The license key you deleted will be removed. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

If you are done configuring the device, enter `commit` from configuration mode.

**Verification**

Confirm that the configuration is working properly.

- Verifying Installed Licenses on page 541

**Verifying Installed Licenses**

**Purpose**

Verify that the expected licenses have been removed from the device.

**Action**

From operational mode, enter the `show system license` command.

**Related Documentation**

- Generating a License Key on page 534
- Example: Adding a New License Key on page 536
- Updating License Keys (CLI) on page 535
- Downloading License Keys on page 534
PART 7

Configuration Statements and Operational Commands

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CHAPTER 20

Configuration Statements

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address-assignment (Access)

Supported Platforms  
SRX Series

Syntax  
address-assignment {  
abated-utilization percentage;  
abated-utilization-v6 percentage;  
high-utilization percentage;  
high-utilization-v6 percentage;  
neighbor-discovery-router-advertisement ndra-name;  
pool pool-name {  
family {  
infamily {  
dhcp-attributes {  
boot-file boot-file-name;  
boot-server boot-server-name;  
domain-name domain-name;  
grace-period seconds;  
maximum-lease-time (seconds | infinite);  
name-server ipv4-address;  
ettios-node-type (b-node | h-node | m-node | p-node);  
next-server next-server-name;  
option dhcp-option-identifier-code {  
array [  
byte [8-bit-value];  
flag [false | off | on | true];  
i32-bit-numeric-values;  
lp-address [lp-address];  
short [signed-16-bit-numeric-value];  
string [character string value];  
unsigned-integer [unsigned-32-bit-numeric-value];  
unsigned-short [16-bit-numeric-value];  
}  
byte 8-bit-value;  
flag (false | off | on | true);  
i32-bit-numeric-values;  
lp-address lp-address;  
short signed-16-bit-numeric-value;  
string character string value;  
unsigned-integer unsigned-32-bit-numeric-value;  
unsigned-short unsigned-16-bit-numeric-value;  
}  
option-match {  
option-82 {  
circuit-id match-value {  
range range-name;  
}  
remote-id match-value;  
range range-name;  
}  
}  
}  
propagate-ppp-settings {interface-name};  
propagate-settings interface-name;  
}  
}  
}  
}  
Copyright © 2017, Juniper Networks, Inc.
router ipv4-address;
sip-server [  
ip-address ipv4-address;  
name sip-server-name;  
]  
tftp-server server-name;  
wins-server ipv4-address;  

host hostname [  
hardware-address mac-address;  
ip-address reserved-address;  
]  
network network address;  
range range-name {  
high upper-limit;  
low lower-limit;  
}  
excluded-range range-name  
high upper-limit;  
low lower-limit;  
}  
xauth-attributes {  
primary-dns ip-address;  
primary-wins ip-address;  
secondary-dns ip-address;  
secondary-wins ip-address;  
}  
inet6 {  
dhcp-attributes [  
dns-server ipv6-address;  
grace-period seconds;  
maximum-lease-time (seconds | infinite);  
option dhcp-option-identifier-code [  
array [  
byte [8-bit-value];  
flag [false | off | on | true];  
integer [32-bit-numeric-values];  
ip-address [ip-address];  
short [signed-16-bit-numeric-value];  
string [character string value];  
unsigned-integer [unsigned-32-bit-numeric-value];  
unsigned-short [16-bit-numeric-value];  
]  
byte 8-bit-value;  
flag (false | off | on | true);  
integer 32-bit-numeric-values;  
ip-address ip-address;  
short signed-16-bit-numeric-value;  
string character string value;  
unsigned-integer unsigned-32-bit-numeric-value;  
unsigned-short 16-bit-numeric-value;  
}  
propagate-ppp-settings [interface-name];  
sip-server-address ipv6-address;
```
sip-server-domain-name domain-name;
}
prefix ipv6-network-prefix;
range range-name {
    high upper-limit;
    low lower-limit;
    prefix-length delegated-prefix-length;
}
excluded-range range-name
    high upper-limit;
    low lower-limit;
}
}
link pool-name;

Hierarchy Level [edit access]

Release Information Statement introduced in Junos OS Release 10.4 for SRX300, SRX320, SRX340, SRX345, SRX550HM devices.

Description The address-assignment pool feature enables you to create IPv4 and IPv6 address pools that different client applications can share. For example, multiple client applications, such as DHCPv4 or DHCPv6, can use an address-assignment pool to provide addresses for their particular clients.

Required Privilege Level

access—To view this statement in the configuration.
access-control—To add this statement to the configuration.

Related Documentation

• Dynamic VPN Overview
address-pool (Access)

**Supported Platforms**  
M Series, MX Series, SRX Series, T Series

**Syntax**  
address-pool pool-name {  
  address address or address prefix;  
  address-range {  
    high upper-limit;  
    low lower-limit;  
    mask network-mask;  
  }  
  primary-dns IP address;  
  primary-wins IP address;  
  secondary-dns IP address;  
  secondary-wins IP address;  
}

**Hierarchy Level**  
[edit access]

**Release Information**  
Statement introduced in Junos OS Release 10.4.

**Description**  
Create an address-pool for L2TP clients.

**Options**
- **pool-name**—Name assigned to the address-pool.
- **address**—Configure subnet information for the address-pool.
- **address-range**—Defines the address range available for clients.
- **primary-dns**—Specify the primary-dns IP address.
- **secondary-dns**—Specify the secondary-dns IP address.
- **primary-wins**—Specify the primary-wins IP address.
- **secondary-wins**—Specify the secondary-wins IP address.

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

**Related Documentation**
- **access-control on page 83**
**allow-configuration**

**Supported Platforms**  
SRX Series

**Syntax**  
`allow-configuration "regular-expression";`

**Hierarchy Level**  
`[edit system login class class-name]`

**Release Information**  
Statement introduced before Junos OS Release 7.4.  
Statement introduced in Junos OS Release 11.2 for SRX Series devices.

**Description**  
Explicitly allow configuration access to the specified levels in the hierarchy even if the permissions set with the `permissions` statement do not grant such access by default.

**Default**  
If you omit this statement and the `deny-configuration` statement, users can edit only those commands for which they have access privileges through the `permissions` statement.

**Options**  
`regular-expression`—Extended (modern) regular expression as defined in POSIX 1003.2.  
If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.

**Required Privilege Level**  
admin—To view this statement in the configuration.  
admin-control—To add this statement to the configuration.
### allow-configuration-regexps

**Supported Platforms**  
SRX Series

**Syntax**  
```
allow-configuration-regexps "regular expression 1" "regular expression 2";
```

**Hierarchy Level**  
```
[edit system login class class-name]
```

**Release Information**  
Statement introduced in Junos OS Release 11.2.

**Description**  
Explicitly allow configuration access to specified hierarchies using regular expressions even if the permissions set with the `permissions` statement allow that access.

The statement `deny-configuration-regexps` takes precedence if it is used in the same login class definition.

**Default**  
If you do not configure this statement or the `deny-configuration-regexps` statement, users can edit only those commands for which they have access privileges set with the `permissions` statement.

**Options**  
*regular expression*—Extended (modern) regular expression as defined in POSIX 1003.2. If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.

**Required Privilege Level**  
system—To view this statement in the configuration.  
system-control—To add this statement to the configuration.
**authentication-key**

**Supported Platforms**  
SRX Series

**Syntax**  
`authentication-key key-number type md5 value <password>;`

**Hierarchy Level**  
[edit system ntp]

**Release Information**  
Statement introduced before Junos OS Release 7.4.

**Description**  
Configure Network Time Protocol (NTP) authentication keys so that the SRX Series device can send authenticated packets. If you configure the SRX Series device to operate in authenticated mode, you must configure a key.

Both the keys and the authentication scheme (MD5) must be identical between a set of peers sharing the same key number.

**Options**  
- `key-number`—Positive integer that identifies the key.
- `type md5`—Authentication type. It can only be `md5`.
- `value password`—The key itself, which can be from 1 through 8 ASCII characters. If the key contains spaces, enclose it in quotation marks.

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

**Related Documentation**  
- ntp on page 613
**authentication-order**

**Supported Platforms**  EX Series, M Series, SRX Series, T Series

**Syntax**  
```
authentication-order [method1 method2...];
```

**Hierarchy Level**  [edit system]

**Release Information**  
Statement introduced before Junos OS Release 7.4.  
Statement introduced in Junos OS Release 9.0 for EX Series switches.

**Description**  Configure the order in which the software tries different user authentication methods when attempting to authenticate a user. For each login attempt, the software tries the authentication methods in order, starting with the first one, until the password matches.

**Default**  If you do not include the `authentication-order` statement, users are verified based on their configured passwords.

**Options**  One or more of the following authentication methods listed in the order in which they must be tried:

- **password**—Use the password configured for the user with the `authentication` statement at the [edit system login user] hierarchy level.
- **radius**—Use RADIUS authentication services.
- **tacplus**—Use TACACS+ authentication services.

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

**Related Documentation**  
- Understanding User Authentication Methods on page 12
boot-server (NTP)

Supported Platforms  SRX Series

Syntax  boot-server (address | hostname);

Hierarchy Level  [edit system ntp]

Release Information  Statement introduced before Junos OS Release 7.4.

Description  Configure the server that NTP queries when the SRX Series device boots to determine the local date and time.

When you boot the SRX Series device, it issues an `ntpdate` request, which polls a network server to determine the local date and time. You need to configure a server that the SRX Series device uses to determine the time when the SRX Series device boots. You can configure either an IP address or a hostname for the boot server. If you configure a hostname instead of an IP address, the `ntpdate` request resolves the hostname to an IP address when the SRX Series device boots up.

If you configure an NTP boot server, then when the SRX Series device boots, it immediately synchronizes with the boot server even if the NTP process is explicitly disabled or if the time difference between the client and the boot server exceeds the threshold value of 1000 seconds.

Options

- `address`—The IP address of an NTP boot server.
- `hostname`—The hostname of an NTP boot server.

Required Privilege Level

- `system`—To view this statement in the configuration.
- `system-control`—To add this statement to the configuration.

Related Documentation

- ntp on page 613
## broadcast

**Supported Platforms** SRX Series

**Syntax**
```
broadcast address <key key-number> <routing-instance-name routing-instance-name> <ttl value> <version value>;
```

**Hierarchy Level** [edit system ntp]

**Release Information** Statement introduced before Junos OS Release 7.4.

**Description** Configure the SRX Series device to operate in broadcast mode with the remote system at the specified address. In this mode, the SRX Series device sends periodic broadcast messages to a client population at the specified broadcast or multicast address. Normally, you include this statement only when the SRX Series device is operating as a transmitter.

**Options**
- **address**—The broadcast address on one of the local networks or a multicast address assigned to NTP. You must specify an address, not a hostname. If the multicast address is used, it must be `224.0.1.1`.
- **key key-number**—(Optional) All packets sent to the address include authentication fields that are encrypted using the specified key number.
  - **Range:** Any unsigned 32-bit integer
- **routing-instance-name routing-instance-name**—(Optional) The routing instance name in which the interface has an address in the broadcast subnet.
  - **Default:** The default routing instance is used to broadcast packets.
- **ttl value**—(Optional) Time-to-live (TTL) value to use.
  - **Range:** 1 through 255
  - **Default:** 1
- **version value**—(Optional) Specify the version number to be used in outgoing NTP packets.
  - **Range:** 1 through 4
  - **Default:** 4

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

**Related Documentation**
- ntp on page 613
**broadcast-client**

**Supported Platforms**  
SRX Series

**Syntax**  
broadcast-client;

**Hierarchy Level**  
[edit system ntp]

**Release Information**  
Statement introduced before Junos OS Release 7.4.

**Description**  
Configure the SRX Series device to listen for broadcast messages on the local network to discover other servers on the same subnet.

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

**Related Documentation**  
- ntp on page 613
ciphers

Supported Platforms MX Series, PTX Series, SRX Series, vSRX

Syntax ciphers [ cipher-1 cipher-2 cipher-3 ...]

Hierarchy Level [edit system services ssh]

Release Information Statement introduced in Junos OS Release 11.2.

Description Specify the set of ciphers the SSH server can use to perform encryption and decryption functions.

Options
- 3des-cbc—Triple Data Encryption Standard (DES) in Cipher Block Chaining (CBC) mode.
- aes128-ctr—128-bit AES in counter mode.
- aes128-gcm@openssh.com—128-bit AES in Galois/Counter Mode.
- aes192-cbc—192-bit AES in CBC mode.
- aes192-ctr—192-bit AES in counter mode.
- aes256-cbc—256-bit AES in CBC mode.
- aes256-ctr—256-bit AES in counter mode.
- aes256-gcm@openssh.com—256-bit AES in Galois/Counter Mode.
- arcfour—128-bit RC4-stream cipher in CBC mode.
- arcfour128—128-bit RC4-stream cipher in CBC mode.
- arcfour256—256-bit RC4-stream cipher in CBC mode.
- blowfish-cbc—128-bit blowfish-symmetric block cipher in CBC mode.
- cast128-cbc—128-bit cast in CBC mode.
- chacha20-poly1305@openssh.com—ChaCha20 stream cipher and Poly1305 MAC

NOTE: Ciphers represent a set. To configure SSH ciphers use the set command as shown in the following example:

user@host#set system services ssh ciphers [ aes256-cbc aes192-cbc ]

Required Privilege Level system—To view this statement in the configuration. system-control—To add this statement to the configuration.
Related Documentation

- Configuring SSH Service for Remote Access to the Router or Switch
- key-exchange
- macs on page 609

connection-limit

Supported Platforms  SRX Series, vSRX

Syntax  

```
connection-limit limit;
```

Hierarchy Level  
```
[edit system services finger]
[edit system services ftp]
[edit system services netconf ssh]
[edit system services ssh]
[edit system services telnet]
[edit system services xnm-clear-text]
[edit system services xnm-ssl]
```

Release Information  Statement introduced in Junos OS Release 11.4.

Description  Configure the maximum number of connection sessions for each type of system services (finger, ftp, ssh, telnet, xnm-clear-text, or xnm-ssl) per protocol (either IPv6 or IPv4).

Options  

- `limit`—Maximum number of established connections per protocol (either IPv6 or IPv4).

  On SRX5400, SRX5600, and SRX5800 devices, the range and default value are as follows:
  
  Range: 1 through 250
  Default: 75

  On SRX300, SRX320, SRX340, and SRX345, and SRX550M devices, the range is as follows:
  
  Range: 1 through 5

  **NOTE:** The actual number of maximum connections depends on the availability of system resources, and might be fewer than the configured connection-limit value if the system resources are limited.

Required Privilege Level  
```
system—To view this statement in the configuration.
system-control—To add this statement to the configuration.
```
### client-ia-type

<table>
<thead>
<tr>
<th>Supported Platforms</th>
<th>SRX Series, vSRX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Syntax</strong></td>
<td>client-ia-type { ia-na; ia-pd; }</td>
</tr>
<tr>
<td><strong>Hierarchy Level</strong></td>
<td>[edit interfaces interface-name unit logical-unit-number family inet6 dhcpv6-client]</td>
</tr>
<tr>
<td><strong>Release Information</strong></td>
<td>Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>Configure the DHCPv6 client identity association type.</td>
</tr>
<tr>
<td><strong>Options</strong></td>
<td>ia-na—Identity association for nontemporary address, ia-pd—Identity association for prefix delegation</td>
</tr>
<tr>
<td><strong>Required Privilege Level</strong></td>
<td>interface—To view this statement in the configuration, interface-control—To add this statement to the configuration</td>
</tr>
<tr>
<td><strong>Related Documentation</strong></td>
<td>• DHCPv6 Client Overview on page 493</td>
</tr>
</tbody>
</table>
# client-identifier (dhcp-client)

<table>
<thead>
<tr>
<th>Supported Platforms</th>
<th>SRX Series, vSRX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Syntax</strong></td>
<td>client-identifier { user-id { ascii</td>
</tr>
<tr>
<td><strong>Hierarchy Level</strong></td>
<td>[edit interfaces interface-name unit logical-unit-number family family dhcp-client]</td>
</tr>
<tr>
<td><strong>Release Information</strong></td>
<td>Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>The DHCP server identifies a client by a client-identifier value.</td>
</tr>
<tr>
<td><strong>Options</strong></td>
<td>The remaining statements are explained separately. See CLI Explorer.</td>
</tr>
<tr>
<td><strong>Required Privilege Level</strong></td>
<td>interface—for view this statement in the configuration. interface-control—for add this statement to the configuration.</td>
</tr>
<tr>
<td><strong>Related Documentation</strong></td>
<td>• DHCPv6 Client Overview on page 493</td>
</tr>
</tbody>
</table>
# client-identifier (dhcppv6-client)

## Supported Platforms
SRX Series

## Syntax
```
client-identifier duid-type (duid-ll | duid-llt | vendor);
```

## Hierarchy Level
```
[edit interfaces interface-name unit logical-unit-number family family dhcpv6-client]
```

## Release Information
Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

## Description
The DHCPv6 server identifies a client by a client-identifier value.

## Options
- **duid-type**—The DHCPv6 client is identified by a DHCP unique identifier (DUID).
  - **duid-ll**—Link Layer address.
  - **duid-llt**—Link Layer address plus time.
  - **vendor**—Vendor-assigned unique ID based on the enterprise number.

## Required Privilege
- **interface**—To view this statement in the configuration.
- **interface-control**—To add this statement to the configuration.

## Related Documentation
- DHCPv6 Client Overview on page 493

---

Chapter 20: Configuration Statements
client-list-name (SNMP)

Syntax

```
client-list-name client-list-name ;
```

Hierarchy Level

```
[edit snmp community community-name ]
```

Release Information

Statement introduced in Junos OS Release 8.5.

Description

Specify the name of the list of SNMP network management system (NSM) clients that are authorized to collect information about network operations. You cannot use an SNMP client list and individually configured SNMP clients in the same configuration.

Options

```
client-list-name — Name of the client list. Client list is the list of IP address prefixes defined with the prefix-list statement in the policy-options hierarchy.
```

Required Privilege

```
Level
snmp—To view this statement in the configuration.
snmp-control—To add this statement to the configuration.
```

Related Documentation

- Understanding the SNMP Implementation in Junos OS
- Standard SNMP MIBs Supported by Junos OS

client-type

Supported Platforms

```
SRX Series, vSRX
```

Syntax

```
client-type (autoconfig | statefull);
```

Hierarchy Level

```
[edit interfaces interface-name unit logical-unit-number family inet6 dhcpv6-client]
```

Release Information

Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.

Description

The type of DHCPv6 client.

Options

- autoconfig—Autoconfig client type for router advertisement
- statefull—Stateful client type for address assignment

Required Privilege

```
Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.
```

Related Documentation

- DHCPv6 Client Overview on page 493
## deny-configuration

<table>
<thead>
<tr>
<th>Supported Platforms</th>
<th>SRX Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax</td>
<td><code>deny-configuration &quot;regular-expression&quot;;</code></td>
</tr>
<tr>
<td>Hierarchy Level</td>
<td>[edit system login class]</td>
</tr>
<tr>
<td>Description</td>
<td>Explicitly deny configuration access to the specified levels in the hierarchy even if the permissions set with the <code>permissions</code> statement grant such access by default.</td>
</tr>
<tr>
<td>Default</td>
<td>If you omit this statement and the <code>allow-configuration</code> statement, users can edit those levels in the configuration hierarchy for which they have access privileges through the <code>permissions</code> statement.</td>
</tr>
<tr>
<td>Options</td>
<td><code>regular-expression</code>—Extended (modern) regular expression as defined in POSIX 1003.2. If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.</td>
</tr>
<tr>
<td>Required Privilege Level</td>
<td>admin—To view this statement in the configuration. admin-control—To add this statement to the configuration.</td>
</tr>
</tbody>
</table>
# deny-configuration-regexps

**Supported Platforms**  
SRX Series

**Syntax**  
deny-configuration-regexps "regular expression 1" "regular expression 2";

**Hierarchy Level**  
[edit system login class class-name]

**Release Information**  
Statement introduced in Junos OS Release 11.2.  
Statement introduced in Junos OS Release 11.2 for SRX Series devices.

**Description**  
Explicitly deny configuration access to specified hierarchies using regular expressions even if the permissions set with the permissions statement allow that access.

Expressions configured with this statement take precedence over allow-configuration-regexps if the two statements are used in the same login class definition.

**Default**  
If you do not configure this statement or the deny-configuration-regexps statement, users can edit only those commands for which they have access privileges set with the permissions statement.

**Options**  
*regular expression*—Extended (modern) regular expression as defined in POSIX 1003.2.  
If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.

**Required Privilege**  
- **Level**  
  - system—To view this statement in the configuration.  
  - system-control—To add this statement to the configuration.
destination (Accounting)

Supported Platforms  SRX Series

Syntax  

```
destination {
  radius {
    server {
      server-address {
        accounting-port port-number;
        max-outstanding-requests value;
        port port-number;
        retry value;
        secret password;
        source-address source-address;
        timeout seconds;
      }
    }
  }
  tacplus {
    server {
      server-address {
        port port-number;
        secret password;
        single-connection;
        timeout seconds;
      }
    }
  }
}
```

Hierarchy Level  [edit system accounting]

Release Information  Statement introduced before Junos OS Release 7.4.
radius statement added in Junos OS Release 7.4. Support for IPv6 source address added in Junos OS Release 12.1X47-D15 for SRX1500, SRX5400, SRX5600, and SRX5800 devices.

Description  Configure the authentication server.

Options  The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level  system—To view this statement in the configuration.
 system-control—To add this statement to the configuration.
**dhcp-attributes (Access IPv4 Address Pools)**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**

dhcp-attributes {  
    boot-file boot-file-name;  
    boot-server boot-server-name;  
    domain-name domain-name;  
    grace-period seconds;  
    maximum-lease-time (seconds | infinite);  
    name-server ipv4-address;  
    netbios-node-type (b-node | h-node | m-node | p-node);  
    next-server next-server-name;  
    option dhcp-option-identifier-code {  
        array {  
            byte [8-bit-value];  
            flag [false | off | on | true];  
            integer [32-bit-numeric-values];  
            ip-address [ip-address];  
            short [signed-16-bit-numeric-value];  
            string [character string value];  
            unsigned-integer [unsigned-32-bit-numeric-value];  
            unsigned-short [16-bit-numeric-value];  
        }  
        byte 8-bit-value;  
        flag (false | off | on | true);  
        integer 32-bit-numeric-values;  
        ip-address ip-address;  
        short signed-16-bit-numeric-value;  
        string character string value;  
        unsigned-integer unsigned-32-bit-numeric-value;  
        unsigned-short unsigned-16-bit-numeric-value;  
    }  
    option-match {  
        option-82 {  
            circuit-id match-value {  
                range range-name;  
            }  
            remote-id match-value;  
            range range-name;  
        }  
    }  
    propagate-ppp-settings [interface-name];  
    propagate-settings interface-name;  
    router ipv4-address;  
    server-identifier ip-address;  
    sip-server {  
        ip-address ipv4-address;  
        name sip-server-name;  
    }  
    tftp-server server-name;  
    wins-server ipv4-address;  
}
Hierarchy Level: [edit access address-assignment pool pool-name family inet]


Description: Configure attributes for IPv4 address pools that can be used by different clients. The DHCP attributes for this statement uses standard IPv4 DHCP options.

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

Related Documentation:
- DHCP Server, Client, and Relay Agent Overview on page 423
**dhcp-attributes (Access IPv6 Address Pools)**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**

dhcp-attributes {
  dns-server ipv6-address;
  grace-period seconds;
  maximum-lease-time (seconds | infinite);
  option dhcp-option-identifier-code {
    array {
      byte [8-bit-value];
      flag [false | off | on | true];
      integer [32-bit-numeric-values];
      ip-address [ip-address];
      short [signed-16-bit-numeric-value];
      string [character string value];
      unsigned-integer [unsigned-32-bit-numeric-value];
      unsigned-short [16-bit-numeric-value];
    }
    byte [8-bit-value];
    flag [false | off | on | true];
    integer 32-bit-numeric-values;
    ip-address ip-address;
    short signed-16-bit-numeric-value;
    string character string value;
    unsigned-integer unsigned-32-bit-numeric-value;
    unsigned-short 16-bit-numeric-value;
  }
  propagate-ppp-settings [interface-name];
  sip-server-address ipv6-address;
  sip-server-domain-name domain-name;
}

**Hierarchy Level**  
[edit access address-assignment pool pool-name family inet6]

**Release Information**  
Statement introduced in Junos OS Release 10.4.

**Description**  
Configure attributes for address pools that can be used by different clients.

**Options**

- **dns-server IPv6-address**—Specify a DNS server to which clients can send DNS queries.
- **grace-period seconds**—Specify the grace period offered with the lease.
  
  **Range:** 0 through 4,294,967,295 seconds
  
  **Default:** 0 (no grace period)

- **maximum-lease-time seconds**—Specify the maximum length of time in seconds for which a client can request and hold a lease on a DHCP server.
  
  **Range:** 30 through 4,294,967,295 seconds
  
  **Default:** 86,400 seconds (24 hours)
• **option dhcp-option-identifier-code**—Specify the DHCP option identifier code.

• **propagate-ppp-settings [interface-name]**—Specify PPP interface name for propagating DNS or WINS settings.

• **sip-server-address IPv6-address**—Specify the IPv6 address of the SIP outbound proxy server.

• **sip-server-domain-name domain-name**—Specify the domain name of the SIP outbound proxy server.

**Required Privilege**

- access—to view this statement in the configuration.
- access-control—to add this statement to the configuration.

**Related Documentation**

- DHCP Server, Client, and Relay Agent Overview on page 423
**dhcp-client**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**

dhcp-client {
  client-identifier {
    prefix {
      host-name;
      logical-system-name;
      routing-instance-name;
    }
    use-interface-description (device | logical);
    user-id (ascii string| hexadecimal string);
  }
  force-discover;
  lease-time (length | infinite);
  no-dns-install;
  options no-hostname;
  retransmission-attempt value;
  retransmission-interval seconds;
  server-address server-address;
  update-server;
  vendor-id vendor-id ;
}

**Hierarchy Level**  
[edit interfaces interface-name unit logical-unit-number family family]

**Release Information**  
Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  
Configure the Dynamic Host Configuration Protocol (DHCP) client.

**Options**

- **force-discover**—Forces the DHCP client to send a DHCP discover packet after one to three failed dhcp-request attempts. The force-discover option ensures that the DHCP server will assign the same or a new IP address to the client.

- **lease-time**—Protocol MS-CHAPv2, used for password authentication and password changing.

- **no-dns-install**—
  - **infinite**—
  - **length**—

- **retransmission-attempt**—

**Required Privilege Level**

- interface—to view this statement in the configuration.
- interface-control—to add this statement to the configuration.
Related Documentation

- DHCP Server, Client, and Relay Agent Overview on page 423
**dhcp-local-server (System Services)**

**Supported Platforms**  
SRX Series

**Syntax**  
dhcp-local-server {  
dhcpv6 {  
  authentication {  
    password password;  
    username-include {  
      circuit-type;  
      client-id;  
      delimiter delimiter-character;  
      domain-name domain-name;  
      interface-name;  
      logical-system-name;  
      relay-agent-interface-id;  
      relay-agent-remote-id;  
      relay-agent-subscriber-id;  
      routing-instance-name;  
      user-prefix user-prefix;  
    }  
  }  
  dynamic-profile {  
    profile-name;  
    aggregate-clients {  
      merge;  
      replace;  
    }  
  }  
  junos-default-profile;  
  use-primary dynamic-profile-name;  
}  

group group-name {  
  authentication {  
    password password;  
    username-include {  
      circuit-type;  
      client-id;  
      delimiter delimiter-character;  
      domain-name domain-name;  
      interface-name;  
      logical-system-name;  
      relay-agent-interface-id;  
      relay-agent-remote-id;  
      relay-agent-subscriber-id;  
      routing-instance-name;  
      user-prefix user-prefix;  
    }  
  }  
  dynamic-profile {  
    profile-name;  
    aggregate-clients {  
      merge;  
      replace;  
    }  
  }  
}
junos-default-profile;
use-primary dynamic-profile;
}
interface interface-name {
  dynamic-profile {
    profile-name;
    aggregate-clients {
      merge;
      replace;
    }
    junos-default-profile;
    use-primary dynamic-profile-name;
  }
  exclude;
  overrides {
    delegated-pool pool-name;
    interface-client-limit number;
    process-inform {
      pool pool-name;
    }
    rapid-commit;
  }
  service-profile service-profile-name
  trace;
  upto interface-name;
}
liveness-detection {
  failure-action {
    clear-binding;
    clear-binding-if-interface-up;
    log-only;
  }
  method {
    bfd {
      detection-time {
        threshold milliseconds;
      }
      holddown-interval interval;
      minimum-interval milliseconds;
      minimum-receive-interval milliseconds;
      multiplier number;
      no-adaptation;
      session-mode (automatic | multihop | single-hop);
      transmit-interval {
        minimum-interval milliseconds;
        threshold milliseconds;
      }
      version (0 | 1 | automatic);
    }
  }
  overrides {
    delegated-pool pool-name;
    interface-client-limit number;
    process-inform {
      pool pool-name;
    }
rapid-commit;
]
reconfigure {
  attempts number;
  clear-on-abort;
  strict;
  timeout number;
  token token-name;
  trigger {
    radius-disconnect;
  }
}
service-profile service-profile-name;
}
liveness-detection {
  failure-action {
    clear-binding;
    clear-binding-if-interface-up;
    log-only;
  }
  method {
    bfd {
      detection-time {
        threshold milliseconds;
      }
      holddown-interval interval;
      minimum-interval milliseconds;
      minimum-receive-interval milliseconds;
      multiplier number;
      no-adaptation;
      session-mode (automatic | multihop | single-hop);
      transmit-interval {
        minimum-interval milliseconds;
        threshold milliseconds;
      }
      version (0 | 1 | automatic);
    }
  }
  overrides {
    delegated-pool pool-name;
    interface-client-limit number;
    process-inform {
      pool pool-name;
    }
    rapid-commit;
  }
reconfigure {
  attempts number;
  clear-on-abort;
  strict;
  timeout number;
  token token-name;
  trigger {
    radius-disconnect;
  }
}
service-profile service-profile-name;
{
  group group-name {
    interface interface-name {
      exclude;
      upto upto-interface-name;
    }
  }
}

Hierarchy Level [edit system services]

Release Information Statement introduced in Junos OS Release 10.4.

Description Configure DHCP Local Server for DHCPv6, forwarding snoop (unicast) packets, and setting trace options.

NOTE: SRX Series devices do not support client authentication.

Options The remaining statements are explained separately. See CLI Explorer.

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

Related Documentation • DHCP Server, Client, and Relay Agent Overview on page 423
**dhcpv6 (System Services)**

**Supported Platforms**  
SRX Series

**Syntax**  
dhcpv6 {
  authentication {
    password password;
    username-include {
      circuit-type;
      client-id;
      delimiter delimiter-character;
      domain-name domain-name;
      interface-name;
      logical-system-name;
      relay-agent-interface-id;
      relay-agent-remote-id;
      relay-agent-subscriber-id;
      routing-instance-name;
      user-prefix user-prefix;
    }
  }
  dynamic-profile {
    profile-name;
    aggregate-clients {
      merge;
      replace;
    }
    junos-default-profile;
    use-primary dynamic-profile-name;
  }
  group group-name {
    authentication {
      password password;
      username-include {
        circuit-type;
        client-id;
        delimiter delimiter-character;
        domain-name domain-name;
        interface-name;
        logical-system-name;
        relay-agent-interface-id;
        relay-agent-remote-id;
        relay-agent-subscriber-id;
        routing-instance-name;
        user-prefix user-prefix;
      }
    }
    dynamic-profile {
      profile-name;
      aggregate-clients {
        merge;
        replace;
      }
      junos-default-profile;
    }
  }
}

use-primary dynamic-profile;
}

interface interface-name [  
  dynamic-profile {  
    profile-name;  
    aggregate-clients {  
      merge;  
      replace;  
    }  
    junos-default-profile;  
    use-primary dynamic-profile-name;  
  }  
  exclude;  
  overrides {  
    delegated-pool pool-name;  
    interface-client-limit number;  
    process-inform {  
      pool pool-name;  
    }  
    rapid-commit;  
  }  
  service-profile service-profile-name  
  trace;  
  upto interface-name;  
}

liveness-detection {  
  failure-action {  
    clear-binding;  
    clear-binding-if-interface-up;  
    log-only;  
  }  
  method {  
    bfd {  
      detection-time {  
        threshold milliseconds;  
      }  
      holddown-interval interval;  
      minimum-interval milliseconds;  
      minimum-receive-interval milliseconds;  
      multiplier number;  
      no-adaptation;  
      session-mode (automatic | multihop | single-hop);  
      transmit-interval {  
        minimum-interval milliseconds;  
        threshold milliseconds;  
      }  
      version (0 | 1| automatic);  
    }  
  }  
  overrides {  
    delegated-pool pool-name;  
    interface-client-limit number;  
    process-inform {  
      pool pool-name;  
    }  
    rapid-commit;  
  }
}
} reconfigure {
  attempts number;
  clear-on-abort;
  strict;
  timeout number;
  token token-name;
  trigger {
    radius-disconnect;
  }
}
}
service-profile service-profile-name;
}
liveness-detection {
  failure-action {
    clear-binding;
    clear-binding-if-interface-up;
    log-only;
  }
  method {
    bfd {
      detection-time {
        threshold milliseconds;
      }
      holddown-interval interval;
      minimum-interval milliseconds;
      minimum-receive-interval milliseconds;
      multiplier number;
      no-adaptation;
      session-mode (automatic | multihop | single-hop);
      transmit-interval {
        minimum-interval milliseconds;
        threshold milliseconds;
      }
      version (0 | 1 | automatic);
    }
  }
  overrides {
    delegated-pool pool-name;
    interface-client-limit number;
    process-inform {
      pool pool-name;
    }
    rapid-commit;
  }
}
reconfigure {
  attempts number;
  clear-on-abort;
  strict;
  timeout number;
  token token-name;
  trigger {
    radius-disconnect;
  }
}
}
service-profile service-profile-name;
Hierarchy Level  [edit system services]

Release Information  Statement introduced in Junos OS Release 10.4.

Description  Configure DHCPv6 server to provide IPv6 addresses to clients.

NOTE: SRX Series devices do not support client authentication.

Options

- duplicate-clients-on-interface—Allow duplicate clients on different interfaces in a subnet.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege

- system—To view this statement in the configuration.
- system-control—To add this statement to the configuration.

Related Documentation

- DHCP Server, Client, and Relay Agent Overview on page 423
dhcpv6-client

Supported Platforms
SRX Series, vSRX

Syntax
dhcpv6-client {
  client-ia-type {
    ia-na;
    ia-pd;
  }
  client-identifier duid-type (duid-il | duid-ilt | vendor);
  client-type (autoconfig | statefull);
  rapid-commit;
  req-option (dns-server | domain | fqdn | nis-domain | nis-server | ntp-server | sip-domain | sip-server | time-zone | vendor-spec);
  retransmission-attempt number;
  update-router-advertisement {
    interface interface-name;
  }
  update-server;
}

Hierarchy Level
[edit interfaces interface-name unit logical-unit-number family inet6]

Release Information
Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340,
SRX550M, and SRX1500 devices.

Description
Configure the Dynamic Host Configuration Protocol version 6 (DHCPv6) client.

Options
client-ia-type—Identity association type for DHCPv6 client. This statement is mandatory.
client-identifier duid-type—Identity a client by a client-identifier value. This statement is mandatory.
client-type—Identify the type of DHCPv6 client. This statement is mandatory.
rapid-commit—The use of the two-message exchange for address assignment.
req-option—Specify options requested by the DHCPv6 client.
retransmission-attempt number—Specify the number of times the device retransmits a DHCPv6 client packet if a DHCPv6 server fails to respond. After the specified number of attempts, no further attempts at reaching a server are made.
update-router-advertisement—Specify the interface used to delegate prefixes.
update-server—Propagate TCP/IP settings to the DHCPv6 server.

For detailed information about these commands, see CLI Explorer.
**disable (System Services)**

**Syntax**  
disable;

**Hierarchy Level**  
[edit system services dns dnssec]

**Description**  
Disables DNSSEC in the DNS server.

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

**Related Documentation**  
- DHCP Server, Client, and Relay Agent Overview on page 423
- Minimum DHCPv6 Client Configuration on page 494
dlv

Supported Platforms  SRX Series, vSRX

Syntax  dlv {
        domain-name domain-name trusted-anchor trusted-anchor;
    }

Hierarchy Level  [edit system services dns dnssec]

Release Information  Statement introduced in Junos OS Release 10.2.

Description  Configure DNSSEC Lookaside Validation (DLV).

Options
- domain-name domain-name—Specify the secure domain server name.
- trusted-anchor trusted-anchor—Specify the trusted DLV anchor.

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

Related Documentation
- DHCP Server, Client, and Relay Agent Overview on page 423
**dynamic-pool**

**Supported Platforms** SRX Series

**Syntax**
```
address-assignment {
    dynamic-pool <dynamic-pool> {
        family {
            inet6 {
                from-interface <interface>;
                delegated-prefix-length <network-prefix-length>;
                range <range-name> {
                    masked-low <masked-low>;
                    masked-high <masked-high>;
                    prefix-length <prefix-length>;
                }
                dhcp-attributes {
                    dns-server <address>;
                    t1-percentage <t1-percentage>;
                    t2-percentage <t2-percentage>;
                    preferred-lifetime <preferred-lifetime>;
                    valid-lifetime <valid-lifetime>;
                }
            }
        }
    }
}
```

**Hierarchy Level** [edit access]

**Release Information** Statement introduced in Junos OS Release 15.1X49-D70.

**Description** Configure the dynamic pool updated by the client running on the WAN interface.

**Options** The remaining statements are explained separately.

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

**Related Documentation**
- Configuring Address-Assignment Pools on page 450
- address-assignment (Access) on page 548
**dynamic-server**

**Supported Platforms**  
SRX Series

**Syntax**

dhcpv6 {  
dynamic-server {  
group <group> {  
neighbor-discovery-router-advertisement <ndra-pool>;  
interface <interface> {  
overrides {  
delegated-pool <delegated-pool>;  
la-na-pool <la-na-pool>;  
process-inform {  
pool <pool>;  
}  
}  
}  
}  
}

**Hierarchy Level**  
[edit system services]

**Release Information**  
Statement introduced in Junos OS Release 15.1X49-D70.

**Description**  
Configure the server running on a LAN interface.

**Options**  
The remaining statements are explained separately.

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

**Related Documentation**  
- [dhcp-local-server (System Services) on page 574](#)
- [dhcp-client on page 572](#)
excluded-address

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
excluded-address;

**Hierarchy Level**  
[edit access address assignment-address pool]

**Release Information**  
Statement introduced in Junos OS Release 15.1X49-D20.

**Description**  
Allows you to exclude select IPv4 or IPv6 addresses from a DHCP address pool. Within a configured address pool, you can specifically exclude up to 20 addresses. Junos OS will not assign these excluded addresses to any clients. If you configure an excluded address that has already been assigned to a DHCP client, that excluded address will be revoked from the client.

---

**NOTE:** Excluded addresses must match the address family of the configured address pool. For example, you cannot exclude an IPv4 address within an IPv6 address pool.

---

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

**Related Documentation**  
• address-assignment (Access) on page 548
family (Security Forwarding Options)

Supported Platforms  SRX Series, vSRX

Syntax  
```plaintext
family {
  inet6 {
    mode (drop | flow-based | packet-based);
  }
  iso {
    mode packet-based;
  }
  mpls {
    mode packet-based;
  }
}
```

Hierarchy Level  [edit security forwarding-options]

Release Information  Statement introduced in Junos OS Release 8.5.

Description  Determine the protocol family to be used for packet forwarding.

NOTE: Packet-based processing is not supported on the following SRX Series devices: SRX5400, SRX5600, and SRX5800.

Options  The remaining statements are explained separately. See CLI Explorer.

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

Related Documentation  •  MPLS Overview
file (System Logging)

Supported Platforms  M Series, MX Series, SRX Series, T Series

Syntax  
```
file filename {
  allow-duplicates;
  any (alert | any | critical | emergency | error | info | none | notice | warning);
  archive {
    archive-sites {
      url password;
    }
    (binary-data | no-binary-data);
    files number;
    size size;
    start-time start-time;
    transfer-interval transfer-interval;
    (world-readable | no-world-readable);
  }
  authorization (alert | any | critical | emergency | error | info | none | notice | warning);
  change-log (alert | any | critical | emergency | error | info | none | notice | warning);
  conflict-log (alert | any | critical | emergency | error | info | none | notice | warning);
  daemon (alert | any | critical | emergency | error | info | none | notice | warning);
  dfe (alert | any | critical | emergency | error | info | none | notice | warning);
  explicit-priority;
  external (alert | any | critical | emergency | error | info | none | notice | warning);
  firewall (alert | any | critical | emergency | error | info | none | notice | warning);
  ftp (alert | any | critical | emergency | error | info | none | notice | warning);
  interactive-commands (alert | any | critical | emergency | error | info | none | notice | warning);
  kernel (alert | any | critical | emergency | error | info | none | notice | warning);
  match "regular-expression";
  ntp (alert | any | critical | emergency | error | info | none | notice | warning);
  pfe (alert | any | critical | emergency | error | info | none | notice | warning);
  security (alert | any | critical | emergency | error | info | none | notice | warning);
  structured-data {
    brief;
  }
  user (alert | any | critical | emergency | error | info | none | notice | warning);
}
```

Hierarchy Level  [edit system syslog]

Release Information  Statement introduced before Junos OS Release 12.1X47 for SRX Series.

Description  Specify the file in which to log data.

Options  
- `filename`—Specify the name of the file in which to log data.
- `allow-duplicates`—Do not suppress the repeated messages.
- `any`—Specify all facilities information.
  - `alert`—Specify the conditions that should be corrected immediately.
• critical—Specify the critical conditions.
• emergency—Specify the conditions that cause security functions to stop.
• error—Specify the general error conditions.
• info—Specify the information about normal security operations.
• none—Do not specify any messages.
• notice—Specify the conditions that should be handled specifically.
• warning—Specify the general warning conditions.
• archive—Specify the archive file information.
  • archive-sites—Specify a list of destination URLs for the archived log files.
  • url—Specify the primary and failover URLs to receive archive files.
• binary-data—Mark file such that it contains binary data.
• no-binary-data—Do not mark the file such that it contains binary data.
• files—Specify the number of files to be archived. Range: 1 through 1000 files.
• size—Specify the size of files to be archived. Range: 65,536 through 1,073,741,824 bytes.
• world-readable—Allow any user to read the log file.
• no-world-readable—Do not allow any user to read the log file.
• start-time—Specify the start time for file transmission. Enter the start time in the yyyy-mm-dd.hh:mm format.
• transfer-interval—Specify the frequency at which to transfer the files to archive sites.
• authorization—Specify the authorization system.
• change-log—Specify the configuration change log.
• conflict-log—Specify the configuration conflict log.
• daemon—Specify the various system processes.
• dfc—Specify the dynamic flow capture.
• explicit-priority—Include the priority and facility in messages.
• external—Specify the local external applications.
• firewall—Specify the firewall filtering system.
• ftp—Specify the FTP process.
• interactive-commands—Specify the commands executed by the UI.
• kernel—Specify the kernel information.
• match—Specify the regular expression for lines to be logged.
• ntp—Specify the NTP process.
- **pfe**—Specify the Packet Forwarding Engine.
- **security**—Specify the security-related information.
- **structured-data**—Log the messages in structured log format.
  - **brief**—Omit English language text from the end of the logged message.
- **user**—Specify the user processes.
  - **info**—Specify the informational messages.

**Required Privilege Level**

- **system**—To view this statement in the configuration.
- **system-control**—To add this statement to the configuration.

**force-discover (dhcp-client)**

**Supported Platforms**

- SRX Series

**Syntax**

```
force-discover;
```

**Hierarchy Level**

```
[edit interfaces interface-name unit logical-unit-number dhcp-client force-discover]
```

**Release Information**

Statement introduced in Junos OS Release 15.1X49-D80.

**Description**

Forces the DHCP client to send a DHCP discover packet after one to three failed dhcp-request attempts. The **force-discover** option ensures that the DHCP server will assign the same or a new IP address to the client.

**Required Privilege Level**

- **interface**—To view this statement in the configuration.
- **interface-control**—To add this statement to the configuration.

**Related Documentation**

- Configuring Optional DHCP Client Attributes on page 463
- Minimum DHCP Client Configuration on page 461
forwarding-options (Security)

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
```
forwarding-options {
family {
  inet6 {
    mode (drop | flow-based | packet-based);
  }
  iso {
    mode packet-based;
  }
  mpls {
    mode packet-based;
  }
}
}
```

**Hierarchy Level**  
[edit security]

**Release Information**  
Statement introduced in Junos OS Release 8.5.

**Description**  
Determine how the inet6, iso, and mpls protocol families manage security forwarding options.

**NOTE:**
- Packet-based processing is not supported on the following SRX Series devices: SRX5400, SRX5600, and SRX5800.
- On SRX Series devices, the default mode for processing traffic is flow mode. To configure an SRX Series device as a border router, you must change the mode from flow-based processing to packet-based processing. Use the `set security forwarding-options family mpls mode packet-based` statement to configure the SRX device to packet mode. You must reboot the device for the configuration to take effect.

**Options**  
The remaining statements are explained separately. See [CLI Explorer](#).

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

**Related Documentation**  
- [MPLS Overview](#)
- [Understanding Packet-Based Processing](#)
- [Juniper Networks Devices Processing Overview](#)
**group (System Services DHCP)**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
```plaintext
group group-name {  
authentication {  
password password;  
username INCLUDE {  
circuit-type;  
client-id;  
delimiter delimiter-character;  
domain-name domain-name;  
interface-name;  
logical-system-name;  
relay-agent-interface-id;  
relay-agent-remote-id;  
relay-agent-subscriber-id;  
routing-instance-name;  
user-prefix user-prefix;  
  }
  }
dynamic-profile {  
profile-name;  
aggregate-clients {  
merge;  
replace;  
}
}
}

dynamic-profile {  
profile-name;  
aggregate-clients {  
merge;  
replace;  
}
nanos-default-profile;  
use-primary dynamic-profile;  
}

interface interface-name {  
dynamic-profile {  
profile-name;  
aggregate-clients {  
merge;  
replace;  
}
nanos-default-profile;  
use-primary dynamic-profile-name;  
}
}
exclude;
overides {  
delegated-pool pool-name;  
interface-client-limit number;  
process-inform {  
  pool pool-name;  
}
  rapid-commit ;  
}
service-profile service-profile-name  
trace ;  
upto interface-name;  
}

liveness-detection {
```
failure-action {
  clear-binding;
  clear-binding-if-interface-up;
  log-only;
}

method {
  bfd {
    detection-time {
      threshold milliseconds;
    }
    holddown-interval interval;
    minimum-interval milliseconds;
    minimum-receive-interval milliseconds;
    multiplier number;
    no-adaptation;
    session-mode (automatic | multihop | single-hop);
    transmit-interval {
      minimum-interval milliseconds;
      threshold milliseconds;
    }
    version (0 | 1 | automatic);
  }
}

overrides {
  delegated-pool pool-name;
  interface-client-limit number;
  process-inform {
    pool pool-name;
  }
  rapid-commit ;
}

reconfigure {
  attempts number;
  clear-on-abort;
  strict;
  timeout number;
  token token-name;
  trigger {
    radius-disconnect;
  }
  service-profile service-profile-name;
}

Hierarchy Level  [edit system services dhcp-local-server dhcpv6]

Release Information  Statement introduced in Junos OS Release 10.4.

Description  Configure a group of interfaces that have a common configuration.

The remaining statements are explained separately. See CLI Explorer.
Options

- `group-name`—Name of the group.

NOTE: SRX Series devices do not support DHCP client authentication.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level

- `access`—To view this statement in the configuration.
- `access-control`—To add this statement to the configuration.

Related Documentation

- DHCP Server, Client, and Relay Agent Overview on page 423
- DHCP Server Configuration Overview on page 448
**host (SSH Known Hosts)**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
```bash
host hostname {
    dsa-key dsa-key;
    ecdsa-sha2-nistp256-key ecdsa-sha2-nistp256-key;
    ecdsa-sha2-nistp384-key ecdsa-sha2-nistp384-key;
    ecdsa-sha2-nistp521-key ecdsa-sha2-nistp521-key;
    ed25519-key ed25519-key
    rsa-key rsa-key;
    rsa1-key rsa1-key;
}
```

**Hierarchy Level**  
[edit security ssh-known-hosts]

**Release Information**  
Statement modified in Junos OS Release 8.5.

**Description**  
Configure the type of base-64 encoded host key.

**Options**
- **hostname**—Name of the SSH known host.
- **dsa-key**—Digital Signature Algorithm (DSA) for SSH version 2
- **ecdsa-sha2-nistp256-key**—Elliptic Curve Digital Signature Algorithm (ECDSA)
- **ecdsa-sha2-nistp384-key**—Elliptic Curve Digital Signature Algorithm (ECDSA)
- **ecdsa-sha2-nistp521-key**—Elliptic Curve Digital Signature Algorithm (ECDSA)
- **ed25519-key**—Elliptic Curve Digital Signature Algorithm (ed25519 for ECDSA)
- **rsa-key**—RSA public key algorithm, which supports encryption and digital signatures for SSH version 1 and SSH version 2
- **rsa1-key**—RSA public key algorithm, which supports encryption and digital signatures for SSH version 1

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

**Related Documentation**
- Generating an SSL Certificate Using the openssl Command on page 356
- Generating a Self-Signed SSL Certificate on page 356
hostkey-algorithm

**Supported Platforms**  
M Series, MX Series, SRX Series, vSRX

**Syntax**  
hostkey-algorithm *(algorithm | no-algorithm)*;

**Hierarchy Level**  
[edit system services ssh]

**Release Information**  

**Description**  
Allow or disallow a host-key signature algorithm for the SSH host to use to authenticate another host.

**Options**  
*algorithm*—Allow the following host-key signature algorithms:

- ssh-ecdsa—Allow generation of an ECDSA host-key.
- ssh-dss—Allow generation of a 1024-bit DSA host-key.

---

**NOTE:** DSA keys are not supported in FIPS, so the ssh-dss option is not available on systems operating in FIPS mode.

- ssh-rsa—Allow generation of an RSA host-key.

*no-algorithm*—Do not allow the following host-key signature algorithms:

- no-ssh-dss—Do not allow generation of a 1024-bit Digital Signature Algorithm (DSA) host-key.
- no-ssh-ecdsa—Do not allow generation of an Elliptic Curve Digital Signature Algorithm (ECDSA) host-key.
- no-ssh-rsa—Do not allow generation of an RSA host-key.

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

**Related Documentation**  
- Generating an SSL Certificate Using the openssl Command on page 356
- Generating a Self-Signed SSL Certificate on page 356
idle-timeout (System)

Supported Platforms  SRX Series, vSRX

Syntax  idle-timeout idle-timeout;

Hierarchy Level  [edit system login]

Statement introduced in Junos OS Release 15.1X49-D70 for the vSRX, SRX4100, SRX4200 and SRX1500 devices.

Description  Configure the maximum time for which the C shell or CLI console session can be idle. The user (including the root user) is logged out after the expiry of idle-timeout.

Options  idle-timeout—Maximum idle time before logout.

Range: 1 through 60 minutes

Required Privilege Level  admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.
interface (System Services DHCP)

Supported Platforms  
SRX Series, vSRX

Syntax  
interface interface-name {  
exclude;  
overrides {  
   interface-client-limit number;  
}  
trace;  
upto upto-interface-name;  
}

Hierarchy Level  
[edit system services dhcp-local-server dhcpv6 group group-name]

Release Information  
Statement introduced in Junos OS Release 10.4.

Description  
Specify one or more interfaces, or a range of interfaces, that are within a specified group on which the DHCP local server is enabled. You can repeat the interface interface-name statement to specify multiple interfaces within a group, but you cannot specify the same interface in more than one group.

Options  
- interface-name—Name of the interface.
- trace—Enable tracing of the interface specified by the interface-name argument.
- upto upto-interface-name—The upper end of the range of interfaces; the lower end of the range is the interface-name entry. The interface device name of the upto-interface-name must be the same as the device name of the interface-name.

Required Privilege  
security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation  
- DHCP Server, Client, and Relay Agent Overview on page 423
- DHCP Server Configuration Overview on page 448
interfaces (ARP)

Supported Platforms  SRX Series, vSRX

Syntax  interfaces { interface-name { aging-timer minutes; } }

Hierarchy Level  [edit system arp]


Description  Specify the Address Resolution Protocol (ARP) aging timer in minutes for a logical interface.

Options  aging-timer minutes—Time between ARP updates, in minutes.

  Range: 1 through 240

  Default: 20

Required Privilege  system—To view this statement in the configuration.

  system-control—To add this statement to the configuration.

Related Documentation  • DHCP Server, Client, and Relay Agent Overview on page 423

  • DHCP Server Configuration Overview on page 448
interfaces (Security Zones)

Supported Platforms  SRX Series, vSRX

Syntax  
```
interfaces interface-name {
  host-inbound-traffic {
    protocols protocol-name {
      except;
    }
    system-services service-name {
      except;
    }
  }
}
```

Hierarchy Level  [edit security zones functional-zone management],
[edit security zones security-zone zone-name]

Release Information  Statement introduced in Junos OS Release 8.5.

Description  Specify the set of interfaces that are part of the zone.

Options  `interface-name` —Name of the interface.

The remaining statements are explained separately. See CLI Explorer.

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

Related Documentation  • Understanding Security Zones
interface-traceoptions (System Services DHCP)

Supported Platforms

SRX Series, vSRX

Syntax

interface-traceoptions {
   file {
      filename;
      files number;
      match regular-expression;
      size maximum-file-size;
      (world-readable | no-world-readable);
   }
   flag flag;
   level (all | error | info | notice | verbose | warning);
   no-remote-trace;
}

Hierarchy Level
[edit routing-instances routing-instance-name system services dhcp-local-server],
[edit system services dhcp-local-server]

Release Information
Statement introduced in Junos OS Release 10.4.

Description
Configure extended DHCP local server tracing operations that can be enabled on a specific interface or group of interfaces. You use the interface interface-name trace statement at the [edit system services group group-name] hierarchy level to enable the tracing operation on the specific interfaces.

Options

file-name—Name of the file to receive the output of the tracing operation. Enclose the name in quotation marks (" "). All files are placed in a file named jdhcpd in the directory /var/log. If you include the file statement, you must specify a filename.

files number—(Optional) Maximum number of trace files. When a trace file named trace-file reaches its maximum size, it is renamed trace-file.0, then trace-file.1, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten. If you specify a maximum number of files, you also must specify a maximum file size with the size option.

Range: 2 through 1000
Default: 3 files

flag flag—Tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags:

- all—Trace all events
- dhcpv6-packet—Trace DHCPv6 packet decoding operations.
- dhcpv6-packet-option—Trace DHCPv6 option decoding operations.
- dhcpv6-state—Trace changes in state for DHCPv6 operations.
- packet—Trace packet decoding operations
- **packet-option**—Trace DHCP option decoding operations
- **state**—Trace changes in state

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

**no-remote-trace**—Disable remote tracing.

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

**size**—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

**Syntax:** \( \text{xk} \) to specify KB, \( \text{xm} \) to specify MB, or \( \text{xg} \) to specify GB

**Range:** 10 KB through 1 GB

**Default:** 128 KB

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

---

**Required Privilege Level**

- **interface**—To view this statement in the configuration.
- **interface-control**—To add this statement to the configuration.

**Related Documentation**

- DHCP Server, Client, and Relay Agent Overview on page 423
- DHCP Server Configuration Overview on page 448
internet-options

Supported Platforms  SRX Series, vSRX

Syntax  internet-options {
    icmpv4-rate-limit {
        bucket-size seconds;
        packet-rate packet-rate;
    };
    icmpv6-rate-limit {
        bucket-size seconds;
        packet-rate packet-rate;
    };
    ipv6-duplicate-addr-detection-transmits number;
    no-path-mtu-discovery;
    no-source-quench;
    no-tcp-reset;
    no-tcp-rfc1323;
    no-tcp-rfc1323-paws;
    path-mtu-discovery;
    source-port {
        upper-limit range;
    };
    source-quench;
    tcp-drop-synfin-set;
}

Hierarchy Level  [edit system]


Description  Configure tunable options for Internet operations.

Options  
- **icmpv4-rate-limit**—Configure rate-limiting parameters for Internet Control Message Protocol version 4 (ICMPv4) messages.
  - **bucket-size seconds**—Set ICMP rate-limiting maximum bucket size in seconds.
  - **packet-rate packet-rate**—Set ICMP rate-limiting packets earned per second.

- **icmpv6-rate-limit**—Configure rate-limiting parameters for Internet Control Message Protocol version 6 (ICMPv6) messages.
  - **bucket-size seconds**—Set ICMP rate-limiting maximum bucket size in seconds.
  - **packet-rate packet-rate**—Set ICMP rate-limiting packets earned per second.

- **ipv6-duplicate-addr-detection-transmits number**—Control the number of attempts for IPv6 duplicate address detection.

- **no-path-mtu-discovery**—Do not enable path maximum transmission unit (MTU) discovery on TCP connections.
• **no-source-quench**—Do not react to incoming ICMP source quench messages.
• **no-tcp-reset**—Do not send RST TCP packets for packets sent to non-listening ports.
• **no-tcp-rfc1323**—Disable RFC 1323 TCP extensions.
• **no-tcp-rfc1323-paws**—Disable RFC 1323 Protection Against Wrapped Sequence Number extension.
• **path-mtu-discovery**—Enable path MTU discovery on TCP connections.
• **source-port**—Configure source port selection parameters.
  • **upper-limit range**—Specify upper limit of source port selection range.
• **source-quench**—React to incoming ICMP source quench messages.
• **tcp-drop-synfin-set**—Drop TCP packets that have both SYN and FIN flags.

---

### Required Privilege

**Level**

- system—To view this statement in the configuration.
- system-control—To add this statement to the configuration.

### kernel-replication (System)

#### Supported Platforms

**SRX Series, vSRX**

#### Syntax

```
kernel-replication;
```

#### Hierarchy Level

```
[edit system]
```

#### Release Information

Statement introduced in Junos OS Release 11.1.

#### Description

Configure kernel replication.

### Required Privilege

**Level**

- system—To view this statement in the configuration.
- system-control—To add this statement to the configuration.
### lease-time (dhcp-client)

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
`lease-time seconds;`

**Hierarchy Level**  
`[edit interfaces interface-name unit logical-unit-number family family dhcp-client]`

**Release Information**  
Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  
Specify the time to negotiate and exchange Dynamic Host Configuration Protocol (DHCP) information.

**Options**  
`seconds`— Request time to negotiate and exchange information.

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

**Related Documentation**  
- DHCP Server, Client, and Relay Agent Overview on page 423
location

Supported Platforms  SRX Series, vSRX

Syntax  location {
        altitude feet;
        building name;
        country -code code;
        floor number;
        hcoord horizontal-coordinate;
        lata service-area;
        latitude degrees;
        longitude degrees;
        npa-nxx number;
        postal-code postal-code;
        rack number;
        vcoord vertical-coordinate;
    }

Hierarchy Level  [edit system]

Release Information  Statement introduced in Junos OS Release 8.5.

Description  Configure the physical location of the device.

Options  •  altitude feet—Number of feet above sea level.

•  building name—Name of building. The name of the building can be 1 to 28 characters in length. If the string contains spaces, enclose it in quotation marks (" ").

•  country-code code—Two-letter country code.

•  floor number—Floor number in the building.

•  hcoord horizontal-coordinate—Belcore Horizontal Coordinate.

•  lata service-area—Long-distance service area.

•  latitude degrees—Latitude in degree format.

•  longitude degrees—Longitude in degree format.

•  npa-nxx number—First six digits of the phone number (area code and exchange).

•  postal-code postal-code—Zip code or Postal code.

•  rack number—Rack number.

•  vcoord vertical-coordinate—Belcore Vertical Coordinate.

Required Privilege Level  system—To view this statement in the configuration.

system-control—To add this statement to the configuration.
lockout-period

**Supported Platforms**  
M Series, MX Series, SRX Series, T Series

**Syntax**  
lockout-period minutes;

**Hierarchy Level**  
[edit system login retry-options]

**Release Information**  
Statement introduced in Junos OS Release 11.2.

**Description**  
Configure the amount of time before the user can attempt to log in to the router after being locked out due to the number of failed login attempts specified in the `tries-before-disconnect` statement.

**Options**  
- `minutes`—Amount of time before the user can attempt to log in after being locked out.  
  - **Default:** Off  
  - **Range:** 1 through 43200

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

**Related Documentation**  
- Limiting the Number of User Login Attempts for SSH and Telnet Sessions  
- Handling Authorization Failure on page 35  
- Example: Configuring System Retry Options on page 36  
- `retry-options`  
- `clear system login lockout` on page 673  
- `show system login lockout` on page 764
macs

Supported Platforms  MX Series, PTX Series, SRX Series, vSRX

Syntax  macs [algorithm1 algorithm2...]

Hierarchy Level  [edit system services ssh]


Description  Specify the set of message authentication code (MAC) algorithms that the SSH server can use to authenticate messages.

Options  Specify one or more of the following MAC algorithms to authenticate messages:

- hmac-md5—Hash-based MAC using Message-Digest 5 (MD5)
- hmac-md5-96—96-bits of hash-based MAC using MD5
- hmac-md5-96-etm@openssh.com—96-bits of hash-based Encrypt-then-MAC using MD5
- hmac-md5-etm@openssh.com—Hash-based Encrypt-then-MAC using MM5
- hmac-ripemd160—Hash-based MAC using RIPEMD
- hmac-ripemd160-etm@openssh.com—Hash-based Encrypt-then-MAC using RIPEMD
- hmac-sha1—Hash-based MAC using secure hash algorithm-1 (SHA-1)
- hmac-sha1-96—96-bits of hash-based MAC using SHA-1
- hmac-sha1-96-etm@openssh.com—96-bits of hash-based Encrypt-then-MAC using SHA-1
- hmac-sha1-etm@openssh.com—Hash-based Encrypt-then-MAC using SHA-1
- hmac-sha2-256—256-bits of hash-based MAC using secure hash algorithm-2 (SHA-2)
- hmac-sha2-256-etm@openssh.com—Hash-based Encrypt-then-Mac using SHA-2
- hmac-sha2-512—512-bits of hash-based MAC using SHA-2
- hmac-sha2-512-etm@openssh.com—Hash-based Encrypt-then-Mac using SHA-2
- umac-128-etm@openssh.com—Encrypt-then-MAC using UMAC-128 algorithm specified in RFC4418
- umac-128@openssh.com—UMAC-128 algorithm specified in RFC4418
- umac-64-etm@openssh.com—Encrypt-then-MAC using UMAC-64 algorithm specified in RFC4418
- umac-64@openssh.com—UMAC-64 algorithm specified in RFC4418
The `macs` configuration statement represents a set. Therefore, it must be configured as shown in the following example.

```
user@host# set system services ssh macs [hmac-md5 hmac-sha1]
```

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

### Related Documentation
- `key-exchange`
- `ciphers on page 559`

### max-pre-authentication-packets

**Supported Platforms**
- SRX Series, vSRX

**Syntax**
```
max-pre-authentication-packets value;
```

**Hierarchy Level**
```
[edit system services ssh]
```

**Release Information**
Statement introduced in Junos OS Release 12.3X48-D10.

**Description**
Define the number of pre-authentication SSH packets that the SSH server will accept prior to user authentication.

**Options**
- `value`—Maximum number of pre-authentication SSH packets that the server will accept.
  - **Range:** 20 through 2147483647.
  - **Default:** 128

**Required Privilege Level**
- admin-control—To add this statement to the configuration.

**Related Documentation**
- `ssh on page 395`
multicast-client

Supported Platforms  SRX Series

Syntax  multicast-client <address>;

Hierarchy Level  [edit system ntp]

Release Information  Statement introduced before Junos OS Release 7.4.

Description  For NTP, configure the SRX Series device to listen for multicast messages on the local network to discover other servers on the same subnet.

Options  address—(Optional) One or more IP addresses. If you specify addresses, the SRX Series device joins those multicast groups.

Default:  224.0.1.1.

Required Privilege Level  system—To view this statement in the configuration.

system-control—To add this statement to the configuration.

Related Documentation  • ntp on page 613

name-server (Access)

Syntax  name-server address

Hierarchy Level  [edit access address-assignment pool <name> family (inet | inet6) xauth-attributes]

Release Information  Statement introduced in Junos OS Release 10.4.

Description  Specify the DNS server IP address for an address-assignment pool.

Required Privilege Level  access—To view this statement in the configuration.

access-control—To add this statement to the configuration.

Related Documentation  • address-assignment (Access) on page 548
neighbor-discovery-router-advertisement (Access)

Supported Platforms  SRX Series, vSRX
Syntax  neighbor-discovery-router-advertisement ndra-pool-name;
Hierarchy Level  [edit access address-assignment]
Release Information  Statement introduced in Junos OS Release 10.4.
Description  Configure the name of the address-assignment pool used to assign the router advertisement prefix.
Options  ndra-pool-name—Name of the address assignment pool.
Required Privilege Level  access—To view this statement in the configuration.
access-control—To add this statement to the configuration.
Related Documentation

non-strict-priority-scheduling

Supported Platforms  SRX Series, vSRX
Syntax  non-strict-priority-scheduling;
Hierarchy Level  [edit class-of-service non-strict-priority-scheduling]
Release Information  Statement introduced in Junos OS Release 15.1X49-D80.

NOTE: This statement is supported only on SRX300, SRX320, SRX340, SRX345, SRX550M, SRX1500, and vSRX2.0 devices.
Description  Configure non-strict priority scheduling to avoid starvation of lower-priority queues on SRX300, SRX320, SRX340, SRX345, SRX1500, SRX550M, and vSRX 2.0 devices.
Required Privilege Level  interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.
Related Documentation  •  Example: Configuring CoS Non-Strict Priority Scheduling
## ntp

**Supported Platforms**  
SRX Series

**Syntax**

```plaintext
ntp {
  authentication-key key-number type md5 value <password>;
  boot-server <address>;
  broadcast <address> <key key-number> <routing-instance routing-instance-name> <version value> <ttl value>;
  broadcast-client;
  multicast-client <address>;
  peer address <key key-number> <version value> <prefer>;
  server address <key key-number> <version value> <prefer>;
  source-address source-address <routing-instance routing-instance-name>;
  trusted-key [key-numbers];
}
```

**Hierarchy Level**  
[edit system]

**Release Information**  
Statement introduced before Junos OS Release 7.4.

**Description**  
Configure Network Time Protocol (NTP) on the SRX Series device.

The remaining statements are explained separately.

**Required Privilege**

- **Level**  
  - system—To view this statement in the configuration.
  - system-control—To add this statement to the configuration.
outbound-ssh

Supported Platforms SRX Series, vSRX

Syntax

```
outbound-ssh {
  client client-id {
    address address {
      port port-number;
      retry number;
      timeout seconds;
    }
    device-id device-id;
    keep-alive {
      retry number;
      timeout seconds;
    }
    reconnect-strategy (in-order | sticky);
    secret password;
  }
  traceoptions {
    file filename <files number> <match regex> <size size> <world-readable | no-world-readable>
    flag flag;
    no-remote-trace;
  }
}
```

Hierarchy Level [edit system services]


Description Initiate outbound SSH connections.

Options

- **client client-id**—Defines a device-initiated connection. This value serves to uniquely identify the outbound-ssh configuration stanza. Each outbound-ssh stanza represents a single outbound SSH connection. Thus, the administrator is free to assign the client-id any meaningful unique value.

- **address address**—Specifies the IPv4 or IPv6 address or hostname of the client.

- **port port-number**—Specifies the port at which a server listens for outbound SSH connection requests.

- **retry number**—Specifies the maximum number of connection attempts a device can make to the specified IP address. The default is three attempts.

- **timeout seconds**—Specifies how long the application waits between attempts to reconnect to the specified IP address, in seconds. The default is 15 seconds.
device device-id—Identifies the device to the management client. Each time the device establishes an outbound SSH connection, it first sends an initiation sequence (device-id) to the management client.

keep-alive—Enables the device to send SSH protocol keepalive messages to the client application. The timeout statement specifies how long the device waits to receive data before sending a request for acknowledgment from the application. The default is 15 seconds. The retry statement specifies how many keepalive messages the router sends without receiving a response from the client. When that number is exceeded, the device disconnects from the application, ending the outbound SSH connection. The default is three retries.

reconnect-strategy (in-order|sticky)—Specifies how the device reconnects to the server after a connection is dropped.

  in-order—Configures the device to reconnect to the first configured server. If this server is unavailable, the device tries to connect to the next configured server. This process repeats until a connection is completed.

  sticky—Configures the device to reconnect to the server from which it disconnected.

secret password—Sends the device's public SSH host key when the device connects to the client.

services netconf—Configures the application to accept NETCONF as an available service.

Required Privilege Level

  system—To view this statement in the configuration.

  system-control—To add this statement to the configuration.

Related Documentation

  • traceoptions (Outbound SSH) on page 644

  • Configuring Outbound SSH Service on page 396
overrides (System Services DHCP)

Supported Platforms  
SRX Series, vSRX

Syntax  
overrides {  
    interface-client-limit number;  
}

Hierarchy Level  
[edit system services dhcp-local-server dhcpv6]  
[edit system services dhcp-local-server dhcpv6 group group-name]  
[edit system services dhcp-local-server dhcpv6 group group-name interface interface-name]

Release Information  
Statement introduced in Junos OS Release 10.4.

Description  
Override the default configuration settings for the extended DHCP local server. Specifying the overrides statement with no subordinate statements removes all DHCP local server overrides at that hierarchy level.

- To override global DHCP local server configuration options, include the overrides statement and its subordinate statements at the [edit system services dhcp-local-server] hierarchy level.
- To override configuration options for a named group of interfaces, include the statements at the [edit system services dhcp-local-server dhcpv6 group group-name] hierarchy level.
- To override configuration options for a specific interface within a named group of interfaces, include the statements at the [edit system services dhcp-local-server dhcpv6 group group-name interface interface-name] hierarchy level.
- Use the DHCPv6 hierarchy levels to override DHCPv6 configuration options.

Options  
interface-client-limit number—Sets the maximum number of DHCP clients per interface allowed for a specific group or for all groups. A group specification takes precedence over a global specification for the members of that group.
Range: 1 through 500,000
Default: No limit

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

Related Documentation  
• DHCP Server, Client, and Relay Agent Overview on page 423
peer (NTP)

Supported Platforms
SRX Series

Syntax
peer address <key key-number> <version value> <prefer>;

Hierarchy Level
[edit system ntp]

Release Information
Statement introduced before Junos OS Release 7.4.

Description
For NTP, configure the SRX Series device to operate in symmetric active mode with the remote system at the specified address. In this mode, the SRX Series device and the remote system can synchronize with each other. This configuration is useful in a network in which either the SRX Series device or the remote system might be a better source of time.

Options
address—Address of the remote system. You must specify an address, not a hostname.

key key-number—(Optional) All packets sent to the address include authentication fields that are encrypted using the specified key number.
Range: Any unsigned 32-bit integer

prefer—(Optional) Mark the remote system as the preferred host, which means that if all other factors are equal, this remote system is chosen for synchronization among a set of correctly operating systems.

version value—(Optional) Specify the NTP version number to be used in outgoing NTP packets.
Range: 1 through 4
Default: 4

Required Privilege
system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
• ntp on page 613
preferred-prefix-length

**Supported Platforms**  SRX Series, vSRX

**Syntax**  preferred-prefix-length preferred-prefix-length;

**Hierarchy Level**  [edit interfaces interface-name unit logical-unit-number family family dhcpv6-client prefix-delegating]

**Release Information**  Statement introduced in Junos OS Release 12.3X48-D30 and in Junos OS Release 15.1X49-D100.

**Description**  Allows you to configure DHCPv6 client preferred prefix length. If preferred-prefix-length is configured, the DHCPv6 client checks the prefix length in the ADVERTISE packet and if the check fails, a syslog is created.

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

**Related Documentation**  •  sub-prefix-length on page 636

prefix

**Supported Platforms**  SRX Series, vSRX

**Syntax**  prefix {  
host-name;  
logical-system-name;  
routing-instance-name;  
}

**Hierarchy Level**  [edit interfaces interface-name unit logical-unit-number family family dhcp-client client-identifier]

**Release Information**  Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  Specify a prefix as a client identifier.

**Required Privilege**  interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.
**profilerd**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
```  
profilerd {  
  command binary-file-path;  
  disable;  
  failover (alternate-media | other-routing-engine);  
}  
```

**Hierarchy Level**  
[edit system processes]

**Release Information**  
Statement introduced in Junos OS Release 8.5.

**Description**  
Specify the profiler process.

**Options**  
- `command binary-file-path`—Path to binary for process.
- `disable`—Disable the profiler process.
- `failover`—Configure the device to reboot if the software process fails four times within 30 seconds, and specify the software to use during the reboot.
  - `alternate-media`—Configure the device to switch to backup media that contains a version of the system if a software process fails repeatedly.
  - `other-routing-engine`—Instruct the secondary Routing Engine to take mastership if a software process fails. If this statement is configured for a process, and that process fails four times within 30 seconds, then the device reboots from the secondary Routing Engine.

**Required Privilege**  
-system—To view this statement in the configuration.
-system-control—To add this statement to the configuration.
## proxy

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
```plaintext
proxy {
    password password;
    port port-number;
    server url;
    username user-name;
}
```

**Hierarchy Level**  
[edit system]

**Release Information**  
Statement introduced in Junos OS Release 8.5.

**Description**  
Specify the proxy information for the router.

**Options**
- **password password**—Password configured in the proxy server.
- **port port number**—Proxy server port number.  
  **Range:** 0 through 65,535
- **server url**—URL or IP address of the proxy server host.
- **username username**—Username configured in the proxy server.

**Required Privilege Level**
- system—To view this statement in the configuration.
- system-control—To add this statement to the configuration.
radius-options

Supported Platforms  SRX Series

Syntax  
```radius-options {
    attributes {
        nas-ip-address nas-ip-address;
    }
    password-protocol mschap-v2;
}
```

Hierarchy Level  [edit system]

Release Information  Statement introduced in Junos OS Release 8.5. Support for network access server (NAS) IPv6 address added in Junos OS Release 12.1X47-D15 for SRX1500, SRX5400, SRX5600, and SRX5800 devices.

Description  Configure RADIUS options for the NAS-IP address for outgoing RADIUS packets and password protocol used in RADIUS packets.

Options
- **attributes**—Configure RADIUS attributes.
  - **nas-ip-address nas-ip-address**—Valid IPv4 or IPv6 address of the NAS requesting user authentication.
  - **password-protocol mschap-v2**—Protocol MS-CHAPv2, used for password authentication and password changing.

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

Related Documentation
- **radius-server on page 622**
radius-server

Supported Platforms
SRX Series

Syntax
radius-server server-address [ accounting-port port-number; max-outstanding-requests value; port port-number; retry value; secret password; source-address source-address; timeout seconds; ]

Hierarchy Level [edit system]


Description Configure RADIUS server address for subscriber access management, Layer 2 Tunnelling Protocol (L2TP), or (Point-to-Point Protocol (PPP).

To configure multiple RADIUS servers, include multiple radius-server statements. The servers are tried in order and in a round-robin fashion until a valid response is received from one of the servers or until all the configured retry limits are reached.

Options
- server-address—Address of the RADIUS server.
- accounting-port port-number—RADIUS server accounting port number.
  Range: 1 through 65,335 files
  Default: 1813
- port port-number—RADIUS server authentication port number.
  Range: 1 through 65,335 files
  Default: 1812
- retry value—Number of times that the router is allowed to attempt to contact a RADIUS server.
  Range: 1 through 10
  Default: 3
- secret password—Password to use; it can include spaces if the character string is enclosed in quotation marks.
- max-outstanding-requests value—Maximum number of outstanding requests in flight to server.
Range: 1 through 65,335 files

- source-address source-address—Valid IPv4 or IPv6 address configured on one of the router or switch interfaces.

- timeout seconds—Amount of time to wait.

  Range: 1 through 90 seconds

  Default: 3 seconds

**Required Privilege Level**

- system—To view this statement in the configuration.
- system-control—To add this statement to the configuration.

### rapid-commit

**Supported Platforms** SRX Series, vSRX

**Syntax** rapid-commit;

**Hierarchy Level** [edit interfaces interface-name unit logical-unit-number family family dhcpv6-client]

**Release Information** Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.

**Description** Used to signal the use of the two-message exchange for address assignment.

**Required Privilege Level**

- interface—To view this statement in the configuration.
- interface-control—To add this statement to the configuration.

**Related Documentation**

- DHCPv6 Client Overview on page 493
- Understanding DHCPv6 Client and Server Identification on page 491
reconfigure (System Services DHCP)

Supported Platforms SRX Series, vSRX

Syntax

reconfigure {
    attempts number;
    clear-on-abort;
    strict;
    timeout number;
    token token-name;
    trigger {
        radius-disconnect;
    }
}

Hierarchy Level [edit system services dhcp-local-server dhcpv6]
[edit system services dhcp-local-server group group-name]
[edit system services dhcp-local-server dhcpv6 group group-name]

Release Information Statement introduced in Junos OS Release 10.4.

Description Enable dynamic reconfiguration triggered by the DHCP local server of all DHCP clients or only the DHCP clients serviced by the specified group of interfaces. A group configuration takes precedence over a DHCP local server configuration.

Options

attempts number—Configure maximum number of attempts to reconfigure all DHCP clients or only the DHCP clients serviced by the specified group of interfaces before reconfiguration is considered to have failed. A group configuration takes precedence over a DHCP local server configuration.

Range: 1 through 10 attempts
Default: 8 attempts

clear-on-abort—Delete all DHCP clients or only the DHCP clients serviced by the specified group of interfaces when reconfiguration fails; that is, when the maximum number of retry attempts have been made without success. A group configuration takes precedence over a DHCP local server configuration.

strict—Configure the system to only allow packets that contain the reconfigure accept option.

timeout seconds—Configure the initial value in seconds between attempts to reconfigure all DHCP clients or only the DHCP clients serviced by the specified group of interfaces. Each successive attempts doubles the interval between attempts. For example, if the first value is 2, the first retry is attempted 2 seconds after the first attempt fails. The second retry is attempted 4 seconds after the first retry fails. The third retry is attempted 8 seconds after the second retry fails, and so on. A group configuration takes precedence over a DHCP local server configuration.

Range: 1 through 10 seconds
Default: 2 seconds

token **token-name**—Configure a plain-text token for all DHCP clients or only the clients specified by the specified group of interfaces. The default is null (empty string).

**trigger** — Specify DHCP reconfigure trigger.

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

**Related Documentation**
- DHCP Server, Client, and Relay Agent Overview on page 423
- DHCP Server Configuration Overview on page 448

**req-option**

**Supported Platforms**
SRX Series, vSRX

**Syntax**
req-option (dns-server | domain | fqdn | nis-domain | nis-server | ntp-server | sip-domain | sip-server | time-zone | vendor-spec);

**Hierarchy Level**
[edit interfaces interface-name unit logical-unit-number family family dhcpv6-client]

**Release Information**
Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.

**Description**
The configuration options requested by the DHCPv6 client.

**Options**
- **dns-server**—Specify a DNS server.
- **domain**—Specify a domain name.
- **fqdn**—Specify a fully qualified domain name.
- **nis-domain**—Specify a Network Information Service (NIS) domain.
- **nis-server**—Specify a Network Information Service (NIS) server.
- **ntp-server**—Specify a Network Time Protocol (NTP) server.
- **sip-domain**—Specify a Session Initiation Protocol (SIP) domain.
- **sip-server**—Specify a Session Initiation Protocol (SIP) server.
- **time-zone**—Specify a time zone.
- **vendor-spec**—Specify vendor specification.

**Required Privilege**
- **Level**
  - interface—To view this statement in the configuration.
  - interface-control—To add this statement to the configuration.
# retransmission-attempt (dhcp-client)

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
`retransmission-attempts number;`

**Hierarchy Level**  
`[edit interfaces interface-name unit logical-unit-number family family dhcp-client]`

**Release Information**  
Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  
Specify the number of times the device attempts to retransmit a Dynamic Host Control Protocol (DHCP) packet fallback.

**Options**  
- **number**—Number of attempts to retransmit the packet.  
  - **Range:** 0 through 6

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

**Related Documentation**  
- [Understanding DHCP Client Operation](#) on page 461  
- [Minimum DHCP Client Configuration](#) on page 461
retransmission-attempt (dhcpv6-client)

**Supported Platforms**  
SRX Series

**Syntax**  
retransmission-attempt number;

**Hierarchy Level**  
[edit interfaces interface-name unit logical-unit-number family family dhcpv6-client]

**Release Information**  
Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.

**Description**  
Specify the number of times the device retransmits a DHCPv6 client packet if a DHCPv6 server fails to respond. After the specified number of attempts, no further attempts at reaching a server are made.

**Options**  
number—Number of retransmit attempts

**Required Privilege**  
interface—to view this statement in the configuration.
interface-control—to add this statement to the configuration.

**Related Documentation**
**retransmission-interval (dhcp-client)**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
retransmission-interval seconds;

**Hierarchy Level**  
[edit interfaces interface-name unit logical-unit-number family family dhcp-client]

**Release Information**  
Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  
Specify the initial retransmission interval. Successive retransmission intervals are doubled as per RFC2131.

---

**NOTE:** Though the SRX series devices implement the exponential backoff, as described in RFC 2131, the retransmit attempt does not stop when the retransmission interval reaches 64 seconds. The packet is transmitted till the retransmission attempt is reached. For example, if you configure the retransmission-attempt to 5 and the retransmission-interval to 20, the sequence of retransmission-interval is 20, 40, 80, 160, 320.

---

**Options**  
seconds—Number of seconds before initial retransmission.

**Range:** The range is 4 through 64. The default is 4 seconds.

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

**Related Documentation**  
• Understanding DHCPv6 Client and Server Identification on page 491
root-authentication

Supported Platforms
SRX Series, vSRX

Syntax
root-authentication { encrypted-password password; load-key-file URL; plain-text-password; ssh-dsa public-key [ <from pattern-list > ]; } ssh-rsa public-key [ <from pattern-list > ]; }

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 8.5.

Description Specify authentication information for the root login.

Options
- encrypted-password password—Specify the encrypted authentication password. You must configure a password whose number of characters range from 1 through 128 characters and enclose the password in quotation marks.
- plain-text-password—The CLI prompts you for a password encrypts it, and stores the encrypted version in its user database.
- load-key-file URL—File URL containing one or more SSH keys.
- ssh-dsa public-key—SSH DSA public key string.
  - from pattern-list—Pattern list of allowed hosts.
- ssh-rsa public-key—SSH RSA public key string.
  - from pattern-list—Pattern list of allowed hosts.

Required Privilege Level system—to view this statement in the configuration.
  system-control—to add this statement to the configuration.
SCP

Supported Platforms SRX300, SRX320, SRX340, SRX345

Syntax `scp (recursive | source-path | destination-path | source-address | routing-instance);`

Release Information Statement introduced in Junos OS Release 15.1X49-D110 for SRX300, SRX320, SRX340, and SRX345 devices.

Description Initiates a secure copy (scp) connection from the Junos CLI shell.

Options
- recursive—Copy files recursively.
- source-path—(Mandatory) Specify the source file location.
- destination-path—(Mandatory) Specify the destination file location.
- source-address—(Optional) Specify the local address to use in originating the secure copy connection.
- routing-instance—(Optional) Specify the name of the routing instance for the secure copy session. Default is `inet.0`.

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

Related Documentation
- ssh on page 395

single-connection

Supported Platforms SRX Series, vSRX

Syntax `single-connection;`

Hierarchy Level
- `[edit system accounting destination tacplus server server-address]`
- `[edit system tacplus-server server-address]`

Release Information Statement introduced in Junos OS Release 8.5.

Description Optimize the attempt to connect to a TACACS+ server. Junos OS maintains one open TCP connection to the server for multiple requests rather than opening a connection for each connection attempt.

Required Privilege Level system—To view this statement in the configuration.
- system-control—To add this statement to the configuration.
server (NTP)

**Supported Platforms**
SRX Series

**Syntax**
`server address <key key-number> <version value> <prefer>;`

**Hierarchy Level**
[edit system ntp]

**Release Information**
Statement introduced before Junos OS Release 7.4.

**Description**
For NTP, configure the SRX Series device to operate in client mode with the remote system at the specified address. In this mode, the SRX Series device can be synchronized with the remote system, but the remote system can never be synchronized with the SRX Series device.

If the NTP client time drifts so that the difference in time from the NTP server exceeds 128 milliseconds, the client is automatically stepped back into synchronization. If the offset between the NTP client and server exceeds the 1000-second threshold, the client still synchronizes with the server, but it also generates a system log message noting that the threshold was exceeded.

**Options**
- **address**—Address of the remote system. You must specify an address, not a hostname.
- **key key-number**—(Optional) Use the specified key number to encrypt authentication fields in all packets sent to the specified address.
  - **Range:** Any unsigned 32-bit integer
- **prefer**—(Optional) Mark the remote system as the preferred host, which means that if all other things are equal, this remote system is chosen for synchronization among a set of correctly operating systems.
- **version value**—(Optional) Specify the version number to be used in outgoing NTP packets.
  - **Range:** 1 through 4
  - **Default:** 4

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

**Related Documentation**
- ntp on page 613
server-address (dhcp-client)

**Supported Platforms**  SRX Series, vSRX

**Syntax**  server address ip-address;

**Hierarchy Level**  [edit interfaces interface-name unit logical-unit-number family family dhcp-client]

**Release Information**  Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  Specify the preferred DHCP server address that is sent to DHCP clients.

**Options**  ip-address—DHCP server address.

**Required Privilege Level**  interface—To view this statement in the configuration.

**Related Documentation**
source-address (NTP, RADIUS, System Logging, or TACACS+)

**Supported Platforms**  
SRX Series

**Syntax**  
source-address source-address <routing-instance routing-instance-name>;

**Hierarchy Level**  
[edit system accounting destination radius server server-address],  
[edit system accounting destination tacplus server server-address],  
[edit system ntp],  
[edit system radius-server server-address],  
[edit system syslog],  
[edit system tacplus-server server-address]

**Release Information**  
Statement introduced before Junos OS Release 7.4.

**Description**  
Specify a source address for each configured TACACS+ server, RADIUS server, or NTP server, or the source address to record in system log messages that are directed to a remote machine.

**Options**  
source-address—A valid IP address configured on one of the SRX Series devices. For system logging, the address is recorded as the message source in messages sent to the remote machines specified in all host hostname statements at the [edit system syslog] hierarchy level, but not for messages directed to the other Routing Engine.

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

**Related Documentation**  
- ntp on page 613
### ssh-known-hosts

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
```bash
ssh-known-hosts {
  fetch-from-server server-name;
  host hostname {
    dsa-key dsa-key;
    ecdsa-sha2-nistp256-key ecdsa-sha2-nistp256-key;
    ecdsa-sha2-nistp384-key ecdsa-sha2-nistp384-key;
    ecdsa-sha2-nistp521-key ecdsa-sha2-nistp521-key;
    ed25519-key ed25519-key
    rsa-key rsa-key;
    rsa1-key rsa1-key;
  }
  load-key-file key-file;
}
```

**Hierarchy Level**  
[edit security]

**Release Information**  
Statement modified in Junos OS Release 8.5.

**Description**  
Configure SSH support for known hosts and for administering SSH host key updates.

**Options**
- `fetch-from-server server-name`—Retrieve SSH public host key information from a specified server.
- `load-key-file key-file`—Import SSH host-key information from the specified `/var/tmp/ssh-known-hosts` file.

The remaining statements are explained separately. See CLI Explorer.

**Required Privilege**
- `security`—To view this statement in the configuration.
- `security-control`—To add this statement to the configuration.

**Related Documentation**
**static-subscribers**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**

```
static-subscribers {
  disable;
}
```

**Hierarchy Level**  
[edit system processes]

**Release Information**  
Statement introduced in Junos OS Release 8.5.

**Description**  
Associate subscribers with statically configured interfaces, and provide dynamic service activation for these subscribers.

**Options**

- **disable**—Disable the static subscribers process.

**Required Privilege**

- system—To view this statement in the configuration.
- system-control—To add this statement to the configuration.

---

**statistics-service**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**

```
statistics-service {
  command binary-file-path;
  disable;
}
```

**Hierarchy Level**  
[edit system processes]

**Release Information**  
Statement introduced in Junos OS Release 8.5.

**Description**  
Specify the Packet Forwarding Engine (PFE) statistics service management process.

**Options**

- **command** `binary-file-path`—Path to the binary process.
- **disable**—Disable the Packet Forwarding Engine (PFE) statistics service management process.

**Required Privilege**

- system—To view this statement in the configuration.
- system-control—To add this statement to the configuration.
sub-prefix-length

Supported Platforms  SRX Series, vSRX

Syntax  sub-prefix-length sub-prefix-length;

Hierarchy Level  [edit interfaces interface-name unit logical-unit-number family family dhcpv6-client prefix-delegating]

Release Information  Statement introduced in Junos OS Release 12.3X48-D30 and in Junos OS Release 15.1X49-D100.

Description  Allows you to configure DHCPv6 client sub prefix length. The DHCPv6 client separates the delegated prefix according to sub-prefix lengths. If the delegated prefix is not enough for all interfaces, the client sends out a syslog message.

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

Related Documentation  • preferred-prefix-length on page 618
subscriber-management-helper

Supported Platforms  SRX Series, vSRX

Syntax  subscriber-management-helper {
    command binary-file-path;
    disable;
    failover (alternate-media | other-routing-engine);
}

Hierarchy Level  [edit system processes]

Release Information  Statement introduced in Junos OS Release 8.5.

Description  Specify the subscriber management helper process.

Options  
- command binary-file-path—Path to the binary process.
- disable—Disable the subscriber management helper process.
- failover—Configure the device to reboot if the software process fails four times within 30 seconds, and specify the software to use during the reboot.
  - alternate-media—Configure the device to switch to backup media that contains a version of the system if a software process fails repeatedly.
  - other-routing-engine—Instruct the secondary Routing Engine to take mastership if a software process fails. If this statement is configured for a process, and that process fails four times within 30 seconds, then the device reboots from the secondary Routing Engine.

Required Privilege Level  
- system—To view this statement in the configuration.
- system-control—To add this statement to the configuration.
**system master password**

**Supported Platforms**  
SRX Series

**Syntax**  
```
set system master-password plain-text-password
Master password: ***
Repeat master password: ***
```

**Hierarchy Level**  
system

**Release Information**  
Statement introduced in Junos OS Release 15.1X49-D50.

**Description**  
Use to set a master password in a hidden configuration within the Junos OS configuration database.

**Options**  
```
set system master-password iteration-count—(Optional) The number of iterations to use for the PBKDF2 hash function. The range is 10 through 10000. Default value is 100. High iteration counts can impact system performance on systems with many secrets.

set system master-password pseudorandom-function (hmac-sha1 | hmac-sha2-256 | hmac-sha2-512); default hmac-sha2-256—(Optional) Hash (prf) algorithm to be used for the PBKDF2 key derivation.
```

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

**Related Documentation**  
- request system decrypt password
tacplus

Supported Platforms  SRX Series, vSRX

Syntax  
```bash
  tacplus {
    server server-address {
      port port-number;
      secret password;
      single-connection;
      source-address source-address;
      timeout seconds;
    }
  }
```

Hierarchy Level  [edit system accounting destination]

Release Information  Statement introduced before Junos OS Release 7.4.

Description  Configure the TACACS+ accounting server.

Options  
- `server-address`—Specify the address of the TACACS+ authentication server.
- `port number`—Configure the port number on which to contact the TACACS+ server.
- `single-connection`—Optimize attempts to connect to a TACACS+ server. The software maintains one open TCP connection to the server for multiple requests rather than opening a connection for each connection attempt.
- `source-address address`—Configure a source address for each configured TACACS+ server.
- `timeout seconds`—Configure the amount of time that the local device waits to receive a response from a TACACS+ server.

Required Privilege  
- `system`—To view this statement in the configuration.
- `system-control`—To add this statement to the configuration.

Related Documentation  
- Example: Configuring a TACACS+ Server for System Authentication on page 344
**tacplus-options**

**Supported Platforms**
EX Series, M Series, MX Series, OCX1100, PTX Series, QFabric System, QFX Series, SRX Series, T Series

**Syntax**
```
tacplus-options {
  (exclude-cmd-attribute | no-cmd-attribute-value);
  enhanced-accounting;
  strict-authorization
  service-name service-name;
  timestamp-and-timezone;
}
```

**Hierarchy Level**
[edit system]

**Release Information**
- Statement introduced before Junos OS Release 7.4.
- Statement introduced in Junos OS Release 9.0 for EX Series switches.
- `no-cmd-attribute-value` and `exclude-cmd-attribute` options introduced in Junos OS Release 9.3.
- Statement introduced in Junos OS Release 11.1 for QFX Series.
- `timestamp-and-timezone` option introduced in Junos OS Release 12.2.

**Description**
Configure TACACS+ options for authentication and accounting.

**Options**
- `enhanced-accounting`—View the attribute values of a logged in user.
- `exclude-cmd-attribute`—Exclude the `cmd` attribute value completely from start and stop accounting records to enable logging of accounting records in the correct log file on a TACACS+ server.
- `no-cmd-attribute-value`—Set the `cmd` attribute value to an empty string in the TACACS+ accounting start and stop requests to enable logging of accounting records in the correct log file on a TACACS+ server.
- `service-name service-name`—Name of the authentication service used when you configure multiple TACACS+ servers to use the same authentication service.

**Default:** junos-exec

- `strict-authorization`—Deny login if authorization request fails. When a user is logging in, Junos OS issues two TACACS+ requests—first the authentication request followed by the authorization request. By default, when the authorization request is rejected by the TACACS+ server, Junos OS ignores this and allows full access to the user. When the `set system tacplus-options strict-authorization` statement is set, Junos OS denies access to the user even on failure of the authorization request.
timestamp-and-timezone—Include this statement if you want start time, stop time, and timezone attributes included in start/stop accounting records.

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

**Related Documentation**
- Configuring the Same Authentication Service for Multiple TACACS+ Servers on page 343
- Configuring TACACS+ System Accounting
- Junos OS Authentication Order for RADIUS, TACACS+, and Password Authentication
- enhanced-accounting
tacplus-server

Supported Platforms

EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

Syntax
tacplus-server server-address {
port port-number;
secret password;
single-connection;
source-address source-address;
timeout seconds;
}

Hierarchy Level
[edit system]

Release Information
Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description
Configure the TACACS+ server.

Options
- server-address—Address of the TACACS+ authentication server.

NOTE: Wildcard characters cannot be used in the TACACS server address or source address. This is because the TACACS server and source can accept both IPv4 and IPv6 addresses and, if you use wildcard characters for these addresses, Junos OS cannot validate mismatching server and source address families.

- port—Port number of TACACS+ authentication server.

- secret—Password to use with the RADIUS or TACACS+ server. The secret password used by the local router or switch must match that used by the server. Password to use; can include spaces included in quotation marks.

- single-connection—Optimize attempts to connect to a TACACS+ server. The software maintains one open TCP connection to the server for multiple requests rather than opening a connection for each connection attempt.

- source-address—Source address for each configured TACACS+ server, RADIUS server, NTP server, or the source address to record in system log messages that are directed to a remote machine. Configure a valid IP address on one of the device interfaces. For system logging, the address is recorded as the message source in messages sent to the remote machines specified in all host hostname statements at the [edit system syslog] hierarchy level.

- timeout—The amount of time that the local device waits to receive a response from a RADIUS or TACACS+ server. The timeout range is 1 through 90 seconds. The default is 3 seconds.
### Required Privilege
- **system**—To view this statement in the configuration.
- **system-control**—To add this statement to the configuration.

### Related Documentation
- [Example: Configuring a TACACS+ Server for System Authentication on page 344](#)
traceoptions (Outbound SSH)

Supported Platforms  
SRX Series, vSRX

Syntax  
```
traceoptions {  
  file {  
    filename ;  
    files number ;  
    match regular-expression ;  
    size maximum-file-size ;  
    (world-readable | no-world-readable) ;  
  }  
  flag flag ;  
  no-remote-trace ;  
}
```

Hierarchy Level  
```
[edit system services outbound-ssh]
```

Release Information  
Statement introduced in Junos OS Release 10.4.

Description  
Set the trace options.

Options  
- file—Configure the trace file information.
  - filename—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory `/var/log`. By default, the name of the file is the name of the process being traced.
  - files number—Maximum number of trace files. When a trace file named `trace-file` reaches its maximum size, it is renamed to `trace-file.0`, then `trace-file.1`, and so on, until the maximum number of trace files is reached. The oldest archived file is overwritten.

If you specify a maximum number of files, you also must specify a maximum file size with the `size` option and a filename.

Range: 2 through 1000 files

Default: 10 files

- match regular-expression—Refine the output to include lines that contain the regular expression.

- size maximum-file-size—Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named `trace-file` reaches this size, it is renamed `trace-file.0`. When `trace-file` again reaches its maximum size, `trace-file.0` is renamed `trace-file.1` and `trace-file` is renamed `trace-file.0`. This renaming scheme continues until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

If you specify a maximum number of files, you also must specify a maximum file size with the `size` option and a filename.
Syntax: \(x\) K to specify KB, \(x\) m to specify MB, or \(x\) g to specify GB

Range: 10 KB through 1 GB

Default: 128 KB

- **world-readable | no-world-readable**—By default, log files can be accessed only by the user who configures the tracing operation. The **world-readable** option enables any user to read the file. To explicitly set the default behavior, use the **no-world-readable** option.

- **flag**—Specify the tracing operation to perform. To specify more than one tracing operation, include multiple flag statements. You can include the following flags.
  - **all**—Trace all events.
  - **configuration**—Trace configuration events.
  - **connectivity**—Trace TCP connection handling.
  - **no-remote-trace**—Disable remote tracing.

**Related Documentation**
- Displaying Log and Trace Files

---

**trusted-key**

**Supported Platforms**
- SRX Series

**Syntax**
```
trusted-key [key-numbers];
```

**Hierarchy Level**
```
[edit system ntp]
```

**Release Information**
Statement introduced before Junos OS Release 7.4.

**Description**
For NTP, configure the keys you are allowed to use when you configure the SRX Series device to synchronize its time with other systems on the network.

**Options**
- **key-numbers**—One or more key numbers. Each key can be any 32-bit unsigned integer except 0.

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

**Related Documentation**
- ntp on page 613
**uac-service**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**

```
uac-service {
  command binary-file-path;
  disable;
  failover (alternate-media | other-routing-engine);
}
```

**Hierarchy Level**  
[edit system processes]

**Release Information**  
Statement introduced in Junos OS Release 8.5.

**Description**  
Specify the unified access control daemon process.

**Options**

- **command binary-file-path**—Path to the binary process.
- **disable**—Disable the unified access control daemon process.
- **failover**—Configure the device to reboot if the software process fails four times within 30 seconds, and specify the software to use during the reboot.
  - **alternate-media**—Configure the device to switch to backup media that contains a version of the system if a software process fails repeatedly.
  - **other-routing-engine**—Instruct the secondary Routing Engine to take mastership if a software process fails. If this statement is configured for a process, and that process fails four times within 30 seconds, then the device reboots from the secondary Routing Engine.

**Required Privilege Level**

- system—To view this statement in the configuration.
- system-control—To add this statement to the configuration.

**Related Documentation**

- Firewall User Authentication Overview
update-router-advertisement

**Supported Platforms**  SRX Series

**Syntax**  `update-router-advertisement (interface interface-name);`

**Hierarchy Level**  `[edit interfaces interface-name unit logical-unit-number family family dhcpv6-client]`

**Release Information**  Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.

**Description**  Specify the interface used to delegate prefixes.

**Options**  `interface interface-name`—Interface on which to delegate prefixes

**Required Privilege**  `interface`—To view this statement in the configuration. `interface-control`—To add this statement to the configuration.

**Related Documentation**

update-server (dhcp-client)

**Supported Platforms**  SRX Series, vSRX

**Syntax**  `update-server;`

**Hierarchy Level**  `[edit interfaces interface-name unit logical-unit-number family family dhcp-client]`

**Release Information**  Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  Propagate DHCP options to a local DHCP server.

**Required Privilege**  `interface`—To view this statement in the configuration. `interface-control`—To add this statement to the configuration.

**Related Documentation**
update-server (dhcpv6-client)

**Supported Platforms**  SRX Series

**Syntax**  
update-server;

**Hierarchy Level**  [edit interfaces interface-name unit logical-unit-number family family dhcpv6-client]

**Release Information**  Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.

**Description**  Propagate TCP/IP settings to the DHCPv6 server.

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

usb-control

**Supported Platforms**  SRX Series, vSRX

**Syntax**  
usb-control {  
   command binary-file-path;  
   disable;  
}

**Hierarchy Level**  [edit system processes]

**Release Information**  Statement introduced in Junos OS Release 8.5 for SRX300, SRX320, SRX340, SRX345, and SRX550M devices.

**Description**  Specify the universal serial bus (USB) supervise process.

**Options**  
- command *binary-file-path*—Path to the binary process.
- disable—Disable the universal serial bus (USB) supervise process.

**Required Privilege Level**  
- system—To view this statement in the configuration.
- system-control—To add this statement to the configuration.
use-interface

Supported Platforms  SRX Series, vSRX

Syntax  use-interface-description {logical|device};

Hierarchy Level  [edit interfaces interface-name unit logical-unit-number family family dhcp-client client-identifier]


Description  The description configured at the physical or logical interface level is used for client identification.

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

Related Documentation

user-id

Supported Platforms  SRX Series, vSRX

Syntax  user-id {ascii ascii hexadecimal hexadecimal};

Hierarchy Level  [edit interfaces interface-name unit logical-unit-number family family dhcp-client client-identifier]


Description  Specify an ASCII or hexadecimal user ID for the Dynamic Host Configuration Protocol (DHCP) client.

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

Related Documentation
### vendor-id

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
vendor-id vendor-id;

**Hierarchy Level**  
[edit interfaces interface-name unit logical-unit-number family family dhcp-client]

**Release Information**  
Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  
Configure a vendor class ID for the Dynamic Host Configuration Protocol (DHCP) client.

**Options**  
vendor-id—Vendor class ID.

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

**Related Documentation**  
- vpn (Forwarding Options)

### vpn (Forwarding Options)

**Syntax**  
vpn;

**Hierarchy Level**  
[edit forwarding-options helpers bootp]

**Release Information**  
Statement introduced in Junos OS Release 9.0.

**Description**  
For Dynamic Host Configuration Protocol (DHCP) or BOOTP client request forwarding, enable virtual private network (VPN) encryption for a client request to pass through a VPN tunnel.

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

**Related Documentation**  
- DHCP Server, Client, and Relay Agent Overview on page 423
**watchdog**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**
```
watchdog {
  disable;
  enable;
  timeout value;
}
```

**Hierarchy Level**  
[edit system processes]

**Release Information**  
Statement introduced in Junos OS Release 8.5.

**Description**  
Enable or disable the watchdog timer when Junos OS encounters a problem.

**Options**
- `disable`—Disable the watchdog timer.
- `enable`—Enable the watchdog timer.
- `timeout value`—Specify amount of time to wait in seconds.

  **Range:** 1 through 3600 seconds.

**Required Privilege Level**
- `system`—To view this statement in the configuration.
- `system-control`—To add this statement to the configuration.
web-management

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
```
web-management {
  disable;
  failover (alternate-media | other-routing-engine);
}
```

**Hierarchy Level**  
[edit system processes]

**Release Information**  
Statement introduced in Junos OS Release 8.5.

**Description**  
Specify the Web management process.

**Options**
- **disable**—Disable the Web management process.
- **failover**—Configure the device to reboot if the software process fails four times within 30 seconds, and specify the software to use during the reboot.
  - **alternate-media**—Configure the device to switch to backup media that contains a version of the system if a software process fails repeatedly.
  - **other-routing-engine**—Instruct the secondary Routing Engine to take mastership if a software process fails. If this statement is configured for a process, and that process fails four times within 30 seconds, then the device reboots from the secondary Routing Engine.

**Required Privilege**
- **system**—To view this statement in the configuration.
- **system-control**—To add this statement to the configuration.
web-management (System Services)

Supported Platforms
SRX Series, vSRX

Syntax
web-management {
  http {
    interfaces interface-names;
    port port;
  }
  https {
    interfaces interface-names;
    local-certificate name;
    pki-local-certificate name;
    system-generated-certificate name;
    port port;
  }
  management-url management-url;
  session {
    idle-timeout minutes;
    session-limit number;
  }
  traceoptions {
    file {
      filename;
      files number;
      match regular-expression;
      size maximum-file-size;
      (no-world-readable | world-readable);
    }
    flag flag;
    level level;
    no-remote-trace;
  }
}

Hierarchy Level
[edit system services]

Release Information
Statement introduced in Junos OS Release 9.0.
Support for https introduced for SRX5400, SRX5600, and SRX5800 devices starting
from Junos OS Release 12.1X44-D10 and on vSRX, SRX300, SRX320, SRX340, SRX345,
SRX550M, and SRX1500 devices starting from Junos OS Release 15.1X49-D40.

Description
Configure settings for HTTP or HTTPS access. HTTP access allows management of the
device using the J-Web interface. HTTPS access allows secure management of the device
using the J-Web interface. With HTTPS access, communication is encrypted between
your browser and the webservice for your device.

NOTE: On SRX340 and SRX345 devices, the factory-default configuration
has a generic HTTP configuration. To use ge and fxp0 ports as management
ports, you must use the set system services web-management http command.
The Web management HTTP and HTTPS interfaces are changed to fxp0.0 and from ge-0/0/1.0 through ge-0/0/7.0.
Options  control—Disable the SBC process.

- max-threads—Maximum simultaneous threads to handle requests.
  Range: 0 through 16

http—Configure HTTP.

- interface [value]—Interface value that accepts HTTP access.
- port number—TCP port for incoming HTTP connections.
  Range: 1 through 65,535

https—Configure HTTPS.

- interface [value]—Interface value that accept HTTP access.
- port number—TCP port for incoming HTTP connections.
  Range: 1 through 65,535
- local-certificate—X.509 certificate to use from the configuration.
- pki-local-certificate—X.509 certificate to use from the PKI local store.
- system-generated-certificate—X.509 certificate generated automatically by the system.

management url management url—URL path for Web management access.

session—Configure the Web-management session.

- idle-timeout minutes—Default timeout of Web-management sessions in minutes.
- session-limit number—Maximum number of Web-management sessions to allow.

traceoptions—Set the trace options.

- file—Configure the trace file information.
  - filename—Name of the file to receive the output of the tracing operation. Enclose the name in quotation marks. All files are placed in the directory /var/log. By default, the name of the file is the name of the process being traced.
  - files number—Maximum number of trace files. When a trace file named trace-file reaches its maximum size, it is renamed trace-file.0, then trace-file.1, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

  If you specify a maximum number of files, you also must specify a maximum file size with the size maximum file-size option.
  Range: 2 through 1000 files
Default: 10 files

- **match regular-expression** — Refine the output to include lines that contain the regular expression.
- **size maximum-file-size** — Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB).
  
  **Range:** 10 KB through 1 GB
  
  **Default:** 128 KB

  If you specify a maximum file size, you also must specify a maximum number of trace files with the **files number** option.

- **(world-readable | no-world-readable)** — By default, log files can be accessed only by the user who configures the tracing operation. The **world-readable** option enables any user to read the file. To explicitly set the default behavior, use the **no-world-readable** option.

- **flag flag** — Specify which tracing operation to perform. To specify more than one tracing operation, include multiple **flag** statements. You can include the following flags.
  
  - **all** — Trace all areas.
  - **configuration** — Trace configuration.
  - **dynamic-vpn** — Trace dynamic VPN events.
  - **init** — Trace the daemon init process.
  - **mgd** — Trace MGD requests.
  - **webauth** — Trace Web authentication requests.

- **level level** — Specify the level of debugging output.
  
  - **all** — Match all levels.
  - **error** — Match error conditions.
  - **info** — Match informational messages.
  - **notice** — Match conditions that should be handled specially.
  - **verbose** — Match verbose messages.
  - **warning** — Match warning messages.

- **no-remote-trace** — Disable remote tracing.

**Required Privilege**

- **Level**: system — To view this statement in the configuration.
- **system-control** — To add this statement to the configuration.
Related Documentation

- Firewall User Authentication Overview
- Dynamic VPN Overview
CHAPTER 21

Operational Commands

- clear dhcp client binding
- clear dhcp client statistics
- clear dhcp relay binding
- clear dhcp relay statistics
- clear dhcp server binding
- clear dhcp server statistics
- clear dhcpv6 client binding
- clear dhcpv6 client statistics
- clear dhcpv6 server binding (Local Server)
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- clear security ssh key-pair-identity
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- file archive
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• request system download abort
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• request system download pause
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• show chassis routing-engine (View)
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• show dhcp client binding
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• show dhcp server binding
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• show dhcpv6 client binding
• show dhcpv6 client statistics
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• show dhcpv6 server statistics (View)
• show firewall (View)
• show security ssh key-pair-identity
• show security tpm status
• show system autorecovery state
• show system download
• show system license (View)
• show system login lockout
• show system services dhcp client
• show system services dhcp relay-statistics
• show system snapshot media
• show system storage partitions (View SRX Series)
clear dhcp client binding

Supported Platforms  SRX Series, vSRX

Syntax  clear dhcp client binding
  [all | interface <interface-name>]
  [routing-instance <routing-instance-name>]


Description  Clear the binding state of a Dynamic Host Configuration Protocol (DHCP) client from the DHCP client table.

Options  all—(Optional) Clear the binding state for all DHCP clients.

interface <interface-name>—(Optional) Clear the binding state for DHCP clients on the specified interface.

routing-instance <routing-instance-name>—(Optional) Clear the binding state for DHCP clients on the specified routing instance. If you do not specify a routing instance, binding state is cleared for DHCP clients on the default routing instance.

Required Privilege Level  clear

Related Documentation  • show dhcp client binding on page 726

Output Fields  This command produces no output.
clear dhcp client statistics

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
`clear dhcp client statistics`  
`<all>`  
`<interface>`  
`<routing-instance>`

**Release Information**  
Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  
Clear all Dynamic Host Configuration Protocol (DHCP) client statistics.

**Options**

- **all**—(Optional) Clear all the DHCP client statistics.
- **interface**—(Optional) Clear the statistics for DHCP clients on the specified interface.
- **routing-instance** —(Optional) Clear the statistics for DHCP clients on the specified routing instance. If you do not specify a routing instance, statistics are cleared for the default routing instance.

**Required Privilege Level**  
clear

**Related Documentation**

- show dhcp client statistics on page 729

**Output Fields**  
This command produces no output.
clear dhcp relay binding

**Supported Platforms**  SRX Series, vSRX

**Syntax**
```
clear dhcp relay binding
<all | ip-address | mac-address>
<interface interface-name>
<routing-instance routing-instance-name>
```

**Release Information**  Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  Clear the binding state of a Dynamic Host Configuration Protocol (DHCP) client from the client table.

**Options**
- `all`—(Optional) Clear the binding state for all DHCP clients.
- `ip-address`—(Optional) Clear the binding state for the DHCP client, using the specified IP address.
- `mac-address`—(Optional) Clear the binding state for the DHCP client, using the specified MAC address.
- `interface interface-name`—(Optional) Clear the binding state for DHCP clients on the specified interface
- `routing-instance routing-instance-name`—(Optional) Clear the binding state for DHCP clients on the specified routing instance. If you do not specify a routing instance, the binding state is cleared for the default routing instance.

**Required Privilege**  clear

**Output Fields**  This command produces no output.

**Related Documentation**
- show dhcp relay binding on page 731
clear dhcp relay statistics

**Supported Platforms**  SRX Series, vSRX

**Syntax**  
clear dhcp relay statistics
<routing-instance routing-instance-name>

**Release Information**  Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  Clear all Dynamic Host Configuration Protocol (DHCP) relay statistics.

**Options**  
- **routing-instance routing-instance-name**—(Optional) Clear the DHCP relay statistics on the specified routing instance. If you do not specify a routing instance name, statistics are cleared for the default routing instance.

**Required Privilege Level**  clear

**Related Documentation**  
- show dhcp relay statistics on page 734

**Output Fields**  This command produces no output.
clear dhcp server binding

Supported Platforms  SRX Series, vSRX

Syntax  
```
clear dhcp server binding
<all | ip-address | mac-address>
<interface interface-name>
<routing-instance routing-instance-name>
```


Description  Clear the binding state of a Dynamic Host Configuration Protocol (DHCP) client from the client table on the DHCP local server.

Options  
- **all**—(Optional) Clear the binding state for all DHCP clients.
- **ip-address**—(Optional) Clear the binding state for the DHCP client, using the specified IP address.
- **mac-address**—(Optional) Clear the binding state for the DHCP client, using the specified MAC address.
- **interface interface-name**—(Optional) Clear the binding state for DHCP clients on the specified interface.
- **routing-instance routing-instance-name**—(Optional) Clear the binding state for DHCP clients on the specified routing instance.

Required Privilege  clear

Related Documentation  
- [show dhcp server binding on page 736](#)

Output Fields  This command produces no output.
## clear dhcp server statistics

### Supported Platforms
- SRX Series, vSRX

### Syntax
```
clear dhcp server statistics <routing-instance routing-instance-name>
```

### Release Information
Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

### Description
Clear all Dynamic Host Configuration Protocol (DHCP) local server statistics.

### Options
- **routing-instance routing-instance-name**—(Optional) Clear the statistics for DHCP clients on the specified routing instance. If you do not specify a routing instance, statistics are cleared for the default routing instance.

### Required Privilege Level
- clear

### Related Documentation
- show dhcp server statistics on page 738

### Output Fields
This command produces no output.
clear dhcpv6 client binding

Supported Platforms  SRX Series

Syntax  clear dhcpv6 client binding
       [all | interface interface-name]
       [routing-instance routing-instance-name]


Description  Clear the binding state of a Dynamic Host Configuration Protocol (DHCPv6) client from the DHCPv6 client table.

Options  all—(Optional) Clear the binding state for all DHCPv6 clients.

interface interface-name—(Optional) Clear the binding state for DHCPv6 clients on the specified interface.

routing-instance routing-instance-name—(Optional) Clear the binding state for DHCPv6 clients on the specified routing instance. If you do not specify a routing instance, the binding state is cleared for DHCPv6 clients on the default routing instance.

Required Privilege Level  clear

Related Documentation  • show dhcpv6 client binding on page 740

Output Fields  This command produces no output.
### clear dhcpv6 client statistics

**Supported Platforms** SRX Series

**Syntax**
```
clear dhcpv6 client statistics
routing-instance routing-instance-name
```

**Release Information** Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description** Clear all DHCPv6 client statistics.

**Options**
- `routing-instance routing-instance-name`—(Optional) Clear the statistics for DHCPv6 clients on the specified routing instance. If you do not specify a routing instance, statistics are cleared for the default routing instance.

**Required Privilege** clear

**Related Documentation**
- show dhcpv6 client statistics on page 742

**Output Fields** This command produces no output.
clear dhcpv6 server binding (Local Server)

**Supported Platforms**  
SRX Series

**Syntax**  
clear dhcpv6 server binding  
<all | client-id | ip-address | session-id>  
<interface interface-name>  
<routing-instance routing-instance-name>

**Release Information**  
Command introduced in Junos OS Release 10.4.

**Description**  
Clear the binding state of a DHCPv6 client from the client table on the DHCPv6 local server.

**Options**
- all—(Optional) Clear the binding state for all DHCPv6 clients.
- client-id—(Optional) Clear the binding state for the DHCPv6 client with the specified client ID (option 1).
- ip-address—(Optional) Clear the binding state for the DHCPv6 client with the specified address.
- session-id—(Optional) Clear the binding state for the DHCPv6 client with the specified session ID.
- interface interface-name—(Optional) Clear the binding state for DHCPv6 clients on the specified interface.
- routing-instance routing-instance-name—(Optional) Clear the binding state for DHCPv6 clients on the specified routing instance.

**Required Privilege Level**  
Clear

**Related Documentation**
- show dhcpv6 server binding (View) on page 744
clear dhcpv6 server statistics (Local Server)

Supported Platforms

| Syntax               | clear dhcpv6 server statistics <logical-system logical-system-name> <routing-instance routing-instance-name> |

Release Information
Command introduced in Junos OS Release 10.4.

Description
Clear all DHCPv6 local server statistics.

Options

logical-system logical-system-name—(Optional) Clear the statistics for DHCPv6 clients on the specified logical system. If you do not specify a logical system, statistics are cleared for the default logical system.

routing-instance routing-instance-name—(Optional) Clear the statistics for DHCPv6 clients on the specified routing instance. If you do not specify a routing instance, statistics are cleared for the default routing instance.

Required Privilege Level
clear

Related Documentation
• show dhcpv6 server statistics (View) on page 749
clear security ssh key-pair-identity

**Supported Platforms**  SRX Series, vSRX

**Syntax**  
clear security ssh key-pair-identity  
<all>  
<identity-name>

**Release Information**  
Command introduced in Junos OS Release 15.1X49-D70.

**Description**  
Clear private and public SSH key pair for the specified files.

**Options**  
- **all**—Clear all the key-pair files.  
- **identity-name**—Clear identity name.

**Required Privilege**  
Level  clear

**Related Documentation**  
- request security ssh key-pair-identity generate on page 690  
- show security ssh key-pair-identity on page 754

**List of Sample Output**  
clear security ssh key-pair-identity sample on page 672

**Sample Output**  
clear security ssh key-pair-identity sample

user@host> clear security ssh key-pair-identity sample  
SSH key sample was removed
clear system login lockout

**Supported Platforms**  EX Series, M Series, MX Series, PTX Series, T Series

**Syntax**  
clear system login lockout  
<all>  
<user username>

**Release Information**  Command introduced in Junos OS Release 11.2.

**Description**  Unlock the user account locked as a result of invalid login attempts.

**Options**  
all—Clear all locked user accounts.

user *username*—Clear the specified locked user account.

**Required Privilege Level**  clear

**Related Documentation**  
- lockout-period on page 608
- show system login lockout on page 764

**Output Fields**  This command produces no output.
## file archive

**Supported Platforms**  
SRX Series

**Syntax**  
`file archive destination destination source source <compress>`

**Release Information**  
Command introduced before Junos OS Release 7.4.

**Description**  
Archive, and optionally compress, one or multiple local system files as a single file, locally or at a remote location.

**Options**  
- `destination destination`—Name of the created archive. Specify the destination as a URL or filename.
- `source source`—Path of directory to archive.
- `compress`—(Optional) Compress the archived file with the GNU zip (gzip) compression utility. The compressed files have the suffix `.tgz`.

**Required Privilege Level**  
maintenance

**Related Documentation**  
- Administration Guide for Security Devices

**List of Sample Output**  
- file archive (Multiple Files) on page 674
- file archive (Single File) on page 674
- file archive (with Compression) on page 675

**Output Fields**  
When you enter this command, you are provided feedback on the status of your request.

### Sample Output

**file archive (Multiple Files)**

The following sample command archives all message files in the local directory `/var/log/messages` as the single file `messages-archive.tar`.

```
user@host> file archive source /var/log/messages* destination /var/log/messages-archive.tar
```

```
/usr/bin/tar: Removing leading / from absolute path names in the archive.
```

**file archive (Single File)**

The following sample command archives one message file in the local directory `/var/log/messages` as the single file `messages-archive.tar`.

```
user@host> file archive source /var/log/messages destination /var/log/messages-archive.tar
```

```
/usr/bin/tar: Removing leading / from absolute path names in the archive.
```

```
user@host
```
file archive (with Compression)

The following sample command archives and compresses all message files in the local directory `/var/log/messages` as the single file `messages-archive.tar`.

```
user@host> file archive compress source /var/log/messages* destination /var/log/messages-archive.tgz
/usr/bin/tar: Removing leading / from absolute path names in the archive.
```
**file checksum md5**

**Supported Platforms** SRX Series

**Syntax**  
`file checksum md5 path`

**Release Information**  
Command introduced before Junos OS Release 7.4.

**Description**  
Calculate the Message Digest 5 (MD5) checksum of a file.

**Options**  
`path`—(Optional) Path to a filename.

**Required Privilege Level**  
maintenance

**Related Documentation**  
- Administration Guide for Security Devices
- `file checksum sha1` on page 677
- `file checksum sha-256` on page 678

**List of Sample Output**  
`file checksum md5` on page 676

**Output Fields**  
When you enter this command, you are provided feedback on the status of your request.

**Sample Output**

```
file checksum md5

user@host> file checksum md5 jbundle-5.3R2.4-export-signed.tgz
MD5 (jbundle-5.3R2.4-export-signed.tgz) = 2a3b69e43f9bd4893729cc16f505a0f5
```
file checksum sha1

**Supported Platforms**  SRX Series

**Syntax**  file checksum sha1 path

**Release Information**  Command introduced in Junos OS Release 9.5.

**Description**  Calculate the Secure Hash Algorithm (SHA-1) checksum of a file.

**Options**  path — (Optional) Path to a filename.

**Required Privilege Level**  maintenance

**Related Documentation**
- Administration Guide for Security Devices
- file checksum md5 on page 676
- file checksum sha-256 on page 678

**List of Sample Output**  file checksum sha1 on page 677

**Output Fields**  When you enter this command, you are provided feedback on the status of your request.

**Sample Output**

file checksum sha1

user@host> file checksum sha1 /var/db/scripts/opscript.slax
SHA1 (/var/db/scripts/opscript.slax) = ba9e47120c7ce55cff29af73ead370e162c676
file checksum sha-256

Supported Platforms  SRX Series

Syntax  file checksum sha-256 path

Release Information  Command introduced in Junos OS Release 9.5.

Description  Calculate the Secure Hash Algorithm 2 family (SHA-256) checksum of a file.

Options  path—(Optional) Path to a filename.

Required Privilege  
Level  maintenance
view
view-configuration

Related Documentation  
- Administration Guide for Security Devices
- file checksum sha1 on page 677
- file checksum md5 on page 676

List of Sample Output  file checksum sha-256 on page 678

Output Fields  When you enter this command, you are provided feedback on the status of your request.

Sample Output

file checksum sha-256

user@host>  file checksum sha-256 /var/db/scripts/commitscript.slax

SHA256 (/var/db/scripts/commitscript.slax) =
94c2b061fb55399e15babd2529453815601a602b5c98e5c12ed929c9d343dd71
file compare

Supported Platforms  
SRX Series, vSRX

Syntax  
file compare (files from-file to-file) <context | unified> <ignore-white-space>

Release Information  
Command introduced before Junos OS Release 7.4.

Description  
Compare two local files and describe the differences between them in default, context, 
or unified output styles:

- **default**—In the first line of output, c means lines were changed between the two files, 
d means lines were deleted between the two files, and a means lines were added 
between the two files. The numbers preceding this alphabetical marker represent the 
first file, and the lines after the alphabetical marker represent the second file. A left 
angle bracket (<) in front of output lines refers to the first file. A right angle bracket (>) 
in front of output lines refers to the second file.

- **context**—The display is divided into two parts. The first part is the first file; the second 
part is the second file. Output lines preceded by an exclamation point (!) have changed. 
Additions are marked with a plus sign (+), and deletions are marked with a 
minus sign (-).

- **unified**—The display is preceded by the line number from the first and the second file 
(xx.xxx.x). Before the line number, additions to the file are marked with a plus sign (+), 
and deletions to the file are marked with a minus sign (-). The body of the output 
contains the affected lines. Changes are viewed as additions plus deletions.

Options  
files from-file—Names of files to compare.

files to-file—Names of files to compare against.

context—(Optional) Display output in context format.

ignore-white-space—(Optional) Ignore changes in the amount of white space.

unified—(Optional) Display output in unified format.

Required Privilege Level  
none

Related Documentation  
- Administration Guide for Security Devices

List of Sample Output  
file compare files on page 680
file compare files context on page 680
file compare files unified on page 680
file compare files unified ignore-white-space on page 681
Output Fields  
When you enter this command, you are provided feedback on the status of your request.

Sample Output

file compare files

user@host> file compare files /tmp/one /tmp/two  
100c100  
<             full-name "File 1";  
---  
>             full-name "File 2";  
102c102  
<             class foo; # 'foo' is not defined  
---  
>             class super-user;

file compare files context

user@host> file compare files /tmp/one /tmp/two context  
*** /tmp/one   Wed Dec  3 17:12:50 2003  
--- /tmp/two   Wed Dec  3 09:13:14 2003  
***************  
*** 97,104 ****  
}  
}  
user bill {  
!             full-name "Bill Smith";  
!             class foo; # 'foo' is not defined  
!             authentication {  
!                 encrypted-password SECRET;  
}  
--- 97,105 ----  
}  
}  
user bill {  
!             full-name "Bill Smith";  
!             uid 1089;  
!             class super-user;  
!             authentication {  
!                 encrypted-password SECRET;  
}  

file compare files unified

user@host> file compare files /tmp/one /tmp/two unified  
--- /tmp/one   Wed Dec  3 17:12:50 2003  
+++ /tmp/two   Wed Dec  3 09:13:14 2003  
@@ -97,8 +97,9 @@  
}  
}  
user bill {  
-             full-name "Bill Smith";  
-             class foo; # 'foo' is not defined  
+             full-name "Bill Smith";  
+             uid 1089;  
+             class super-user;  
             authentication {  
             encrypted-password SECRET;  
}
file compare files unified ignore-white-space

user@host> file compare files /tmp/one /tmp/two unified ignore-white-space
--- /tmp/one Wed Dec  3 09:13:10 2003
+++ /tmp/two Wed Dec  3 09:13:14 2003
@@ -99,7 +99,7 @@
  user bill {
    full-name "Bill Smith";
    uid 1089;
-   class foo; # 'foo' is not defined
+   class super-user;
     authentication {
       encrypted-password <SECRET>; # SECRET-DATA
     }
}
**file copy**

**Supported Platforms**  
SRX Series

**Syntax**  
`file copy source destination <source-address source-address>

**Release Information**  
Command introduced before Junos OS Release 7.4.

**Description**  
Copy files from one location to another location on the local device or to a location on a remote device that is reachable by the local device.

**WARNING:** The `sslv3-support` option is not available for configuration with the `set system services xnm-ssl` and `file copy` commands. SSLv3 is no longer supported or available.

You can use the `set system services xnm-ssl sslv3-support` command to enable SSLv3 for a Junos XML protocol client application to use as the protocol to connect to the Junos XML protocol server on a device, and you can use the `file copy source destination sslv3-support` command to enable the copying of files from an SSLv3 URL.

Using SSLv3 presents a potential security vulnerability, and we recommend that you not use SSLv3. For more details about this security vulnerability, go to [http://kb.juniper.net/InfoCenter/index?page=content&id=JSA10656](http://kb.juniper.net/InfoCenter/index?page=content&id=JSA10656).

**Required Privilege Level**  
maintenance

**Related Documentation**  
- Administration Guide for Security Devices

**List of Sample Output**  
- Copy a File from the Local Device to a Personal Computer on page 682
- Copy a Configuration File Between Routing Engines on page 683
- Copy a Log File Between Routing Engines on page 683
- Copy a File Using FTP on page 683
- Copy a File Using FTP and Requiring a Password on page 683
- Copy a File Using Secure Copy on page 683

**Sample Output**

The following are examples of a variety of file copy scenarios.

**Copy a File from the Local Device to a Personal Computer**

```
user@host> file copy /var/tmp/rpd.core.4 /tmp
```
Copy a Configuration File Between Routing Engines

The following sample command copies a configuration file from Routing Engine 0 to Routing Engine 1:

```bash
user@host> file copy /config/juniper.conf re0:/var/tmp/copied-juniper.conf
```

Copy a Log File Between Routing Engines

The following sample command copies a log file from Routing Engine 0 to Routing Engine 1:

```bash
user@host> file copy lcc0-re0:/var/log/chassisd lcc0-re1:/var/tmp
```

Copy a File Using FTP

To use anonymous FTP to copy a local file to a remote system:

```bash
user@host> filecopy filename ftp://hostname/filename
```

In the following example, `/config/juniper.conf` is the local file and `hostname` is the FTP server:

```bash
user@host> file copy /config/juniper.conf ftp://hostname/juniper.conf
Receiving ftp: //hostname/juniper.conf (2198 bytes): 100%
2198 bytes transferred in 0.0 seconds (2.69 MBps)
```

Copy a File Using FTP and Requiring a Password

To use FTP where you require more privacy and are prompted for a password:

```bash
root@host> file copy filename ftp://user@hostname/username
```

In the following example, `/config/juniper.conf` is the local file and `hostname` is the FTP server:

```bash
root@host> file copy /config/juniper.conf ftp://user@hostname/juniper.conf
Password for user@hostname: ******
Receiving ftp: //user@hostname/juniper.conf (2198 bytes): 100%
2198 bytes transferred in 0.0 seconds (2.69 MBps)
```

Copy a File Using Secure Copy

To use scp to copy a local file to a remote system:

```bash
root@host> file copy filename scp://user@hostname/path/filename
```

In the following example, `/config/juniper.conf` is the local file, `user` is the username, and `ssh-host` is the scp server:

```bash
root@host> file copy /config/juniper.conf scp://user@ssh-host/tmp/juniper.conf
user@ssh-host's password: ******
juniper.conf         100%
|*********************************************************************************|
2198 00:00
```
file delete

Supported Platforms  
SRX Series

Syntax  
file delete path
<purge>

Release Information  
Command introduced before Junos OS Release 7.4.

Description  
Delete a path on the device.

Options  
path—Name of the path to delete.

purge—(Optional) Overwrite regular files before deleting them.

Required Privilege
Level  
maintenance

Related Documentation  
• Administration Guide for Security Devices

List of Sample Output  
file delete on page 684

Output Fields  
When you enter this command, you are provided feedback on the status of your request.

Sample Output

file delete

user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file delete /var/tmp/snmpd.core
user@host> file list /var/tmp
dcd.core
rpd.core
file list

Supported Platforms: SRX Series

Syntax:
```
file list path
<detail | recursive>
```

Release Information:
Command introduced before Junos OS Release 7.4.

Description:
Display a list of paths on the device.

Options:
- `path`—(Optional) Display a list of paths.
- `detail | recursive`—(Optional) Display detailed output or descend recursively through the directory hierarchy, respectively.

Additional Information:
The default directory is the home directory of the user logged in to the device. To view available directories, enter a space and then a slash (/) after the `file list` command. To view files within a specific directory, include a slash followed by the directory and, optionally, subdirectory name after the `file list` command.

Required Privilege Level: maintenance

Related Documentation:
- Administration Guide for Security Devices

List of Sample Output:
file list on page 685

Output Fields:
When you enter this command, you are provided feedback on the status of your request.

Sample Output:
```
file list
```

```
user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core
```
file rename

Supported Platforms: SRX Series

Syntax: file rename source destination

Release Information: Command introduced before Junos OS Release 7.4.

Description: Rename a file on the device.

Options:
- **destination**—New name for the file.
- **source**—Original name of the file.

Required Privilege Level: maintenance

Related Documentation:
- Administration Guide for Security Devices

List of Sample Output: file rename on page 686

Output Fields:
When you enter this command, you are provided feedback on the status of your request.

Sample Output:

The following example lists the files in /var/tmp, renames one of the files, and then displays the list of files again to reveal the newly named file.

```
user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file rename /var/tmp/dcd.core /var/tmp/dcd.core.990413

user@host> file list /var/tmp
dcd.core.990413
rpd.core
snmpd.core
```
file show

Supported Platforms  SRX Series

Syntax  file show filename
<encoding (base64 | raw)>

Release Information  Command introduced before Junos OS Release 7.4.

Description  Display the contents of a file.

Options  filename—Name of a file.

encoding (base64 | raw)—(Optional) Encode file contents with base64 encoding or show raw text.

Required Privilege  maintenance

Level

Related Documentation
• Administration Guide for Security Devices

List of Sample Output  file show on page 687

Output Fields  When you enter this command, you are provided feedback on the status of your request.

Sample Output

user@host> file show /var/log/messages
Apr 13 21:00:08 romney /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:00:40 romney /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:02:48 romney last message repeated 4 times
Apr 13 21:07:04 romney last message repeated 8 times
Apr 13 21:07:13 romney /kernel: so-1/1/0: Clearing SONET alarm(s) RDI-P
Apr 13 21:07:29 romney /kernel: so-1/1/0: Asserting SONET alarm(s) RDI-P
...
request dhcp client renew

Supported Platforms  SRX Series, vSRX

Syntax  request dhcp client renew
        [all|interface <interface-name>]
        routing-instance <routing-instance-name>


Description  Initiates a renew request for the specified clients if they are in the bound state.

Options  all—Initiate renew requests for all DHCP clients. If you specify a routing instance, renew requests are initiated for all DHCP clients within that routing instance.

interface <interface-name>—Initiate renew requests for DHCP clients on the specified interface.

routing-instance <routing-instance-name>—Initiate renew requests for DHCP clients in the specified routing instance. If you do not specify a routing instance, renew requests are initiated on the default routing instance.

Required Privilege Level  view

Related Documentation  •  request dhcpv6 client renew on page 689

Output Fields  This command produces no output.
**request dhcpv6 client renew**

**Supported Platforms**  
SRX Series

**Syntax**  
request dhcpv6 client renew  
[all | interface interface-name]  
routing-instance <routing-instance-name>

**Release Information**  
Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  
Initiate a renew request for the specified DHCPv6 clients if they are in the bound state.

**Options**  
all—Initiate renew requests for all DHCPv6 clients. If you specify a routing instance, renew requests are initiated for all DHCPv6 clients within that routing instance.

interface-name interface-name—Initiate renew requests for DHCPv6 clients on the specified interface.

routing-instance routing-instance-name—Initiate renew requests for DHCPv6 clients in the specified routing instance. If you do not specify a routing instance, renew requests are initiated on the default routing instance.

**Required Privilege**  
view

**Output Fields**  
This command produces no output.
request security ssh key-pair-identity generate

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
request security ssh key-pair-identity generate <identity-name> passphrase

**Release Information**  
Command introduced in Junos OS Release 15.1X49-D70.

**Description**  
Generate the SSH private and public key pair for a specified identity. The private and public key files are stored in the /var/db directory, which is accessible through root only. Filenames are based on the `identity-name` with extensions. The files are similar to the certificate files that are stored in Junos OS.

**Options**  
- `passphrase`— An SSH identity generated with a passphrase. The passphrase is used to protect the private key file stored in the file system. This option does not allow the user to enter a weak passphrase, which ensures stronger security. A Private key is used to connect to a remote server and is never displayed or transferred between servers, even if the system is compromised.

**NOTE:** By default, the `passphrase` uses Advanced Encryption Standard (AES) 128 in cipher block chaining (CBC) mode to encrypt a private key. All generated keys are stored in the `/var/db/ssh_key` directory.

- `identity-name`—Identity name.

**Required Privilege Level**  
maintenance

**Related Documentation**  
- show security ssh key-pair-identity on page 754
- clear security ssh key-pair-identity on page 672

**List of Sample Output**  
request security ssh key-pair-identity generate on page 690

**Output Fields**  
When you enter this command, you are provided feedback on the status of your request.

**Sample Output**

```
request security ssh key-pair-identity generate sample passphrase identity-name
Created SSH key sample
```
**request security tpm master-encryption-password set**

**Supported Platforms**  
SRX300, SRX320, SRX340, SRX345

**Syntax**  
request security tpm master-encryption-password set plain-text-password

**Release Information**  
Command introduced in Junos OS Release 15.1X49-D80.

**Description**  
Use this command to set or replace the password (in plain text).

**Options**  
plain-text-password—Set or replace the password (in plain text).

**Required Privilege Level**  
maintenance

**Related Documentation**  
- show security tpm status on page 756

**List of Sample Output**  
show security tpm status on page 691

**Output Fields**  
When you enter this command, you are provided feedback on the status of your request.

**Sample Output**

```
show security tpm status

user@host> request security tpm master-encryption-password set plain-text-password
Enter new master encryption password:
Repeat new master encryption password:
Binding password with TPM
Master encryption password is bound to TPM
Encoding master password ..
Successfully encoded master password
Encrypted key-pair files
```
request system autorecovery state

Supported Platforms  SRX Series, vSRX

Syntax  request system autorecovery state (save | recover | clear)

Release Information  Command introduced in Junos OS Release 11.2 for SRX300, SRX320, SRX345, and SRX550M devices.

Description  Prepare the system for autorecovery of configuration, licenses, and disk information.

Options  

- **save**—Save the current state of the disk partitioning, configuration, and licenses for autorecovery.
  
The active Junos OS configuration is saved as the Junos rescue configuration, after which the rescue configuration, licenses, and disk partitioning information is saved for autorecovery. Autorecovery information must be initially saved using this command for the autorecovery feature to verify integrity of data on every bootup.

  **NOTE:**
  
  - Any recovery performed at a later stage will restore the data to the same state as it was when the save command was executed.
  - A fresh rescue configuration is generated when the command is executed. Any existing rescue configuration will be overwritten.


- **recover**—Recover the disk partitioning, configuration, and licenses.
  
  After autorecovery data has been saved, the integrity of saved items is always checked automatically on every bootup. The recovery command allows you to forcibly re-run the tests at any time if required.

- **clear**—Clear all saved autorecovery information.
  
  Only the autorecovery information is deleted; the original copies of the data used by the router are not affected. Clearing the autorecovery information also disables all autorecovery integrity checks performed during bootup.

Required Privilege  maintenance

Related Documentation  
- show system autorecovery state on page 757

List of Sample Output  request system autorecovery state save on page 693
Output Fields  When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system autorecovery state save

```
user@host> request system autorecovery state save
Saving config recovery information
    Saving license recovery information
    Saving bsdlabel recovery information
```

Sample Output

request system autorecovery state recover

```
user@host> request system autorecovery state recover
Configuration:
  File             Recovery Information    Integrity Check    Action / Status
  rescue.conf.gz   Saved                   Passed             None

Licenses:
  File             Recovery Information    Integrity Check    Action / Status
  JUNOS282736.lic  Saved                   Passed             None
  JUNOS282737.lic  Saved                   Failed             Recovered

BSD Labels:
  Slice            Recovery Information    Integrity Check    Action / Status
  s1               Saved                   Passed             None
  s2               Saved                   Passed             None
  s3               Saved                   Passed             None
  s4               Saved                   Passed             None
```

Sample Output

request system autorecovery state clear

```
user@host> request system autorecovery state clear
Clearing config recovery information
    Clearing license recovery information
    Clearing bsdlabel recovery information
```
request system decrypt password

**Supported Platforms**  
SRX Series

**Syntax**  
request system decrypt password

**Release Information**  
Statement introduced in Junos OS Release 15.1X49-D50.

**Description**  
Use to display plain text versions of obfuscated (\$9) or encrypted (\$8) passwords. If the password was encrypted using the new \$8\$ method, you are prompted for the master password.

**Options**  
- *decrypt*—Decrypt a \$8\$-encrypted or \$9\$-encrypted password.

**Required Privilege Level**  
system

**Output Fields**  
When you enter this command, you are provided feedback on the status of your request.

**Sample Output**

```
// Decrypting a \$9\$ password
user@host> request system decrypt password \$9\$ABC123
Plaintext password: mysecret
```

**Sample Output**

```
// Decrypting a \$8\$ password
user@host> request system decrypt password \$8\$ABC123
Master password:
Plaintext password: mysecret
(Simple passwords like "mysecret" are discouraged. This is an example only.)
```
request system download abort

Supported Platforms  EX Series, SRX Series, vSRX

Syntax  request system download abort <download-id>

Release Information  Command introduced in Junos OS Release 11.2 for SRX300, SRX320, SRX340, SRX345, and SRX550M devices.
Command introduced in Junos OS Release 13.2X50-D15 for EX Series switches.

Description  Abort a download. The download instance is stopped and cannot be resumed. Any partially downloaded file is automatically deleted to free disk space. Information regarding the download is retained and can be displayed with the show system download command until a request system download clear operation is performed.

NOTE: Only downloads in the active, paused, and error states can be aborted.

Options  download-id—(Required) The ID number of the download to be aborted.

Required Privilege Level  maintenance

Related Documentation  • request system download start on page 699
• request system download pause on page 697
• request system download resume on page 698
• request system download clear on page 696

List of Sample Output  request system download abort on page 695

Output Fields  When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system download abort

user@host> request system download abort 1
Aborted download #1
request system download clear

**Supported Platforms**  EX Series, SRX Series, vSRX

**Syntax**  request system download clear


**Description**  Delete the history of completed and aborted downloads.

**Required Privilege Level**  maintenance

**Related Documentation**
- request system download start on page 699
- request system download pause on page 697
- request system download resume on page 698
- request system download abort on page 695

**List of Sample Output**  request system download clear on page 696

**Output Fields**  When you enter this command, you are provided feedback on the status of your request.

**Sample Output**

request system download clear

```
user@host> request system download clear
Cleared information on completed and aborted downloads
```
**request system download pause**

**Supported Platforms**  EX Series, SRX Series, vSRX

**Syntax**  
```
request system download pause <download-id>
```

**Release Information**  
Command introduced in Junos OS Release 11.2 for SRX300, SRX320, SRX340, SRX345, and SRX550M devices.  
Command introduced in Junos OS Release 13.2X50-D15 for EX Series switches.

**Description**  
Suspend a particular download instance.

**NOTE:** Only downloads in the active state can be paused.

**Options**  
**download-id**—(Required) The ID number of the download to be paused.

**Required Privilege Level**  
maintenance

**Related Documentation**  
- request system download start on page 699  
- request system download resume on page 698  
- request system download abort on page 695  
- request system download clear on page 696

**List of Sample Output**  
request system download pause on page 697

**Output Fields**  
When you enter this command, you are provided feedback on the status of your request.

**Sample Output**

```
request system download pause
user@host> request system download pause 1
Paused download #1
```
**request system download resume**

**Supported Platforms**  
EX Series, SRX Series

**Syntax**  
`request system download resume download-id <max-rate>`

**Release Information**  
Command introduced in Junos OS Release 11.2 for SRX300, SRX320, SRX340, SRX345, and SRX550M devices.  
Command introduced in Junos OS Release 13.2X50-D15 for EX Series switches.

**Description**  
Resume a download that has been paused. Download instances that are not in progress because of an error or that have been explicitly paused by the user can be resumed by the user. The file will continue downloading from the point where it paused. By default, the download resumes with the same bandwidth specified with the `request system download start` command. The user can optionally specify a new (maximum) bandwidth with the `request system download resume` command.

**NOTE:** Only downloads in the paused and error states can be resumed.

**Options**

- `download-id`—(Required) The ID number of the download to be resumed.
- `max-rate`—(Optional) The maximum bandwidth for the download.

**Required Privilege Level**
maintenance

**Related Documentation**
- `request system download start` on page 699
- `request system download pause` on page 697
- `request system download abort` on page 695
- `request system download clear` on page 696

**List of Sample Output**  
`request system download resume` on page 698

**Output Fields**  
When you enter this command, you are provided feedback on the status of your request.

**Sample Output**

`request system download resume`

```
user@host> request system download resume 1
Resumed download #1
```
**request system download start**

<table>
<thead>
<tr>
<th>Supported Platforms</th>
<th>EX Series, SRX Series, vSRX</th>
</tr>
</thead>
</table>

**Syntax**  
request system download start (sftp-url | delay | identity-file | login | max-rate | passphrase | save as )

**Release Information**  
Command introduced in Junos OS Release 11.2 for SRX300, SRX320, SRX340, SRX345, and SRX550M devices.  
Command introduced in Junos OS Release 13.2X50-D15 for EX Series switches.

**Description**  
Create a download instance and identify it with a unique integer called the download ID.

**Options**

- **sftp-url**—(Required) The FTP or HTTP URL location of the file to be downloaded securely.
- **delay**—(Optional) The number of hours after which the download should start (range from 1 through 48 hours).
- **identity-file**—(Required) The name of the file requesting a Secure FTP (SFTP) download. The SFTP in smart download leverages public key authentication to authenticate a download request. Users need to generate a private or public key pair before starting a download, and then upload a public key to an SFTP server.
- **login**—(Optional) The username and password for the server in the format username:password.
- **max-rate**—(Optional) The maximum average bandwidth for the download. Numbers with the suffix k or K, m or M, and g or G are interpreted as Kbps, Mbps, or Gbps, respectively.
- **passphrase**—(Required) The passphrase to protect the private key file stored on the file system. This option does not allow the user to enter a weak passphrase, which ensures stronger security.
- **save-as**—(Optional) The filename to be used for saving the file in the /var/tmp location.

**Required Privilege Level**  
maintenance

**Related Documentation**
- request system download pause on page 697
- request system download resume on page 698
- request system download abort on page 695
- request system download clear on page 696

**List of Sample Output**
- request system download start on page 700
Output Fields  When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system download start
user@host> request system download start identity-file mytestkey
sftp://mysftpserver/homes/kelly/test.tgz max-rate 200 save as newfile.tgz
Starting download #8
request system firmware upgrade

Supported Platforms  MX2010, MX2020, MX240, MX480, MX960, SRX Series, vSRX

Syntax  request system firmware upgrade

Release Information  Command introduced in Junos OS Release 10.2.

Description  Upgrade firmware on a system.

Options  
- fpc—Upgrade FPC ROM monitor.
- pic—Upgrade PIC firmware.
- re—Upgrade baseboard BIOS/FPGA. There is an active BIOS image and a backup BIOS image.
  - bios—(Optional) Upgrade BIOS.
  - fpga—(Optional) Upgrade baseboard FPGA.
  - ssd—(Optional) Upgrade Routing Engine solid-state drive (SSD) firmware.
    - disk1—Upgrade SSD disk1 firmware.
    - disk2—Upgrade SSD disk2 firmware.

NOTE: Starting in Junos OS Release 17.2R1, you can upgrade the SSD firmware on MX Series routers with the RE-S-X6-64G and RE-MX2K-X8-64G Routing Engines.

- vcpu—Upgrade VCPU ROM monitor.

Required Privilege Level  maintenance

Related Documentation  
- request system license update on page 703

List of Sample Output  request system firmware upgrade on page 702

Output Fields  When you enter this command, you are provided feedback on the status of your request.
Sample Output

request system firmware upgrade

user@host> request system firmware upgrade re bios
Part           Type           Tag Current     Available Status
Routing Engine 0 RE BIOS  0 1.5       1.9       OK
Routing Engine 0 RE BIOS Backup 1 1.7       1.9       OK
Perform indicated firmware upgrade ? [yes,no] (no) yes

user@host> request system firmware upgrade re bios backup
Part           Type           Tag Current     Available Status
Routing Engine 0 RE BIOS  0 1.5       1.9       OK
Routing Engine 0 RE BIOS Backup 1 1.7       1.9       OK
Perform indicated firmware upgrade ? [yes,no] (no) yes

user@host> request system firmware upgrade re ssd disk1
Part       Type       Tag Current     Available Status
Routing Engine 0 RE SSD1  4 12028     12029        OK
Perform indicated firmware upgrade ? [yes,no] (no) yes

Firmware upgrade initiated, use "show system firmware" to monitor status.
request system license update

Supported Platforms   ACX Series, EX Series, MX Series, PTX Series, QFX Series, SRX Series, vSRX

Syntax  request system license update

Release Information  Command introduced in Junos OS Release 9.5.

Description  If your device supports initial install from the EMS server in Products Supporting Juniper Agile Licensing, you can use this command to install all licenses from the EMS server. You can also autoupdate license keys from the LMS or EMS server.

NOTE: The request system license update command always uses the default Juniper license server:

- For Juniper Agile Licensing (JAL) keys: https://license.juniper.net/
- For non-JAL keys: https://ae1.juniper.net

Options

- trial—(For non-Juniper Agile Licensing keys only) Immediately updates trial license keys from the LMS server.

Required Privilege Level  maintenance

Related Documentation

- Example: Configuring a Proxy Server for License Updates

List of Sample Output  request system license update on page 703
request system license update trial on page 703

Output Fields  When you enter this command, you are provided feedback on the status of your request.

Sample Output

request system license update

user@host> request system license update

Trying to update license keys from https://ae1.juniper.net has been sent, use show system license to check status.

request system license update trial

user@host> request system license update trial
Request to automatically update trial license keys from https://ael.juniper.net has been sent, use show system license to check status.
request system power-off fpc

Supported Platforms  
SRX Series

Syntax  
request system (halt | power-off | reboot) power-off fpc

Release Information  
Command introduced in Junos OS Release 11.4.

Description  
Bring Flexible PIC Concentrators (FPCs) offline before Routing Engines are shut down.

Options  
- **halt**—Bring FPC offline and then halt the system.
- **power-off**—Bring FPC offline and then power off the system.
- **reboot**—Bring FPC offline and then reboot the system.

Required Privilege  
Level maintenance

Related Documentation  
- request system reboot on page 712

List of Sample Output  
- request system halt power-off fpc on page 705
- request system power-off power-off fpc on page 705
- request system reboot power-off fpc on page 705

Output Fields  
When you enter this command, you are provided feedback on the status of your request.

Sample Output

**request system halt power-off fpc**

user@host> request system halt power-off fpc
Halt the system ? [yes,no] (no) yes

Offline fpc slot 0

**request system power-off power-off fpc**

user@host> request system power-off power-off fpc
Power off the system ? [yes,no] (no) yes

Offline fpc slot 0

**request system reboot power-off fpc**

user@host> request system reboot power-off fpc
Reboot the system ? [yes,no] (no) yes

Offline fpc slot 0
**request system services dhcp**

<table>
<thead>
<tr>
<th>Supported Platforms</th>
<th>SRX Series, vSRX</th>
</tr>
</thead>
</table>

**Syntax**

```
request system services dhcp (release interface-name | renew interface-name)
```

**Release Information**

Command introduced in Junos OS Release 8.5.

**Description**

Release or renew the acquired IP address for a specific interface.

To view the status of the Dynamic Host Configuration Protocol (DHCP) clients on the specified interfaces, enter the `show system services dhcp client interface-name` command.

**Options**

- `release interface-name` — Clears other resources received earlier from the server, and reinitializes the client state to INIT for the particular interface.

- `renew interface-name` — Reacquires an IP address from the server for the interface. When you use this option, the command sends a discover message if the client state is INIT and a renew request message if the client state is BOUND. For all other states it performs no action.

**Required Privilege Level**

maintenance

**Related Documentation**

- `dhcp`

  - show system services dhcp client on page 765

**Output Fields**

This command produces no output.
**request system snapshot (Maintenance)**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
```bash
request system snapshot
<factory>
<media (compact-flash | hard-disk | internal | usb)>
<node (all | local | node-id | primary)>
<partition>
<slice (alternate) >
```

**Release Information**  
Command introduced in Junos OS Release 10.2.

**Description**  
Back up the currently running and active file system partitions on the device.

**Options**

- **factory**— (Optional) Specifies that only the files shipped from the factory are included in the snapshot.
- **media**— (Optional) Specify the media to be included in the snapshot:
  - **compact-flash**—Copy the snapshot to the CompactFlash card.
  - **hard-disk**—Copy the snapshot to the hard disk.
  - **usb**—Copy the snapshot to the USB storage device.
  - **internal**—Copies the snapshot to internal media. This is the default.

<table>
<thead>
<tr>
<th>NOTE: USB option is available on all SRX series devices; hard disk and compact-flash options are available only on SRX5800, SRX5600, and SRX5400 devices; media internal option is available only on SRX300, SRX320, SRX340, SRX345, and SRX550M devices.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>external</strong>—Copies the snapshot to an external storage device. This option is available for the compact flash on the SRX650 Services Gateway.</td>
</tr>
<tr>
<td><strong>node</strong>—(Optional) Specify the archive data and executable areas of a specific node.</td>
</tr>
<tr>
<td><strong>node-id</strong>—Specify for node (0, 1).</td>
</tr>
<tr>
<td><strong>all</strong>—Specify for all nodes.</td>
</tr>
<tr>
<td><strong>local</strong>—Specify for local nodes.</td>
</tr>
<tr>
<td><strong>primary</strong>—Specify for primary nodes.</td>
</tr>
<tr>
<td><strong>partition</strong>—(Default) Specify that the target media should be repartitioned before the backup is saved to it.</td>
</tr>
</tbody>
</table>
NOTE: The target media is partitioned whether or not it is specified in the command, because this is a mandatory option.

Example: request system snapshot media usb partition

Example: request system snapshot media usb partition factory

- slice—(Optional) Take a snapshot of the root partition the system has currently booted from to another slice in the same media.
- alternate—(Optional) Store the snapshot on the other root partition in the system.

NOTE: The slice option cannot be used along with the other request system snapshot options, because the options are mutually exclusive. If you use the factory, media, or partition option, you cannot use the slice option; if you use the slice option, you cannot use any of the other options.

Required Privilege
Level maintenance

Related Documentation
- Backing Up the Current Installation (SRX Series Devices)

List of Sample Output
request system snapshot media hard-disk on page 708
request system snapshot media usb (when usb device is missing on page 708
request system snapshot media compact-flash on page 709
request system snapshot partition on page 709

Output Fields
When you enter this command, you are provided feedback on the status of your request.

Sample Output
request system snapshot media hard-disk

user@host> request system snapshot media hard-disk
Verifying compatibility of destination media partitions...
Running newfs (880MB) on hard-disk media / partition (ad2s1a)...
Running newfs (98MB) on hard-disk media /config partition (ad2s1e)...
Copying '/dev/ad0s1a' to '/dev/ad2s1a' .. (this may take a few minutes)
...

request system snapshot media usb (when usb device is missing

user@host> request system snapshot media usb
Verifying compatibility of destination media partitions...
Running newfs (254MB) on usb media / partition (dals1a)...
Running newfs (47MB) on usb media /config partition (dals1e)...

Copying '/dev/da0s2a' to '/dev/da1s1a' .. (this may take a few minutes)
Copying '/dev/da0s2e' to '/dev/da1s1e' .. (this may take a few minutes)
The following filesystems were archived: / /config

request system snapshot media compact-flash

user@host> request system snapshot media compact-flash
error: cannot snapshot to current boot device

request system snapshot partition

user@host> request system snapshot partition
Verifying compatibility of destination media partitions...
Running newfs (439MB) on internal media / partition (da0s1a)...
Running newfs (46MB) on internal media /config partition (da0s1e)...
Copying '/dev/da1s1a' to '/dev/da0s1a' .. (this may take a few minutes)
Copying '/dev/da1s1e' to '/dev/da0s1e' .. (this may take a few minutes)
The following filesystems were archived: / /config
**request system software abort in-service-upgrade (ICU)**

**Supported Platforms**  
MX Series, SRX Series, vSRX

**Syntax**  
request system software abort in-service-upgrade

**Release Information**  
Command introduced in Junos OS Release 11.2 for SRX300, SRX320, SRX340, SRX345, and SRX550M devices.

**Description**  
Abort an in-band cluster upgrade (ICU). This command must be issued from a router session other than the one on which you issued the `request system in-service-upgrade` command that launched the ICU. If an ICU is in progress, this command aborts it. If the node is being upgraded, this command will cancel the upgrade. The command is also helpful in recovering the node in case of a failed ICU.

**NOTE:** We recommend that you use the command only when there is an issue with the ongoing session of ISSU. You may need to manually intervene to bring the system to sane state if after issuing the command the system does not recover from the abort.

**Options**  
This command has no options.

**Required Privilege Level**  
view

**Related Documentation**  
- `request system software in-service-upgrade` (Maintenance)

**List of Sample Output**  
request system software abort in-service-upgrade on page 710

**Output Fields**  
When you enter this command, you are provided feedback on the status of your request.

**Sample Output**

```bash
user@host> request system software abort in-service-upgrade
In-Service-Upgrade aborted
```
**request system software add (Maintenance)**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
`request system software add package-name`

**Release Information**  
Partition option introduced in the command in Junos OS Release 10.1.

**Description**  
Install the new software package on the device, for example:  
`request system software add junos-srxsme-10.0R2-domestic.tgz no-copy no-validate partition reboot`.

**Options**

- **delay-restart**—Install the software package but does not restart the software process.
- **best-effort-load**—Activate a partial load and treat parsing errors as warnings instead of errors.
- **no-copy**—Install the software package but does not saves the copies of package files.
- **no-validate**—Do not check the compatibility with current configuration before installation starts.
- **partition**—Format and re-partition the media before installation.
- **reboot**—Reboot the device after installation is completed.
- **unlink**—Remove the software package after successful installation.
- **validate**—Check the compatibility with current configuration before installation starts.

**Required Privilege Level**  
maintenance

**Related Documentation**

- request system reboot on page 712
request system reboot

Supported Platforms  
SRX Series, vSRX

Syntax  
request system reboot <at time> <in minutes> <media> <message “text”>

Release Information  
Command introduced in Junos OS Release 10.1.  
Command hypervisor option introduced in Junos OS Release 15.1X49-D10 for vSRX.  
Command introduced in Junos OS Release 15.1X49-D50 for SRX1500 devices.

Description  
Reboot the software.

Options  
• at time (Optional) — Specify the time at which to reboot the device. You can specify time in one of the following ways:  
  • now — Reboot the device immediately. This is the default.  
  • +minutes — Reboot the device in the number of minutes from now that you specify.  
  • yymmdhhmm — Reboot the device at the absolute time on the date you specify. Enter the year, month, day, hour (in 24-hour format), and minute.  
  • hh:mm — Reboot the device at the absolute time you specify, on the current day. Enter the time in 24-hour format, using a colon (:) to separate hours from minutes.  
  • in minutes (Optional) — Specify the number of minutes from now to reboot the device. This option is a synonym for the at +minutes option  
• media type (Optional) — Specify the boot device to boot the device from:  
  • disk/internal — Reboot from the internal media. This is the default.  
  • usb — Reboot from the USB storage device.  
  • compact flash — Reboot from the external CompactFlash card.

NOTE: The media command option is not available on vSRX.

• message “text” (Optional) — Provide a message to display to all system users before the device reboots.

Example: request system reboot at 5 in 50 media internal message stop

Required Privilege Level  
maintenance

Related Documentation  
• request system software rollback (SRX Series) on page 713
request system software rollback (SRX Series)

- **Supported Platforms**: SRX Series, vSRX

- **Syntax**: `request system software rollback <node-id>`


- **Description**: Revert to the software that was loaded at the last successful `request system software add` command.

- **Options**: `node-id`—Identification number of the chassis cluster node. It can be 0 or 1.

- **Required Privilege Level**: maintenance

- **Related Documentation**: request system reboot on page 712
**request system zeroize**

**Supported Platforms**  
SRX Series

**Syntax**  
request system zeroize <media>

**Description**  
Erases all configuration information and resets all key values. The command removes all data files, including customized configuration and log files, by unlinking the files from their directories.

The command removes all user-created files from the system including all plain-text passwords, secrets, and private keys for SSH, local encryption, local authentication, IPsec, RADIUS, TACACS+, and SNMP.

This command reboots the device and sets it to the factory default configuration. After the reboot, you cannot access the device through the management Ethernet interface. Log in through the console as root and start the Junos OS CLI by typing cli at the prompt.

**Options**  
media—(Optional) In addition to removing all configuration and log files, the media option causes memory and the media to be scrubbed, removing all traces of any user-created files. Every storage device attached to the system is scrubbed, including disks, flash drives, removable USBs, and the like. The duration of the scrubbing process is dependent on the size of the media being erased. As a result, the request system zeroize media operation can take considerably more time than the request system zeroize operation. However, the critical security parameters are all removed at the beginning of the process.

**NOTE:** The media option is not supported on SRX5000 line devices.

**Required Privilege Level**  
Not applicable.

**Related Documentation**  
- request system reboot on page 712
- request system software rollback (SRX Series) on page 713

**List of Sample Output**  
request system zeroize on page 714

**Sample Output**  
request system zeroize

user@host> request system zeroize  
warning: System will be rebooted and may not boot without configuration  
Erase all data, including configuration and log files? [yes,no] (no) yes
warning: zeroizing re0

Loading /boot/loader Consoles: serial port
BIOS driver C: is disk0
BIOS 607kB/2087552kB available memory

FreeBSD/i386 bootstrap loader, Revision 1.1
(builder@youcompany.com, Mon Mar 28 20:49:26 UTC 2011)
Loading /boot/defaults/loader.config
/kernel text=0x837a60 data=0x46a78+0x9d44c syms=[0x4+0x8f38+0x4+0xcalee]

Hit [Enter] to boot immediately, or space bar for command prompt.
Booting [/kernel]...
platform_early_bootinit: MAG Series Early Boot Initialiaization
GDB: debug ports: sio
GDB: current port: sio
KDB: debugger backends: ddb gdb
KDB: current backend: ddb
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...
output truncated
# restart (Reset)

**Supported Platforms**  
SRX Series, vSRX

**Syntax**
```
restart
```

- `<application-identification>`—(Optional) Restart the process that identifies an application using intrusion detection and prevention (IDP) to allow or deny traffic based on applications running on standard or nonstandard ports.
- `<application-security>`—(Optional) Restart the application security process.
- `<audit-process>`—(Optional) Restart the RADIUS accounting process that gathers statistical data that can be used for general network monitoring, for analyzing and tracking usage patterns, and for billing a user based upon the amount of time used or the type of services accessed.
- `<chassis-control>`—(Optional) Restart the chassis management process.
- `<class-of-service>`—(Optional) Restart the class-of-service (CoS) process, which controls the router's or switch's CoS configuration.
- `<commitd-service>`—(Optional) Restart the committed services.
- `<database-replication>`—(Optional) Restart the database replication process.

**Release Information**  
Command introduced before Junos OS Release 9.2

**Description**  
Restart a Junos OS process.

---

**CAUTION:** Never restart a software process unless instructed to do so by a customer support engineer. A restart might cause the router to drop calls and interrupt transmission, resulting in possible loss of data.

---

**Options**
- `<application-identification>`—(Optional) Restart the process that identifies an application using intrusion detection and prevention (IDP) to allow or deny traffic based on applications running on standard or nonstandard ports.
- `<application-security>`—(Optional) Restart the application security process.
- `<audit-process>`—(Optional) Restart the RADIUS accounting process that gathers statistical data that can be used for general network monitoring, for analyzing and tracking usage patterns, and for billing a user based upon the amount of time used or the type of services accessed.
- `<chassis-control>`—(Optional) Restart the chassis management process.
- `<class-of-service>`—(Optional) Restart the class-of-service (CoS) process, which controls the router's or switch's CoS configuration.
- `<commitd-service>`—(Optional) Restart the committed services.
- `<database-replication>`—(Optional) Restart the database replication process.
• datapath-trace-service—(Optional) Restart the packet path tracing process.
• ddns—(Optional) Restart the dynamic domain name system, which dynamically updates IP addresses for registered domain names.
• dhcp—(Optional) Restart the software process for a Dynamic Host Configuration Protocol (DHCP) server. A DHCP server allocates network IP addresses and delivers configuration settings to client hosts without user intervention.
• dhcp-service—(Optional) Restart the Dynamic Host Configuration Protocol process.
• disk-monitoring—(Optional) Restart disk monitoring, which checks the health of the hard disk drive on the Routing Engine.
• dynamic-flow-capture—(Optional) Restart the dynamic flow capture (DFC) process, which controls DFC configurations on PIC3 monitoring services cards.
• ethernet-connectivity-fault-management—(Optional) Restart the process that provides IEEE 802.1ag Operation, Administration, and Maintenance (OAM) connectivity fault management (CFM) database information for CFM maintenance association end points (MEPs) in a CFM session.
• ethernet-link-fault-management—(Optional) Restart the process that provides the OAM link fault management (LFM) information for Ethernet interfaces.
• event-processing—(Optional) Restart the event process (eventd).
• extensible-subscriber-services—(Optional) Restart the extensible subscriber services process.
• fipsd—(Optional) Restart the fipsd services.
• firewall—(Optional) Restart the firewall management process, which manages the firewall configuration and accepts or rejects packets that are transiting an interface on a router or switch.
• firewall-authentication-service—(Optional) Restart the firewall authentication service process.
• general-authentication-service—(Optional) Restart the general authentication process.
• gprs-process—(Optional) Restart the General Packet Radio Service (GPRS) process.
• gracefully—(Optional) Restart the software process.
• idp-policy—(Optional) Restart the intrusion detection and prevention (IDP) protocol process.
• immediately—(Optional) Immediately restart the software process.
• interface-control—(Optional) Restart the interface process, which controls the router's or switch's physical interface devices and logical interfaces.
• ipmi—(Optional) Restart the intelligent platform management interface process.
• ipsec-key-management—(Optional) Restart the IPsec key management process.
• jflow-service—(Optional) Restart jflow service process.
• jnu-management—(Optional) Restart jnu management process.
- jnx-wmicd-service—(Optional) Restart jnx wmicd service process.
- jsrp-service—(Optional) Restart the Juniper Services Redundancy Protocol (jsrdp) process, which controls chassis clustering.
- kernel-replication—(Optional) Restart the kernel replication process, which replicates the state of the backup Routing Engine when graceful Routing Engine switchover (GRES) is configured.
- lacp—(Optional) Restart the Link Aggregation Control Protocol (LACP) process. LACP provides a standardized means for exchanging information between partner systems on a link. The LACP process allows link aggregation control instances to reach agreement on the identity of the LAG to which a link belongs, moves the link to that LAG, and enables the transmission and reception processes for the link to function in an orderly manner.
- l2cpd-service—(SRX5400, SRX5600, and SRX5800 devices only) (Optional) Restart the Layer 2 Control Protocol (L2CP) process, which enables features such as L2 protocol tunneling and nonstop bridging.
- l2-learning—(Optional) Restart the Layer 2 (L2) address flooding and learning process.
- license-service—(Optional) Restart the feature license management process.
- logical-system-service—(Optional) Restart the logical system service process.
- mib-process—(Optional) Restart the MIB version II process, which provides the router’s MIB II agent.
- mountd-service—(Optional) Restart the service for Network File System (NFS) mount requests.
- named-service—(Optional) Restart the DNS Server process, which is used by a router or a switch to resolve hostnames into addresses.
- network-security—(Optional) Restart the network security process.
- network-security-trace—(Optional) Restart the network security trace process.
- nfsd-service—(Optional) Restart the remote NFS server process, which provides remote file access for applications that need NFS-based transport.
- ntpd-service—(Optional) Restart the Network Time Protocol (NTP) process.
- pgm—(Optional) Restart the process that implements the Pragmatic General Multicast (PGM) protocol for assisting in the reliable delivery of multicast packets.
- pic-services-logging—(Optional) Restart the logging process for some PICs. With this process, also known as fsad (the file system access daemon), PICs send special logging information to the Routing Engine for archiving on the hard disk.
- pki-service—(Optional) Restart the public key infrastructure (PKI) service process.
- profilerd—(Optional) Restart the profiler process.
- remote-operations—(Optional) Restart the remote operations process, which provides the ping and traceroute MIBs.
- rest-api—(Optional) Restart the rest api process.
- `routing`—(Optional) Restart the routing protocol process (rpd).
- `sampling`—(Optional) Restart the sampling process, which performs packet sampling based on particular input interfaces and various fields in the packet header.
- `sampling-route-record`—(Optional) Restart the sampling route record process.
- `scc-chassisd`—(Optional) Restart the scc chassisd process.
- `secure-neighbor-discovery`—(Optional) Restart the secure Neighbor Discovery Protocol (NDP) process, which provides support for protecting NDP messages.
- `security-intelligence`—(Optional) Restart security intelligence process.
- `security-log`—(Optional) Restart the security log process.
- `service-deployment`—(Optional) Restart the service deployment process, which enables Junos OS to work with the Session and Resource Control (SRC) software.
- `services`—(Optional) Restart a service.
- `simple-mail-client-service`—(Optional) Restart the simple mail client service process.
- `snmp`—(Optional) Restart the SNMP process, which enables the monitoring of network devices from a central location and provides the router’s or switch’s SNMP master agent.
- `static-routed`—(Optional) Restart the static routed process.
- `soft`—(Optional) Reread and reactivate the configuration without completely restarting the software processes. For example, BGP peers stay up and the routing table stays constant. Omitting this option results in a graceful restart of the software process.
- `statistics-service`—(Optional) Restart the process that manages the Packet Forwarding Engine statistics.
- `subscriber-management`—(Optional) Restart the subscriber management process.
- `subscriber-management-helper`—(Optional) Restart the subscriber management helper process.
- `system-log-vital`—(Optional) Restart system log vital process.
- `tunnel-oamd`—(Optional) Restart the tunnel OAM process for L2 tunneled networks.
- `uac-service`—(Optional) Restart the Unified Access Control (UAC) process.
- `user-ad-authentication`—(Optional) Restart User ad Authentication process
- `vrrp`—(Optional) Restart the Virtual Router Redundancy Protocol (VRRP) process, which enables hosts on a LAN to make use of redundant routing platforms on that LAN without requiring more than the static configuration of a single default route on the hosts.
- `web-management`—(Optional) Restart the Web management process.
List of Sample Output  restart interfaces on page 720

Output Fields  When you enter this command, you are provided feedback on the status of your request.

Sample Output

restart interfaces

    user@host> restart interfaces
    interfaces process terminated
    interfaces process restarted

Restart Commands Overview

Supported Platforms  SRX Series, vSRX

Use the restart operational commands to restart software processes on the device. Operational commands are organized alphabetically.

Related Documentation  • restart
**show chassis routing-engine (View)**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
show chassis routing-engine

**Release Information**  
Command introduced in Junos OS Release 9.5.

**Description**  
Display the Routing Engine status of the chassis cluster.

**Required Privilege Level**  
view

**Related Documentation**  
- cluster (Chassis)
- request system snapshot (Maintenance) on page 707

**List of Sample Output**  
- show chassis routing-engine (Sample 1 - SRX550M) on page 722
- show chassis routing-engine (Sample 2 - vSRX) on page 722

**Output Fields**  
Table 17 on page 721 lists the output fields for the show chassis routing-engine command. Output fields are listed in the approximate order in which they appear.

**Table 17: show chassis routing-engine Output Fields**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>Routing Engine temperature. (Not available for vSRX deployments.)</td>
</tr>
<tr>
<td>CPU temperature</td>
<td>CPU temperature. (Not available for vSRX deployments.)</td>
</tr>
<tr>
<td>Total memory</td>
<td>Total memory available on the system.</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> Starting with Junos OS Release 15.1x49-D70 and Junos OS Release 17.3R1, there is a change in the method for calculating the memory utilization by a Routing Engine. The inactive memory is now subtracted from the total available memory. There is thus, a decrease in the reported value for used memory; as the inactive memory is now considered as free.</td>
</tr>
<tr>
<td>Control plane memory</td>
<td>Memory available for the control plane.</td>
</tr>
<tr>
<td>Data plane memory</td>
<td>Memory reserved for data plane processing.</td>
</tr>
<tr>
<td>CPU utilization</td>
<td>Current CPU utilization statistics on the control plane core.</td>
</tr>
<tr>
<td>User</td>
<td>Current CPU utilization in user mode on the control plane core.</td>
</tr>
<tr>
<td>Background</td>
<td>Current CPU utilization in nice mode on the control plane core.</td>
</tr>
<tr>
<td>Kernel</td>
<td>Current CPU utilization in kernel mode on the control plane core.</td>
</tr>
</tbody>
</table>
### Table 17: show chassis routing-engine Output Fields  *(continued)*

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interrupt</td>
<td>Current CPU utilization in interrupt mode on the control plane core.</td>
</tr>
<tr>
<td>Idle</td>
<td>Current CPU utilization in idle mode on the control plane core.</td>
</tr>
<tr>
<td>Model</td>
<td>Routing Engine model.</td>
</tr>
<tr>
<td>Start time</td>
<td>Routing Engine start time.</td>
</tr>
<tr>
<td>Uptime</td>
<td>Length of time the Routing Engine has been up (running) since the last start.</td>
</tr>
<tr>
<td>Last reboot reason</td>
<td>Reason for the last reboot of the Routing Engine.</td>
</tr>
<tr>
<td>Load averages</td>
<td>The average number of threads waiting in the run queue or currently executing over 1-, 5-, and 15-minute periods.</td>
</tr>
</tbody>
</table>

### Sample Output

**show chassis routing-engine (Sample 1 - SRX550M)**

```
user@host> show chassis routing-engine
Routing Engine status:
  Temperature                 38 degrees C / 100 degrees F
  CPU temperature             36 degrees C / 96 degrees F
  Total memory               512 MB Max   435 MB used ( 85 percent)
    Control plane memory     344 MB Max   296 MB used ( 86 percent)
    Data plane memory        168 MB Max   138 MB used ( 82 percent)
  CPU utilization:
    User                       8 percent
    Background                 0 percent
    Kernel                     4 percent
    Interrupt                  0 percent
    Idle                      88 percent
  Model                          RE-SRX5500-LOWMEM
  Serial ID                      AAAP8652
  Start time                     2009-09-21 00:04:54 PDT
  Uptime                         52 minutes, 47 seconds
  Last reboot reason             0x200:chassis control reset
  Load averages:                 1 minute   5 minute 15 minute
                                   0.12       0.15       0.10
```

**show chassis routing-engine (Sample 2 - vSRX)**

```
user@host> show chassis routing-engine
Routing Engine status:
  Total memory              1024 MB Max   358 MB used ( 35 percent)
  Control plane memory     1024 MB Max   358 MB used ( 35 percent)
  5 sec CPU utilization:
    User                       2 percent
    Background                 0 percent
    Kernel                     4 percent
```
<table>
<thead>
<tr>
<th>Interrupt</th>
<th>6 percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle</td>
<td>88 percent</td>
</tr>
<tr>
<td>Model</td>
<td>VSRX RE</td>
</tr>
<tr>
<td>Start time</td>
<td>2015-03-03 07:04:18 UTC</td>
</tr>
<tr>
<td>Uptime</td>
<td>2 days, 11 hours, 51 minutes, 11 seconds</td>
</tr>
<tr>
<td>Last reboot reason</td>
<td>Router rebooted after a normal shutdown.</td>
</tr>
<tr>
<td>Load averages:</td>
<td>1 minute 5 minute 15 minute</td>
</tr>
<tr>
<td></td>
<td>0.07 0.04 0.06</td>
</tr>
</tbody>
</table>
show cli authorization

**Supported Platforms**  
EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX

**Syntax**  
show cli authorization

**Release Information**  
Command introduced before Junos OS Release 7.4.

**Description**  
Display the permissions for the current user.

```plaintext
user@host> show cli authorization
Current user: 'root' login: 'boojum' class '(root)'
Permissions:
admin       -- Can view user accounts
admin-control-- Can modify user accounts
clear       -- Can clear learned network info
configure   -- Can enter configuration mode
control     -- Can modify any config
edit        -- Can edit full files
field       -- Can use field debug commands
floppy      -- Can read and write the floppy
interface   -- Can view interface configuration
interface-control-- Can modify interface configuration
network     -- Can access the network
reset       -- Can reset/restart interfaces and daemons
routing     -- Can view routing configuration
routing-control-- Can modify routing configuration
shell       -- Can start a local shell
snmp        -- Can view SNMP configuration
snmp-control-- Can modify SNMP configuration
system      -- Can view system configuration
system-control-- Can modify system configuration
trace       -- Can view trace file settings
trace-control-- Can modify trace file settings
view        -- Can view current values and statistics
maintenance -- Can become the super-user
firewall    -- Can view firewall configuration
firewall-control-- Can modify firewall configuration
secret      -- Can view secret statements
secret-control-- Can modify secret statements
rollback    -- Can rollback to previous configurations
security    -- Can view security configuration
security-control-- Can modify security configuration
access      -- Can view access configuration
access-control-- Can modify access configuration
view-configuration-- Can view all configuration (not including secrets)
flow-tap     -- Can view flow-tap configuration
flow-tap-control-- Can modify flow-tap configuration
idp-profiler-operation-- Can Profiler data
pgcp-session-mirroring-- Can view pgcp session mirroring configuration
pgcp-session-mirroring-control-- Can modify pgcp session mirroring configuration
storage     -- Can view fibre channel storage protocol configuration
storage-control-- Can modify fibre channel storage protocol configuration
all-control -- Can modify any configuration
```
<table>
<thead>
<tr>
<th>Required Privilege</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>view</td>
<td></td>
</tr>
</tbody>
</table>
show dhcp client binding

Supported Platforms
- SRX Series, vSRX

Syntax
```
show dhcp client binding
[<address> | interface <interface-name>]
[routing-instance <routing-instance name>]
[brief | detail | summary ]
```

Release Information
Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

Description
Display the address bindings in the Dynamic Host Configuration Protocol (DHCP) client table.

Options
- **address**—(Optional) Display DHCP binding information for a specific client identified by one of the following entries:
  - ip-address—The specified IP address.
  - mac-address—The specified MAC address.
- **routing-instance <routing-instance name>**—(Optional) Display DHCP binding information for DHCP clients on the specified routing instance.
- **interface <interface-name>**—(Optional) Perform this operation on the specified interface.
- **brief**—(Optional) Display brief information about the active client bindings.
- **detail**—(Optional) Display detailed client binding information.
- **summary**—(Optional) Display a summary of DHCP client information.

Required Privilege Level
view

Related Documentation
- clear dhcp client binding on page 662

List of Sample Output
show dhcp client binding on page 727

Output Fields
Table 18 on page 726 lists the output fields for the show dhcp client binding command. Output fields are listed in the approximate order in which they appear.

Table 18: show dhcp client binding Output Fields

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP address</td>
<td>IP address of the DHCP client.</td>
</tr>
</tbody>
</table>
Table 18: show dhcp client binding Output Fields (continued)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware address</td>
<td>Hardware address of the DHCP client.</td>
</tr>
<tr>
<td>Server</td>
<td>IP address of the DHCP server.</td>
</tr>
<tr>
<td>Expires</td>
<td>Number of seconds in which the lease expires.</td>
</tr>
<tr>
<td>State</td>
<td>State of the address binding table on the DHCP local server.</td>
</tr>
<tr>
<td>Interface</td>
<td>Interface on which the request was received.</td>
</tr>
<tr>
<td>Lease Expires</td>
<td>Date and time at which the client's IP address lease expires.</td>
</tr>
<tr>
<td>Lease Expires in</td>
<td>Number of seconds in which the lease expires.</td>
</tr>
<tr>
<td>Lease Start</td>
<td>Date and time at which the client's IP address lease started.</td>
</tr>
<tr>
<td>Vendor Identifier</td>
<td>Vendor identifier.</td>
</tr>
<tr>
<td>Server Identifier</td>
<td>IP address of the DHCP server.</td>
</tr>
<tr>
<td>Client IP Address</td>
<td>IP address of the DHCP client.</td>
</tr>
</tbody>
</table>

Sample Output

show dhcp client binding

```
user@host> show dhcp client binding
2 clients, (2 bound, 0 init, 0 discover, 0 renew, 0 rebind)

                     IP address     Hardware address     Server      Expires     State
Interface
10.1.1.89             00:0a:12:00:12:12 10.1.1.1    348         BOUND
fe-0/0/1.0
20.1.1.90             00:0a:12:00:12:34 20.1.1.1   568         BOUND
fe-0/0/2.0
```

```
user@host> show dhcp client binding interface fe-0/0/1.0 detail
Client Interface: fe-0/0/1.0

                     Hardware address     State:             Lease Expires:    Lease Expires in:
                   00:0a:12:00:12:12  BOUND
                   2010-09-16 14:45:41 UTC
                   528 seconds
                   2010-09-16 14:35:41 UTC
                   ether
                   10.1.1.1
                   10.1.1.89
update server enabled

DHCP Options :
Name: name-server, Value: [ 10.209.194.131, 198.51.110.2, 192.0.2.3
```
Name: server-identifier, Value: 10.1.1.1
Name: router, Value: [ 10.1.1.80 ]
Name: domain-name, Value: example-50

user@host> show dhcp client binding 10.1.1.89

<table>
<thead>
<tr>
<th>IP address</th>
<th>Hardware address</th>
<th>Server</th>
<th>Expires</th>
<th>State</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1.1.89</td>
<td>00:0a:12:00:12:12</td>
<td>10.1.1.1</td>
<td>348</td>
<td>BOUND</td>
<td>fe-0/0/1.0</td>
</tr>
</tbody>
</table>
show dhcp client statistics

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
```
show dhcp client statistics  
<routing-instance routing-instance-name >
```

**Release Information**  
Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  
Display Dynamic Host Configuration Protocol (DHCP) client statistics.

**Options**  
```
Routing-instance routing-instance-name — (Optional) Display the statistics for DHCP clients on the specified routing instance.
```

**Required Privilege**  
view

**Related Documentation**  
- clear dhcp client statistics on page 663

**List of Sample Output**  
show dhcp client statistics on page 730

**Output Fields**  
Table 19 on page 729 lists the output fields for the `show dhcp client statistics` command. Output fields are listed in the approximate order in which they appear.

**Table 19: show dhcp client statistics**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packets dropped</td>
<td>Number of packets discarded by the DHCP local server because of errors. Only nonzero statistics appear in the Packets dropped output. When all of the Packets dropped statistics are 0 (zero), only the Total field appears.</td>
</tr>
<tr>
<td>Messages received</td>
<td>Number of DHCP messages received.</td>
</tr>
</tbody>
</table>

- **BOOTREPLY**—Number of BOOTP protocol data units (PDUs) received
- **DHCPOFFER**—Number of DHCP PDUs of type OFFER received
- **DHPACK**—Number of DHCP PDUs of type ACK received
- **DHCPACK**—Number of DHCP PDUs of type NACK received
- **DHCPFORCERENEW**—Number of DHCP PDUs of type FORCERENEW received
<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages sent</td>
<td>Number of DHCP messages sent.</td>
</tr>
<tr>
<td></td>
<td>• BOOTREQUEST—Number of BOOTP protocol data units (PDUs) transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPDECLINE—Number of DHCP PDUs of type DECLINE transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPDISCOVER—Number of DHCP PDUs of type DISCOVER transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPREQUEST—Number of DHCP PDUs of type REQUEST transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPINFORM—Number of DHCP PDUs of type INFORM transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPRELEASE—Number of DHCP PDUs of type RELEASE transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPRENEW—Number of DHCP PDUs of type RENEW transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPREBIND—Number of DHCP PDUs of type REBIND transmitted</td>
</tr>
</tbody>
</table>

### Sample Output

**show dhcp client statistics**

```
user@host> show dhcp client statistics
Packets dropped:
   Total                      0
Messages received:
   BOOTREPLY                  0
   DHCPOFFER                  0
   DHCPACK                    0
   DHCPNAK                    0
   DHCPFORCERENEW             0
Messages sent:
   BOOTREQUEST                0
   DHCPDECLINE                0
   DHCPDISCOVER               0
   DHCPREQUEST                0
   DHCPINFORM                 0
   DHCPRELEASE                0
   DHCPRENEW                  0
   DHCPREBIND                 0
```
show dhcp relay binding

Supported Platforms  
SRX Series, vSRX

Syntax  
Show dhcp relay binding  
[<address> | interface <interface-name>]  
routing-instance <routing-instance-name>  
[brief | detail | summary]

Release Information  
Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

Description  
Display the address bindings in the Dynamic Host Configuration Protocol (DHCP) relay client table.

Options  
address—(Optional) Display DHCP binding information for a specific client identified by one of the following entries:

  • ip-address—The specified IP address.
  • mac-address—The specified MAC address.

routing-instance <routing-instance-name>—(Optional) Display DHCP binding information on the specified routing instance.

interface <interface-name>—(Optional) Perform this operation on the specified interface.

brief—(Optional) Display brief information about the active client bindings.

detail—(Optional) Display detailed client binding information.

summary—(Optional) Display a summary of DHCP client information.

Required Privilege  
view

Related Documentation  
• clear dhcp relay binding on page 664

List of Sample Output  
show dhcp relay binding on page 732

Output Fields  
Table 20 on page 731 lists the output fields for the show dhcp relay binding command. Output fields are listed in the approximate order in which they appear.

Table 20: show dhcp relay binding Output Fields

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP address</td>
<td>IP address of the DHCP client.</td>
</tr>
</tbody>
</table>
Table 20: show dhcp relay binding Output Fields (continued)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware address</td>
<td>Hardware address of the DHCP client.</td>
</tr>
<tr>
<td>Request received on</td>
<td>Interface on which the request was received.</td>
</tr>
<tr>
<td>Type</td>
<td>Type of DHCP packet processing performed on the device.</td>
</tr>
<tr>
<td>Obtained at</td>
<td>Date and time at which the client's IP address lease started.</td>
</tr>
<tr>
<td>Expires at</td>
<td>Date and time at which the client's IP address lease expires.</td>
</tr>
<tr>
<td>State</td>
<td>State of the address binding table on the DHCP local server.</td>
</tr>
</tbody>
</table>

Sample Output

show dhcp relay binding

user@host> show dhcp relay binding detail
IP address Hardware address Type Lease expires State
100.20.32.1 90:00:00:01:00:01 active 2007-01-17 11:38:47 PST
rebind
100.20.32.3 90:00:00:02:00:01 active 2007-01-17 11:38:41 PST
rebind
100.20.32.4 90:00:00:03:00:01 active 2007-01-17 11:38:01 PST
rebind
100.20.32.5 90:00:00:04:00:01 active 2007-01-17 11:38:07 PST
rebind
100.20.32.6 90:00:00:05:00:01 active 2007-01-17 11:38:47 PST
rebind

user@host> show dhcp relay binding 100.20.32.1
Active binding information:
IP address 100.20.32.1
Hardware address 90:00:00:01:00:01
Lease information:
Type DHCP
Obtained at 2007-01-17 11:28:47 PST
Expires at 2007-01-17 11:38:47 PST

> show dhcp relay binding 100.20.32.1 detail
Active binding information:
IP address 100.20.32.1
Hardware address 90:00:00:01:00:01
Request received on fe-0/0/2.0, relayed by 100.20.32.2
Lease information:
Type DHCP
Obtained at 2007-01-17 11:28:47 PST
Expires at 2007-01-17 11:38:47 PST
State rebind
show dhcp relay statistics

Supported Platforms SRX Series, vSRX

Syntax show dhcp relay statistics
[<routing-instance>]


Description Display Dynamic Host Configuration Protocol (DHCP) relay statistics.

Options routing-instance—(Optional) Display the DHCP relay statistics on the specified routing instance.

Required Privilege Level view

Related Documentation
• clear dhcp relay statistics on page 665

List of Sample Output show dhcp relay statistics on page 735

Output Fields Table 21 on page 734 lists the output fields for the show dhcp relay statistics command. Output fields are listed in the approximate order in which they appear.

Table 21: show dhcp relay statistics

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages received</td>
<td>Number of DHCP messages sent.</td>
</tr>
<tr>
<td></td>
<td>• BOOTREQUEST—Number of BOOTP protocol data units (PDUs) received</td>
</tr>
<tr>
<td></td>
<td>• DHCPDECLINE—Number of DHCP PDUs of type DECLINE received</td>
</tr>
<tr>
<td></td>
<td>• DHCPDISCOVER—Number of DHCP PDUs of type DISCOVER received</td>
</tr>
<tr>
<td></td>
<td>• DHCPREQUEST—Number of DHCP PDUs of type REQUEST received</td>
</tr>
<tr>
<td></td>
<td>• DHCPINFORM—Number of DHCP PDUs of type INFORM received</td>
</tr>
<tr>
<td></td>
<td>• DHCPRELEASE—Number of DHCP PDUs of type RELEASE received</td>
</tr>
<tr>
<td>Messages sent</td>
<td>Number of DHCP messages received.</td>
</tr>
<tr>
<td></td>
<td>• BOOTREPLY—Number of BOOTP PDUs transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPOFFER—Number of DHCP PDUs of type OFFER transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPACK—Number of DHCP PDUs of type ACK transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPNACK—Number of DHCP PDUs of type NACK transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPFORCERENEW—Number of DHCP PDUs of type FORCERENEW transmitted</td>
</tr>
</tbody>
</table>
### Sample Output

**show dhcp relay statistics**

```
user@host> show dhcp relay statistics
Messages received:
  BOOTREQUEST          0
  DHCPDECLINE          0
  DHCPDISCOVER         0
  DHCPINFORM           0
  DHCPRELEASE          0
  DHCPREQUEST          0

Messages sent:
  BOOTREPLY            0
  DHCPOFFER            0
  DHCPACK              0
  DHCPNAK              0
  DHCPFORCERENEW       0
```
show dhcp server binding

Supported Platforms  SRX Series, vSRX

Syntax  
show dhcp server binding
[interface <interface name>]
<brief | detail | summary | verbose>
<ip-address | MAC address>
<routing-instance routing-instance-name>


Description  Display the address bindings in the client table on the Dynamic Host Configuration Protocol (DHCP) local server.

Options  interface <interface name>—(Optional) Display information about active client bindings on the specified interface.

brief | detail | summary—(Optional) Display the specified level of output about active client bindings. The default is brief, which produces the same output as show dhcp server binding.

ip-address—Display DHCP binding information for a specific client identified by the specified IP address.

MAC address—Display DHCP binding information for a specific client identified by the specified MAC address.

routinig-instance routing-instance-name—(Optional) Display information about active client bindings for DHCP clients on the specified routing instance.

Related Documentation  
• clear dhcp server binding on page 666

List of Sample Output  show dhcp server binding on page 737

Output Fields  Table 22 on page 736 lists the output fields for the show dhcp server binding command. Output fields are listed in the approximate order in which they appear.

Table 22: show dhcp server binding Output Fields

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP address</td>
<td>IP address of the DHCP client.</td>
</tr>
</tbody>
</table>
Table 22: show dhcp server binding Output Fields (continued)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware address</td>
<td>Hardware address of the DHCP client.</td>
</tr>
<tr>
<td>Request received on</td>
<td>Interface on which the request was received.</td>
</tr>
<tr>
<td>Type</td>
<td>Type of DHCP packet processing performed on the device.</td>
</tr>
<tr>
<td>Obtained at</td>
<td>Date and time at which the client's IP address lease started.</td>
</tr>
<tr>
<td>Expires at</td>
<td>Date and time at which the client's IP address lease expires.</td>
</tr>
<tr>
<td>State</td>
<td>State of the address binding table on the DHCP local server.</td>
</tr>
</tbody>
</table>

Sample Output

```
show dhcp server binding 100.20.32.1 detail

Active binding information:
  IP address            100.20.32.1
  Hardware address      90:00:00:01:00:01
  Request received on   fe-0/0/2.0, relayed by 100.20.32.2

Lease information:
  Type                  DHCP
  Obtained at           2007-01-17 11:28:47 PST
  Expires at            2007-01-17 11:38:47 PST
  State                 rebind
```

show dhcp server statistics

Supported Platforms  SRX Series, vSRX

Syntax  
```
show dhcp server statistics
<routing-instance>
```


Description  Display Dynamic Host Configuration Protocol (DHCP) local server statistics.

Options  
- `routuing-instance`—(Optional) Display information about DHCP local server statistics on the specified routing instance. If you do not specify a routing instance, statistics are displayed for the default routing instance.

Required Privilege  view

Related Documentation  
- clear dhcp server statistics on page 667

List of Sample Output  show dhcp server statistics on page 739

Output Fields  Table 23 on page 738 lists the output fields for the `show dhcp server statistics` command. Output fields are listed in the approximate order in which they appear.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packets dropped</td>
<td>Number of packets discarded by the DHCP local server because of errors. Only nonzero statistics appear in the Packets dropped output. When all of the Packets dropped statistics are 0 (zero), only the Total field appears.</td>
</tr>
<tr>
<td>Messages received</td>
<td>Number of DHCP messages sent.</td>
</tr>
<tr>
<td>- BOOTREQUEST</td>
<td>Number of BOOTP protocol data units (PDUs) received</td>
</tr>
<tr>
<td>- DHCPDECLINE</td>
<td>Number of DHCP PDUs of type DECLINE received</td>
</tr>
<tr>
<td>- DHCPDISCOVER</td>
<td>Number of DHCP PDUs of type DISCOVER received</td>
</tr>
<tr>
<td>- DHCPREQUEST</td>
<td>Number of DHCP PDUs of type REQUEST received</td>
</tr>
<tr>
<td>- DHCPINFORM</td>
<td>Number of DHCP PDUs of type INFORM received</td>
</tr>
<tr>
<td>- DHCPRELEASE</td>
<td>Number of DHCP PDUs of type RELEASE received</td>
</tr>
</tbody>
</table>
Table 23: show dhcp server statistics (continued)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages sent</td>
<td>Number of DHCP messages received.</td>
</tr>
<tr>
<td></td>
<td>• BOOTREPLY—Number of BOOTP PDUs transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPOFFER—Number of DHCP PDUs of type OFFER transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPACK—Number of DHCP PDUs of type ACK transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPNACK—Number of DHCP PDUs of type NACK transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPFORCERENEW—Number of DHCP PDUs of type FORCERENEW transmitted</td>
</tr>
</tbody>
</table>

Sample Output

show dhcp server statistics

user@host> show dhcp server statistics

Packets dropped:

Total               0

Messages received:

BOOTREQUEST         0
DHCDECLINE          0
DHCDISCOVER         0
DHCPINFORM          0
DHCPRLEASE          0
DHCPRREQUEST        0

Messages sent:

BOOTREPLY           0
DHCPOFFER           0
DHCPPACK            0
DHCPNACK            0
DHCPFORCERENEW      0
**show dhcpv6 client binding**

**Supported Platforms**  
SRX Series

**Syntax**  
```
show dhcpv6 client binding  
interface interface-name  
routing-instance <routing-instance-name>  
[brief | detail | summary]
```

**Release Information**  
Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  
Display the address bindings in the Dynamic Host Configuration Protocol version 6 (DHCPv6) client table.

**Options**
- `interface interface-name` — (Optional) Perform this operation on the specified interface.
- `routing-instance routing-instance-name` — (Optional) Display DHCPv6 binding information for DHCPv6 clients on the specified routing instance.
- `brief` — (Optional) Display brief information about the active client bindings.
- `detail` — (Optional) Display detailed client binding information.
- `summary` — (Optional) Display a summary of DHCPv6 client information.

**Required Privilege Level**  
view

**Related Documentation**  
- clear dhcpv6 client binding on page 668

**List of Sample Output**  
show dhcpv6 client binding on page 741

**Output Fields**  
Table 24 on page 740 lists the output fields for the `show dhcpv6 client binding` command. Output fields are listed in the approximate order in which they appear.

**Table 24: show dhcpv6 client binding Output Fields**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Address</td>
<td>Hardware address of the DHCPv6 client.</td>
</tr>
<tr>
<td>State</td>
<td>State of the address-binding table on the DHCPv6 local server.</td>
</tr>
<tr>
<td>Lease Expires</td>
<td>Date and time at which the client’s IP address lease expires.</td>
</tr>
<tr>
<td>Lease Expires in</td>
<td>Number of seconds until the lease expires.</td>
</tr>
</tbody>
</table>
Table 24: show dhcv6 client binding Output Fields (continued)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lease Start</td>
<td>Date and time at which the client’s IP address lease started.</td>
</tr>
<tr>
<td>Client DUID</td>
<td>The DHCPv6 client’s unique identifier.</td>
</tr>
<tr>
<td>Bind type</td>
<td>The bind type.</td>
</tr>
<tr>
<td>Client Type</td>
<td>The type of DHCPv6 client. The client type can be autoconfig or stateful.</td>
</tr>
<tr>
<td>Rapid Commit</td>
<td>Two-message exchange option for address assignment.</td>
</tr>
<tr>
<td>Server IP Address</td>
<td>IP address of the DHCPv6 server.</td>
</tr>
<tr>
<td>Client IP Address</td>
<td>IP address of the DHCPv6 client.</td>
</tr>
</tbody>
</table>

Sample Output

show dhcv6 client binding

```
user@host> show dhcv6 client binding
IP prefix           Expires      ClientType  State  Interface       Client DUID
2001:db8::b2b7:8631:d968:8d5e/128  96        STATEFUL   BOUND ge-0/0/1.0
LL_TIME0x3-0x0-2c:6b:f5:62:39:c1
```

show dhcv6 client binding detail

```
user@host> show dhcv6 client binding detail
Client Interface: ge-0/0/1.0
Hardware Address: 2c:6b:f5:62:39:c1
State: BOUND(DHCPV6_CLIENT_STATE_BOUND)
Lease Expires: 2012-08-07 15:52:19 UTC
Lease Expires in: 116 seconds
Lease Start: 2012-08-07 15:50:19 UTC
Client DUID: VENDOR0x00000583-0x3000103f
Bind Type: IA_NA
ClientType: STATEFUL
Rapid Commit: Off
Server Ip Address: fe80::230:48ff:fe5d:5bf7
Client Ip Address: 2001:db8::655b:3c80:2deb:1a3/128

DHCP options:
Name: server-identifier, Value: LL_TIME0x1-0x17acddab-00:30:48:5d:5b:f7
Name: vendor-opts, Value: 000005830002aaaa
Name: sip-server-list, Value: 2000::300 2000::302 2000::303 2000::304
Name: dns-recursive-server, Value: 2000::ff2000::fe
Name: domain-search-list, Value: 076578616d706c6503636f6d00
```
show dhcpv6 client statistics

**Supported Platforms**  
SRX Series

**Syntax**  
show dhcpv6 client statistics  
routing-instance <routing-instance-name>

**Release Information**  
Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**Description**  
Display Dynamic Host Configuration Protocol (DHCPv6) client statistics.

**Options**  
routing-instance <routing-instance-name>—(Optional) Display the statistics for DHCPv6 clients on the specified routing instance.

**Required Privilege**  
view

**Related Documentation**  
- clear dhcpv6 client statistics on page 669

**List of Sample Output**  
show dhcpv6 client statistics on page 743

**Output Fields**  
Table 25 on page 742 lists the output fields for the `show dhcpv6 client statistics` command. Output fields are listed in the approximate order in which they appear.

**Table 25: show dhcpv6 client statistics Output Fields**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dhcpv6 Packets dropped</td>
<td>Number of packets discarded by the DHCPv6 local server because of errors. Only nonzero statistics appear in the DHCPv6 Packets dropped output. When all of the Packets dropped statistics are 0 (zero), only the Total field appears.</td>
</tr>
</tbody>
</table>
Table 25: show dhcpv6 client statistics Output Fields (continued)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages sent</td>
<td>Number of DHCPv6 messages sent.</td>
</tr>
<tr>
<td></td>
<td>• DHCPV6_DECLINE—Number of DHCPv6 PDUsof type DECLINE transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPV6_SOLICIT—Number of DHCPv6 PDUsof type SOLICIT transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPV6_INFORMATION_REQUEST—Number of DHCPv6 PDUsof type INFORMATION REQUEST transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPV6_RELEASE—Number of DHCPv6 PDUsof type RELEASE transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPV6_REQUEST—Number of DHCPv6 PDUsof type REQUEST transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPV6_CONFIRM—Number of DHCPv6 PDUsof type CONFIRM transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPV6_RENEW—Number of DHCPv6 PDUsof type RENEW transmitted</td>
</tr>
<tr>
<td></td>
<td>• DHCPV6_REBIND—Number of DHCPv6 PDUsof type REBIND transmitted</td>
</tr>
<tr>
<td>Messages received</td>
<td>Number of DHCPv6 messages received.</td>
</tr>
<tr>
<td></td>
<td>• DHCPV6_ADVERTISE—Number of DHCPv6 PDUsof type ADVERTISE received</td>
</tr>
<tr>
<td></td>
<td>• DHCPV6_REPLY—Number of DHCPv6 PDUsof type REPLY received</td>
</tr>
<tr>
<td></td>
<td>• DHCPV6_RECONFIGURE—Number of DHCPv6 PDUsof type RECONFIGURE received</td>
</tr>
</tbody>
</table>

Sample Output

show dhcpv6 client statistics

user@host> show dhcpv6 client statistics
Dhcpv6 Packets dropped: Total 0

Messages sent:
  DHCPV6_DECLINE 0
  DHCPV6_SOLICIT 3
  DHCPV6_INFORMATION_REQUEST 6
  DHCPV6_RELEASE 1
  DHCPV6_REQUEST 2
  DHCPV6_CONFIRM 0
  DHCPV6_RENEW 0
  DHCPV6_REBIND 0

Messages received:
  DHCPV6_ADVERTISE 3
  DHCPV6_REPLY 3
  DHCPV6_RECONFIGURE 0
show dhcpv6 server binding (View)

Supported Platforms  SRX Series

Syntax  
show dhcpv6 server binding
  <brief | detail | summary>
  <interface interface-name>
  <routing-instance routing-instance-name>

Release Information  Command introduced in Junos OS Release 10.4.

Description  Display the address bindings in the client table for DCHPv6 local server.

Options  
  • brief | detail | summary—(Optional) Display the specified level of output about active client bindings. The default is brief, which produces the same output as show dhcpv6 server binding.
  
  • interface interface-name—(Optional) Display information about active client bindings on the specified interface.

  • routing-instance routing-instance-name—(Optional) Display information about active client bindings for DHCPv6 clients on the specified routing instance.

Required Privilege  view

Related Documentation  
  • clear dhcpv6 server binding (Local Server) on page 670

List of Sample Output  
  show dhcpv6 server binding on page 746  
  show dhcpv6 server binding detail on page 746  
  show dhcpv6 server binding interface on page 747  
  show dhcpv6 server binding interface detail on page 747  
  show dhcpv6 server binding prefix on page 747  
  show dhcpv6 server binding session-id on page 747  
  show dhcpv6 server binding summary on page 747

Output Fields  
  Table 26 on page 745 lists the output fields for the show dhcpv6 server binding command. Output fields are listed in the approximate order in which they appear.
### Table 26: show dhcv6p server binding Output Fields

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
<th>Level of Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>number clients, (number init, number bound, number selecting, number requesting, number renewing, number releasing)</td>
<td>Summary counts of the total number of DHCPv6 clients and the number of DHCPv6 clients in each state.</td>
<td>summary</td>
</tr>
<tr>
<td>Prefix</td>
<td>Client's DHCPv6 prefix.</td>
<td>brief detail</td>
</tr>
<tr>
<td>Session Id</td>
<td>Session ID of the subscriber session.</td>
<td>brief detail</td>
</tr>
<tr>
<td>Expires</td>
<td>Number of seconds in which lease expires.</td>
<td>brief detail</td>
</tr>
<tr>
<td>State</td>
<td>State of the address binding table on the DHCPv6 local server:</td>
<td>brief detail</td>
</tr>
<tr>
<td></td>
<td>• BOUND—Client has active IP address lease.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• INIT—Initial state.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• RELEASE—Client is releasing IP address lease.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• RECONFIGURE—Client has received reconfigure message from server.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• RENEWING—Client sending request to renew IP address lease.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• REQUESTING—Client requesting a DHCPv6 server.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• SELECTING—Client receiving offers from DHCPv6 servers.</td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td>Interface on which the DHCPv6 request was received.</td>
<td>brief</td>
</tr>
<tr>
<td>Client DUID</td>
<td>Client's DHCP Unique Identifier (DUID).</td>
<td>brief</td>
</tr>
<tr>
<td>Lease expires</td>
<td>Date and time at which the client's IP address lease expires.</td>
<td>detail</td>
</tr>
<tr>
<td>Lease expires in</td>
<td>Number of seconds in which lease expires.</td>
<td>detail</td>
</tr>
<tr>
<td>Lease Start</td>
<td>Date and time at which the client's address lease was obtained.</td>
<td>detail</td>
</tr>
<tr>
<td>Incoming Client Interface</td>
<td>Client's incoming interface.</td>
<td>detail</td>
</tr>
<tr>
<td>Server IP Address</td>
<td>IP address of DHCPv6 server.</td>
<td>detail</td>
</tr>
<tr>
<td>Server Interface</td>
<td>Interface of DHCPv6 server.</td>
<td>detail</td>
</tr>
<tr>
<td>Client Id length</td>
<td>Length of the DHCPv6 client ID, in bytes.</td>
<td>detail</td>
</tr>
<tr>
<td>Client Id</td>
<td>ID of the DHCPv6 client.</td>
<td>detail</td>
</tr>
</tbody>
</table>
Table 26: show dhcv6p server binding Output Fields (continued)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
<th>Level of Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server Id</td>
<td>ID type and ID of the DHCPv6 server.</td>
<td>detail</td>
</tr>
</tbody>
</table>

Sample Output

show dhcpv6 server binding

```
user@host> show dhcpv6 server binding
```

```
Prefix                  Session Id  Expires  State    Interface    Client DUID
2001:bd8:1111:2222::/64 6           86321    BOUND    ge-1/0/0.0
LL_TIME0x1-0x2e159c0-00:10:94:00:00:01
2001:bd8:1111:2222::/64 7           86321    BOUND    ge-1/0/0.0
LL_TIME0x1-0x2e159c0-00:10:94:00:00:02
2001:bd8:1111:2222::/64 8           86321    BOUND    ge-1/0/0.0
LL_TIME0x1-0x2e159c0-00:10:94:00:00:03
2001:bd8:1111:2222::/64 9           86321    BOUND    ge-1/0/0.0
LL_TIME0x1-0x2e159c1-00:10:94:00:00:04
2001:bd8:1111:2222::/64 10          86321    BOUND    ge-1/0/0.0
LL_TIME0x1-0x2e159c1-00:10:94:00:00:05
```

show dhcpv6 server binding detail

```
user@host> show dhcpv6 server binding detail
```

```
Session Id:  6
Client IPv6 Prefix:  2001:bd8:1111:2222::/64
Client DUID:  LL_TIME0x1-0x2e159c0-00:10:94:00:00:01
State:  BOUND(bound)
Lease Expires:  2009-07-21 10:41:15 PDT
Lease Expires in:  86308 seconds
Lease Start:  2009-07-20 10:41:15 PDT
Incoming Client Interface:  ge-1/0/0.0
Server Ip Address:  0.0.0.0
Server Interface:  none
Client Id Length:  14
Client Id:
```
/V0x00010001/0x02e159c0/0x00109400/0x0001
```
Server Id:
```
<VENDOR 2198142976/4a4e313133241434337414643000000000000000>
```

Session Id:  7
Client IPv6 Prefix:  2001:bd8:1111:2222::/64
Client DUID:  LL_TIME0x1-0x2e159c0-00:10:94:00:00:02
State:  BOUND(bound)
Lease Expires:  2009-07-21 10:41:15 PDT
Lease Expires in:  86308 seconds
Lease Start:  2009-07-20 10:41:15 PDT
Incoming Client Interface:  ge-1/0/0.0
Server Ip Address:  0.0.0.0
Server Interface:  none
Client Id Length:  14
Client Id:
### show dhcpv6 server binding interface

```
user@host> show dhcpv6 server binding interface ge-1/0/0:10-101
Prefix     Session Id  Expires  State    Interface    Client DUID
2001:bd8:1111:2222::/64 1           86055    BOUND    ge-1/0/0.100
LL_TIME0x1-0x4b0a53b9-00:10:94:00:00:01
```

### show dhcpv6 server binding interface detail

```
user@host> show dhcpv6 server binding interface ge-1/0/0:10-101 detail
Session Id: 7
Client IPv6 Prefix: 2001:bd8:1111:2222::/64
Client DUID: LL_TIME0x1-0x2e159c0-00:10:94:00:00:02
State: BOUND(bound)
Lease Expires: 2009-07-21 10:41:15 PDT
Lease Expires in: 86136 seconds
Lease Start: 2009-07-20 10:41:15 PDT
Incoming Client Interface: ge-1/0/0.0
Server Ip Address: 0.0.0.0
Server Interface: none
Client Id Length: 14
Client Id: /0x00010001/0x02e159c0/0x00109400/0x0002
```

### show dhcpv6 server binding prefix

```
user@host> show dhcpv6 server binding 14/0x00010001/0x02b3be8f/0x00109400/0x0005 detail
Session Id: 7
Client IPv6 Prefix: 2001:bd8:1111:2222::/64
Client DUID: LL_TIME0x1-0x2e159c0-00:10:94:00:00:02
State: BOUND(bound)
Lease Expires: 2009-07-21 10:41:15 PDT
Lease Expires in: 86136 seconds
Lease Start: 2009-07-20 10:41:15 PDT
Incoming Client Interface: ge-1/0/0.0
Server Ip Address: 0.0.0.0
Server Interface: none
Client Id Length: 14
Client Id: /0x00010001/0x02e159c0/0x00109400/0x0002
```

### show dhcpv6 server binding session-id

```
user@host> show dhcpv6 server binding 8
Prefix     Session Id  Expires  State    Interface    Client DUID
2001:bd8:1111:2222::/64 8           86235    BOUND    ge-1/0/0.0
LL_TIME0x1-0x2e159c0-00:10:94:00:00:03
```

### show dhcpv6 server binding summary

```
user@host> show dhcpv6 server binding summary
```
5 clients, (0 init, 5 bound, 0 selecting, 0 requesting, 0 renewing, 0 releasing)
**show dhcpv6 server statistics (View)**

**Supported Platforms**
SRX Series

**Syntax**
```
show dhcpv6 server statistics
<logical-system logical-system-name>
<routing-instance routing-instance-name>
```

**Release Information**
Command introduced in Junos OS Release 10.4.

**Description**
Display DHCPv6 local server statistics.

**Options**
- `logical-system logical-system-name`—(Optional) Display information about extended DHCPv6 local server statistics on the specified logical system. If you do not specify a logical system, statistics are displayed for the default logical system.
- `routing-instance routing-instance-name`—(Optional) Display information about DHCPv6 local server statistics on the specified routing instance. If you do not specify a routing instance, statistics are displayed for the default routing instance.

**Required Privilege Level**
view

**Related Documentation**
- clear dhcpv6 server statistics (Local Server) on page 671

**List of Sample Output**
show dhcpv6 server statistics on page 751

**Output Fields**
Table 27 on page 750 lists the output fields for the `show dhcpv6 server statistics` command. Output fields are listed in the approximate order in which they appear.
Table 27: show dhcpv6 server statistics Output Fields

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dhcpv6 Packets dropped</td>
<td>Number of packets discarded by the DHCPv6 local server because of errors. Only nonzero statistics appear in the Packets dropped output. When all of the Packets dropped statistics are 0 (zero), only the Total field appears.</td>
</tr>
<tr>
<td></td>
<td>• <strong>Total</strong>—Total number of packets discarded by the DHCPv6 local server</td>
</tr>
<tr>
<td></td>
<td>• <strong>Strict Reconfigure</strong>—Number of solicit messages discarded because the client does not support reconfiguration</td>
</tr>
<tr>
<td></td>
<td>• <strong>Bad hardware address</strong>—Number of packets discarded because an invalid hardware address was specified</td>
</tr>
<tr>
<td></td>
<td>• <strong>Bad opcode</strong>—Number of packets discarded because an invalid operation code was specified</td>
</tr>
<tr>
<td></td>
<td>• <strong>Bad options</strong>—Number of packets discarded because invalid options were specified</td>
</tr>
<tr>
<td></td>
<td>• <strong>Invalid server address</strong>—Number of packets discarded because an invalid server address was specified</td>
</tr>
<tr>
<td></td>
<td>• <strong>No available addresses</strong>—Number of packets discarded because there were no addresses available for assignment</td>
</tr>
<tr>
<td></td>
<td>• <strong>No interface match</strong>—Number of packets discarded because they did not belong to a configured interface</td>
</tr>
<tr>
<td></td>
<td>• <strong>Norouting instance match</strong>—Number of packets discarded because they did not belong to a configured routing instance</td>
</tr>
<tr>
<td></td>
<td>• <strong>No valid local address</strong>—Number of packets discarded because there was no valid local address</td>
</tr>
<tr>
<td></td>
<td>• <strong>Packet too short</strong>—Number of packets discarded because they were too short</td>
</tr>
<tr>
<td></td>
<td>• <strong>Read error</strong>—Number of packets discarded because of a system read error</td>
</tr>
<tr>
<td></td>
<td>• <strong>Send error</strong>—Number of packets that the DHCPv6 local server could not send</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Messages received</th>
<th>Number of DHCPv6 messages received.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• <strong>DHCPV6_CONFIRM</strong>—Number of DHCPv6 CONFIRM PDUs received.</td>
</tr>
<tr>
<td></td>
<td>• <strong>DHCPV6_DECLINE</strong>—Number of DHCPv6 DECLINE PDUs received.</td>
</tr>
<tr>
<td></td>
<td>• <strong>DHCPV6_INFORMATION_REQUEST</strong>—Number of DHCPv6 INFORMATION-REQUEST PDUs received.</td>
</tr>
<tr>
<td></td>
<td>• <strong>DHCPV6_REBIND</strong>—Number of DHCPv6 REBIND PDUs received.</td>
</tr>
<tr>
<td></td>
<td>• <strong>DHCPV6_RELAY_FORW</strong>—Number of DHCPv6 RELAY-FORW PDUs received from a relay by the DHCPv6 server.</td>
</tr>
<tr>
<td></td>
<td>• <strong>DHCPV6_RELEASE</strong>—Number of DHCPv6 RELEASE PDUs received.</td>
</tr>
<tr>
<td></td>
<td>• <strong>DHCPV6_RENEW</strong>—Number of DHCPv6 RENEW PDUs received.</td>
</tr>
<tr>
<td></td>
<td>• <strong>DHCPV6_REQUEST</strong>—Number of DHCPv6 REQUEST PDUs received.</td>
</tr>
<tr>
<td></td>
<td>• <strong>DHCPV6_SOLICIT</strong>—Number of DHCPv6 SOLICIT PDUs received.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Messages sent</th>
<th>Number of DHCPv6 messages sent.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• <strong>DHCPV6_ADVERTISE</strong>—Number of DHCPv6 ADVERTISE PDUs transmitted.</td>
</tr>
<tr>
<td></td>
<td>• <strong>DHCPV6_REPLY</strong>—Number of DHCPv6 ADVERTISE PDUs transmitted.</td>
</tr>
<tr>
<td></td>
<td>• <strong>DHC6_RECONFIGURE</strong>—Number of DHCPv6 RECONFIGURE PDUs transmitted.</td>
</tr>
<tr>
<td></td>
<td>• <strong>DHCPV6_RELAY_REPL</strong>—Number of DHCPv6 RELAY-REPL PDUs sent from DHCPv6 server to DHCPv6 relay.</td>
</tr>
</tbody>
</table>
Sample Output

show dhcpv6 server statistics

user@host> show dhcpv6 server statistics
Dhcpv6 Packets dropped:
  Total               0

Messages received:
  DHCPV6_DECLINE       0
  DHCPV6_SOLICIT       9
  DHCPV6_INFORMATION_REQUEST 0
  DHCPV6_RELEASE       0
  DHCPV6_REQUEST       5
  DHCPV6_CONFIRM       0
  DHCPV6_RENEW         0
  DHCPV6_REBIND        0
  DHCPV6_RELAY_FORW    0

Messages sent:
  DHCPV6_ADVERTISE     9
  DHCPV6_REPLY          5
  DHCPV6_RECONFIGURE   0
  DHCPV6_RELAY_REPL    0
show firewall (View)

Supported Platforms  SRX Series, vSRX

Syntax  
```
show firewall
<filter filter-name>
<counter counter-name>
<log>
<prefix-action-stats>
<terse>
```

Release Information  Command introduced before Junos OS Release 10.0.

Description  Display statistics about configured firewall filters.

Options  none—Display statistics about configured firewall filters.
  filter filter-name—Name of a configured filter.
  counter counter-name—Name of a filter counter.
  log—Display log entries for firewall filters.
  prefix-action-stats—Display prefix action statistics for firewall filters.
  terse—Display firewall filter names only.

Required Privilege  Level  view

Related Documentation  •  firewall on page 160

List of Sample Output  show firewall on page 753

Output Fields  Table 28 on page 752 lists the output fields for the show firewall command. Output fields are listed in the approximate order in which they appear.

Table 28: show firewall Output Fields

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter</td>
<td>Name of a filter that has been configured with the filter at the [edit firewall] hierarchy level. When an interface-specific filter is displayed, the name of the filter is followed by the full interface name and by either -i for an input filter or -o for an output filter. When dynamic filters are displayed, the name of the filter is prefixed with two underscore (__) characters and the name of the logical system (for example, __ls1/filter).</td>
</tr>
</tbody>
</table>
Table 28: show firewall Output Fields (continued)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Counters</strong></td>
<td>Display filter counter information:</td>
</tr>
<tr>
<td>• Name—Name of a filter counter that has been configured with the <code>counter</code> firewall filter action.</td>
<td></td>
</tr>
<tr>
<td>• Bytes—Number of bytes that match the filter term under which the <code>counter</code> action is specified.</td>
<td></td>
</tr>
<tr>
<td>• Packets—Number of packets that matched the filter term under which the <code>counter</code> action is specified.</td>
<td></td>
</tr>
<tr>
<td><strong>Policers</strong></td>
<td>Display policer information:</td>
</tr>
<tr>
<td>• Name—Name of policer.</td>
<td></td>
</tr>
<tr>
<td>• Bytes—Number of bytes that match the filter term under which the policer action is specified. This is only the number out-of-specification (out-of-spec) byte counts, not all the bytes in all packets policed by the policer.</td>
<td></td>
</tr>
<tr>
<td>• Packets—Number of packets that matched the filter term under which the policer action is specified. This is only the number of out-of-specification (out-of-spec) packet counts, not all packets policed by the policer.</td>
<td></td>
</tr>
</tbody>
</table>

**Sample Output**

show firewall

```
user@host> show firewall
Filter: ef_path
Counters:
<table>
<thead>
<tr>
<th>Name</th>
<th>Bytes</th>
<th>Packets</th>
</tr>
</thead>
<tbody>
<tr>
<td>def-count</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>video-count</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>voice-count</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Filter: __default_bpdu_filter__

Filter: deep
Counters:
<table>
<thead>
<tr>
<th>Name</th>
<th>Bytes</th>
<th>Packets</th>
</tr>
</thead>
<tbody>
<tr>
<td>deep2</td>
<td>302076</td>
<td>5031</td>
</tr>
</tbody>
</table>

Filter: deep-flood
Counters:
<table>
<thead>
<tr>
<th>Name</th>
<th>Bytes</th>
<th>Packets</th>
</tr>
</thead>
<tbody>
<tr>
<td>deep_flood_def</td>
<td>302136</td>
<td>5032</td>
</tr>
<tr>
<td>deep1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Policers:
<table>
<thead>
<tr>
<th>Name</th>
<th>Packets</th>
</tr>
</thead>
<tbody>
<tr>
<td>deep-pol-op-first</td>
<td>0</td>
</tr>
</tbody>
</table>
```
**show security ssh key-pair-identity**

**Supported Platforms** SRX Series, vSRX

**Syntax**

```
show security ssh key-pair-identity
  ( brief <identity-name> | public identity-name )
```

**Release Information** Command introduced in Junos OS Release 15.1X49-D70.

**Description** Display the SSH key pair identity information.

**Options**

- **brief identity-name**—Display the brief information for a specified identity. The `identity-name` variable is optional, if an identity is not specified, the command will list brief information of all identities.

- **public identity-name**—Display the public key for a specified identity.

---

**NOTE:** The public and brief options are mutually exclusive

**Required Privilege Level** view

**Related Documentation**
- request security ssh key-pair-identity generate on page 690
- clear security ssh key-pair-identity on page 672

**List of Sample Output**

- show security ssh key-pair-identity brief on page 754
- show security ssh key-pair-identity brief sample on page 754

**Output Fields** When you enter this command, you are provided feedback on the status of your request.

### Sample Output

**show security ssh key-pair-identity brief**

```
user@host> show security ssh key-pair-identity brief
SSH Key Pair Identity Information:
  Name             Create Time      Encrypted
  sample           Dec 28, 17:40    yes
  identity-name    Dec 28, 17:26    yes
```

**show security ssh key-pair-identity brief sample**

```
user@host> show security ssh key-pair-identity brief sample
SSH Key Pair Identity Information:
  Name             Create Time      Encrypted
  sample           Dec 28, 17:34    yes
```
show security tpm status

Supported Platforms  SRX300, SRX320, SRX340, SRX345

Syntax  show security tpm status

Release Information  Command introduced in Junos OS Release 15.1X49-D80.

Description  Display the current status of the Trusted Platform Module (TPM) such as:

- TPM enabled/disabled
- TPM ownership
- TPM’s Master Binding Key status (created or not created)
- Master Encryption Password status (set or not set)

Options  This command has no options.

Required Privilege Level  security

Related Documentation
- Using Trusted Platform Module to Bind Secrets on SRX Series Devices on page 14
- request security tpm master-encryption-password set on page 691

List of Sample Output  show security tpm status on page 756

Sample Output

show security tpm status

user@host> show security tpm status
TPM Status:
   Enabled: yes
   Owned: yes
   Master Binding Key: not-created
   Master Encryption Key: not-configured
show system autorecovery state

**Supported Platforms**  
SRX Series

**Syntax**  
show system autorecovery state

**Release Information**  
Command introduced in Junos OS Release 11.2 for SRX300, SRX320, SRX340, SRX345, and SRX550M devices.

**Description**  
Perform checks and show status of all autorecovered items.

**Required Privilege**  
view

**Related Documentation**  
- request system autorecovery state on page 692

**List of Sample Output**  
show system autorecovery state on page 757

**Output Fields**  
Table 29 on page 757 lists the output fields for the show system autorecovery state command. Output fields are listed in the approximate order in which they appear.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>File</td>
<td>The name of the file on which autorecovery checks are performed.</td>
</tr>
<tr>
<td>Slice</td>
<td>The disk partition on which autorecovery checks are performed.</td>
</tr>
<tr>
<td>Recovery Information</td>
<td>Indicates whether autorecovery information for the file or slice has been saved.</td>
</tr>
<tr>
<td>Integrity Check</td>
<td>Displays the status of the file's integrity check (passed or failed).</td>
</tr>
<tr>
<td>Action / Status</td>
<td>Displays the status of the item, or the action required to be taken for that item.</td>
</tr>
</tbody>
</table>

**Sample Output**

show system autorecovery state

```
user@host> show system autorecovery state

Configuration:
  File rescue.conf.gz Recovery Information: Saved
  File Licenses:
  File JUNOS282736.lic Recovery Information: Saved
  File JUNOS282737.lic Integrity Check: Passed
  BSD Labels:              Action / Status: None

```
<table>
<thead>
<tr>
<th>Slice</th>
<th>Recovery Information</th>
<th>Integrity Check</th>
<th>Action / Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>s1</td>
<td>Saved</td>
<td>Passed</td>
<td>None</td>
</tr>
<tr>
<td>s2</td>
<td>Saved</td>
<td>Passed</td>
<td>None</td>
</tr>
<tr>
<td>s3</td>
<td>Saved</td>
<td>Passed</td>
<td>None</td>
</tr>
<tr>
<td>s4</td>
<td>Saved</td>
<td>Passed</td>
<td>None</td>
</tr>
</tbody>
</table>
show system download

Supported Platforms  
- SRX Series, vSRX

Syntax  
show system download <download-id>

Release Information  
Command introduced in Junos OS Release 11.2 for SRX300, SRX320, SRX340, SRX345, and SRX550M devices.

Description  
Display a brief summary of all the download instances along with their current state and extent of progress. If a download-id is provided, the command displays a detailed report of the particular download instance.

Options  
- download-id—(Optional) The ID number of the download instance.

Required Privilege  
view

Related Documentation  
- request system download start on page 699
- Understanding Download Manager for SRX Series Devices

Sample Output  
show system download on page 759
show system download 1 on page 760

Table 30 on page 759 lists the output fields for the show system download command. Output fields are listed in the approximate order in which they appear.

Table 30: show system download Output Fields

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>Displays the download identification number.</td>
</tr>
<tr>
<td>Status</td>
<td>Displays the state of a particular download.</td>
</tr>
<tr>
<td>Start Time</td>
<td>Displays the start time of a particular download.</td>
</tr>
<tr>
<td>Progress</td>
<td>Displays the percentage of a download that has been completed.</td>
</tr>
<tr>
<td>URL</td>
<td>Displays the URL from which the file was downloaded.</td>
</tr>
</tbody>
</table>

Sample Output  
show system download

user@host> show system download
show system download 1

download status information:

<table>
<thead>
<tr>
<th>ID</th>
<th>Status</th>
<th>Start Time</th>
<th>Progress</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Active</td>
<td>May 4 06:28:36</td>
<td>5%</td>
<td>ftp://ftp-server//tftpboot/1m_file</td>
</tr>
<tr>
<td>2</td>
<td>Active</td>
<td>May 4 06:29:07</td>
<td>3%</td>
<td>ftp://ftp-server//tftpboot/5m_file</td>
</tr>
<tr>
<td>4</td>
<td>Completed</td>
<td>May 4 06:29:40</td>
<td>100%</td>
<td>ftp://ftp-server//tftpboot/smallfile</td>
</tr>
</tbody>
</table>

download id: 1
status: active
progress: 6%
url: ftp://ftp-server//tftpboot/1m_file
local path: /var/tmp/1m_file
maximum rate: 1k
creation time: May 4 06:28:36
scheduled time: May 4 06:28:36
start time: May 4 06:28:37
error count: 0
**show system license (View)**

**Supported Platforms**
SRX Series, vSRX

**Syntax**
show system license
<installed | keys | status | usage>

**Release Information**
Command introduced in Junos OS Release 9.5. Logical system status option added in Junos OS Release 11.2.

**Description**
Display licenses and information about how licenses are used.

**Options**
- **none**—Display all license information.
- **installed**—(Optional) Display installed licenses only.
- **keys**—(Optional) Display a list of license keys. Use this information to verify that each expected license key is present.
- **status**—(Optional) Display license status for a specified logical system or for all logical systems.
- **usage**—(Optional) Display the state of licensed features.

**Required Privilege Level**
view

**Related Documentation**
- Adding New Licenses (CLI Procedure)

**List of Sample Output**
- show system license on page 762
- show system license installed on page 762
- show system license keys on page 763
- show system license usage on page 763
- show system license status logical-system all on page 763

**Output Fields**
Table 31 on page 761 lists the output fields for the `show system license` command. Output fields are listed in the approximate order in which they appear.

**Table 31: show system license Output Fields**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature name</td>
<td>Name assigned to the configured feature. You use this information to verify that all the features for which you installed licenses are present.</td>
</tr>
<tr>
<td>Licenses used</td>
<td>Number of licenses used by the device. You use this information to verify that the number of licenses used matches the number configured. If a licensed feature is configured, the feature is considered used.</td>
</tr>
</tbody>
</table>
Table 31: show system license Output Fields (continued)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>License identifier</td>
<td>Identifier associated with a license key.</td>
</tr>
<tr>
<td>License version</td>
<td>Version of a license. The version indicates how the license is validated, the type</td>
</tr>
<tr>
<td></td>
<td>of signature, and the signer of the license key.</td>
</tr>
<tr>
<td>Valid for device</td>
<td>Device that can use a license key.</td>
</tr>
<tr>
<td>Features</td>
<td>Feature associated with a license.</td>
</tr>
</tbody>
</table>

Licenses installed: Information about the installed license key:

- License identifier—Identifier associated with a license key.
- License version—Version of a license. The version indicates how the license is validated, the type of signature, and the signer of the license key.
- Valid for device—Device that can use a license key.
- Features—Feature associated with a license.

Licenses needed: Number of licenses required for features being used but not yet properly licensed.

Expiry: Time remaining in the grace period before a license is required for a feature being used.

Logical system license status: Displays whether a license is enabled for a logical system.

Sample Output

```bash
show system license

user@host> show system license

License usage:

<table>
<thead>
<tr>
<th>Feature name</th>
<th>Licenses used</th>
<th>Licenses installed</th>
<th>Licenses needed</th>
<th>Expiry</th>
</tr>
</thead>
<tbody>
<tr>
<td>av_key_kaspersky_engine</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2012-03-30 01:00:00 IST</td>
</tr>
<tr>
<td>wf_key_surfcontrol_cpa</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2012-03-30 01:00:00 IST</td>
</tr>
<tr>
<td>dynamic-vpn</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>permanent</td>
</tr>
<tr>
<td>ax411-wlan-ap</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>permanent</td>
</tr>
</tbody>
</table>

Licenses installed:
- License identifier: JUNOS301998
- License version: 2
- Valid for device: AG4909AA0080
- Features:
  - av_key_kaspersky_engine - Kaspersky AV
date-based, 2011-03-30 01:00:00 IST - 2012-03-30 01:00:00 IST

License identifier: JUNOS302000
- License version: 2
- Valid for device: AG4909AA0080
- Features:
  - wf_key_surfcontrol_cpa - Web Filtering
date-based, 2011-03-30 01:00:00 IST - 2012-03-30 01:00:00 IST

show system license installed

user@host> show system license installed

License identifier: JUNOS301998
- License version: 2
- Valid for device: AG4909AA0080
```
Features:
  av_key_kaspersky_engine - Kaspersky AV
    date-based, 2011-03-30 01:00:00 IST - 2012-03-30 01:00:00 IST

License identifier: JUNOS302000
License version: 2
Valid for device: AG4909AA0080
Features:
  wf_key_surfcontrol_cpa - Web Filtering
    date-based, 2011-03-30 01:00:00 IST - 2012-03-30 01:00:00 IST

show system license keys
user@host> show system license keys

XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx
xxxxxx xxxxxx xxx

show system license usage
user@host> show system license usage

<table>
<thead>
<tr>
<th>Feature name</th>
<th>Licenses used</th>
<th>Licenses installed</th>
<th>Licenses needed</th>
<th>Expiry</th>
</tr>
</thead>
<tbody>
<tr>
<td>av_key_kaspersky_engine</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2012-03-30</td>
</tr>
<tr>
<td>01:00:00 IST</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wf_key_surfcontrol_cpa</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2012-03-30</td>
</tr>
<tr>
<td>01:00:00 IST</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dynamic-vpn</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>permanent</td>
</tr>
<tr>
<td>ax411-wlan-ap</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>permanent</td>
</tr>
</tbody>
</table>

show system license status logical-system all
user@host> show system license status logical-system all
Logical system license status:

<table>
<thead>
<tr>
<th>logical system name</th>
<th>license status</th>
</tr>
</thead>
<tbody>
<tr>
<td>root-logical-system</td>
<td>enabled</td>
</tr>
<tr>
<td>LSYS0</td>
<td>enabled</td>
</tr>
<tr>
<td>LSYS1</td>
<td>enabled</td>
</tr>
<tr>
<td>LSYS2</td>
<td>enabled</td>
</tr>
</tbody>
</table>
show system login lockout

Supported Platforms  EX Series, M Series, MX Series, PTX Series, SRX Series, T Series

Syntax  show system login lockout

Release Information  Command introduced in Junos OS Release 11.2.

Description  Display the usernames locked after unsuccessful login attempts.

Required Privilege Level  view and system

Related Documentation  • lockout-period on page 608
                      • clear system login lockout on page 673

List of Sample Output  show system login lockout on page 764

Output Fields  Table 32 on page 764 lists the output fields for the show system login lockout command. Output fields are listed in the approximate order in which they appear.

Table 32: show system login lockout

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
<th>Level of Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>Username</td>
<td>All levels</td>
</tr>
<tr>
<td>Lockout start</td>
<td>Date and time the username was locked</td>
<td>All levels</td>
</tr>
<tr>
<td>Lockout end</td>
<td>Date and time the username was unlocked</td>
<td>All levels</td>
</tr>
</tbody>
</table>

Sample Output

show system login lockout

user@host> show system login lockout

<table>
<thead>
<tr>
<th>User</th>
<th>Lockout start</th>
<th>Lockout end</th>
</tr>
</thead>
</table>
show system services dhcp client

**Supported Platforms**  EX Series, SRX Series

**Syntax**  
```
show system services dhcp client
  < interface-name >
  <statistics>
```


**Description**  Display information about DHCP clients.

**Options**  
- none—Display DHCP information for all interfaces.
- `interface-name`—(Optional) Display DHCP information for the specified interface.

**Required Privilege Level**  view and system

**Related Documentation**  
- `dhcp (Interfaces)`
- request system services dhcp on page 706
- Administration Guide for Security Devices

**List of Sample Output**  
- show system services dhcp client on page 766
- show system services dhcp client ge-0/0/34.0 on page 767
- show system services dhcp client statistics on page 767

**Output Fields**  Table 33 on page 765 lists the output fields for the `show system services dhcp client` command. Output fields are listed in the approximate order in which they appear.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical Interface Name</td>
<td>Name of the logical interface.</td>
</tr>
<tr>
<td>Client Status</td>
<td>State of the client binding.</td>
</tr>
<tr>
<td>Vendor Identifier</td>
<td>Vendor ID.</td>
</tr>
<tr>
<td>Server Address</td>
<td>IP address of the DHCP server.</td>
</tr>
<tr>
<td>Address obtained</td>
<td>IP address obtained from the DHCP server.</td>
</tr>
</tbody>
</table>
### Table 33: show system services dhcp client Output Fields (continued)

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lease Obtained at</td>
<td>Date and time the lease was obtained.</td>
</tr>
<tr>
<td>Lease Expires in</td>
<td>(EX Series switches only) Time the current lease expires in (seconds).</td>
</tr>
<tr>
<td>Lease Expires at</td>
<td>Date and time the lease expires.</td>
</tr>
<tr>
<td>DHCP Options</td>
<td>• Name: server-identifier, Value: IP address of the name server.</td>
</tr>
<tr>
<td></td>
<td>• Name: device, Value: IP address of the name device.</td>
</tr>
<tr>
<td></td>
<td>• Name: domain-name, Value: Name of the domain.</td>
</tr>
<tr>
<td>Packets dropped</td>
<td>Total packets dropped.</td>
</tr>
<tr>
<td>Messages received</td>
<td>Number of the following DHCP messages received:</td>
</tr>
<tr>
<td></td>
<td>• DHCP OFFER—First packet received on a logical interface when DHCP is enabled.</td>
</tr>
<tr>
<td></td>
<td>• DHCP ACK—When received from the server, the client sends an ARP request for that</td>
</tr>
<tr>
<td></td>
<td>address and adds a (ARP response) timer for 4 seconds and stops the earlier timer</td>
</tr>
<tr>
<td></td>
<td>added for DHCP ACK.</td>
</tr>
<tr>
<td></td>
<td>• DHCP NAK—When a DHCP NAK is received instead of DHCP ACK, the logical interface</td>
</tr>
<tr>
<td></td>
<td>sends a DHCP DISCOVER packet.</td>
</tr>
<tr>
<td>Messages sent</td>
<td>Number of the following DHCP messages sent:</td>
</tr>
<tr>
<td></td>
<td>• DHCP DECLINE—Packet sent when ARP response is received and there is a conflict.</td>
</tr>
<tr>
<td></td>
<td>The logical interface sends a new DHCP DISCOVER packet.</td>
</tr>
<tr>
<td></td>
<td>• DHCP DISCOVER—Packet sent on the interface for which the DHCP client is enabled.</td>
</tr>
<tr>
<td></td>
<td>• DHCP REQUEST—Packet sent to the DHCP server after accepting the DHCP OFFER.</td>
</tr>
<tr>
<td></td>
<td>After sending the DHCP REQUEST, the device adds a retransmission-interval timer.</td>
</tr>
<tr>
<td></td>
<td>• DHCP INFORM—Packet sent to the DHCP server for local configuration parameters.</td>
</tr>
<tr>
<td></td>
<td>• DHCP RELEASE—Packet sent to the DHCP server to relinquish network address and</td>
</tr>
<tr>
<td></td>
<td>cancel remaining lease.</td>
</tr>
<tr>
<td></td>
<td>• DHCP RENEW—Packet sent to the DHCP server to renew the address. The next message</td>
</tr>
<tr>
<td></td>
<td>to be sent will be a DHCPREQUEST message, which will be unicast directly to the</td>
</tr>
<tr>
<td></td>
<td>server.</td>
</tr>
<tr>
<td></td>
<td>• DHCP REBIND—Packet sent to any server to renew the address. The next message to</td>
</tr>
<tr>
<td></td>
<td>be sent will be a DHCPREQUEST message, which will be broadcast.</td>
</tr>
</tbody>
</table>

### Sample Output

`show system services dhcp client`

```
user@host> show system services dhcp client
Logical Interface name          ge-0/0/34.0
Hardware address                00:1f:12:38:5f:e5
Client status                    bound
Address obtained                  10.0.0.2
Update server                    disabled
Lease obtained at                2013-12-23 08:11:40 UTC
Lease expires in                 93
Lease expires at                 2013-12-23 08:13:20 UTC
```
Sample Output

show system services dhcp client ge-0/0/34.0

user@host> show system services dhcp client ge-0/0/34.0

Logical Interface name         ge-0/0/34.0
Hardware address        00:1f:12:38:5f:e5
Client status           bound
Address obtained        10.0.0.2
Update server           disabled
Lease obtained at       2013-12-23 08:11:40 UTC
Lease expires in        87
Lease expires at        2013-12-23 08:13:20 UTC

DHCP options:
   Name: server-identifier, Value: 10.0.0.1
   Code: 1, Type: ip-address, Value: 255.255.255.0

Sample Output

show system services dhcp client statistics

user@host> show system services dhcp client statistics

Packets dropped:
   Total                      0
Messages received:
   DHCP OFFER                0
   DHCP ACK                   8
   DHCP NAK                  0
Messages sent:
   DHCP DECLINE              0
   DHCP DISCOVER             0
   DHCP REQUEST              1
   DHCP INFORM               0
   DHCP RELEASE              0
   DHCP RENEW                7
   DHCP REBIND               0
**show system services dhcp relay-statistics**

**Supported Platforms**  
SRX Series, vSRX

**Syntax**  
`show system services dhcp relay-statistics`

**Release Information**  
Command introduced in Junos OS Release 8.5.

**Description**  
Display information about the DHCP relay.

**Required Privilege Level**  
view and system

**Related Documentation**  
- `dhcp`

**List of Sample Output**  
show system services dhcp relay-statistics on page 769

**Output Fields**  
Table 34 on page 768 lists the output fields for the `show system services dhcp relay-statistics` command. Output fields are listed in the approximate order in which they appear.

**Table 34: show system services dhcp relay-statistics Output Fields**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Field Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received packets</td>
<td>Total DHCP packets received.</td>
</tr>
<tr>
<td>Forwarded packets</td>
<td>Total DHCP packet forwarded.</td>
</tr>
<tr>
<td>Dropped packets</td>
<td>Total DHCP packets dropped for the following reasons:</td>
</tr>
<tr>
<td></td>
<td>- <strong>Due to a missing interface in the relay database</strong>—Number of packets discarded because they did not belong to a configured interface.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Due to a missing matching routing instance</strong>—Number of packets discarded because they did not belong to a configured routing instance.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Due to an error during packet read</strong>—Number of packets discarded because of a system read error.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Due to an error during packet send</strong>—Number of packets that the DHCP relay application could not send.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Due to an invalid server address</strong>—Number of packets discarded because an invalid server address was specified.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Due to a missing valid local address</strong>—Number of packets discarded because there was no valid local address.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Due to a missing route to the server or client</strong>—Number of packets discarded because there were no addresses available for assignment.</td>
</tr>
</tbody>
</table>
Sample Output

show system services dhcp relay-statistics

user@host> show system services dhcp relay-statistics
  Received packets: 4
  Forwarded packets: 4
  Dropped packets: 4
    Due to missing interface in relay database: 4
    Due to missing matching routing instance: 0
    Due to an error during packet read: 0
    Due to an error during packet send: 0
    Due to invalid server address: 0
    Due to missing valid local address: 0
    Due to missing route to server/client: 0
show system snapshot media

Supported Platforms  SRX Series, vSRX

Syntax  show system snapshot media media-type

Release Information  Command introduced in Junos OS Release 10.2.

Description  Display the snapshot information for both root partitions on SRX Series devices

Options
- internal—Show snapshot information from internal media.
- usb—Show snapshot information from device connected to USB port.
- external—Show snapshot information from the external CompactFlash card.

Required Privilege  View

Related Documentation
- Example: Creating a Snapshot and Using It to Boot an SRX Series Device

List of Sample Output  show system snapshot media internal on page 770
- show system snapshot media usb on page 770

Sample Output

show system snapshot media internal

    show system snapshot media internal
    Information for snapshot on internal (/dev/da0s1a) (primary)
    Creation date: Jan 15 10:43:26 2010
    JUNOS version on snapshot:
        junos : 10.1B3-domestic
    Information for snapshot on internal (/dev/da0s2a) (backup)
    Creation date: Jan 15 10:15:32 2010
    JUNOS version on snapshot:
        junos : 10.2-20100112.0-domestic

show system snapshot media usb

    show system snapshot media usb
    Information for snapshot on usb (/dev/dal1s1a) (primary)
    Creation date: Jul 24 16:16:01 2009
    JUNOS version on snapshot:
        junos : 10.0I20090723_1017-domestic
    Information for snapshot on usb (/dev/dal1s2a) (backup)
    Creation date: Jul 24 16:17:13 2009
    JUNOS version on snapshot:
        junos : 10.0I20090724_0719-domestic
show system storage partitions (View SRX Series)

Supported Platforms  SRX Series, vSRX

Syntax  show system storage partitions

Release Information  Command introduced in Junos OS Release 10.2.

Description  Display the partitioning scheme details on SRX300, SRX320, SRX340, SRX345, and SRX550HM devices.

Required Privilege  View

Related Documentation  • Example: Installing Junos OS on SRX Series Devices Using the Partition Option

List of Sample Output  show system storage partitions (single root partitioning) on page 771
  show system storage partitions (USB) on page 771

show system storage partitions (dual root partitioning)

```
show system storage partitions
Boot Media: internal (da0)
Active Partition: da0s2a
Backup Partition: da0s1a
Currently booted from: active (da0s2a)

Partitions Information:
  Partition  Size   Mountpoint
  s1a    293M   altroot
  s2a    293M   /
  s3e    24M    /config
  s3f    342M   /var
  s4a    30M    recovery
```

show system storage partitions (single root partitioning)

```
show system storage partitions
Boot Media: internal (da0)
Partitions Information:
  Partition  Size   Mountpoint
  s1a    898M   /
  s1e    24M    /config
  s1f    61M    /var
```

show system storage partitions (USB)

```
show system storage partitions
Boot Media: usb (da1)
Active Partition: dals1a
Backup Partition: dals2a
 Currently booted from: active (dals1a)
```
<table>
<thead>
<tr>
<th>Partition</th>
<th>Size</th>
<th>Mountpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>s1a</td>
<td>293M</td>
<td>/</td>
</tr>
<tr>
<td>s2a</td>
<td>293M</td>
<td>altroot</td>
</tr>
<tr>
<td>s3e</td>
<td>24M</td>
<td>/config</td>
</tr>
<tr>
<td>s3f</td>
<td>342M</td>
<td>/var</td>
</tr>
<tr>
<td>s4a</td>
<td>30M</td>
<td>recovery</td>
</tr>
</tbody>
</table>

Partitions Information: