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Junos<sup>®</sup> OS

## Administration Guide for Security Devices



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## Documentation and Release Notes

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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

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

- SRX Series
- vSRX

## Using the Examples in This Manual

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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.xml;
    }
  }
}
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.xml; }
```

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 1: Notice Icons

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

[Table 2 on page xix](#) defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
<b>Bold text like this</b>	Represents text that you type.	To enter configuration mode, type the <b>configure</b> command:  user@host> <b>configure</b>

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

Convention	Description	Examples
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> <b>show chassis alarms</b>  No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"><li>Introduces or emphasizes important new terms.</li><li>Identifies guide names.</li><li>Identifies RFC and Internet draft titles.</li></ul>	<ul style="list-style-type: none"><li>A policy <i>term</i> is a named structure that defines match conditions and actions.</li><li><i>Junos OS CLI User Guide</i></li><li>RFC 1997, <i>BGP Communities Attribute</i></li></ul>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name:  [edit] root@# <b>set system domain-name</b> <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"><li>To configure a stub area, include the <b>stub</b> statement at the [edit protocols ospf area area-id] hierarchy level.</li><li>The console port is labeled <b>CONSOLE</b>.</li></ul>
< > (angle brackets)	Encloses optional keywords or variables.	<b>stub &lt;default-metric <i>metric</i>&gt;;</b>
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	<b>broadcast   multicast</b>  <b>(<i>string1</i>   <i>string2</i>   <i>string3</i>)</b>
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	<b>rsvp { # Required for dynamic MPLS only</b>
[ ] (square brackets)	Encloses a variable for which you can substitute one or more values.	<b>community name members [</b> <i>community-ids</i> <b>]</b>
Indentation and braces ( { } )	Identifies a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
<b>GUI Conventions</b>		
<b>Bold text like this</b>	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"><li>In the Logical Interfaces box, select <b>All Interfaces</b>.</li><li>To cancel the configuration, click <b>Cancel</b>.</li></ul>

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

Convention	Description	Examples
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select <b>Protocols&gt;Ospf</b> .

## Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can 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>, 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/>.
- E-mail—Send your comments to [techpubs-comments@juniper.net](mailto:techpubs-comments@juniper.net). Include the document or topic name, URL or page number, and software version (if applicable).

## Requesting Technical Support

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

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

## Self-Help Online Tools and Resources

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

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>

- Download the latest versions of software and review release notes:  
<http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications:  
<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://tools.juniper.net/SerialNumberEntitlementSearch/>

## Opening a Case with JTAC

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

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

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

## PART 1

# User Access and Authentication

- [User Access and Authentication Overview on page 3](#)
- [Configuring Junos OS User Accounts on page 15](#)
- [Configuring User Access Privileges on page 37](#)
- [Permissions Flags for User Access Privileges on page 75](#)
- [Configuring Authentication Methods on page 291](#)





## 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](#)

## 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**

Login Class	Permission Bits Set
operator	clear, network, reset, trace, view
read-only	view
super-user and superuser	all
unauthorized	None

**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**

Permission Bit	Access
<b>admin</b>	Can view user account information in configuration mode and with the <b>show configuration</b> command.
<b>admin-control</b>	Can view user accounts and configure them (at the <b>[edit system login]</b> hierarchy level).
<b>access</b>	Can view the access configuration in configuration mode and with the <b>show configuration</b> operational mode command.
<b>access-control</b>	Can view and configure access information (at the <b>[edit access]</b> hierarchy level).
<b>all</b>	Has all permissions.
<b>clear</b>	Can clear (delete) information learned from the network that is stored in various network databases (using the <b>clear</b> commands).

Table 4: Permission Bits for Login Classes (*continued*)

Permission Bit	Access
<b>configure</b>	Can enter configuration mode (using the <b>configure</b> command) and commit configurations (using the <b>commit</b> command).
<b>control</b>	Can perform all control-level operations (all operations configured with the <b>-control</b> permission bits).
<b>field</b>	Reserved for field (debugging) support.
<b>firewall</b>	Can view the firewall filter configuration in configuration mode.
<b>firewall-control</b>	Can view and configure firewall filter information (at the <b>[edit firewall]</b> hierarchy level).
<b>floppy</b>	Can read from and write to the removable media.
<b>interface</b>	Can view the interface configuration in configuration mode and with the <b>show configuration</b> operational mode command.
<b>interface-control</b>	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 <b>[edit]</b> hierarchy).
<b>maintenance</b>	Can perform system maintenance, including starting a local shell on the device and becoming the superuser in the shell (by issuing the <b>su root</b> command), and can halt and reboot the device (using the <b>request system</b> commands).
<b>network</b>	Can access the network by entering the <b>ping</b> , <b>ssh</b> , <b>telnet</b> , and <b>traceroute</b> commands.
<b>reset</b>	Can restart software processes using the <b>restart</b> command and can configure whether software processes are enabled or disabled (at the <b>[edit system processes]</b> hierarchy level).
<b>rollback</b>	Can use the <b>rollback</b> command to return to a previously committed configuration other than the most recently committed one.
<b>routing</b>	Can view general routing, routing protocol, and routing policy configuration information in configuration and operational modes.
<b>routing-control</b>	Can view general routing, routing protocol, and routing policy configuration information and configure general routing (at the <b>[edit routing-options]</b> hierarchy level), routing protocols (at the <b>[edit protocols]</b> hierarchy level), and routing policy (at the <b>[edit policy-options]</b> hierarchy level).
<b>secret</b>	Can view passwords and other authentication keys in the configuration.
<b>secret-control</b>	Can view passwords and other authentication keys in the configuration and can modify them in configuration mode.
<b>security</b>	Can view security configuration in configuration mode and with the <b>show configuration</b> operational mode command.

Table 4: Permission Bits for Login Classes (*continued*)

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

## 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 18](#)
- [Example: Configuring New Users on page 15](#)

## 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 294](#)
- [Example: Configuring a TACACS+ Server for System Authentication on page 299](#)
- [Example: Configuring Authentication Order on page 302](#)

## 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**

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

Table 5: Login Class Permission Flags (*continued*)

Permission Flag	Description
<b>flow-tap-control</b>	Can view the flow-tap configuration in configuration mode and can configure flow-tap configuration information at the <b>[edit services flow-tap]</b> hierarchy level.
<b>flow-tap-operation</b>	Can make flow-tap requests to the router or switch. For example, a Dynamic Tasking Control Protocol (DTCP) client must have <b>flow-tap-operation</b> permission to authenticate itself to the Junos OS as an administrative user.  <b>NOTE:</b> The <b>flow-tap-operation</b> option is not included in the <b>all-control</b> permissions flag.
<b>idp-profiler-operation</b>	Can view profiler data.
<b>interface</b>	Can view the interface configuration in configuration mode and with the <b>show configuration</b> operational mode command.
<b>interface-control</b>	Can view chassis, class of service (CoS), groups, forwarding options, and interfaces configuration information. Can edit configuration at the following hierarchy levels: <ul style="list-style-type: none"> <li>• <b>[edit chassis]</b></li> <li>• <b>[edit class-of-service]</b></li> <li>• <b>[edit groups]</b></li> <li>• <b>[edit forwarding-options]</b></li> <li>• <b>[edit interfaces]</b></li> </ul>
<b>maintenance</b>	Can perform system maintenance, including starting a local shell on the router or switch and becoming the superuser in the shell by using the <b>su root</b> command, and can halt and reboot the router or switch by using the <b>request system</b> commands.
<b>network</b>	Can access the network by using the <b>ping</b> , <b>ssh</b> , <b>telnet</b> , and <b>traceroute</b> commands.
<b>pgcp-session-mirroring</b>	Can view the <b>pgcp</b> session mirroring configuration.
<b>pgcp-session-mirroring-control</b>	Can modify the <b>pgcp</b> session mirroring configuration.
<b>reset</b>	Can restart software processes by using the <b>restart</b> command and can configure whether software processes are enabled or disabled at the <b>[edit system processes]</b> hierarchy level.
<b>rollback</b>	Can use the <b>rollback</b> command to return to a previously committed configuration other than the most recently committed one.
<b>routing</b>	Can view general routing, routing protocol, and routing policy configuration information in configuration and operational modes.

Table 5: Login Class Permission Flags (*continued*)

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



## 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 37](#)
  - [Regular Expressions for Allowing and Denying Junos OS Operational Mode Commands, Configuration Statements, and Hierarchies](#)
  - [Access Privilege User Permission Flags Overview on page 76](#)

---

## Understanding User Authentication Methods

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**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 18](#)
  - [Example: Configuring Authentication Order on page 302](#)
  - [Example: Configuring a RADIUS Server for System Authentication on page 294](#)
  - [Example: Configuring a TACACS+ Server for System Authentication on page 299](#)

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## Hardening Shared Secrets in Junos OS

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**Supported Platforms**   [SRX Series](#)

- [Understanding Hardening Shared Secrets on page 13](#)

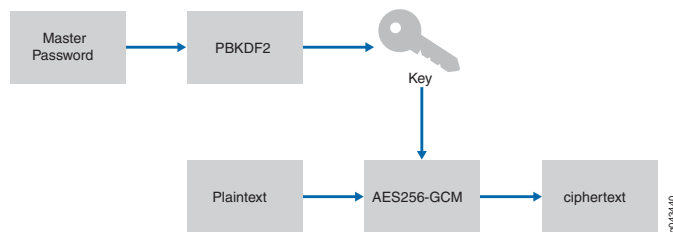
## Understanding Hardening Shared Secrets

Existing shared secrets (\$9\$ 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 \$8\$ formatted 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**



The \$8\$ configuration secrets can only be shared between devices using the same master password.

The \$8\$-encrypted passwords have the following format:

**\$8\$crypt-algo\$hash-algo\$iterations\$salt\$iv\$tag\$encrypted.** See [Table 6 on page 13](#) for the master password format details.

**Table 6: \$8\$-encrypted Password Format**

Format	Description
crypt-algo	Encryption/decryption algorithm to be used. Currently only AES256-GCM is supported.
hash-algo	Hash (prf) algorithm to be used for the PBKDF2 key derivation.
iterations	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.

Table 6: \$8\$-encrypted Password Format (*continued*)

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

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/4YMC4YDLU$FzYDI4jjN6YCyQsYLsaf8A$llu4jLcZarD9YnyD/Hejww$okhBlc0cGakSqYxKww
```

### 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

Release	Description
15.1X49-D50	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.

## CHAPTER 2

# Configuring Junos OS User Accounts

- [Example: Configuring New Users on page 15](#)
- [Understanding Template Accounts on page 18](#)
- [Example: Creating Template Accounts on page 19](#)
- [Understanding Administrative Roles on page 21](#)
- [Example: Configuring Administrative Roles on page 24](#)
- [Handling Authorization Failure on page 30](#)
- [Example: Configuring System Retry Options on page 31](#)

### Example: Configuring New Users

---

**Supported Platforms**    [SRX Series, vSRX](#)

This example shows how to configure new users.

- [Requirements on page 15](#)
- [Overview on page 15](#)
- [Configuration on page 16](#)
- [Verification on page 18](#)

### Requirements

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

### 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 provide 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.

```
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 RADIUS server. See [“Example: Configuring a RADIUS Server for System Authentication” on page 294](#).
  - Configure a TACACS+ server. See [“Example: Configuring a TACACS+ Server for System Authentication” on page 299](#).
  - Configure a user. See [“Example: Configuring New Users” on page 15](#).
  - Configure template accounts. See [“Example: Creating Template Accounts” on page 19](#).
- 

## Verification

Confirm that the configuration is working properly.

### Verifying the New Users Configuration

<b>Purpose</b>	Verify that the new users have been configured.
<b>Action</b>	From operational mode, enter the <b>show system login</b> command.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Understanding User Authentication Methods on page 12</a></li><li>• <a href="#">Understanding User Accounts on page 6</a></li><li>• <a href="#">Understanding Template Accounts on page 18</a></li><li>• <a href="#">Understanding Login Classes on page 3</a></li></ul>

## 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 19](#)

---

## Example: Creating Template Accounts

---

**Supported Platforms** [SRX Series, vSRX](#)

This example shows how to create template accounts.

- [Requirements on page 19](#)
- [Overview on page 19](#)
- [Configuration on page 19](#)
- [Verification on page 21](#)

### 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 20](#)
- [Creating a Local Template Account on page 20](#)

### 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 a RADIUS server. See [“Example: Configuring a RADIUS Server for System Authentication” on page 294](#).
- Configure a TACACS+ server. See [“Example: Configuring a TACACS+ Server for System Authentication” on page 299](#).
- Configure system authentication order. See [“Example: Configuring Authentication Order” on page 302](#).

## 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 User Accounts on page 6](#)
- [Understanding Login Classes on page 3](#)
- [Understanding Template Accounts on page 18](#)

## 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 24](#)

## 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 24](#)
- [Overview on page 24](#)
- [Configuration on page 24](#)
- [Verification on page 29](#)

### 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.

```
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 security-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|
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)"
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
set system login user ids-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 (log|security log)"
user@host# set deny-commands "^clear (security alarms|system login logout)|^file
(copy|delete|rename)|^request (security|system
set-encryption-key)|^rollback|^set date|^show security
(alarms|dynamic-policies|match-policies|policies)|^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 logout)|^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 logout)|^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 logout)|^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)" "security log exclude.* event-id IDP_.*"
            "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_.*";
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)"
security-role ids-administrator;
}
user audit-officer {
class audit-admin;
authentication {
encrypted-password "$1$ABC123"; ## SECRET-DATA
}
}
user crypto-officer {
class crypto-admin;
authentication {
encrypted-password "$1$ABC123."; ## SECRET-DATA
}
}
user security-officer {
class security-admin;
authentication {
encrypted-password "$1$ABC123."; ## SECRET-DATA
}
}
user ids-officer {
class ids-admin;
authentication {
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
tion
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 21](#)

---

## Handling Authorization Failure

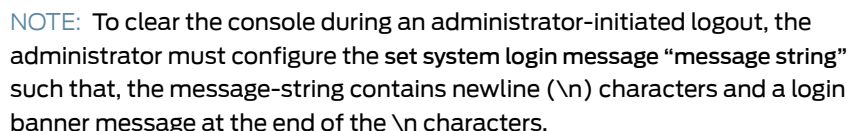
**Supported Platforms** [SRX Series, vSRX](#)

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

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.

[illegible]

- [Example: Configuring System Retry Options on page 31](#)

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

- [Requirements on page 32](#)
- [Overview on page 32](#)
- [Configuration on page 34](#)
- [Verification on page 35](#)

## Requirements

Before you begin, you should understand [“Handling Authorization Failure” on page 30](#).

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

---

**Purpose** Verify that the login lockout configuration is enabled.

**Action** 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.

**Meaning** 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.

**Related Documentation**

- [Handling Authorization Failure on page 30](#)



## CHAPTER 3

# Configuring User Access Privileges

- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 41](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 52](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands, Configuration Statements, and Hierarchies on page 66](#)

### 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 37](#)
- [Overview on page 38](#)
- [Configuration on page 39](#)
- [Verification on page 40](#)

### 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 297](#).

- 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           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 40](#)
- [Verifying non-SNMP Configuration on page 40](#)

---

## Verifying SNMP Configuration

<b>Purpose</b>	Verify that SNMP configuration can be executed.
<b>Action</b>	<p>From configuration mode, execute basic SNMP commands at the <b>[edit snmp]</b> hierarchy level.</p> <pre>[edit snmp] user@host# set name <i>device1</i> user@host# set description <i>switch1</i> user@host# set location <i>Lab1</i> user@host# set contact <i>example.com</i> user@host# commit</pre>
<b>Meaning</b>	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

<b>Purpose</b>	Verify that non-SNMP configuration is denied for the network-management login class.
<b>Action</b>	<p>From the configuration mode, execute any non-SNMP configuration, for example, interfaces configuration.</p> <pre>[edit] user@host# edit interfaces Syntax error, expecting &lt;statement&gt; or &lt;identifier&gt;.</pre>

- 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 Privilege Levels

**Supported Platforms** [EX Series](#), [M Series](#), [MX Series](#), [PTX Series](#), [QFX Series](#), [SRX Series](#), [T Series](#), [vSRX](#)

Create two access privilege classes on the router or switch, one for configuring and viewing user accounts only and the second for configuring and viewing SNMP parameters only:

In this example, you create two custom login classes on the router or switch and assign access privileges to each class through permission flags. The first custom login class is called **user-accounts** and it only includes access privileges for configuring and viewing user accounts. The second custom login class is called **network-mgmt** and only includes access privileges for configuring SNMP parameters.

```
[edit]
system {
  login {
    class user-accounts {
      permissions [ configure admin admin-control ];
    }
    class network-mgmt {
      permissions [ configure snmp snmp-control ];
    }
  }
}
```

1. Create the **user-accounts** custom login class and give it control over user accounts with the **configure admin admin-control** permission flag.

```
[edit system login]
user@router# set class user-accounts permissions configure admin admin-control
```

2. Create the **network-mgmt** custom login class and use the **configure snmp snmp-control** permission flag to assign it SNMP configuration privileges.

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

3. Check your configuration by using the **show system login** command.

```
user@router# show system login
class user-accounts {
  permissions [ configure admin admin-control ];
}
class network-mgmt {
  permissions [ configure snmp snmp-control ];
}
```

- Related Documentation**
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)

## 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 standalone switches](#), [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 42](#)
- [Overview and Topology on page 42](#)
- [Configuration on page 45](#)
- [Verification on page 49](#)

### 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 297](#).

- 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 44 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.

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

```
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 [ 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 49](#)
- [Verifying Class2 Configuration on page 50](#)
- [Verifying Class3 Configuration on page 51](#)

### 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                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]  
User3@R1#
```

**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 54](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands, Configuration Statements, and Hierarchies on page 66](#)

---

## 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 standalone switches, T Series

Each operational mode command has an access privilege level associated with it. Access privileges control the commands that each custom login class can execute, configure, and view. Custom login classes are groups of users who are assigned with customized levels of access to different commands and statements. This ensures that each group of users can only use commands appropriate to their function, preventing unauthorized users from executing sensitive commands that could potentially cause damage to the network.

In this example, you create three custom login classes on the router or switch and assign access privileges for operational mode commands through the **allow-commands** and **deny-commands** settings. Each custom login class uses the same set of permission flags as the default login class **operator**, but the login class is allowed or denied certain operational mode commands. The first custom login class is called **operator-and-boot** and it has access to the **request system reboot** operational mode command. The second custom login class is called **operator-no-set** and it is denied access to any **set** commands. The third login class is called **operator-and-install-but-no-bgp** and it has access to the **request system software add** and **show route** operational mode commands, but it is denied access to the **show bgp** command.

```
[edit]
system {
  login {
    class operator-and-boot {
      permissions [ clear network reset trace view ];
      allow-commands "request system reboot";
    }
    class operator-no-set {
      permissions [ clear network reset trace view ];
      deny-commands "set";
    }
    class operator-and-install-but-no-bgp {
      permissions [ clear network reset trace view ];
      allow-commands "(request system software add)|(show route$)";
      deny-commands "show bgp";
    }
  }
}
```

1. Create the **operator-and-boot** custom login class, give it **operator** level permission flags, and authorize it to use the **request system reboot** command.

```
[edit system login]
user@router# set class operator-and-boot permissions clear network reset trace view
user@router# set class operator-and-boot allow-commands request system reboot
```

2. Create the **operator-no-set** custom login class, give it **operator** level permission flags, and deny it access to the **set** command.

```
[edit system login]
user@router# set class operator-no-set clear network reset trace view
user@router# set class operator-no-set deny-commands set
```

3. Create the **operator-and-install-but-no-bgp** custom login class, give it **operator** level permission flags, authorize it to use the **request system software add** and **show route** commands, and deny it access to the **show bgp** command.

```
[edit system login]
```

```
user@router# set class operator-and-install-but-no-bgp clear network reset trace
view
user@router# set class operator-and-install-but-no-bgp request system software
add show route
user@router# set class operator-and-install-but-no-bgp show bgp
```

4. Check your configuration by using the **show system login** command.

```
user@router# show system login
class operator-and-boot {
  permissions [ clear network reset trace view ];
  allow-commands "request system reboot";
}
class operator-no-set {
  permissions [ clear network reset trace view ];
  deny-commands "set";
}
class operator-and-install-but-no-bgp {
  permissions [ clear network reset trace view ];
  allow-commands "(request system software add)|(show route$)";
  deny-commands "show bgp";
}
```

**Related Documentation** • [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)

---

## 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 54](#)
- [Overview and Topology on page 55](#)
- [Configuration on page 61](#)
- [Verification on page 64](#)

### 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 297](#).

- 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/deny-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 57](#) 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**

Configuration Denied	Using: deny-configuration	Using: deny-configuration-regexps	Result
xnm-ssl	<pre>[edit system] login {   class test {     permissions configure;     allow-configuration .*;     deny-configuration .*xnm-ssl;   } }</pre>	<pre>[edit system] login {   class test {     permissions configure;     allow-configuration .*;     deny-configuration-regexps ".*.* .*-ssl"";   } }</pre>	<p>The following configuration statement is denied:</p> <ul style="list-style-type: none"> <li>• system services xnm-ssl</li> </ul>
ssh	<pre>[edit system] login {   class test {     permissions configure;     allow-configuration .*;     deny-configuration ".*ssh";   } }</pre>	<pre>[edit system] login {   class test {     permissions configure;     allow-configuration .*;     deny-configuration-regexps ".*ssh";     deny-configuration-regexps ".* .*ssh";     deny-configuration-regexps ".*.* .*ssh";   } }</pre>	<p>The following configuration statements are denied:</p> <ul style="list-style-type: none"> <li>• system host-name hostname-ssh</li> <li>• system services ssh</li> <li>• system services outbound-ssh</li> <li>• security ssh-known-host</li> </ul>

Although the **allow/deny-configuration** statements are also useful when simple configuration is desired, the **allow/deny-configuration-regexps** 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-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.

### Configuration Notes

When configuring the `allow-configuration`, `deny-configuration`, `allow-configuration-regexps`, and `deny-configuration-regexps` 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-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.
- 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 "(system login class)|(system services)"
```

- 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-regexps [ "interfaces.* description.*"
"interfaces.* unit.* description.*" "interfaces.* unit.* family inet address.*"
"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 60 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

**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 `allow-configuration` and `deny-configuration` Statements (Class1)

---

#### Step-by-Step Procedure

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.

```
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";
    }
  }
}
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 65](#)
- [Verifying Class2 Configuration on page 65](#)

### 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 42](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands, Configuration Statements, and Hierarchies on page 66](#)

## 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 66](#)
- [Overview and Topology on page 67](#)
- [Configuration on page 70](#)
- [Verification on page 73](#)

### 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 297](#).



- 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 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.
- 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-regexps [ "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 70 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, 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 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 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;
}
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 security;
    allow-commands configure;
    deny-commands .*;
    allow-configuration "security group-vpn";
    deny-configuration multi-chassis;
  }
  user User1 {
    uid 2005;
    class Class1;
    authentication {
      encrypted-password "$ABC123";
    }
  }
}

```

## 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 73](#)

### 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** User1 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 42](#)
  - [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)



## CHAPTER 4

# Permissions Flags for User Access Privileges

- [Access Privilege User Permission Flags Overview on page 76](#)
- [access on page 78](#)
- [access-control on page 79](#)
- [admin on page 79](#)
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- [control on page 149](#)
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- [firewall on page 150](#)
- [firewall-control on page 151](#)
- [floppy on page 152](#)
- [flow-tap on page 152](#)
- [flow-tap-control on page 152](#)
- [flow-tap-operation on page 153](#)
- [idp-profiler-operation on page 153](#)
- [interface on page 154](#)
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- [secret-control on page 169](#)
- [security on page 171](#)
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- [shell on page 178](#)
- [snmp on page 178](#)
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- [trace on page 183](#)
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- [view-configuration on page 290](#)

---

## Access Privilege User Permission Flags Overview

---

**Supported Platforms**   [EX Series](#), [M Series](#), [MX Series](#), [PTX Series](#), [SRX Series](#), [T Series](#), [vSRX](#)

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 78](#)
- [access-control on page 79](#)
- [admin on page 79](#)
- [admin-control on page 80](#)

- [all-control on page 81](#)
- [clear on page 81](#)
- [configure on page 149](#)
- [control on page 149](#)
- [field on page 150](#)
- [firewall on page 150](#)
- [firewall-control on page 151](#)
- [floppy on page 152](#)
- [flow-tap on page 152](#)
- [flow-tap-operation on page 153](#)
- [idp-profiler-operation on page 153](#)
- [interface on page 154](#)
- [interface-control on page 155](#)
- [maintenance on page 156](#)
- [network on page 164](#)
- [pgcp-session-mirroring on page 166](#)
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- [reset on page 167](#)
- [rollback on page 168](#)
- [secret on page 168](#)
- [secret-control on page 169](#)
- [security on page 171](#)
- [security-control on page 174](#)
- [shell on page 178](#)
- [snmp on page 178](#)
- [system on page 179](#)
- [system-control on page 181](#)
- [trace on page 183](#)
- [trace-control on page 188](#)
- [view on page 193](#)
- [view-configuration on page 290](#)

## 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** No associated CLI commands.

### 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]
```

- Related Documentation**
- [Access Privilege User Permission Flags Overview on page 76](#)
  - [Understanding Junos OS Access Privilege Levels on page 7](#)
  - [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
  - [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
  - [access-control on page 79](#)

## 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
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 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 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
- [access on page 78](#)

## admin

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

Can view user account information in configuration mode.

<b>Commands</b>	show system audit
<b>Configuration Hierarchy Levels</b>	<pre>[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] [edit system services ssh no-tcp-fowarding] [edit system services ssh protocol-version] [edit system services ssh root-login] [edit system services ssh tcp-fowarding]</pre>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Access Privilege User Permission Flags Overview on page 76</a></li> <li>• <a href="#">Understanding Junos OS Access Privilege Levels on page 7</a></li> <li>• <a href="#">Example: Configuring User Permissions with Access Privilege Levels on page 37</a></li> <li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42</a></li> <li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54</a></li> <li>• <a href="#">admin-control on page 80</a></li> </ul>

## admin-control

<b>Supported Platforms</b>	EX Series, M Series, MX Series, SRX Series, T Series, vSRX
	Can view user account information and configure it at the <b>[edit system]</b> hierarchy level.
<b>Commands</b>	show system audit
<b>Configuration Hierarchy Levels</b>	<pre>[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]</pre>

```
[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 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
- [admin on page 79](#)

## 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 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)

## 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 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 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 protocols
clear ddos-protection protocols all-fiber-channel-enode
clear ddos-protection protocols all-fiber-channel-enode aggregate
clear ddos-protection protocols all-fiber-channel-enode aggregate culprit-flows
<clear-ddos-all-fc-enode-aggregate-flows>
clear ddos-protection protocols all-fiber-channel-enode aggregate states
<clear-ddos-all-fc-enode-aggregate-states>
clear ddos-protection protocols all-fiber-channel-enode aggregate statistics
<clear-ddos-all-fc-enode-aggregate-statistics>
clear ddos-protection protocols all-fiber-channel-enode culprit-flows
<clear-ddos-all-fc-enode-flows>
clear ddos-protection protocols all-fiber-channel-enode states
<clear-ddos-all-fc-enode-states>
clear ddos-protection protocols all-fiber-channel-enode statistics
<clear-ddos-all-fc-enode-statistics>
clear ddos-protection protocols amtv4
clear ddos-protection protocols amtv4 aggregate
clear ddos-protection protocols amtv4 aggregate culprit-flows
clear ddos-protection protocols amtv4 aggregate states
clear ddos-protection protocols amtv4 aggregate statistics
clear ddos-protection protocols amtv4 culprit-flows
clear ddos-protection protocols amtv4 states
clear ddos-protection protocols amtv4 statistics
clear ddos-protection protocols amtv6
clear ddos-protection protocols amtv6 aggregate
clear ddos-protection protocols amtv6 aggregate culprit-flows
<clear-ddos-amtv6-aggregate-flows>
clear ddos-protection protocols amtv6 aggregate states
<clear-ddos-amtv6-aggregate-states>
clear ddos-protection protocols amtv6 aggregate statistics
<clear-ddos-amtv6-aggregate-statistics>
clear ddos-protection protocols amtv6 culprit-flows
<clear-ddos-amtv6-flows>
clear ddos-protection protocols amtv6 states
<clear-ddos-amtv6-states>
clear ddos-protection protocols amtv6 statistics
<clear-ddos-amtv6-statistics>
clear ddos-protection protocols ancp aggregate culprit-flows
<clear-ddos-ancp-aggregate-flows>
clear ddos-protection protocols ancp culprit-flows

```

```
clear ddos-protection protocols ancp
clear ddos-protection protocols ancp aggregate
clear ddos-protection protocols ancp aggregate states
clear ddos-protection protocols ancp aggregate statistics
<clear-ddos-ancp-aggregate-statistics>
clear ddos-protection protocols ancp states
<clear-ddos-ancp-states>
clear ddos-protection protocols ancp statistics
<clear-ddos-ancp-statistics>
clear ddos-protection protocols ancpv6
clear ddos-protection protocols ancpv6 aggregate
clear ddos-protection protocols ancpv6 aggregate states

clear ddos-protection protocols ancpv6 aggregate culprit-flows
clear ddos-protection protocols arp aggregate statistics
clear-ddos-arp-aggregate-statistics
clear ddos-protection protocols arp aggregate culprit-flows
clear ddos-protection protocols arp states
clear-ddos-arp-states
clear ddos-protection protocols arp statistics
<clear-ddos-arp-statistics>
clear ddos-protection protocols arp-snoop
clear ddos-protection protocols arp-snoop aggregate
clear ddos-protection protocols arp-snoop aggregate culprit-flows
<clear-ddos-arp-snoop-aggregate-flows>
clear ddos-protection protocols arp-snoop aggregate states
<clear-ddos-arp-snoop-aggregate-states>
clear ddos-protection protocols arp-snoop aggregate statistics
<clear-ddos-arp-snoop-aggregate-statistics>
clear ddos-protection protocols arp-snoop culprit-flows
<clear-ddos-arp-snoop-flows>
clear ddos-protection protocols arp-snoop states
<clear-ddos-arp-snoop-states>
clear ddos-protection protocols arp-snoop statistics
<clear-ddos-arp-snoop-statistics>
clear ddos-protection protocols arp culprit-flows
clear ddos-protection protocols atm
clear ddos-protection protocols atm aggregate
clear ddos-protection protocols atm aggregate culprit-flows
clear ddos-protection protocols atm aggregate states
<clear-ddos-atm-aggregate-states>
clear ddos-protection protocols atm aggregate statistics
<clear-ddos-atm-aggregate-statistics>
clear ddos-protection protocols atm culprit-flows
clear ddos-protection protocols bfd aggregate culprit-flows
clear ddos-protection protocols atm states
clear-ddos-atm-states
clear ddos-protection protocols atm statistics
clear-ddos-atm-statistics
clear ddos-protection protocols bfd
clear ddos-protection protocols bfd aggregate
clear ddos-protection protocols bfd culprit-flows
clear ddos-protection protocols bfd aggregate states
clear-ddos-bfd-aggregate-states
clear ddos-protection protocols bfd aggregate statistics
clear-ddos-bfd-aggregate-statistics
clear ddos-protection protocols bfd states
clear-ddos-bfd-states
clear ddos-protection protocols bfd statistics
clear-ddos-bfd-statistics
clear ddos-protection protocols bfdv6
```

```

clear ddos-protection protocols bfdv6 aggregate
clear ddos-protection protocols bfdv6 culprit-flows
clear ddos-protection protocols bfdv6 aggregate states
clear-ddos-bfdv6-aggregate-states
clear ddos-protection protocols bfdv6 aggregate statistics
clear-ddos-bfdv6-aggregate-statistics
clear ddos-protection protocols bfdv6 states
clear-ddos-bfdv6-states
clear ddos-protection protocols bfdv6 statistics
clear-ddos-bfdv6-statistics
clear ddos-protection protocols bgp
clear ddos-protection protocols bgp aggregate
clear ddos-protection protocols bgp aggregate culprit-flows
clear ddos-protection protocols bgp aggregate states
clear-ddos-bgp-aggregate-states
clear ddos-protection protocols bgp aggregate statistics
clear ddos-protection protocols bgp culprit-flows
clear ddos-protection protocols bgp states
clear-ddos-bgp-states
clear ddos-protection protocols bgp statistics
clear-ddos-bgp-statistics
clear ddos-protection protocols bgpv6
clear ddos-protection protocols bgpv6 aggregate
clear ddos-protection protocols bgpv6 aggregate culprit-flows
clear ddos-protection protocols bgpv6 aggregate states
clear-ddos-bgpv6-aggregate-states
clear ddos-protection protocols bgpv6 aggregate statistics
clear-ddos-bgpv6-aggregate-statistics
clear ddos-protection protocols bgpv6 states
clear-ddos-bgp-aggregate-states
clear-ddos-bgp-aggregate-statistics
clear-ddos-bgp-states
clear-ddos-bgp-statistics
clear-ddos-bgpv6-aggregate-states
clear-ddos-bgpv6-aggregate-statistics
clear-ddos-bgpv6-states
clear ddos-protection protocols bgpv6 statistics
<clear-ddos-bgpv6-statistics>
clear ddos-protection protocols bridge-control
clear ddos-protection protocols bridge-control aggregate
clear ddos-protection protocols bridge-control aggregate culprit-flows
<clear-ddos-brg-ctrl-aggregate-flows>
clear ddos-protection protocols bridge-control aggregate states
<clear-ddos-brg-ctrl-aggregate-states>
clear ddos-protection protocols bridge-control aggregate statistics
<clear-ddos-brg-ctrl-aggregate-statistics>
clear ddos-protection protocols bridge-control culprit-flows
<clear-ddos-brg-ctrl-flows>
clear ddos-protection protocols bridge-control states
<clear-ddos-brg-ctrl-states>
clear ddos-protection protocols bridge-control statistics
<clear-ddos-brg-ctrl-statistics>
clear ddos-protection protocols culprit-flows
clear ddos-protection protocols demux-autosense
clear ddos-protection protocols demux-autosense aggregate
clear ddos-protection protocols demux-autosense aggregate culprit-flows
clear ddos-protection protocols demux-autosense aggregate states
clear-ddos-demuxauto-aggregate-states
clear ddos-protection protocols demux-autosense aggregate statistics
clear ddos-protection protocols demux-autosense culprit-flows
clear ddos-protection protocols demux-autosense states

```

```
clear-ddos-demuxauto-states
clear ddos-protection protocols demux-autosense statistics
clear-ddos-demuxauto-statistics
clear ddos-protection protocols dhcpv4
clear ddos-protection protocols dhcpv4 ack
clear ddos-protection protocols dhcpv4 ack culprit-flows
clear ddos-protection protocols dhcpv4 ack states
clear ddos-protection protocols dhcpv4 ack statistics
clear ddos-protection protocols dhcpv4 aggregate
clear ddos-protection protocols dhcpv4v6
clear ddos-protection protocols dhcpv4v6 aggregate
clear ddos-protection protocols dhcpv4v6 aggregate culprit-flows
<clear-ddos-dhcpv4v6-aggregate-flows>
clear ddos-protection protocols dhcpv4v6 aggregate states
<clear-ddos-dhcpv4v6-aggregate-states>
clear ddos-protection protocols dhcpv4v6 aggregate statistics
<clear-ddos-dhcpv4v6-aggregate-statistics>
clear ddos-protection protocols dhcpv4v6 culprit-flows
<clear-ddos-dhcpv4v6-flows>
clear ddos-protection protocols dhcpv4v6 states
<clear-ddos-dhcpv4v6-states>
clear ddos-protection protocols dhcpv4v6 statistics
<clear-ddos-dhcpv4v6-statistics>
clear-ddos-demuxauto-aggregate-states
clear-ddos-demuxauto-aggregate-statistics
clear-ddos-demuxauto-states
clear-ddos-demuxauto-statistics
clear-ddos-dhcpv4-ack-states
clear ddos-protection protocols dhcpv4 ack statistics
clear-ddos-dhcpv4-ack-statistics
clear ddos-protection protocols dhcpv4 aggregate
clear ddos-protection protocols dhcpv4 aggregate states
clear-ddos-dhcpv4-aggregate-states
clear ddos-protection protocols dhcpv4 aggregate statistics
clear-ddos-dhcpv4-aggregate-statistics
clear ddos-protection protocols dhcpv4 bad-packets
clear ddos-protection protocols dhcpv4 bad-packets states
clear-ddos-dhcpv4-bad-pack-states
clear ddos-protection protocols dhcpv4 bad-packets statistics
clear-ddos-dhcpv4-bad-pack-statistics
clear ddos-protection protocols dhcpv4 bootp
clear ddos-protection protocols dhcpv4 bootp states
clear-ddos-dhcpv4-bootp-states
clear ddos-protection protocols dhcpv4 bootp statistics
clear-ddos-dhcpv4-bootp-statistics
clear ddos-protection protocols dhcpv4 decline
clear ddos-protection protocols dhcpv4 decline culprit-flows
clear ddos-protection protocols dhcpv4 decline states
clear-ddos-dhcpv4-decline-states
clear ddos-protection protocols dhcpv4 decline statistics
clear-ddos-dhcpv4-decline-statistics
clear ddos-protection protocols dhcpv4 discover
clear ddos-protection protocols dhcpv4 discover states
clear-ddos-dhcpv4-discover-states
clear ddos-protection protocols dhcpv4 discover statistics
clear-ddos-dhcpv4-discover-statistics
clear ddos-protection protocols dhcpv4 force-renew
clear ddos-protection protocols dhcpv4 force-renew culprit-flows
clear ddos-protection protocols dhcpv4 force-renew states
clear-ddos-dhcpv4-forcerenew-states
clear ddos-protection protocols dhcpv4 force-renew statistics
```

```

clear-ddos-dhcpv4-forcerenew-statistics
clear ddos-protection protocols dhcpv4 inform
clear ddos-protection protocols dhcpv4 inform culprit-flows
clear ddos-protection protocols dhcpv4 inform states
clear-ddos-dhcpv4-decline-states
clear-ddos-dhcpv4-decline-statistics
clear-ddos-dhcpv4-discover-states
clear-ddos-dhcpv4-discover-statistics
clear-ddos-dhcpv4-forcerenew-states
clear-ddos-dhcpv4-forcerenew-statistics
clear ddos-protection protocols dhcpv4 unclassified culprit-flows
clear ddos-protection protocols dhcpv4 unclassified states
clear-ddos-dhcpv4-unclass-states
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clear-ddos-dhcpv6-leaseq-do-states
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clear-ddos-dhcpv6-leaseq-do-statistics
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clear-ddos-dhcpv6-leaseq-re-states
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clear ddos-protection protocols dhcpv6 request statistics
clear-ddos-dhcpv6-request-statistics
```



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clear-ddos-igmp-states
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clear ddos-protection protocols tcp-flags initial culprit-flows
clear ddos-protection protocols tcp-flags initial states
clear-ddos-tcp-flags-initial-states
clear ddos-protection protocols tcp-flags initial statistics
clear-ddos-tcp-flags-initial-statistics
clear ddos-protection protocols tcp-flags states
clear-ddos-tcp-flags-states
clear ddos-protection protocols tcp-flags statistics
clear-ddos-tcp-flags-statistics
clear ddos-protection protocols tcp-flags unclassified
clear ddos-protection protocols tcp-flags unclassified states
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clear ddos-protection protocols telnet aggregate states
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clear ddos-protection protocols telnet aggregate statistics
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clear-ddos-telnet-states
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clear-ddos-telnet-statistics
clear ddos-protection protocols telnetv6
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clear ddos-protection protocols telnetv6 aggregate statistics
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clear ddos-protection protocols telnetv6 states
clear-ddos-telnetv6-states
clear ddos-protection protocols telnetv6 statistics
clear-ddos-telnetv6-statistics
clear ddos-protection protocols ttl
clear ddos-protection protocols ttl aggregate
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clear ddos-protection protocols ttl aggregate states
clear-ddos-ttl-aggregate-states
clear ddos-protection protocols ttl aggregate statistics
```

```
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clear ddos-protection protocols ttl states
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clear-ddos-ttl-statistics
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clear-ddos-tun-frag-states
clear ddos-protection protocols tunnel-fragment statistics
clear-ddos-tun-frag-statistics
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```

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clear-ddos-protocols-states

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```
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clear-ddos-ripv6-states
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clear-ddos-rsvp-aggregate-statistics
clear-ddos-rsvp-states
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clear-ddos-telnet-aggregate-statistics
clear-ddos-telnet-states
clear-ddos-telnet-statistics
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clear-ddos-vchassis-control-lo-statistics
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clear-ddos-vchassis-states
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clear dhcp relay binding
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clear pfe tcam-errors tcam-stage pre-ingress app fw-fbf-inet6 list-shared-apps
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clear pfe tcam-errors tcam-stage pre-ingress app fw-fbf-inet6 shared-usage
detail
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clear pfe tcam-errors tcam-stage pre-ingress app fw-semantics detail
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clear pfe tcam-errors tcam-stage pre-ingress app fw-semantics list-shared-apps
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list-shared-apps
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detail
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```

```
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clear pfe tcam-errors tcam-stage pre-ingress app ing-out-iff shared-usage
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detail
clear pfe tcam-errors tcam-stage pre-ingress app ip-mac-val
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list-related-apps
clear pfe tcam-errors tcam-stage pre-ingress app ip-mac-val-bcast
list-shared-apps
clear pfe tcam-errors tcam-stage pre-ingress app ip-mac-val-bcast shared-usage
clear pfe tcam-errors tcam-stage pre-ingress app ip-mac-val-bcast shared-usage
detail
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list-related-apps
clear pfe tcam-errors tcam-stage pre-ingress app rfc2544-layer2-in
list-shared-apps
clear pfe tcam-errors tcam-stage pre-ingress app rfc2544-layer2-in shared-usage
clear pfe tcam-errors tcam-stage pre-ingress app rfc2544-layer2-in shared-usage
detail
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clear pim snooping statistics
clear pim statistics
<clear-pim-statistics>
clear poe
clear poe telemetries
clear poe telemetries interface
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clear ppp
```

```
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clear pppoe lockout
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clear-pppoe-lockout-timers-vlan
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clear protection-group ethernet-ring statistics
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  < clear-rsvp-counters-information>
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clear synchronous-ethernet esmc
clear synchronous-ethernet esmc statistics
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clear-twamp-server-information
clear-twamp-server-connection-information
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clear unified-edge ggsn-pgw aaa
clear unified-edge ggsn-pgw aaa radius
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clear unified-edge ggsn-pgw charging transfer statistics
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```



```
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<clear-virtual-chassis-port-statistics>
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<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
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clear vrrp
```

```
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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
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<clear-inline-stateful-firewall-statistics>
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<clear-service-set-drop-flow-statistics>
clear services service-sets statistics jflow-log
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request services ipsec-vpn ipsec switch
request services ipsec-vpn ipsec switch tunnel
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request unified-edge ggsn-pgw call-trace
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request unified-edge ggsn-pgw call-trace start
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request unified-edge ggsn-pgw call-trace stop
<get-mobile-gateways-call-trace-stop-information>
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request unified-edge sgw call-trace
request unified-edge sgw call-trace clear
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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 76](#)
  - [Understanding Junos OS Access Privilege Levels on page 7](#)
  - [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
  - [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)

## configure

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**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 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)

## 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 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)

## field

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<b>Supported Platforms</b>	EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX
	Can view field debug commands.
<b>Commands</b>	No associated CLI commands.
<b>Configuration Hierarchy Levels</b>	No associated CLI configuration hierarchy levels and statements.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Access Privilege User Permission Flags Overview on page 76</a></li><li>• <a href="#">Understanding Junos OS Access Privilege Levels on page 7</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privilege Levels on page 37</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54</a></li></ul>

## firewall

---

<b>Supported Platforms</b>	EX Series, M Series, MX Series, PTX Series, SRX Series, T Series, vSRX
	Can view the firewall filter configuration in configuration mode.
<b>Commands</b>	<pre>show firewall   &lt;get-firewall-information&gt;  show firewall counter   &lt;get-firewall-counter-information&gt;  show firewall filter   &lt;get-firewall-filter-information&gt;  show firewall filter version   &lt;get-filter-version&gt;  show firewall log   &lt;get-firewall-log-information&gt;  show firewall prefix-action-stats   &lt;get-firewall-prefix-action-information&gt;  show policer   &lt;get-policer-information&gt;</pre>
<b>Configuration Hierarchy Levels</b>	<pre>[edit chassis satellite-management] [edit firewall] [edit dynamic-profiles firewall] [edit firewall] [edit logical-systems firewall]</pre>

- Related Documentation**
- [Access Privilege User Permission Flags Overview on page 76](#)
  - [Understanding Junos OS Access Privilege Levels on page 7](#)
  - [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
  - [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
  - [firewall-control on page 151](#)

## 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 76](#)
  - [Understanding Junos OS Access Privilege Levels on page 7](#)
  - [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
  - [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
  - [firewall on page 150](#)

## floppy

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<b>Supported Platforms</b>	EX Series, M Series, MX Series, SRX Series, T Series, vSRX
	Can read from and write to the removable media.
<b>Commands</b>	No associated CLI commands.
<b>Configuration Hierarchy Levels</b>	No associated CLI configuration hierarchy levels and statements.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Access Privilege User Permission Flags Overview on page 76</a></li><li>• <a href="#">Understanding Junos OS Access Privilege Levels on page 7</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privilege Levels on page 37</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54</a></li></ul>

## flow-tap

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<b>Supported Platforms</b>	M Series, MX Series, SRX Series, T Series, vSRX
	Can view the flow-tap configuration in configuration mode.
<b>Commands</b>	No associated CLI commands.
<b>Configuration Hierarchy Levels</b>	<pre>[edit services flow-tap] [edit services radius-flow-tap] [edit system services flow-tap-dtcp]</pre>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Access Privilege User Permission Flags Overview on page 76</a></li><li>• <a href="#">Understanding Junos OS Access Privilege Levels on page 7</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privilege Levels on page 37</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54</a></li><li>• <a href="#">flow-tap-control on page 152</a></li></ul>

## flow-tap-control

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<b>Supported Platforms</b>	M Series, MX Series, SRX Series, T Series, vSRX
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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 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
- [flow-tap on page 152](#)

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## 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 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)

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## 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** 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**
- [Access Privilege User Permission Flags Overview on page 76](#)
  - [Understanding Junos OS Access Privilege Levels on page 7](#)
  - [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
  - [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
  - [interface-control on page 155](#)



## 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**
- [Access Privilege User Permission Flags Overview on page 76](#)
  - [Understanding Junos OS Access Privilege Levels on page 7](#)
  - [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
  - [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
  - [interface on page 154](#)

## maintenance

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**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 feb
<request-feb>

request chassis fpc
<request-chassis-fpc>
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 tfcb
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 l2circuit-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-eedebg-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 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 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 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-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**

- [Access Privilege User Permission Flags Overview on page 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)

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**network**

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**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 l2circuit
ping mpls l2circuit interface
    <request-ping-l2circuit-interface>

ping mpls l2circuit virtual-circuit
    <request-ping-l2circuit-virtual-circuit>

ping mpls l2vpn
ping mpls l2vpn fec129
ping mpls l2vpn fec129 interface
    <request-ping-l2vpn-fec129-interface>
```

```
ping mpls l2vpn instance
    <request-ping-l2vpn-instance>

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

ping mpls l3vpn
    <request-ping-l3vpn>

ping mpls ldp
    <request-ping-ldp-lsp>

ping mpls ldp p2mp
    <request-ping-ldp-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 minfo
ssh
telnet
traceroute
    <traceroute>

traceroute cns
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>
```

<b>Configuration Hierarchy Levels</b>	No associated CLI configuration hierarchy levels and statements.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Access Privilege User Permission Flags Overview on page 76</a></li><li>• <a href="#">Understanding Junos OS Access Privilege Levels on page 7</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privilege Levels on page 37</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54</a></li></ul>

---

## pgcp-session-mirroring

---

<b>Supported Platforms</b>	M Series, MX Series, PTX Series, SRX Series, T Series, vSRX
	Can view session mirroring configuration by using the <b>pgcp</b> command.
<b>Commands</b>	<code>show services pgcp gates gate-way display session-mirroring</code>
<b>Configuration Hierarchy Levels</b>	<code>[edit services pgcp gateway session-mirroring]</code> <code>[edit services pgcp session-mirroring]</code>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Access Privilege User Permission Flags Overview on page 76</a></li><li>• <a href="#">Understanding Junos OS Access Privilege Levels on page 7</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privilege Levels on page 37</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42</a></li><li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54</a></li><li>• <a href="#">pgcp-session-mirroring-control on page 166</a></li></ul>

---

## pgcp-session-mirroring-control

---

<b>Supported Platforms</b>	M Series, MX Series, SRX Series, T Series, vSRX
	Can modify PGCP session mirroring configuration
<b>Commands</b>	<code>show services pgcp gates gate-way display session-mirroring</code>
<b>Configuration Hierarchy Levels</b>	<code>[edit services pgcp gateway session-mirroring]</code> <code>[edit services pgcp session-mirroring]</code>
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Access Privilege User Permission Flags Overview on page 76</a></li><li>• <a href="#">Understanding Junos OS Access Privilege Levels on page 7</a></li></ul>

- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
- [pgcp-session-mirroring on page 166](#)

## 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 cfeb master switch
request chassis cfeb 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 76](#)
  - [Understanding Junos OS Access Privilege Levels on page 7](#)
  - [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)

- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)

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## 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 76](#)
  - [Understanding Junos OS Access Privilege Levels on page 7](#)
  - [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
  - [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)

---

## 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.

**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 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]
[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]

```

#### Related Documentation

- [Access Privilege User Permission Flags Overview on page 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
- [secret-control on page 169](#)

## 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.

<b>Commands</b>	No associated CLI commands.
<b>Configuration Hierarchy Levels</b>	<pre> [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 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 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] [edit system accounting destination radius server secret] [edit system accounting destination tacplus server 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] </pre>
<b>Related Documentation</b>	<ul style="list-style-type: none"> <li>• <a href="#">Access Privilege User Permission Flags Overview on page 76</a></li> <li>• <a href="#">Understanding Junos OS Access Privilege Levels on page 7</a></li> <li>• <a href="#">Example: Configuring User Permissions with Access Privilege Levels on page 37</a></li> <li>• <a href="#">Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42</a></li> </ul>



- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
- [secret on page 168](#)

## 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>
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
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 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
- [security-control on page 174](#)

---

## 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 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 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 76](#)
  - [Understanding Junos OS Access Privilege Levels on page 7](#)
  - [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
  - [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
  - [security on page 171](#)

---

## 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 76](#)
  - [Understanding Junos OS Access Privilege Levels on page 7](#)
  - [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
  - [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)

---

## 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** No associated CLI commands.

**Configuration Hierarchy Levels** `[edit snmp]`

- Related Documentation**
- [Access Privilege User Permission Flags Overview on page 76](#)
  - [Understanding Junos OS Access Privilege Levels on page 7](#)
  - [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)



- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)

## system

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

Can view system-level configuration information.

<b>Commands</b>	<pre> 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 &lt;request-path-computation-retry-delegation&gt; request virtual-chassis request virtual-chassis device-reachability &lt;get-virtual-chassis-diagnostic-information&gt; request virtual-chassis member-id request virtual-chassis member-id delete delete-virtual-chassis-member-id request virtual-chassis member-id set &lt;set-virtual-chassis-member-id&gt; request virtual-chassis mode request virtual-chassis mode mixed &lt;request-virtual-chassis-mode-mixed&gt; request virtual-chassis reactivate &lt;request-virtual-chassis-reactivate&gt; request virtual-chassis recycle &lt;request-virtual-chassis-recycle&gt; request virtual-chassis renumber &lt;request-virtual-chassis-renumber&gt; request virtual-chassis routing-engine request virtual-chassis routing-engine master request virtual-chassis routing-engine master switch &lt;switch-vc-routing-engine-protocol-master&gt; request virtual-chassis vc-port request virtual-chassis vc-port delete request virtual-chassis vc-port delete fpc-slot &lt;request-virtual-chassis-vc-port-delete-fpc-slot&gt; request virtual-chassis vc-port delete pic-slot &lt;request-virtual-chassis-vc-port-delete-pic-slot&gt; request virtual-chassis vc-port set request virtual-chassis vc-port set fpc-slot &lt;request-virtual-chassis-vc-port-set-fpc-slot&gt; request virtual-chassis vc-port set interface &lt;request-virtual-chassis-vc-port-set-interface&gt; request virtual-chassis vc-port set pic-slot &lt;request-virtual-chassis-vc-port-set-pic-slot&gt; &lt;set-virtual-chassis-mode&gt; </pre>
-----------------	---

**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 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]
[edit logical-systems routing-instances instance routing-options fate-sharing]
[edit logical-systems routing-options fate-sharing]
[edit logical-systems system]
[edit logical-systems system syslog]
[edit poe]
[edit protocols uplink-failure-detection]
[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]
[edit routing-options fate-sharing]
[edit services]
[edit services ggsn charging charging-log traceoptions]
[edit system]
[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]
[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]
[edit system internet-options no-tcp-rfc1323]
[edit system internet-options no-tcp-rfc1323-paws]
[edit system internet-options path-mtu-discovery]
[edit system internet-options source-port upper-limit]
[edit system internet-options source-quench]
[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 no-debugger-on-alt-break]
[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]
[edit system ports auxiliary log-out-on-disconnect]
[edit system ports auxiliary port-type]
[edit system ports auxiliary silent-with-modem]
[edit system ports console log-out-on-disconnect]
[edit system ports console port-type]
[edit system ports console silent-with-modem]
[edit system processes]
[edit system proxy]
[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 virtual-chassis locality-bias]
[edit vlans]

```

#### Related Documentation

- [Access Privilege User Permission Flags Overview on page 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
- [system-control on page 181](#)

## system-control

#### 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]
[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]
[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]
[edit routing-options fate-sharing]
[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 dgasg-in]
[edit system dgasg-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]
[edit system internet-options no-tcp-rfc1323]
[edit system internet-options no-tcp-rfc1323-paws]
[edit system internet-options path-mtu-discovery]
[edit system internet-options source-port upper-limit]
[edit system internet-options source-quench]
[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 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
- [system on page 179](#)

## 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>
monitor
  request-monitor-ethernet-delay-measurement
    <request-monitor-ethernet-loss-measurement>
monitor interface
monitor interface traffic
monitor label-switched-path
monitor list
monitor start
monitor static-lsp
monitor stop
show log
<get-log>
show log user
  <get-syslog-events>
```

#### Configuration Hierarchy Levels

```
[edit vlans domain multicast-snooping-options traceoptions]
[edit vlans domain protocols igmp-snooping]
[edit vlans domain forwarding-options dhcp-relay traceoptions]
[edit vlans domain protocols igmp-snooping traceoptions]
[edit vlans domain forwarding-options dhcp-relay interface-traceoptions]
[edit vlans domain multicast-snooping-options traceoptions]
[edit vlans domain protocols igmp-snooping traceoptions]
[edit class-of-service application-traffic-control traceoptions]
[edit demux traceoptions]
[edit dynamic-profiles protocols igmp traceoptions]
```

```
[edit dynamic-profiles protocols mld traceoptions]
[edit dynamic-profiles class-of-service application-traffic-control
traceoptions]
[edit dynamic-profiles protocols oam ethernet link-fault-management
traceoptions]
[dynamic-profiles protocols oam ethernet lmi]
[edit dynamic-profiles protocols router-advertisement traceoptions]
[edit dynamic-profiles protocols oam gre-tunnel traceoptions]
[edit dynamic-profiles routing-instances instance vlans domain
forwarding-options dhcp-relay traceoptions]
[edit dynamic-profiles routing-instances instance vlans domain
multicast-snooping-options traceoptions]
[edit dynamic-profiles routing-instances instance vlans domain protocols
igmp-snooping traceoptions]
[edit dynamic-profiles routing-instances instance forwarding-options dhcp-relay
traceoptions]
[edit dynamic-profiles routing-instances instance multicast-snooping-options
traceoptions]
[edit dynamic-profiles routing-instances instance protocols bgp group neighbor
traceoptions]
[edit dynamic-profiles routing-instances instance protocols bgp group
traceoptions]
[edit dynamic-profiles routing-instances instance protocols bgp traceoptions]
[edit dynamic-profiles routing-instances instance protocols esis traceoptions]
[edit dynamic-profiles routing-instances instance protocols igmp-snooping
traceoptions]
[edit dynamic-profiles routing-instances instance protocols isis traceoptions]
[edit dynamic-profiles routing-instances instance protocols l2vpn traceoptions]
[edit dynamic-profiles routing-instances instance protocols ldp traceoptions]
[edit dynamic-profiles routing-instances instance protocols msdp group peer
traceoptions]
[edit dynamic-profiles routing-instances instance protocols msdp group
traceoptions]
[edit dynamic-profiles routing-instances instance protocols msdp peer
traceoptions]
[edit dynamic-profiles routing-instances instance protocols msdp traceoptions]
[edit dynamic-profiles routing-instances instance protocols mvpn traceoptions]
[edit dynamic-profiles routing-instances instance protocols ospf traceoptions]
[edit dynamic-profiles routing-instances instance protocols pim traceoptions]
[edit dynamic-profiles routing-instances instance protocols rip traceoptions]
[edit dynamic-profiles routing-instances instance protocols ripng traceoptions]
[edit dynamic-profiles routing-instances instance protocols router-discovery
traceoptions]
[edit dynamic-profiles routing-instances instance protocols vpls traceoptions]
[edit dynamic-profiles routing-instances instance routing-options multicast
traceoptions]
[edit dynamic-profiles routing-instances instance routing-options traceoptions]
[edit dynamic-profiles routing-instances instance services mobile-ip
traceoptions]
[edit dynamic-profiles routing-instances instance system services
dhcp-local-server traceoptions]
[edit dynamic-profiles routing-options multicast traceoptions]
[edit fabric protocols bgp group neighbor traceoptions]
[edit fabric protocols bgp group traceoptions]
[edit fabric protocols bgp traceoptions]
[edit fabric routing-instances instance routing-options traceoptions]
[edit fabric routing-options traceoptions]
[edit jnx-example traceoptions]
[edit logical-systems vlans domain forwarding-options dhcp-relay traceoptions]
[edit logical-systems vlans domain forwarding-options dhcp-relay
interface-traceoptions]
```

```

[edit logical-systems vlans domain multicast-snooping-options traceoptions]
[edit logical-systems vlans domain protocols igmp-snooping traceoptions]
[edit logical-systems forwarding-options dhcp-relay traceoptions]
[edit logical-systems protocols ancp traceoptions]
[edit logical-systems protocols bgp group neighbor traceoptions]
[edit logical-systems protocols bgp group traceoptions]
[edit logical-systems protocols bgp traceoptions]
[edit logical-systems protocols dot1x traceoptions]
[edit logical-systems protocols dvmrp traceoptions]
[edit logical-systems protocols esis traceoptions]
[edit logical-systems protocols igmp traceoptions]
[edit logical-systems protocols igmp-host traceoptions]
[edit logical-systems protocols ilmi traceoptions]
[edit logical-systems protocols isis traceoptions]
[edit logical-systems protocols l2circuit traceoptions]
[edit logical-systems protocols l2iw traceoptions]
[edit logical-systems protocols lacp traceoptions]
[edit logical-systems protocols layer2-control traceoptions]
[edit logical-systems protocols ldp traceoptions]
[edit logical-systems protocols mld traceoptions]
[edit dynamic-profiles protocols oam ethernet fnp traceoptions]
[edit logical-systems protocols mld-host traceoptions]
[edit logical-systems protocols mpls label-switched-path oam traceoptions]
[edit logical-systems protocols mpls label-switched-path primary oam
traceoptions]
[edit logical-systems protocols mpls label-switched-path secondary oam
traceoptions]
[edit logical-systems protocols mpls oam traceoptions]
[edit logical-systems protocols msdp group peer traceoptions]
[edit logical-systems protocols msdp group traceoptions]
[edit logical-systems protocols msdp peer traceoptions]
[edit logical-systems protocols msdp traceoptions]
[edit logical-systems protocols neighbor-discovery secure traceoptions]
[edit logical-systems protocols oam ethernet fnp traceoptions]
[edit logical-systems protocols oam ethernet link-fault-management traceoptions]
[edit logical-systems protocols oam ethernet lmi traceoptions]
[edit logical-systems protocols ospf traceoptions]
[edit logical-systems protocols pim traceoptions]
[edit logical-systems protocols ppp monitor-session]
[edit logical-systems protocols ppp traceoptions]
[edit logical-systems protocols ppp-service traceoptions]
[edit logical-systems protocols pppoe traceoptions]
[edit logical-systems protocols rip traceoptions]
[edit logical-systems protocols ripng traceoptions]
[edit logical-systems protocols router-advertisement traceoptions]
[edit logical-systems protocols router-discovery traceoptions]
[edit logical-systems protocols rsvp lsp-set traceoptions]
[edit logical-systems protocols rsvp traceoptions]
[edit logical-systems routing-instances instance vlans domain
multicast-snooping-options traceoptions]
[edit logical-systems routing-instances instance vlans domain protocols
igmp-snooping traceoptions]
[edit logical-systems routing-instances instance forwarding-options dhcp-relay
traceoptions]
[edit logical-systems routing-instances instance multicast-snooping-options
traceoptions]
[edit logical-systems routing-instances instance protocols bgp group neighbor
traceoptions]
[edit logical-systems routing-instances instance protocols bgp group
traceoptions]
[edit logical-systems routing-instances instance protocols bgp traceoptions]

```

```
[edit logical-systems routing-instances instance protocols esis traceoptions]
[edit logical-systems routing-instances instance protocols igmp-snooping
traceoptions]
[edit logical-systems routing-instances instance protocols isis traceoptions]
[edit logical-systems routing-instances instance protocols l2vpn traceoptions]
[edit logical-systems routing-instances instance protocols ldp traceoptions]
[edit logical-systems routing-instances instance protocols msdp group peer
traceoptions]
[edit logical-systems routing-instances instance protocols msdp group
traceoptions]
[edit logical-systems routing-instances instance protocols msdp peer
traceoptions]
[edit logical-systems routing-instances instance protocols msdp traceoptions]
[edit logical-systems routing-instances instance protocols mvpn traceoptions]
[edit logical-systems routing-instances instance protocols ospf traceoptions]
[edit logical-systems routing-instances instance protocols pim traceoptions]
[edit logical-systems routing-instances instance protocols rip traceoptions]
[edit logical-systems routing-instances instance protocols ripng traceoptions]
[edit logical-systems routing-instances instance protocols router-discovery
traceoptions]
[edit logical-systems routing-instances instance protocols vpls traceoptions]
[edit logical-systems routing-instances instance routing-options multicast
traceoptions]
[edit logical-systems routing-instances instance routing-options traceoptions]
[edit logical-systems routing-instances instance services mobile-ip
traceoptions]
[edit logical-systems routing-instances instance system services
dhcp-local-server traceoptions]
[edit logical-systems routing-instances instance system services
dhcp-local-server interface-traceoptions]
[edit logical-systems routing-options multicast traceoptions]
[edit logical-systems routing-options traceoptions]
[edit logical-systems services mobile-ip traceoptions]
[edit logical-systems system services dhcp-local-server traceoptions]
[edit logical-systems system services dhcp-local-server interface-traceoptions]
[edit multicast-snooping-options traceoptions]
[edit protocols ancp traceoptions]
[edit protocols bgp group neighbor traceoptions]
[edit protocols bgp group traceoptions]
[edit protocols bgp traceoptions]
[edit protocols dot1x traceoptions]
[edit protocols dvmrp traceoptions]
[edit protocols esis traceoptions]
[edit protocols igmp traceoptions]
[edit protocols igmp-host traceoptions]
[edit protocols ilmi traceoptions]
[edit protocols isis traceoptions]
[edit protocols l2circuit traceoptions]
[edit protocols l2iw traceoptions]
[edit protocols lacp traceoptions]
[edit protocols layer2-control traceoptions]
[edit protocols ldp traceoptions]
[edit protocols mld traceoptions]
[edit protocols mld-host traceoptions]
[edit protocols mpls label-switched-path oam traceoptions]
[edit protocols mpls label-switched-path primary oam traceoptions]
[edit protocols mpls label-switched-path secondary oam traceoptions]
[edit protocols mpls oam traceoptions]
[edit protocols msdp group peer traceoptions]
[edit protocols msdp group traceoptions]
[edit protocols msdp peer traceoptions]
```



```
[edit protocols msdp traceoptions]
[edit protocols neighbor-discovery secure traceoptions]
[edit protocols protocols oam ethernet fnp]
[edit protocols oam ethernet connectivity-fault-management traceoptions]
[edit protocols oam ethernet link-fault-management traceoptions]
[edit protocols oam ethernet lmi traceoptions]
[edit protocols ospf traceoptions]
[edit protocols pim traceoptions]
[edit protocols ppp monitor-session]
[edit protocols ppp traceoptions]
[edit protocols ppp-service traceoptions]
[edit protocols pppoe traceoptions]
[edit protocols rip traceoptions]
[edit protocols ripng traceoptions]
[edit protocols router-advertisement traceoptions]
[edit protocols router-discovery traceoptions]
[edit protocols rsvp lsp-set traceoptions]
[edit protocols rsvp traceoptions]
[edit routing-instances instance vlans domain multicast-snooping-options
traceoptions]
[edit routing-instances instance vlans domain protocols igmp-snooping
traceoptions]
[edit routing-instances instance multicast-snooping-options traceoptions]
[edit routing-instances instance protocols bgp group neighbor traceoptions]
[edit routing-instances instance protocols bgp group traceoptions]
[edit routing-instances instance protocols bgp traceoptions]
[edit routing-instances instance protocols esis traceoptions]
[edit routing-instances instance protocols igmp-snooping traceoptions]
[edit routing-instances instance protocols isis traceoptions]
[edit routing-instances instance protocols l2vpn traceoptions]
[edit routing-instances instance protocols ldp traceoptions]
[edit routing-instances instance protocols msdp group peer traceoptions]
[edit routing-instances instance protocols msdp group traceoptions]
[edit routing-instances instance protocols msdp peer traceoptions]
[edit routing-instances instance protocols msdp traceoptions]
[edit routing-instances instance protocols mvpn traceoptions]
[edit routing-instances instance protocols ospf traceoptions]
[edit routing-instances instance protocols pim traceoptions]
[edit routing-instances instance protocols rip traceoptions]
[edit routing-instances instance protocols ripng traceoptions]
[edit routing-instances instance protocols router-discovery traceoptions]
[edit routing-instances instance protocols vpls traceoptions]
[edit routing-instances instance routing-options multicast traceoptions]
[edit routing-instances instance routing-options traceoptions]
[edit routing-options multicast traceoptions]
[edit routing-options traceoptions]
[edit security idp traceoptions]
[edit security pki traceoptions]
[edit services adaptive-services-pics traceoptions]
[edit services captive-portal-content-delivery]
[edit services l2tp traceoptions]
[edit services server-load-balance traceoptions]
[edit services logging traceoptions]
[edit services mobile-ip traceoptions]
[edit services ssl traceoptions]
[edit system accounting traceoptions]
[edit system auto-configuration traceoptions]
[edit system ddos-protection traceoptions]
[edit system license traceoptions]
[edit system processes app-engine-virtual-machine-management-service
traceoptions]
```

```
[edit system processes datapath-trace-service traceoptions]
[edit system processes dhcp-service interface-traceoptions]
[edit system processes dhcp-service traceoptions]
[edit system processes diameter-service traceoptions]
[edit system processes general-authentication-service traceoptions]
[edit system processes mac-validation traceoptions]
[edit system processes mag-service traceoptions]
[edit system processes process-monitor traceoptions]
[edit system processes resource-cleanup traceoptions]
[edit system processes sdk-service traceoptions]
[edit system processes static-subscribers traceoptions]
[edit system services database-replication traceoptions]
[edit system services dhcp traceoptions]
[edit system services local-policy-decision-function traceoptions]
[edit system services outbound-ssh traceoptions]
[edit system services service-deployment traceoptions]
[edit system services subscriber-management traceoptions]
[edit system services subscriber-management-helper traceoptions]
[edit system services web-management traceoptions]
```

**Related  
Documentation**

- [Access Privilege User Permission Flags Overview on page 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
- [trace-control on page 188](#)

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## trace-control

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**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]
[edit demux traceoptions]
[edit dynamic-profiles protocols igmp traceoptions]
[edit dynamic-profiles protocols mld traceoptions]
[edit dynamic-profiles protocols oam ethernet link-fault-management
traceoptions]
[dynamic-profiles protocols oam ethernet lmi]
[edit dynamic-profiles protocols router-advertisement traceoptions]
[edit dynamic-profiles protocols oam gre-tunnel traceoptions]
[edit dynamic-profiles routing-instances instance vlans domain
forwarding-options dhcp-relay traceoptions]
[edit dynamic-profiles routing-instances instance vlans domain
multicast-snooping-options traceoptions]
[edit dynamic-profiles routing-instances instance vlans domain protocols
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[edit system ddos-protection traceoptions]
[edit services l2tp traceoptions]
[edit services logging traceoptions]
[edit services mobile-ip traceoptions]
[edit services server-load-balance traceoptions]
[edit services ssl traceoptions]
[edit system accounting traceoptions]
[edit system auto-configuration traceoptions]
[edit system license traceoptions]
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[edit system processes diameter-service traceoptions]
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[edit system processes mac-validation traceoptions]
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```
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[edit system services outbound-ssh traceoptions]
[edit system services service-deployment traceoptions]
[edit system services subscriber-management traceoptions]
[edit system services subscriber-management-helper traceoptions]
[edit unified-edge aaa traceoptions]
[edit unified-edge gateways tdf charging traceoptions]
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- Related Documentation**
- [Access Privilege User Permission Flags Overview on page 76](#)
  - [Understanding Junos OS Access Privilege Levels on page 7](#)
  - [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
  - [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
  - [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)
  - [trace on page 183](#)

## 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>
<request-validation-policy>
show
show access-security
show access-security router-advertisement-guard
show access-security router-advertisement-guard entries
<show-as-router-advertisement-entry>
show access-security router-advertisement-guard state
<show-as-ra-state>
show access-security router-advertisement-guard statistics
<get-as-router-advertisement-statistics>
show access-security router-advertisement-guard statistics interface
<get-as-router-advertisement-interface>
show accounting

show accounting profile
<get-accounting-profile-information>

show accounting records
<get-accounting-record-information>
```

```
show amt
show amt statistics
  <get-amt-statistics>
show amt summary
  <get-amt-summary>
show amt tunnel
  <get-amt-tunnel-information>
show amt tunnel gateway-address
  <get-amt-tunnel-gateway-address>
show amt tunnel tunnel-interface
  <get-amt-tunnel-interface>
show analytics collector
  <get-analytics-collector>
show ancp
show ancp cos
  <get-ancp-cos-information>
show ancp cos last-update
  <get-ancp-cos-last-update-information>

show ancp cos pending-update
  <get-ancp-cos-pending-information>

show ancp neighbor
  <get-ancp-neighbor-information>
show ancp statistics
  <get-ancp-stats-information>
show ancp subscriber
  <get-ancp-subscriber-information>

show ancp subscriber identifier
  <get-ancp-subscriber-identifier-information>
show ancp subscriber neighbor
show app-engine
show app-engine information
show app-engine packages
show app-engine packages remote
  <get-virtual-machine-package-remote>
show app-engine packages system
  <get-virtual-machine-package-system>
show app-engine processes
show app-engine resource-usage
show app-engine route-table
show app-engine routing-instance
show app-engine routing-instance compute-clusters
show app-engine routing-instance virtual-machines
show app-engine status
show app-engine virtual-machine package
  <get-virtual-machine-package-information>
show application-monitor
  <get-application-monitor-information>
show application-monitor probe
show application-monitor probe flows
  <get-application-monitor-probe-flows-information>
show application-monitor probe measurements
  <get-application-monitor-probe-measurements>
show application-monitor probe mirrors
  <get-application-monitor-probe-mirrors>
show app-engine virtual-machine vm-instance
show aps
  <get-aps-information>
```



```
show aps group
  <get-aps-group-information>
show aps interface
  <get-aps-interface-information>
show arp
  <get-arp-table-information>

show as-path
  <get-as-path>
show as-path domain
  <get-as-path-domain>
show auto-configuration
show auto-configuration interfaces
show backup-selection
  <get-backup-selection>
show backup-selection instance
  <get-backup-selection-instance>
show bfd
show bfd session
  <get-bfd-session-information>

show bfd session address
  <get-bfd-session-address>
show bfd session client
  <get-bfd-session-client>
show bfd session client rsvp-oam
  <get-bfd-session-client-rsvp>
show bfd session client vpls-oam
  <get-bfd-session-client-vpls>
show bfd session client vpls-oam instance
  <get-bfd-session-client-vpls-instance>
show bfd session discriminator
  <get-bfd-session-discriminator>
show bfd session prefix
  <get-bfd-session-prefix>
show bfd subscriber
show bfd subscriber session
  <get-bfd-subscriber-session>
show bgp
show bgp bmp
  <get-bgp-monitoring-protocol-statistics>
show bgp group
  <get-bgp-group-information>
show bgp group output-queues
  <get-bgp-group-output-queue-information>

show bgp group rtf
  <get-bgp-rtf-information>

show bgp group traffic-statistics
  <get-bgp-traffic-statistics-information>

show bgp neighbor
  <get-bgp-neighbor-information>

show bgp neighbor orf
  <get-bgp-orf-information>
show bgp neighbor output-queue
  <get-bgp-output-queue-information>
show bgp output-scheduler
```

```
show bgp replication
<get-bgp-replication-information>
show bgp summary
<get-bgp-summary-information>

show bridge
show bridge domain
<get-bridge-instance-information>

show bridge domain operational
<get-operational-bridge-instance-information>
show bridge domain satellite
<get-satellite-control-bridge-domain>
show bridge evpn
show bridge evpn arp-table
<get-bridge-evpn-arp-table>
show bridge evpn peer-gateway-macs
<get-bridge-peer-gateway-mac>
<get-bridge-flood-information>
show bridge flood
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>
show bridge flood route
show bridge flood route all-ce-flood
<get-show-bridge-domain-all-ce-flood-route-information>

show bridge flood route all-ve-flood
<get-show-bridge-domain-ve-flood-route-information>
show bridge flood route alt-root-flood
<get-bridge-domain-alt-root-flood-route-information>
show bridge flood route bd-flood
<get-bridge-domain-bd-flood-route-information>
show bridge flood route mlp-flood
<get-bridge-domain-mlp-flood-route-information>
show bridge flood route re-flood
<get-bridge-domain-re-flood-route-information>
show bridge flood satellite
<get-satellite-control-flood>
show bridge interface
show bridge interface satellite
<get-satellite-control-bridge-interface>
show bridge mac-table
<get-bridge-mac-table>
show bridge mac-table interface
<get-bridge-interface-mac-table>
show bridge mac-table satellite
<get-satellite-control-bridge-mac-table>
show bridge satellite
show bridge satellite device
<get-satellite-device-db>
show bridge satellite events
<get-satellite-control-history-information>
show bridge satellite logging
<get-satellite-control-logging-information>
show bridge satellite summary
<get-satellite-control-bridge-summary>

show bridge statistics
```

```

    <get-bridge-statistics-information>
show chassis
show chassis adc
show chassis alarms
    <get-alarm-information>
show chassis alarms fpc
<get-fpc-alarm-information>
show chassis alarms satellite
<get-chassis-alarm-satellite-information>
show chassis beacon
    <get-chassis-beacon-information>
show chassis beacon cb
    <get-chassis-cb-beacon-information>
show chassis environment adc
show chassis environment ccg
<get-environment-ccg-information>
show chassis cfeb
    <get-cfeb-information>
show chassis cip
show chassis craft-interface
    <get-craft-information>
show chassis environment
    <get-environment-information>
show chassis environment cb
    <get-environment-cb-information>
show chassis environment cip
    <get-environment-cip-information>
show chassis environment feb
    <get-environment-feb-information>
show chassis environment fan
show chassis environment fpc
    <get-environment-fpc-information>
show chassis environment fpc satellite
<get-chassis-environment-fpc-satellite-info>
show chassis environment fpm
    <get-environment-fpm-information>
show chassis environment mcs
    <get-environment-mcs-information>
show chassis environment pcg
    <get-environment-pcg-information>
show chassis environment pdu
<get-environment-pdu-information>
show chassis environment pem
    <get-environment-pem-information>
show chassis environment pem satellite
<get-chassis-environment-pem-satellite-info>
show chassis environment psm
show chassis environment psu
    <get-environment-psu-information>
show chassis environment routing-engine
    <get-environment-re-information>
show chassis environment routing-engine satellite
<get-chassis-environment-re-satellite-info>
show chassis environment satellite
<get-chassis-environment-satellite-information>
show chassis environment scg
    <get-environment-scg-information>
show chassis environment service-node
<get-environment-service-node-information>
show chassis environment sfb
show chassis environment sfm

```

```
<get-environment-sfm-information>

show chassis environment sib
  <get-environment-sib-information>

show chassis environment sib f13
show chassis environment sib f2s
show chassis ethernet-switch
show chassis ethernet-switch errors
show chassis ethernet-switch statistics
show chassis ethernet-switch temperature
show chassis fabric
show chassis fabric degraded-fabric-reachability
show chassis fabric device
  <get-chassis-fabric-information-device>
show chassis fabric connectivity
  <get-chassis-fabric-connectivity-information>
show chassis fabric degradation
  <get-fm-degradation-information>
show chassis fabric degradation actions
  <get-fm-degradation-information-details>
show chassis fabric destinations
  <get-fm-fabric-destinations-state>
show chassis fabric errors
show chassis fabric errors autoheal
  <get-fm-plane-autoheal-errors>
show chassis fabric errors fpc
  <get-fm-fpc-errors>

show chassis fabric errors sib
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  <get-fm-plane-state-information>

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  <get-fm-fabric-reachability-information>
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  <get-fm-sib-state-information>
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  <get-chassis-fabric-spray-weight-information>
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show chassis fabric spray-weights to
show chassis fabric summary
  <get-fm-state-information>

show chassis fabric topology
  <get-chassis-fabric-topology-information>
show chassis fabric unreachable-destinations
  <get-fm-unreachable-dest-information>
show chassis fan
```

```
show chassis fan satellite
get-chassis-fan-satellite-information
show chassis feb
  <get-feb-brief-information>

show chassis feb detail
  <get-feb-information>

show chassis firmware
  <get-firmware-information>

show chassis firmware detail
  <get-firmware-information-detail>
show chassis firmware satellite
<get-chassis-firmware-satellite-information>
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  <get-fwdd-information>

show chassis fpc
  <get-fpc-information>

show chassis fpc errors
  <get-fpc-error-information>

show chassis fpc pic-status
  <get-pic-information>

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  <get-fpc-feb-connectivity-information>

show chassis hardware
  <get-chassis-inventory>
show chassis hardware satellite
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show chassis hss
show chassis hss link-quality
show chassis in-service-upgrade
show chassis ioc-npc-connectivity
  <get-ioc-npc-connectivity-information>
show chassis jam-test
<get-jam-test-information>
show chassis lcc-mode
<get-chassis-lcc-mode-information>

show chassis lccs
  <get-fru-information>
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show chassis location
  <get-chassis-location>

show chassis location fpc
show chassis location interface
show chassis location interface by-name
  <get-interface-location-name-information>

show chassis location interface by-slot
  <get-interface-location-information>
show chassis mac-addresses
show chassis multicast-loadbalance
<get-chassis-ae-lb-information>
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```
show chassis network-services
    <network-services>

show chassis nonstop-upgrade
show chassis pic
    <get-pic-detail>

show chassis power
    <get-power-usage-information>

show chassis power detail
    <get-power-usage-information-detail>
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show chassis power upgrade

show chassis power-ratings
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    <get-psd-information>

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show chassis redundancy feb
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show chassis redundancy feb errors
    <get-feb-redundancy-error-information>

show chassis redundancy feb redundancy-group
    <get-feb-redundancy-group-information>

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    <get-rps-chassis-information>

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    <get-route-engine-information>

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    <get-bios-version-information>
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    <get-chassis-routing-engine-bios-satellite-info>
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show chassis satellite
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show chassis satellite extended-port
    <get-chassis-satellite-extended-port-information>
show chassis satellite interface
    <get-chassis-satellite-interface-information>
show chassis satellite neighbor
    <get-chassis-satellite-neighbor-information>
show chassis satellite neighbor statistics
    <get-chassis-satellite-neighbor-statistics>
    show chassis satellite power-budget-statistics
    <get-power-budget-information>
show chassis satellite redundancy-group
    <get-chassis-satellite-redundancy-group-info>
show chassis satellite redundancy-group devices
    <get-chassis-satellite-redundancy-grp-devices-info>
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show chassis satellite redundancy-group devices history
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show chassis satellite software
<get-satellite-management-software-information>
show chassis satellite statistics
<get-chassis-satellite-statistics>
show chassis satellite unprovision
<get-chassis-satellite-unprovision-information>
show chassis satellite upgrade-group
<get-chassis-satellite-upgrade-group-information>
show chassis satellite-cluster
<get-chassis-satellite-cluster-information>
show chassis satellite-cluster route
<get-chassis-satellite-cluster-route>
show chassis satellite-cluster statistics
<get-chassis-satellite-cluster-statistics>
show chassis scb
<get-scb-information>

show chassis service-node
<get-service-node-information>

show chassis sfm
<get-sfm-information>

show chassis sfm detail
show chassis sibs
<get-sib-information>

show chassis spmb
<get-spmb-information>
show chassis spmb errors
<get-spmb-error-information>

show chassis spmb sibs
<get-spmb-sib-information>

show chassis ssb
<get-ssb-information>

show chassis synchronization
<get-clock-synchronization-information>

show chassis synchronization backup
show chassis synchronization gnss
show chassis synchronization master
show chassis system-mode
<get-system-mode-information>
show chassis temperature-thresholds
<get-temperature-threshold-information>
show chassis temperature-thresholds satellite
<get-chassis-temp-thresholds-satellite-info>
show chassis vcpu
show chassis zones
<get-chassis-zones-information>
show class-of-service
<get-cos-information>

show class-of-service adaptive-shaper
<get-cos-adaptive-shaper-information>
```

```
show class-of-service application-traffic-control
show class-of-service application-traffic-control counter
show class-of-service application-traffic-control rate-limiters
show class-of-service application-traffic-control rate-limiters rl-all
<get-appqos-swrl-stat-all>
show class-of-service application-traffic-control rate-limiters rl-name
<get-appqos-swrl-stat-name>
show class-of-service application-traffic-control rate-limiters summary
<get-appqos-swrl-stat-summary>
show class-of-service application-traffic-control statistics
show class-of-service application-traffic-control statistics rate-limiter
show class-of-service application-traffic-control statistics rule
  <get-appqos-rule-statistics>
show class-of-service classifier
  <get-cos-classifier-information>

show class-of-service code-point-aliases
  <get-cos-code-point-map-information>

show class-of-service congestion-notification
  <get-cos-congestion-notification-information>
show class-of-service drop-profile
  <get-cos-drop-profile-information>

show class-of-service fabric
show class-of-service fabric scheduler-map
  <get-cos-fabric-scheduler-map-information>

show class-of-service fabric statistics
  <get-fabric-queue-information>

show class-of-service fabric statistics detail
<get-fabric-queue-detailed-information>

show class-of-service forwarding-class
  <get-cos-forwarding-class-information>

show class-of-service forwarding-class-set
  <get-cos-forwarding-class-set-information>
show class-of-service forwarding-table
  <get-cos-table-information>

show class-of-service forwarding-table classifier
  <get-cos-classifier-table-information>

show class-of-service forwarding-table classifier mapping
  <get-cos-classifier-table-map-information>

show class-of-service forwarding-table drop-profile
  <get-cos-red-information>

show class-of-service forwarding-table fabric
show class-of-service forwarding-table fabric scheduler-map
  <get-cos-fwtab-fabric-scheduler-map-information>

show class-of-service forwarding-table forwarding-class-map
  <get-cos-forwarding-class-map-table-information>

show class-of-service forwarding-table forwarding-class-map mapping
  <get-cos-forwarding-class-map-interface-table-information>
```



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show class-of-service forwarding-table loss-priority-map
  <get-cos-loss-priority-map-table-information>

show class-of-service forwarding-table loss-priority-map mapping
  <get-cos-loss-priority-map-table-binding-information>

show class-of-service forwarding-table loss-priority-rewrite
  <get-cos-loss-priority-rewrite-table-information>
show class-of-service forwarding-table loss-priority-rewrite mapping
  <get-cos-loss-priority-rewrite-table-binding-information>
show class-of-service forwarding-table policer
  <get-cos-policer-table-map-information>
show class-of-service forwarding-table policy-map
  <get-cos-policy-map-table-information>
show class-of-service forwarding-table policy-map mapping
  <get-cos-policy-map-table-map-information>
show class-of-service forwarding-table
  rewrite-rule
    <get-cos-rewrite-table-information>

show class-of-service forwarding-table rewrite-rule mapping
  <get-cos-rewrite-table-map-information>

show class-of-service forwarding-table scheduler-map
  <get-cos-scheduler-map-table-information>
show class-of-service forwarding-table scheduler-map mapping
  <get-cos-scheduler-map-table-map-information>

show class-of-service forwarding-table shaper
  <get-cos-shaper-table-map-information>

show class-of-service forwarding-table translation-table
  <get-cos-translation-table-information>

show class-of-service forwarding-table translation-table mapping
  <get-cos-translation-table-mapping-information>

show class-of-service fragmentation-map
  <get-cos-fragmentation-map-information>

show class-of-service interface
  <get-cos-interface-map-information>

show class-of-service interface-set
  <get-cos-interface-set-map-information>

show class-of-service l2tp-session
  <get-cos-l2tp-session-map-information>

show class-of-service loss-priority-map
  <get-cos-loss-priority-map-information>

show class-of-service loss-priority-rewrite
  <get-cos-loss-priority-rewrite-information>
show class-of-service multi-destination
  <get-cos-multi-destination-information>
show class-of-service multi-destination classifier-binding
  <get-cos-multi-destination-classifier-binding-information>

show class-of-service packet-buffer
  <get-cos-packet-buffer-information>
show class-of-service packet-buffer usage
```

```
<get-cos-packet-buffer-usage-information>
show class-of-service policy-map
<get-cos-policy-map-information>

show class-of-service rewrite-rule
<get-cos-rewrite-information>

show class-of-service routing-instance
<get-cos-routing-instance-map-information>

show class-of-service scheduler-hierarchy
show class-of-service scheduler-hierarchy interface
<get-interface-scheduler-hierarchy-information>

show class-of-service scheduler-hierarchy interface-set
<get-interface-set-scheduler-hierarchy-information>

show class-of-service scheduler-map
<get-cos-scheduler-map-information>

show class-of-service traffic-control-profile
<get-cos-traffic-control-profile-information>

show class-of-service translation-table
<get-cos-translation-table-map-information>

show class-of-service virtual-channel
<get-cos-virtual-channel-information>

show class-of-service virtual-channel-group
<get-cos-virtual-channel-group-information>

show cli
show cli authorization
<get-authorization-information>
show cli commands
show cli commands
show cli directory
<get-current-working-directory>
show cli history
show cloud-analytics
show cloud-analytics connections
<get-cloud-analytics-connections>
show cloud-analytics discovery-service
<get-cloud-analytics-discovery-service>
show cloud-analytics linecard
<get-cloud-analytics-lc>
show cloud-analytics resources
<get-cloud-analytics-resources>
show cloud-analytics resources-sampling
<get-cloud-analytics-resources-sampling>
show cloud-analytics resources-summary
<get-cloud-analytics-resources-summary>
show cloud-analytics sensors
<sensor-information>
show cloud-analytics streaming-policies
<get-cloud-analytics-streaming-policies>
show configuration
show connections
<get-ccc-information>
show database-replication
```

```
show database-replication statistics
  <get-database-replication-statistics-information>

show database-replication summary
  <get-database-replication-summary-information>

show ddos-protection
show ddos-protection protocols
  <get-ddos-protocols-information>
show ddos-protection protocols all-fiber-channel-enode
  <get-ddos-all-fc-enode-information>
show ddos-protection protocols all-fiber-channel-enode aggregate
  <get-ddos-all-fc-enode-aggregate>
show ddos-protection protocols all-fiber-channel-enode aggregate culprit-flows
  <get-ddos-all-fc-enode-aggregate-flows>
show ddos-protection protocols all-fiber-channel-enode culprit-flows
  <get-ddos-all-fc-enode-flows>
show ddos-protection protocols all-fiber-channel-enode flow-detection
  <get-ddos-all-fc-enode-flow-parameters>
show ddos-protection protocols all-fiber-channel-enode parameters
  <get-ddos-all-fc-enode-parameters>
show ddos-protection protocols all-fiber-channel-enode statistics
  <get-ddos-all-fc-enode-statistics>
show ddos-protection protocols all-fiber-channel-enode violations
  <get-ddos-all-fc-enode-violations>
show ddos-protection protocols amtv4
show ddos-protection protocols amtv4 aggregate
show ddos-protection protocols amtv4 aggregate culprit-flows
show ddos-protection protocols amtv4 culprit-flows
show ddos-protection protocols amtv4 flow-detection
show ddos-protection protocols amtv4 parameters
show ddos-protection protocols amtv4 statistics
show ddos-protection protocols amtv4 violations
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
show ddos-protection protocols amtv6 flow-detection
show ddos-protection protocols amtv6 statistics
show ddos-protection protocols amtv6 violations

show ddos-protection protocols ancp
  <get-ddos-ancp-information>

show ddos-protection protocols ancp aggregate
  <get-ddos-ancp-aggregate>
show ddos-protection protocols ancp parameters
  <get-ddos-ancp-parameters>

show ddos-protection protocols ancp statistics
  <get-ddos-ancp-statistics>
show ddos-protection protocols ancp violations
  <get-ddos-ancp-violations>
show ddos-protection protocols ancpv6
  <get-ddos-ancpv6-information>
show ddos-protection protocols ancpv6 aggregate
  get-ddos-ancpv6-aggregate
show ddos-protection protocols ancpv6 parameters
  get-ddos-ancpv6-parameters
show ddos-protection protocols ancpv6 statistics
  get-ddos-ancpv6-statistics
```

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show ddos-protection protocols ancpv6 violations
  get-ddos-ancpv6-violations
show ddos-protection protocols arp
  get-ddos-arp-information
show ddos-protection protocols arp aggregate
  get-ddos-arp-aggregate
show ddos-protection protocols arp parameters
  get-ddos-arp-parameters
show ddos-protection protocols arp statistics
  get-ddos-arp-statistics
show ddos-protection protocols arp violations
  get-ddos-arp-violations
show ddos-protection protocols arp-snoop
  <get-ddos-arp-snoop-information>
show ddos-protection protocols arp-snoop aggregate
  <get-ddos-arp-snoop-aggregate>
show ddos-protection protocols arp-snoop aggregate culprit-flows
  <get-ddos-arp-snoop-aggregate-flows>
show ddos-protection protocols arp-snoop culprit-flows
  <get-ddos-arp-snoop-flows>
show ddos-protection protocols arp-snoop flow-detection
  <get-ddos-arp-snoop-flow-parameters>
show ddos-protection protocols arp-snoop parameters
  <get-ddos-arp-snoop-parameters>
  show ddos-protection protocols arp-snoop statistics
  <get-ddos-arp-snoop-statistics>
show ddos-protection protocols arp-snoop violations
  <get-ddos-arp-snoop-violations>
show ddos-protection protocols atm
  get-ddos-atm-information
show ddos-protection protocols atm aggregate
  get-ddos-atm-aggregate
show ddos-protection protocols atm parameters
  get-ddos-atm-parameters
show ddos-protection protocols atm statistics
  get-ddos-atm-statistics
show ddos-protection protocols atm violations
  get-ddos-atm-violations
show ddos-protection protocols bfd
  get-ddos-bfd-information
show ddos-protection protocols bfd aggregate
  get-ddos-bfd-aggregate
show ddos-protection protocols bfd parameters
  get-ddos-bfd-parameters
show ddos-protection protocols bfd statistics
  get-ddos-bfd-statistics
show ddos-protection protocols bfd violations
  get-ddos-bfd-violations
show ddos-protection protocols bfdv6
  get-ddos-bfdv6-information
show ddos-protection protocols bfdv6 aggregate
  get-ddos-bfdv6-aggregate
show ddos-protection protocols bfdv6 parameters
  get-ddos-bfdv6-parameters
show ddos-protection protocols bfdv6 statistics
  get-ddos-bfdv6-statistics
show ddos-protection protocols bfdv6 violations
  get-ddos-bfdv6-violations
show ddos-protection protocols bgp
  get-ddos-bgp-information
show ddos-protection protocols bgp aggregate
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    get-ddos-bgp-aggregate
show ddos-protection protocols bgp parameters
    get-ddos-bgp-parameters
show ddos-protection protocols bgp statistics
    get-ddos-bgp-statistics
show ddos-protection protocols bgp violations
    get-ddos-bgp-violations
show ddos-protection protocols bgpv6
    get-ddos-bgpv6-information
show ddos-protection protocols bgpv6 aggregate
    get-ddos-bgpv6-aggregate
show ddos-protection protocols bgpv6 parameters
    get-ddos-bgpv6-parameters
show ddos-protection protocols bgpv6 statistics
    get-ddos-bgpv6-statistics
show ddos-protection protocols bgpv6 violations
    get-ddos-bgpv6-violations
show ddos-protection protocols bridge-control
<get-ddos-brg-ctrl-information>
show ddos-protection protocols bridge-control aggregate
<get-ddos-brg-ctrl-aggregate>
show ddos-protection protocols bridge-control aggregate culprit-flows
<get-ddos-brg-ctrl-aggregate-flows>
show ddos-protection protocols bridge-control culprit-flows
<get-ddos-brg-ctrl-flows>
show ddos-protection protocols bridge-control flow-detection
<get-ddos-brg-ctrl-flow-parameters>
show ddos-protection protocols bridge-control parameters
<get-ddos-brg-ctrl-parameters>
show ddos-protection protocols bridge-control statistics
<get-ddos-brg-ctrl-statistics>
show ddos-protection protocols bridge-control violations
<get-ddos-brg-ctrl-violations>show ddos-protection protocols demux-autosense
    get-ddos-demuxauto-information
show ddos-protection protocols demux-autosense aggregate
    get-ddos-demuxauto-aggregate
show ddos-protection protocols demux-autosense parameters
    get-ddos-demuxauto-parameters
show ddos-protection protocols demux-autosense statistics
    get-ddos-demuxauto-statistics
show ddos-protection protocols demux-autosense violations
    get-ddos-demuxauto-violations
show ddos-protection protocols dhcpv4
    get-ddos-dhcpv4-information
show ddos-protection protocols dhcpv4 ack
    get-ddos-dhcpv4-ack
show ddos-protection protocols dhcpv4 aggregate
    get-ddos-dhcpv4-aggregate
show ddos-protection protocols dhcpv4 bad-packets
    get-ddos-dhcpv4-bad-pack
show ddos-protection protocols dhcpv4 bootp
    get-ddos-dhcpv4-bootp
show ddos-protection protocols dhcpv4 decline
    get-ddos-dhcpv4-decline
show ddos-protection protocols dhcpv4 discover
    get-ddos-dhcpv4-discover
show ddos-protection protocols dhcpv4 force-renew
    get-ddos-dhcpv4-forcerenew
show ddos-protection protocols dhcpv4 inform
    get-ddos-dhcpv4-inform
show ddos-protection protocols dhcpv4 lease-active

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get-ddos-dhcpv4-leaseact
show ddos-protection protocols dhcpv4 lease-query
get-ddos-dhcpv4-leasequery
show ddos-protection protocols dhcpv4 lease-unassigned
get-ddos-dhcpv4-leaseuna
show ddos-protection protocols dhcpv4 lease-unknown
get-ddos-dhcpv4-leaseunk
show ddos-protection protocols dhcpv4 nak
get-ddos-dhcpv4-nak
show ddos-protection protocols dhcpv4 no-message-type
get-ddos-dhcpv4-no-msgtype
show ddos-protection protocols dhcpv4 offer
get-ddos-dhcpv4-offer
show ddos-protection protocols dhcpv4 offer culprit-flows
show ddos-protection protocols dhcpv4 parameters
get-ddos-dhcpv4-parameters
show ddos-protection protocols dhcpv4 release
get-ddos-dhcpv4-release
show ddos-protection protocols dhcpv4 renew
get-ddos-dhcpv4-renew
show ddos-protection protocols dhcpv4 request
get-ddos-dhcpv4-request
show ddos-protection protocols dhcpv4 statistics
get-ddos-dhcpv4-statistics
show ddos-protection protocols dhcpv4 unclassified
get-ddos-dhcpv4-unclass
show ddos-protection protocols dhcpv4 violations
get-ddos-dhcpv4-violations
show ddos-protection protocols dhcpv4v6
<get-ddos-dhcpv4v6-information>
show ddos-protection protocols dhcpv4v6 aggregate
<get-ddos-dhcpv4v6-aggregate>
show ddos-protection protocols dhcpv4v6 aggregate culprit-flows
<get-ddos-dhcpv4v6-aggregate-flows>
show ddos-protection protocols dhcpv4v6 culprit-flows
<get-ddos-dhcpv4v6-flows>
show ddos-protection protocols dhcpv4v6 flow-detection
<get-ddos-dhcpv4v6-flow-parameters>
show ddos-protection protocols dhcpv4v6 parameters
<get-ddos-dhcpv4v6-parameters>
show ddos-protection protocols dhcpv4v6 statistics
<get-ddos-dhcpv4v6-statistics>
show ddos-protection protocols dhcpv4v6 violations
<get-ddos-dhcpv4v6-violations>
show ddos-protection protocols dhcpv6
get-ddos-dhcpv6-information
show ddos-protection protocols dhcpv6 advertise
get-ddos-dhcpv6-advertise
show ddos-protection protocols dhcpv6 advertise culprit-flows
show ddos-protection protocols dhcpv6 aggregate
get-ddos-dhcpv6-aggregate
show ddos-protection protocols dhcpv6 confirm
get-ddos-dhcpv6-confirm
show ddos-protection protocols dhcpv6 decline
get-ddos-dhcpv6-decline
show ddos-protection protocols dhcpv6 information-request
get-ddos-dhcpv6-info-req
show ddos-protection protocols dhcpv6 leasequery
get-ddos-dhcpv6-leasequery
show ddos-protection protocols dhcpv6 leasequery culprit-flows
show ddos-protection protocols dhcpv6 leasequery-data
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get-ddos-dhcpv6-leaseq-da
show ddos-protection protocols dhcpv6 leasequery-done
get-ddos-dhcpv6-leaseq-do
show ddos-protection protocols dhcpv6 leasequery-reply
get-ddos-dhcpv6-leaseq-re
show ddos-protection protocols dhcpv6 parameters
get-ddos-dhcpv6-parameters
show ddos-protection protocols dhcpv6 rebind
get-ddos-dhcpv6-rebind
show ddos-protection protocols dhcpv6 reconfigure
get-ddos-dhcpv6-reconfig
show ddos-protection protocols dhcpv6 relay-forward
get-ddos-dhcpv6-relay-for
show ddos-protection protocols dhcpv6 relay-reply
get-ddos-dhcpv6-relay-rep
show ddos-protection protocols dhcpv6 release
get-ddos-dhcpv6-release
show ddos-protection protocols dhcpv6 renew
get-ddos-dhcpv6-renew
show ddos-protection protocols dhcpv6 reply
get-ddos-dhcpv6-reply
show ddos-protection protocols dhcpv6 request
get-ddos-dhcpv6-request
show ddos-protection protocols dhcpv6 solicit
get-ddos-dhcpv6-solicit
show ddos-protection protocols dhcpv6 statistics
get-ddos-dhcpv6-statistics
show ddos-protection protocols dhcpv6 unclassified
get-ddos-dhcpv6-unclass
show ddos-protection protocols dhcpv6 unclassified culprit-flows
show ddos-protection protocols dhcpv6 violations
get-ddos-dhcpv6-violations
show ddos-protection protocols diameter
get-ddos-diameter-information
show ddos-protection protocols diameter aggregate
get-ddos-diameter-aggregate
show ddos-protection protocols diameter parameters
get-ddos-diameter-parameters
show ddos-protection protocols diameter statistics
get-ddos-diameter-statistics
show ddos-protection protocols diameter violations
get-ddos-diameter-violations
show ddos-protection protocols dns
get-ddos-dns-information
show ddos-protection protocols dns aggregate
get-ddos-dns-aggregate
show ddos-protection protocols dns parameters
get-ddos-dns-parameters
show ddos-protection protocols dns statistics
get-ddos-dns-statistics
show ddos-protection protocols dns violations
get-ddos-dns-violations
show ddos-protection protocols dtcp
get-ddos-dtcp-information
show ddos-protection protocols dtcp aggregate
get-ddos-dtcp-aggregate
show ddos-protection protocols dtcp aggregate culprit-flows
show ddos-protection protocols dtcp parameters
get-ddos-dtcp-parameters
show ddos-protection protocols dtcp statistics
get-ddos-dtcp-statistics

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show ddos-protection protocols dtcp violations
  get-ddos-dtcp-violations
show ddos-protection protocols dynamic-vlan
  get-ddos-dynvlan-information
show ddos-protection protocols dynamic-vlan aggregate
  get-ddos-dynvlan-aggregate
show ddos-protection protocols dynamic-vlan parameters
  get-ddos-dynvlan-parameters
show ddos-protection protocols dynamic-vlan statistics
  get-ddos-dynvlan-statistics
show ddos-protection protocols dynamic-vlan violations
  get-ddos-dynvlan-violations
show ddos-protection protocols egpv6
  get-ddos-egpv6-information
show ddos-protection protocols egpv6 aggregate
  get-ddos-egpv6-aggregate
show ddos-protection protocols egpv6 parameters
  get-ddos-egpv6-parameters
show ddos-protection protocols egpv6 statistics
  get-ddos-egpv6-statistics
show ddos-protection protocols egpv6 violations
  get-ddos-egpv6-violations
show ddos-protection protocols eoam
  get-ddos-eoam-information
show ddos-protection protocols eoam aggregate
  get-ddos-eoam-aggregate
show ddos-protection protocols eoam parameters
  get-ddos-eoam-parameters
show ddos-protection protocols eoam statistics
  get-ddos-eoam-statistics
show ddos-protection protocols eoam violations
  get-ddos-eoam-violations
show ddos-protection protocols esmc
  get-ddos-esmc-information
show ddos-protection protocols esmc aggregate
  get-ddos-esmc-aggregate
show ddos-protection protocols esmc parameters
  get-ddos-esmc-parameters
show ddos-protection protocols esmc statistics
  get-ddos-esmc-statistics
show ddos-protection protocols esmc violations
  get-ddos-esmc-violations
show ddos-protection protocols ethernet-tcc
  <get-ddos-eth-tcc-information>
show ddos-protection protocols ethernet-tcc aggregate
  <get-ddos-eth-tcc-aggregate>
show ddos-protection protocols ethernet-tcc aggregate culprit-flows
  <get-ddos-eth-tcc-aggregate-flows>
show ddos-protection protocols ethernet-tcc culprit-flows
  <get-ddos-eth-tcc-flows>
show ddos-protection protocols ethernet-tcc flow-detection
  <get-ddos-eth-tcc-flow-parameters>
show ddos-protection protocols ethernet-tcc parameters
  <get-ddos-eth-tcc-parameters>
show ddos-protection protocols ethernet-tcc statistics
  <get-ddos-eth-tcc-statistics>
show ddos-protection protocols ethernet-tcc violations
  <get-ddos-eth-tcc-violations>
show ddos-protection protocols exceptions
  <get-ddos-exception-information>
show ddos-protection protocols exceptions aggregate
```



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<get-ddos-exception-aggregate>
show ddos-protection protocols exceptions aggregate culprit-flows
<get-ddos-exception-aggregate-flows>
show ddos-protection protocols exceptions culprit-flows
<get-ddos-exception-flows>
show ddos-protection protocols exceptions flow-detection
<get-ddos-exception-flow-parameters>
show ddos-protection protocols exceptions mcast-rpf-err
<get-ddos-exception-mcast-rpf>
show ddos-protection protocols exceptions mcast-rpf-err culprit-flows
<get-ddos-exception-mcast-rpf-flows>
show ddos-protection protocols exceptions mtu-exceeded
<get-ddos-exception-mtu-exceed>
show ddos-protection protocols exceptions mtu-exceeded culprit-flows
<get-ddos-exception-mtu-exceed-flows>
show ddos-protection protocols exceptions parameters
<get-ddos-exception-parameters>
show ddos-protection protocols exceptions statistics
<get-ddos-exception-statistics>
show ddos-protection protocols exceptions unclassified
<get-ddos-exception-unclass>
show ddos-protection protocols exceptions unclassified culprit-flows
<get-ddos-exception-unclass-flows>
show ddos-protection protocols exceptions violations
<get-ddos-exception-violations>

show ddos-protection protocols fab-probe
<get-ddos-fab-probe-information>
show ddos-protection protocols fab-probe aggregate
<get-ddos-fab-probe-aggregate>
show ddos-protection protocols fab-probe parameters
<get-ddos-fab-probe-parameters>
show ddos-protection protocols fab-probe statistics
<get-ddos-fab-probe-statistics>
show ddos-protection protocols fab-probe violations
<get-ddos-fab-probe-violations>
show ddos-protection protocols firewall-host
  get-ddos-fw-host-information
show ddos-protection protocols firewall-host aggregate
  get-ddos-fw-host-aggregate
show ddos-protection protocols firewall-host parameters
  get-ddos-fw-host-parameters
show ddos-protection protocols firewall-host statistics
  get-ddos-fw-host-statistics
show ddos-protection protocols firewall-host violations
  get-ddos-fw-host-violations

show ddos-protection protocols ftp
  get-ddos-ftp-information
show ddos-protection protocols ftp aggregate
  get-ddos-ftp-aggregate
show ddos-protection protocols ftp parameters
  get-ddos-ftp-parameters
show ddos-protection protocols ftp statistics
  get-ddos-ftp-statistics
show ddos-protection protocols ftp violations
  get-ddos-ftp-violations
show ddos-protection protocols ftpv6
  get-ddos-ftp6-information
show ddos-protection protocols ftpv6 aggregate
```

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get-ddos-ftp6-aggregate
show ddos-protection protocols ftp6 parameters
get-ddos-ftp6-parameters
show ddos-protection protocols ftp6 statistics
get-ddos-ftp6-statistics
show ddos-protection protocols ftp6 violations
get-ddos-ftp6-violations
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show ddos-protection protocols garp-reply aggregate
<get-ddos-garp-reply-aggregate>
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get-ddos-gre-aggregate
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get-ddos-gre-parameters
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get-ddos-gre-statistics
show ddos-protection protocols gre violations
get-ddos-gre-violations
show ddos-protection protocols icmp
get-ddos-icmp-information
show ddos-protection protocols icmp aggregate
get-ddos-icmp-aggregate
show ddos-protection protocols icmp parameters
get-ddos-icmp-parameters
show ddos-protection protocols icmp statistics
get-ddos-icmp-statistics
show ddos-protection protocols icmp violations
get-ddos-icmp-violations
show ddos-protection protocols icmpv6
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show ddos-protection protocols icmpv6 aggregate
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show ddos-protection protocols icmpv6 aggregate culprit-flows
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show ddos-protection protocols icmpv6 statistics
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show ddos-protection protocols igmp aggregate
  get-ddos-igmp-aggregate
show ddos-protection protocols igmp aggregate culprit-flows
show ddos-protection protocols igmp parameters
  get-ddos-igmp-parameters
show ddos-protection protocols igmp statistics
  get-ddos-igmp-statistics
show ddos-protection protocols igmp violations
  get-ddos-igmp-violations
show ddos-protection protocols igmp-snoop
  get-ddos-igmp-snoop-information
show ddos-protection protocols igmp-snoop aggregate
  get-ddos-igmp-snoop-aggregate
show ddos-protection protocols igmp-snoop parameters
  get-ddos-igmp-snoop-parameters
show ddos-protection protocols igmp-snoop statistics
  get-ddos-igmp-snoop-statistics
show ddos-protection protocols igmp-snoop violations
  get-ddos-igmp-snoop-violations
show ddos-protection protocols igmpv4v6
  get-ddos-igmpv4v6-information
show ddos-protection protocols igmpv4v6 aggregate
  get-ddos-igmpv4v6-aggregate
show ddos-protection protocols igmpv4v6 aggregate culprit-flows
show ddos-protection protocols igmpv4v6 parameters
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show ddos-protection protocols igmpv4v6 statistics
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show ddos-protection protocols igmpv4v6 violations
  get-ddos-igmpv4v6-violations
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show ddos-protection protocols igmpv6 statistics
  get-ddos-igmpv6-statistics
show ddos-protection protocols igmpv6 violations
  get-ddos-igmpv6-violations
show ddos-protection protocols ip-fragments
  get-ddos-ip-frag-information
show ddos-protection protocols ip-fragments aggregate
  get-ddos-ip-frag-aggregate
show ddos-protection protocols ip-fragments first-fragment
  get-ddos-ip-frag-first-frag
show ddos-protection protocols ip-fragments parameters
  get-ddos-ip-frag-parameters
show ddos-protection protocols ip-fragments statistics
  get-ddos-ip-frag-statistics
show ddos-protection protocols ip-fragments trail-fragment
  get-ddos-ip-frag-trail-frag
show ddos-protection protocols ip-fragments violations
  get-ddos-ip-frag-violations
show ddos-protection protocols ip-options
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show ddos-protection protocols ip-options aggregate
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show ddos-protection protocols ip-options non-v4v6
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show ddos-protection protocols ip-options parameters
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show ddos-protection protocols ip-options router-alert
get-ddos-ip-opt-rt-alert
show ddos-protection protocols ip-options statistics
get-ddos-ip-opt-statistics
show ddos-protection protocols ip-options unclassified
get-ddos-ip-opt-unclass
show ddos-protection protocols ipmc-reserved culprit-flows
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show ddos-protection protocols ipmc-reserved flow-detection
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show ddos-protection protocols ipmc-reserved parameters
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show ddos-protection protocols ipmc-reserved statistics
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show ddos-protection protocols ipmc-reserved violations
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show ddos-protection protocols ipmcast-miss aggregate culprit-flows
<get-ddos-ipmcast-miss-aggregate-flows>
show ddos-protection protocols ipmcast-miss culprit-flows
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get-ddos-ipv4-uncls-information
show ddos-protection protocols ipv4-unclassified aggregate
get-ddos-ipv4-uncls-aggregate
show ddos-protection protocols ipv4-unclassified parameters
get-ddos-ipv4-uncls-parameters
show ddos-protection protocols ipv4-unclassified statistics
get-ddos-ipv4-uncls-statistics
show ddos-protection protocols ipv4-unclassified violations
get-ddos-ipv4-uncls-violations
show ddos-protection protocols ipv6-unclassified
get-ddos-ipv6-uncls-information
show ddos-protection protocols ipv6-unclassified aggregate
get-ddos-ipv6-uncls-aggregate
show ddos-protection protocols ipv6-unclassified parameters
get-ddos-ipv6-uncls-parameters
show ddos-protection protocols ipv6-unclassified statistics
get-ddos-ipv6-uncls-statistics
show ddos-protection protocols ipv6-unclassified violations
get-ddos-ipv6-uncls-violations
show ddos-protection protocols isis
get-ddos-isis-information
```

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show ddos-protection protocols isis aggregate
  get-ddos-isis-aggregate
show ddos-protection protocols isis parameters
  get-ddos-isis-parameters
show ddos-protection protocols isis statistics
  get-ddos-isis-statistics
show ddos-protection protocols isis violations
  get-ddos-isis-violations
show ddos-protection protocols iso-tcc
  <get-ddos-iso-tcc-information>
show ddos-protection protocols iso-tcc aggregate
  <get-ddos-iso-tcc-aggregate>
show ddos-protection protocols iso-tcc aggregate culprit-flows
  <get-ddos-iso-tcc-aggregate-flows>
show ddos-protection protocols iso-tcc culprit-flows
  <get-ddos-iso-tcc-flows>
show ddos-protection protocols iso-tcc flow-detection
  <get-ddos-iso-tcc-flow-parameters>
show ddos-protection protocols iso-tcc parameters
  <get-ddos-iso-tcc-parameters>
show ddos-protection protocols iso-tcc statistics
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show ddos-protection protocols iso-tcc violations
  <get-ddos-iso-tcc-violations>
show ddos-protection protocols jfm
  get-ddos-jfm-information
show ddos-protection protocols jfm aggregate
  get-ddos-jfm-aggregate
show ddos-protection protocols jfm parameters
  get-ddos-jfm-parameters
show ddos-protection protocols jfm statistics
  get-ddos-jfm-statistics
show ddos-protection protocols jfm violations
  get-ddos-jfm-violations
show ddos-protection protocols l2tp
  get-ddos-l2tp-information
show ddos-protection protocols l2tp aggregate
  get-ddos-l2tp-aggregate
show ddos-protection protocols l2tp parameters
  get-ddos-l2tp-parameters
show ddos-protection protocols l2tp statistics
  get-ddos-l2tp-statistics
show ddos-protection protocols l2tp violations
  get-ddos-l2tp-violations
show ddos-protection protocols l3dest-miss
  <get-ddos-l3dest-miss-information>
show ddos-protection protocols l3dest-miss aggregate
  <get-ddos-l3dest-miss-aggregate>
show ddos-protection protocols l3dest-miss aggregate culprit-flows
  <get-ddos-l3dest-miss-aggregate-flows>
show ddos-protection protocols l3dest-miss culprit-flows
  <get-ddos-l3dest-miss-flows>
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show ddos-protection protocols l3dest-miss statistics
  <get-ddos-l3dest-miss-statistics>
show ddos-protection protocols l3dest-miss violations
  <get-ddos-l3dest-miss-violations>
show ddos-protection protocols l3mc-sgv-hit-icl
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  <get-ddos-l3mc-sgv-hit-icl-aggregate-flows>
show ddos-protection protocols l3mc-sgv-hit-icl culprit-flows
  <get-ddos-l3mc-sgv-hit-icl-flows>
show ddos-protection protocols l3mc-sgv-hit-icl flow-detection
  <get-ddos-l3mc-sgv-hit-icl-flow-parameters>
show ddos-protection protocols l3mc-sgv-hit-icl parameters
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show ddos-protection protocols l3mc-sgv-hit-icl violations
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show ddos-protection protocols l3mtu-fail aggregate culprit-flows
  <get-ddos-l3mtu-fail-aggregate-flows>
show ddos-protection protocols l3mtu-fail culprit-flows
  <get-ddos-l3mtu-fail-flows>
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  <get-ddos-l3nhop-aggregate>
show ddos-protection protocols l3nhop aggregate culprit-flows
  <get-ddos-l3nhop-aggregate-flows>
show ddos-protection protocols l3nhop culprit-flows
  <get-ddos-l3nhop-flows>
show ddos-protection protocols l3nhop flow-detection
  <get-ddos-l3nhop-flow-parameters>
show ddos-protection protocols l3nhop parameters
  <get-ddos-l3nhop-parameters>
show ddos-protection protocols l3nhop statistics
  <get-ddos-l3nhop-statistics>
show ddos-protection protocols l3nhop violations
  <get-ddos-l3nhop-violations>
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show ddos-protection protocols lacp aggregate
  <get-ddos-lacp-aggregate>
show ddos-protection protocols lacp parameters
  <get-ddos-lacp-parameters>
show ddos-protection protocols lacp statistics
  <get-ddos-lacp-statistics>
show ddos-protection protocols lacp violations
  <get-ddos-lacp-violations>
show ddos-protection protocols ldp
  <get-ddos-ldp-information>
show ddos-protection protocols ldp aggregate
  <get-ddos-ldp-aggregate>
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show ddos-protection protocols ldp statistics
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show ddos-protection protocols ldp violations
<get-ddos-ldp-violations>
show ddos-protection protocols ldp-hello
<get-ddos-ldp-hello-information>
show ddos-protection protocols ldp-hello aggregate
<get-ddos-ldp-hello-aggregate>
show ddos-protection protocols ldp-hello aggregate culprit-flows
<get-ddos-ldp-hello-aggregate-flows>
show ddos-protection protocols ldp-hello culprit-flows
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show ddos-protection protocols ldp-hello violations
<get-ddos-ldp-hello-violations>
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show ddos-protection protocols lmp violations
<get-ddos-lmp-violations>
show ddos-protection protocols lmpv6
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show ddos-protection protocols lmpv6 statistics
<get-ddos-lmpv6-statistics>
show ddos-protection protocols lmpv6 violations
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  <get-ddos-localnh-information>
show ddos-protection protocols localnh aggregate
  <get-ddos-localnh-aggregate>
show ddos-protection protocols localnh aggregate culprit-flows
  <get-ddos-localnh-aggregate-flows>
show ddos-protection protocols localnh culprit-flows
  <get-ddos-localnh-flows>
show ddos-protection protocols localnh flow-detection
  <get-ddos-localnh-flow-parameters>
show ddos-protection protocols localnh parameters
  <get-ddos-localnh-parameters>
show ddos-protection protocols localnh statistics
  <get-ddos-localnh-statistics>
show ddos-protection protocols localnh violations
  <get-ddos-localnh-violations>
show ddos-protection protocols mac-host
  <get-ddos-mac-host-information>
show ddos-protection protocols mac-host aggregate
  <get-ddos-mac-host-aggregate>
show ddos-protection protocols mac-host aggregate culprit-flows
  <get-ddos-mac-host-aggregate-flows>
show ddos-protection protocols mac-host culprit-flows
  <get-ddos-mac-host-flows>
show ddos-protection protocols mac-host flow-detection
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show ddos-protection protocols mac-host parameters
  <get-ddos-mac-host-parameters>
show ddos-protection protocols mac-host statistics
  <get-ddos-mac-host-statistics>
show ddos-protection protocols mac-host violations
  <get-ddos-mac-host-violations>
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  <get-ddos-martian-address-information>
show ddos-protection protocols martian-address aggregate
  <get-ddos-martian-address-aggregate>
show ddos-protection protocols martian-address aggregate culprit-flows
  <get-ddos-martian-address-aggregate-flows>
show ddos-protection protocols martian-address culprit-flows
  <get-ddos-martian-address-flows>
show ddos-protection protocols martian-address flow-detection
  <get-ddos-martian-address-flow-parameters>
show ddos-protection protocols martian-address parameters
  <get-ddos-martian-address-parameters>
show ddos-protection protocols martian-address statistics
  <get-ddos-martian-address-statistics>
show ddos-protection protocols martian-address violations
  <get-ddos-martian-address-violations>
show ddos-protection protocols mac-host
  <get-ddos-mac-host-information>
show ddos-protection protocols mac-host aggregate
  <get-ddos-mac-host-aggregate>
show ddos-protection protocols mac-host parameters
  <get-ddos-mac-host-parameters>
show ddos-protection protocols mac-host statistics
  <get-ddos-mac-host-statistics>
show ddos-protection protocols mac-host violations
  <get-ddos-mac-host-violations>
show ddos-protection protocols mcast-snoop mld
  <get-ddos-mcast-snoop-mld>
```



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show ddos-protection protocols mcast-snoop mld culprit-flows
<get-ddos-mcast-snoop-mld-flows>
show ddos-protection protocols mld
<get-ddos-mld-information>
show ddos-protection protocols mld aggregate
<get-ddos-mld-aggregate>
show ddos-protection protocols mld aggregate culprit-flows
show ddos-protection protocols mld culprit-flows
<get-ddos-mld-flows>
show ddos-protection protocols mld flow-detection
<get-ddos-mld-flow-parameters>
show ddos-protection protocols mld parameters
<get-ddos-mld-parameters>
show ddos-protection protocols mld statistics
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show ddos-protection protocols mld violations
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show ddos-protection protocols mlp add culprit-flows
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  <get-ddos-mlp-aggregate>
show ddos-protection protocols mlp aggregate culprit-flows
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show ddos-protection protocols mlp culprit-flows
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show ddos-protection protocols mlp delete
<get-ddos-mlp-delete>
show ddos-protection protocols mlp delete culprit-flows
get-ddos-mlp-delete-flows
show ddos-protection protocols mlp flow-detection
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<get-ddos-mlp-mac-pinning>
show ddos-protection protocols mlp macpin-exception culprit-flows
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  <get-ddos-mlp-aging-exc>
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show ddos-protection protocols mlp parameters
  get-ddos-mlp-parameters
show ddos-protection protocols mlp statistics
  <get-ddos-mlp-statistics>
show ddos-protection protocols mlp unclassified
  <get-ddos-mlp-unclass>
show ddos-protection protocols mlp violations
  <get-ddos-mlp-violations>
show ddos-protection protocols msdp
  <get-ddos-msdp-information>
show ddos-protection protocols msdp aggregate
  <get-ddos-msdp-aggregate>
show ddos-protection protocols msdp parameters
  <get-ddos-msdp-parameters>

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show ddos-protection protocols msdp statistics
<get-ddos-msdp-statistics>
show ddos-protection protocols msdp violations
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show ddos-protection protocols msdpv6
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show ddos-protection protocols msdpv6 aggregate
<get-ddos-msdpv6-aggregate>
show ddos-protection protocols msdpv6 parameters
<get-ddos-msdpv6-parameters>
show ddos-protection protocols msdpv6 statistics
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show ddos-protection protocols msdpv6 violations
<get-ddos-msdpv6-violations>
show ddos-protection protocols multihop-bfd
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show ddos-protection protocols multihop-bfd aggregate
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show ddos-protection protocols multihop-bfd aggregate culprit-flows
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show ddos-protection protocols multihop-bfd culprit-flows
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show ddos-protection protocols multihop-bfd flow-detection
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show ddos-protection protocols multihop-bfd parameters
<get-ddos-mhop-bfd-parameters>
show ddos-protection protocols multihop-bfd statistics
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show ddos-protection protocols multihop-bfd violations
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show ddos-protection protocols multicast-copy aggregate
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show ddos-protection protocols multicast-copy parameters
<get-ddos-mcast-copy-parameters>
show ddos-protection protocols multicast-copy statistics
<get-ddos-mcast-copy-statistics>
show ddos-protection protocols multicast-copy violations
<get-ddos-mcast-copy-violations>
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<get-ddos-mvrp-information>
show ddos-protection protocols mvrp aggregate
<get-ddos-mvrp-aggregate>
show ddos-protection protocols mvrp parameters
<get-ddos-mvrp-parameters>
show ddos-protection protocols mvrp statistics
<get-ddos-mvrp-statistics>
show ddos-protection protocols mvrp violations
<get-ddos-mvrp-violations>
show ddos-protection protocols ndpv6
<get-ddos-ndpv6-information>
show ddos-protection protocols ndpv6 aggregate
<get-ddos-ndpv6-aggregate>
show ddos-protection protocols ndpv6 aggregate culprit-flows
<get-ddos-ndpv6-aggregate-flows>
show ddos-protection protocols ndpv6 culprit-flows
<get-ddos-ndpv6-flows>
show ddos-protection protocols ndpv6 flow-detection
<get-ddos-ndpv6-flow-parameters>
show ddos-protection protocols ndpv6 neighbor-advertisement
<get-ddos-ndpv6-neighb-adv>
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show ddos-protection protocols ndpv6 neighbor-advertisement culprit-flows
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<get-ddos-ndpv6-neighb-sol>
show ddos-protection protocols ndpv6 neighbor-solicitation culprit-flows
<get-ddos-ndpv6-neighb-sol-flows>
show ddos-protection protocols ndpv6 parameters
<get-ddos-ndpv6-parameters>
show ddos-protection protocols ndpv6 redirect
<get-ddos-ndpv6-redirect>
show ddos-protection protocols ndpv6 redirect culprit-flows
<get-ddos-ndpv6-redirect-flows>
show ddos-protection protocols ndpv6 router-advertisement
<get-ddos-ndpv6-router-adv>
show ddos-protection protocols ndpv6 router-advertisement culprit-flows
<get-ddos-ndpv6-router-adv-flows>
show ddos-protection protocols ndpv6 router-solicitation
<get-ddos-ndpv6-router-sol>
show ddos-protection protocols ndpv6 router-solicitation culprit-flows
<get-ddos-ndpv6-router-sol-flows>
show ddos-protection protocols nonucast-switch
<get-ddos-nonucast-switch-information>
show ddos-protection protocols nonucast-switch aggregate
<get-ddos-nonucast-switch-aggregate>
show ddos-protection protocols nonucast-switch aggregate culprit-flows
<get-ddos-nonucast-switch-aggregate-flows>
show ddos-protection protocols nonucast-switch culprit-flows
<get-ddos-nonucast-switch-flows>
show ddos-protection protocols nonucast-switch flow-detection
<get-ddos-nonucast-switch-flow-parameters>
show ddos-protection protocols nonucast-switch parameters
<get-ddos-nonucast-switch-parameters>
show ddos-protection protocols nonucast-switch statistics
<get-ddos-nonucast-switch-statistics>
show ddos-protection protocols nonucast-switch violations
<get-ddos-nonucast-switch-violations>
show ddos-protection protocols ntp
  get-ddos-ntp-information
show ddos-protection protocols ntp aggregate
  get-ddos-ntp-aggregate
show ddos-protection protocols ntp parameters
  get-ddos-ntp-parameters
show ddos-protection protocols ntp statistics
  get-ddos-ntp-statistics
show ddos-protection protocols ntp violations
  get-ddos-ntp-violations
show ddos-protection protocols oam-cfm
  get-ddos-oam-cfm-information
show ddos-protection protocols oam-cfm aggregate
  <get-ddos-oam-cfm-aggregate>
show ddos-protection protocols oam-cfm aggregate culprit-flows
  <get-ddos-oam-cfm-aggregate-flows>
show ddos-protection protocols oam-cfm culprit-flows
  <get-ddos-oam-cfm-flows>
show ddos-protection protocols oam-cfm flow-detection
  <get-ddos-oam-cfm-flow-parameters>
show ddos-protection protocols oam-cfm parameters
  <get-ddos-oam-cfm-parameters>
show ddos-protection protocols oam-cfm statistics
  <get-ddos-oam-cfm-statistics>
show ddos-protection protocols oam-cfm violations
```

```
<get-ddos-oam-cfm-violations>
show ddos-protection protocols oam-lfm
  get-ddos-oam-lfm-information
show ddos-protection protocols oam-lfm aggregate
  get-ddos-oam-lfm-aggregate
show ddos-protection protocols oam-lfm parameters
  get-ddos-oam-lfm-parameters
show ddos-protection protocols oam-lfm statistics
  get-ddos-oam-lfm-statistics
show ddos-protection protocols oam-lfm violations
  get-ddos-oam-lfm-violations
show ddos-protection protocols ospf
  get-ddos-ospf-information
show ddos-protection protocols ospf aggregate
  get-ddos-ospf-aggregate
show ddos-protection protocols ospf parameters
  get-ddos-ospf-parameters
show ddos-protection protocols ospf statistics
  get-ddos-ospf-statistics
show ddos-protection protocols ospf violations
  get-ddos-ospf-violations
show ddos-protection protocols ospf-hello
<get-ddos-ospf-hello-information>
show ddos-protection protocols ospf-hello aggregate
<get-ddos-ospf-hello-aggregate>
show ddos-protection protocols ospf-hello aggregate culprit-flows
<get-ddos-ospf-hello-aggregate-flows>
show ddos-protection protocols ospf-hello culprit-flows
<get-ddos-ospf-hello-flows>
show ddos-protection protocols ospf-hello flow-detection
<get-ddos-ospf-hello-flow-parameters>
show ddos-protection protocols ospf-hello parameters
<get-ddos-ospf-hello-parameters>
show ddos-protection protocols ospf-hello statistics
<get-ddos-ospf-hello-statistics>
show ddos-protection protocols ospf-hello violations
<get-ddos-ospf-hello-violations>
show ddos-protection protocols ospfv3v6
  get-ddos-ospfv3v6-information
show ddos-protection protocols ospfv3v6 aggregate
  get-ddos-ospfv3v6-aggregate
show ddos-protection protocols ospfv3v6 parameters
  get-ddos-ospfv3v6-parameters
show ddos-protection protocols ospfv3v6 statistics
  get-ddos-ospfv3v6-statistics
show ddos-protection protocols ospfv3v6 violations
  get-ddos-ospfv3v6-violations
show ddos-protection protocols parameters
  get-ddos-protocols-parameters
show ddos-protection protocols pfe-alive
  get-ddos-pfe-alive-information
show ddos-protection protocols pfe-alive aggregate
  get-ddos-pfe-alive-aggregate
show ddos-protection protocols pfe-alive parameters
  get-ddos-pfe-alive-parameters
show ddos-protection protocols pfe-alive statistics
  get-ddos-pfe-alive-statistics
show ddos-protection protocols pfe-alive violations
  get-ddos-pfe-alive-violations
show ddos-protection protocols pim
  get-ddos-pim-information
```

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show ddos-protection protocols pim aggregate
  get-ddos-pim-aggregate
show ddos-protection protocols pim aggregate culprit-flows
show ddos-protection protocols pim parameters
  get-ddos-pim-parameters
show ddos-protection protocols pim statistics
  get-ddos-pim-statistics
show ddos-protection protocols pim violations
  get-ddos-pim-violations
show ddos-protection protocols pim-ctrl
  <get-ddos-pim-ctrl-information>
show ddos-protection protocols pim-ctrl aggregate
  <get-ddos-pim-ctrl-aggregate>
show ddos-protection protocols pim-ctrl aggregate culprit-flows
  <get-ddos-pim-ctrl-aggregate-flows>
show ddos-protection protocols pim-ctrl culprit-flows
  <get-ddos-pim-ctrl-flows>
show ddos-protection protocols pim-ctrl flow-detection
  <get-ddos-pim-ctrl-flow-parameters>
show ddos-protection protocols pim-ctrl parameters
  <get-ddos-pim-ctrl-parameters>
show ddos-protection protocols pim-ctrl statistics
  <get-ddos-pim-ctrl-statistics>
show ddos-protection protocols pim-ctrl violations
  <get-ddos-pim-ctrl-violations>
show ddos-protection protocols pim-data
  <get-ddos-pim-data-information>
show ddos-protection protocols pim-data aggregate
  <get-ddos-pim-data-aggregate>
show ddos-protection protocols pim-data aggregate culprit-flows
  <get-ddos-pim-data-aggregate-flows>
show ddos-protection protocols pim-data culprit-flows
  <get-ddos-pim-data-flows>
show ddos-protection protocols pim-data flow-detection
  <get-ddos-pim-data-flow-parameters>
show ddos-protection protocols pim-data parameters
  <get-ddos-pim-data-parameters>
show ddos-protection protocols pim-data statistics
  <get-ddos-pim-data-statistics>
show ddos-protection protocols pim-data violations
  <get-ddos-pim-data-violations>
show ddos-protection protocols pimv6
  <get-ddos-pimv6-information>
show ddos-protection protocols pimv6 aggregate
  <get-ddos-pimv6-aggregate>
show ddos-protection protocols pimv6 aggregate culprit-flows
show ddos-protection protocols pimv6 parameters
  <get-ddos-pimv6-parameters>
show ddos-protection protocols pimv6 statistics
  <get-ddos-pimv6-statistics>
show ddos-protection protocols pimv6 violations
  <get-ddos-pimv6-violations>

show ddos-protection protocols pmvrp
  get-ddos-pmvrp-information
show ddos-protection protocols pmvrp aggregate
  get-ddos-pmvrp-aggregate
show ddos-protection protocols pmvrp parameters
  get-ddos-pmvrp-parameters
show ddos-protection protocols pmvrp statistics
```

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get-ddos-pmvrp-statistics
show ddos-protection protocols pmvrp violations
get-ddos-pmvrp-violations
show ddos-protection protocols pos
get-ddos-pos-information
show ddos-protection protocols pos aggregate
get-ddos-pos-aggregate
show ddos-protection protocols pos aggregate culprit-flows
show ddos-protection protocols pos parameters
get-ddos-pos-parameters
show ddos-protection protocols pos statistics
get-ddos-pos-statistics
show ddos-protection protocols pos violations
get-ddos-pos-violations
show ddos-protection protocols ppp
get-ddos-ppp-information
show ddos-protection protocols ppp aggregate
get-ddos-ppp-aggregate
show ddos-protection protocols ppp authentication
get-ddos-ppp-auth
show ddos-protection protocols ppp authentication culprit-flows
show ddos-protection protocols ppp ipcp
get-ddos-ppp-ipcp
show ddos-protection protocols ppp ipv6cp
get-ddos-ppp-ipv6cp
show ddos-protection protocols ppp isis
get-ddos-ppp-isis
show ddos-protection protocols ppp isis culprit-flows
show ddos-protection protocols ppp lcp
get-ddos-ppp-lcp
show ddos-protection protocols ppp lcp culprit-flows
show ddos-protection protocols ppp mplsdp
get-ddos-ppp-mplsdp
show ddos-protection protocols ppp mplsdp culprit-flows
show ddos-protection protocols ppp parameters
get-ddos-ppp-parameters
show ddos-protection protocols ppp statistics
get-ddos-ppp-statistics
show ddos-protection protocols ppp unclassified
<get-ddos-ppp-unclass>
show ddos-protection protocols ppp violations
get-ddos-ppp-violations
show ddos-protection protocols pppoe
get-ddos-pppoe-information
show ddos-protection protocols pppoe aggregate
get-ddos-pppoe-aggregate
show ddos-protection protocols pppoe padi
get-ddos-pppoe-padi
show ddos-protection protocols pppoe padm
get-ddos-pppoe-padm
show ddos-protection protocols pppoe padn
get-ddos-pppoe-padn
show ddos-protection protocols pppoe pado
get-ddos-pppoe-pado
show ddos-protection protocols pppoe padr
get-ddos-pppoe-padr
show ddos-protection protocols pppoe pads
get-ddos-pppoe-pads
show ddos-protection protocols pppoe padt
get-ddos-pppoe-padt
show ddos-protection protocols pppoe parameters
```

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    get-ddos-pppoe-parameters
show ddos-protection protocols pppoe statistics
    get-ddos-pppoe-statistics
show ddos-protection protocols pppoe violations
    get-ddos-pppoe-violations
show ddos-protection protocols proto-802-1x
<get-ddos-8021x-information>
show ddos-protection protocols proto-802-1x aggregate
<get-ddos-8021x-aggregate>
show ddos-protection protocols proto-802-1x aggregate culprit-flows
get-ddos-8021x-aggregate-flows
show ddos-protection protocols proto-802-1x culprit-flows
<get-ddos-8021x-flows>
show ddos-protection protocols proto-802-1x flow-detection
<get-ddos-8021x-flow-parameters>
show ddos-protection protocols proto-802-1x parameters
<get-ddos-8021x-parameters>
show ddos-protection protocols proto-802-1x statistics
<get-ddos-8021x-statistics>
show ddos-protection protocols proto-802-1x violations
<get-ddos-8021x-violations>
show ddos-protection protocols ptp
    get-ddos-ntp-information
show ddos-protection protocols ptp aggregate
    get-ddos-ntp-aggregate
show ddos-protection protocols ptp aggregate culprit-flows
show ddos-protection protocols ptp parameters
    get-ddos-ntp-parameters
show ddos-protection protocols ptp statistics
    get-ddos-ntp-statistics
show ddos-protection protocols ptp violations
    get-ddos-ntp-violations
show ddos-protection protocols pvstp
    get-ddos-pvstp-information
show ddos-protection protocols pvstp aggregate
    get-ddos-pvstp-aggregate
show ddos-protection protocols pvstp parameters
    get-ddos-pvstp-parameters
show ddos-protection protocols pvstp statistics
    get-ddos-pvstp-statistics
show ddos-protection protocols pvstp violations
    get-ddos-pvstp-violations
show ddos-protection protocols radius
    get-ddos-radius-information
show ddos-protection protocols radius accounting
    get-ddos-radius-account
show ddos-protection protocols radius aggregate
    get-ddos-radius-aggregate
show ddos-protection protocols radius accounting culprit-flows
show ddos-protection protocols radius authorization
    get-ddos-radius-auth
show ddos-protection protocols radius parameters
    get-ddos-radius-parameters
show ddos-protection protocols radius server
    get-ddos-radius-server
show ddos-protection protocols radius statistics
    get-ddos-radius-statistics
show ddos-protection protocols radius violations
    get-ddos-radius-violations
show ddos-protection protocols re-services
    <get-ddos-re-services-information>

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```
show ddos-protection protocols re-services aggregate
  <get-ddos-re-services-aggregate>
show ddos-protection protocols re-services aggregate culprit-flows
  <get-ddos-re-services-aggregate-flows>
show ddos-protection protocols re-services captive-portal
  <get-ddos-re-services-captive-portal>
show ddos-protection protocols re-services captive-portal culprit-flows
  <get-ddos-re-services-captive-portal-flows>
show ddos-protection protocols re-services culprit-flows
  <get-ddos-re-services-flows>
show ddos-protection protocols re-services flow-detection
  <get-ddos-re-services-flow-parameters>
show ddos-protection protocols re-services parameters
  <get-ddos-re-services-parameters>
show ddos-protection protocols re-services statistics
  <get-ddos-re-services-statistics>
show ddos-protection protocols re-services violations
  <get-ddos-re-services-violations>
show ddos-protection protocols re-services-v6
  <get-ddos-re-services-v6-information>
show ddos-protection protocols re-services-v6 aggregate
  <get-ddos-re-services-v6-aggregate>
show ddos-protection protocols re-services-v6 aggregate culprit-flows
  <get-ddos-re-services-v6-aggregate-flows>
show ddos-protection protocols re-services-v6 captive-portal
  <get-ddos-re-services-v6-captive-portal-v6>
show ddos-protection protocols re-services-v6 captive-portal culprit-flows
  <get-ddos-re-services-v6-captive-portal-v6-flows>
show ddos-protection protocols re-services-v6 culprit-flows
  <get-ddos-re-services-v6-flows>
show ddos-protection protocols re-services-v6 flow-detection
  <get-ddos-re-services-v6-flow-parameters>
show ddos-protection protocols re-services-v6 parameters
  <get-ddos-re-services-v6-parameters>
show ddos-protection protocols re-services-v6 statistics
  <get-ddos-re-services-v6-statistics>
show ddos-protection protocols re-services-v6 violations
  <get-ddos-re-services-v6-violations>
show ddos-protection protocols redirect
  get-ddos-redirect-information
show ddos-protection protocols redirect aggregate
  get-ddos-redirect-aggregate
show ddos-protection protocols redirect parameters
  get-ddos-redirect-parameters
show ddos-protection protocols redirect statistics
  get-ddos-redirect-statistics
show ddos-protection protocols redirect violations
  get-ddos-redirect-violations

show ddos-protection protocols reject
  <get-ddos-reject-information>
show ddos-protection protocols reject aggregate
  <get-ddos-reject-aggregate>
show ddos-protection protocols reject parameters
  <get-ddos-reject-parameters>
show ddos-protection protocols reject statistics
  <get-ddos-reject-statistics>
show ddos-protection protocols reject violations
  <get-ddos-reject-violations>
show ddos-protection protocols rejectv6show ddos-protection protocols rejectv6
```



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aggregate
show ddos-protection protocols rejectv6 aggregate culprit-flows
show ddos-protection protocols rejectv6 flow-detection
show ddos-protection protocols rejectv6 parameters
show ddos-protection protocols rejectv6 statistics
show ddos-protection protocols rejectv6 violations
show ddos-protection protocols rip
  get-ddos-rip-information
show ddos-protection protocols rip aggregate
  get-ddos-rip-aggregate
show ddos-protection protocols rip aggregate culprit-flows
show ddos-protection protocols rip culprit-flows
show ddos-protection protocols rip parameters
  get-ddos-rip-parameters
show ddos-protection protocols rip statistics
  get-ddos-rip-statistics
show ddos-protection protocols rip violations
  get-ddos-rip-violations
show ddos-protection protocols ripv6
  get-ddos-ripv6-information
show ddos-protection protocols ripv6 aggregate
  get-ddos-ripv6-aggregate
show ddos-protection protocols ripv6 aggregate culprit-flows
show ddos-protection protocols ripv6 parameters
  get-ddos-ripv6-parameters
show ddos-protection protocols ripv6 statistics
  get-ddos-ripv6-statistics
show ddos-protection protocols ripv6 violations
  get-ddos-ripv6-violations
show ddos-protection protocols rsvp
  get-ddos-rsvp-information
show ddos-protection protocols rsvp aggregate
  get-ddos-rsvp-aggregate
show ddos-protection protocols rsvp aggregate culprit-flows
show ddos-protection protocols rsvp parameters
  get-ddos-rsvp-parameters
show ddos-protection protocols rsvp statistics
  get-ddos-rsvp-statistics
show ddos-protection protocols rsvp violations
  get-ddos-rsvp-violations
show ddos-protection protocols rsvpv6
  get-ddos-rsvpv6-information
show ddos-protection protocols rsvpv6 aggregate
  get-ddos-rsvpv6-aggregate
show ddos-protection protocols rsvpv6 aggregate culprit-flows
show ddos-protection protocols rsvpv6 parameters
  get-ddos-rsvpv6-parameters
show ddos-protection protocols rsvpv6 statistics
  get-ddos-rsvpv6-statistics
show ddos-protection protocols rsvpv6 violations
  get-ddos-rsvpv6-violations
show ddos-protection protocols sample
<get-ddos-sample-information>
show ddos-protection protocols sample aggregate
<get-ddos-sample-aggregate>
show ddos-protection protocols sample aggregate culprit-flows
show ddos-protection protocols sample host
<get-ddos-sample-host>
show ddos-protection protocols sample parameters
<get-ddos-sample-parameters>
show ddos-protection protocols sample pfe

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```
<get-ddos-sample-pfe>
show ddos-protection protocols sample pfe culprit-flows
show ddos-protection protocols sample sflow
<get-ddos-sample-sflow>
show ddos-protection protocols sample sflow culprit-flows
<get-ddos-sample-sflow-flows>
show ddos-protection protocols sample statistics
<get-ddos-sample-statistics>
show ddos-protection protocols sample syslog
show ddos-protection protocols sample tap
<get-ddos-sample-tap>
show ddos-protection protocols sample tap culprit-flows
show ddos-protection protocols sample violations
<get-ddos-sample-violations>
show ddos-protection protocols services
    get-ddos-services-information
show ddos-protection protocols sample-dest
<get-ddos-sample-dest-information>
show ddos-protection protocols sample-dest aggregate
<get-ddos-sample-dest-aggregate>
show ddos-protection protocols sample-dest aggregate culprit-flows
<get-ddos-sample-dest-aggregate-flows>
show ddos-protection protocols sample-dest culprit-flows
<get-ddos-sample-dest-flows>
show ddos-protection protocols sample-dest flow-detection
<get-ddos-sample-dest-flow-parameters>
show ddos-protection protocols sample-dest parameters
<get-ddos-sample-dest-parameters>
show ddos-protection protocols sample-dest statistics
<get-ddos-sample-dest-statistics>
show ddos-protection protocols sample-dest violations
<get-ddos-sample-dest-violations>
show ddos-protection protocols sample-source
<get-ddos-sample-source-information>
show ddos-protection protocols sample-source aggregate
<get-ddos-sample-source-aggregate>
show ddos-protection protocols sample-source aggregate culprit-flows
<get-ddos-sample-source-aggregate-flows>
show ddos-protection protocols sample-source culprit-flows
<get-ddos-sample-source-flows>
show ddos-protection protocols sample-source flow-detection
<get-ddos-sample-source-flow-parameters>
show ddos-protection protocols sample-source parameters
<get-ddos-sample-source-parameters>
show ddos-protection protocols sample-source statistics
<get-ddos-sample-source-statistics>
show ddos-protection protocols sample-source violations
<get-ddos-sample-source-violations>
show ddos-protection protocols services aggregate
    <get-ddos-services-aggregate>
show ddos-protection protocols services parameters
    <get-ddos-services-parameters>
show ddos-protection protocols services statistics
    <get-ddos-services-statistics>
show ddos-protection protocols syslog
    <get-ddos-syslog-information>
show ddos-protection protocols syslog aggregate
    <get-ddos-syslog-aggregate>
show ddos-protection protocols syslog aggregate culprit-flows
    <get-ddos-syslog-aggregate-flows>
show ddos-protection protocols syslog culprit-flows
```

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<get-ddos-syslog-flows>
show ddos-protection protocols syslog flow-detection
  <get-ddos-syslog-flow-parameters>
show ddos-protection protocols syslog parameters
  <get-ddos-syslog-parameters>
show ddos-protection protocols syslog statistics
  <get-ddos-syslog-statistics>
show ddos-protection protocols syslog violations
  <get-ddos-syslog-violations>
show ddos-protection protocols services violations
  get-ddos-services-violations
show ddos-protection protocols snmp
  get-ddos-snmp-information
show ddos-protection protocols snmp aggregate
  get-ddos-snmp-aggregate
show ddos-protection protocols snmp aggregate culprit-flows
show ddos-protection protocols snmp parameters
  get-ddos-snmp-parameters
show ddos-protection protocols snmp statistics
  get-ddos-snmp-statistics
show ddos-protection protocols snmp violations
  get-ddos-snmp-violations
show ddos-protection protocols snmpv6
  get-ddos-snmpv6-information
show ddos-protection protocols snmpv6 aggregate
  get-ddos-snmpv6-aggregate
show ddos-protection protocols snmpv6 aggregate culprit-flows
show ddos-protection protocols snmpv6 parameters
  get-ddos-snmpv6-parameters
show ddos-protection protocols snmpv6 statistics
  get-ddos-snmpv6-statistics
show ddos-protection protocols snmpv6 violations
  get-ddos-snmpv6-violations
show ddos-protection protocols ssh
  get-ddos-ssh-information
show ddos-protection protocols ssh aggregate
  get-ddos-ssh-aggregate
show ddos-protection protocols ssh parameters
  get-ddos-ssh-parameters
show ddos-protection protocols ssh statistics
  get-ddos-ssh-statistics
show ddos-protection protocols ssh violations
  get-ddos-ssh-violations
show ddos-protection protocols sshv6
  get-ddos-sshv6-information
show ddos-protection protocols sshv6 aggregate
  get-ddos-sshv6-aggregate
show ddos-protection protocols sshv6 parameters
  get-ddos-sshv6-parameters
show ddos-protection protocols sshv6 statistics
  <get-ddos-sshv6-statistics>
show ddos-protection protocols sshv6 violations
  <get-ddos-sshv6-violations>
show ddos-protection protocols statistics
  <get-ddos-protocols-statistics>
show ddos-protection protocols stp
  <get-ddos-stp-information>
show ddos-protection protocols stp aggregate
  <get-ddos-stp-aggregate>
show ddos-protection protocols stp parameters
  <get-ddos-stp-parameters>
```

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show ddos-protection protocols stp statistics
  <get-ddos-stp-statistics>
show ddos-protection protocols stp violations
  <get-ddos-stp-violations>
show ddos-protection protocols tacacs
  <get-ddos-tacacs-information>
show ddos-protection protocols tacacs aggregate
  <get-ddos-tacacs-aggregate>
show ddos-protection protocols tacacs parameters
  <get-ddos-tacacs-parameters>
show ddos-protection protocols tacacs statistics
  <get-ddos-tacacs-statistics>
show ddos-protection protocols tacacs violations
  <get-ddos-tacacs-violations>
show ddos-protection protocols tcp-flags
  <get-ddos-tcp-flags-information>
show ddos-protection protocols tcp-flags aggregate
  <get-ddos-tcp-flags-aggregate>
show ddos-protection protocols tcp-flags established
  <get-ddos-tcp-flags-establish>
show ddos-protection protocols tcp-flags initial
  <get-ddos-tcp-flags-initial>
show ddos-protection protocols tcp-flags parameters
  <get-ddos-tcp-flags-parameters>
show ddos-protection protocols tcp-flags statistics
  <get-ddos-tcp-flags-statistics>
show ddos-protection protocols tcp-flags unclassified
  <get-ddos-tcp-flags-unclass>
show ddos-protection protocols tcp-flags violations
  <get-ddos-tcp-flags-violations>
show ddos-protection protocols telnet
  <get-ddos-telnet-information>
show ddos-protection protocols telnet aggregate
  <get-ddos-telnet-aggregate>
show ddos-protection protocols telnet aggregate culprit-flows
show ddos-protection protocols telnet parameters
  <get-ddos-telnet-parameters>
show ddos-protection protocols telnet statistics
  <get-ddos-telnet-statistics>
show ddos-protection protocols telnet violations
  <get-ddos-telnet-violations>
show ddos-protection protocols telnetv6
  <get-ddos-telnetv6-information>
show ddos-protection protocols telnetv6 aggregate
  <get-ddos-telnetv6-aggregate>
show ddos-protection protocols telnetv6 aggregate culprit-flows
show ddos-protection protocols telnetv6 parameters
  <get-ddos-telnetv6-parameters>
show ddos-protection protocols telnetv6 statistics
  <get-ddos-telnetv6-statistics>
show ddos-protection protocols telnetv6 violations
  <get-ddos-telnetv6-violations>
show ddos-protection protocols ttl
  <get-ddos-ttl-information>
show ddos-protection protocols ttl aggregate
  <get-ddos-ttl-aggregate>
show ddos-protection protocols ttl parameters
  <get-ddos-ttl-parameters>
show ddos-protection protocols ttl statistics
  <get-ddos-ttl-statistics>
show ddos-protection protocols ttl violations
```

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    <get-ddos-ttl-violations>
show ddos-protection protocols tunnel-fragment
    <get-ddos-tun-frag-information>
show ddos-protection protocols tunnel-fragment aggregate
    <get-ddos-tun-frag-aggregate>
show ddos-protection protocols tunnel-fragment aggregate culprit-flows
show ddos-protection protocols tunnel-fragment parameters
    <get-ddos-tun-frag-parameters>
show ddos-protection protocols tunnel-fragment statistics
    <get-ddos-tun-frag-statistics>
show ddos-protection protocols tunnel-fragment violations
    <get-ddos-tun-frag-violations>
show ddos-protection protocols tunnel-ka
    <get-ddos-tunnel-ka-information>
show ddos-protection protocols tunnel-ka aggregate
    <get-ddos-tunnel-ka-aggregate>
show ddos-protection protocols tunnel-ka aggregate culprit-flows
    <get-ddos-tunnel-ka-aggregate-flows>
show ddos-protection protocols tunnel-ka culprit-flows
    <get-ddos-tunnel-ka-flows>
show ddos-protection protocols tunnel-ka flow-detection
    <get-ddos-tunnel-ka-flow-parameters>
show ddos-protection protocols tunnel-ka parameters
    <get-ddos-tunnel-ka-parameters>
show ddos-protection protocols tunnel-ka statistics
    <get-ddos-tunnel-ka-statistics>
show ddos-protection protocols tunnel-ka violations
    <get-ddos-tunnel-ka-violations>
show ddos-protection protocols unknown-l2mc
    <get-ddos-unknown-l2mc-information>
show ddos-protection protocols unknown-l2mc aggregate
    <get-ddos-unknown-l2mc-aggregate>
show ddos-protection protocols unknown-l2mc aggregate culprit-flows
    <get-ddos-unknown-l2mc-aggregate-flows>
show ddos-protection protocols unknown-l2mc culprit-flows
    <get-ddos-unknown-l2mc-flows>
show ddos-protection protocols unknown-l2mc flow-detection
    <get-ddos-unknown-l2mc-flow-parameters>
show ddos-protection protocols unknown-l2mc parameters
    <get-ddos-unknown-l2mc-parameters>
show ddos-protection protocols unknown-l2mc statistics
    <get-ddos-unknown-l2mc-statistics>
show ddos-protection protocols unknown-l2mc violations
    <get-ddos-unknown-l2mc-violations>
show ddos-protection protocols unclassified
    <get-ddos-uncls-information>
show ddos-protection protocols unclassified aggregate
    <get-ddos-uncls-aggregate>
show ddos-protection protocols unclassified parameters
    <get-ddos-uncls-parameters>
show ddos-protection protocols unclassified resolve-v4
show ddos-protection protocols unclassified resolve-v4 culprit-flows
show ddos-protection protocols unclassified resolve-v6
show ddos-protection protocols unclassified resolve-v6 culprit-flows
show ddos-protection protocols unclassified statistics
    <get-ddos-uncls-statistics>
show ddos-protection protocols unclassified violations
    <get-ddos-uncls-violations>
show ddos-protection protocols urpf-fail
    <get-ddos-urpf-fail-information>
show ddos-protection protocols urpf-fail aggregate

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```
<get-ddos-urpf-fail-aggregate>
show ddos-protection protocols urpf-fail aggregate culprit-flows
  <get-ddos-urpf-fail-aggregate-flows>
show ddos-protection protocols urpf-fail culprit-flows
  <get-ddos-urpf-fail-flows>
show ddos-protection protocols urpf-fail flow-detection
  <get-ddos-urpf-fail-flow-parameters>
show ddos-protection protocols urpf-fail parameters
  <get-ddos-urpf-fail-parameters>
show ddos-protection protocols urpf-fail statistics
  <get-ddos-urpf-fail-statistics>
show ddos-protection protocols urpf-fail violations
  <get-ddos-urpf-fail-violations>
show ddos-protection protocols vcipc-udp
  <get-ddos-vcipc-udp-information>
show ddos-protection protocols vcipc-udp aggregate
  <get-ddos-vcipc-udp-aggregate>
show ddos-protection protocols vcipc-udp aggregate culprit-flows
  <get-ddos-vcipc-udp-aggregate-flows>
show ddos-protection protocols vcipc-udp culprit-flows
  <get-ddos-vcipc-udp-flows>
show ddos-protection protocols vcipc-udp flow-detection
  <get-ddos-vcipc-udp-flow-parameters>
show ddos-protection protocols vcipc-udp parameters
  <get-ddos-vcipc-udp-parameters>
show ddos-protection protocols vcipc-udp statistics
  <get-ddos-vcipc-udp-statistics>
show ddos-protection protocols vcipc-udp violations
  <get-ddos-vcipc-udp-violations>
show ddos-protection protocols violations
  get-ddos-protocols-violations
show ddos-protection protocols virtual-chassis
  get-ddos-vchassis-information
show ddos-protection protocols virtual-chassis aggregate
  get-ddos-vchassis-aggregate
show ddos-protection protocols virtual-chassis aggregate culprit-flows
show ddos-protection protocols virtual-chassis control-high
  get-ddos-vchassis-control-hi
show ddos-protection protocols virtual-chassis control-low
  get-ddos-vchassis-control-lo
show ddos-protection protocols virtual-chassis parameters
  get-ddos-vchassis-parameters
show ddos-protection protocols virtual-chassis statistics
  get-ddos-vchassis-statistics
show ddos-protection protocols virtual-chassis unclassified
  get-ddos-vchassis-unclass
show ddos-protection protocols virtual-chassis vc-packets
  get-ddos-vchassis-vc-packets
show ddos-protection protocols virtual-chassis vc-ttl-errors
  get-ddos-vchassis-vc-ttl-err
show ddos-protection protocols virtual-chassis violations
  get-ddos-vchassis-violations
show ddos-protection protocols vrrp
  get-ddos-vrrp-information
show ddos-protection protocols vrrp aggregate
  get-ddos-vrrp-aggregate
show ddos-protection protocols vrrp aggregate culprit-flows
show ddos-protection protocols vrrp parameters
  get-ddos-vrrp-parameters
show ddos-protection protocols vrrp statistics
  get-ddos-vrrp-statistics
```

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show ddos-protection protocols vrrp violations
  get-ddos-vrrp-violations
show ddos-protection protocols vrrpv6
  get-ddos-vrrpv6-information
show ddos-protection protocols vrrpv6 aggregate
  get-ddos-vrrpv6-aggregate
show ddos-protection protocols vrrpv6 aggregate culprit-flows
show ddos-protection protocols vrrpv6 parameters
  get-ddos-vrrpv6-parameters
show ddos-protection protocols vrrpv6 statistics
  get-ddos-vrrpv6-statistics
show ddos-protection protocols vrrpv6 violations
  get-ddos-vrrpv6-violations
show ddos-protection statistics
  get-ddos-statistics-information
show ddos-protection version
  get-ddos-version
show ddos-protection protocols vxlan
  <get-ddos-vxlan-information>
show ddos-protection protocols vxlan aggregate
  <get-ddos-vxlan-aggregate>
show ddos-protection protocols vxlan aggregate culprit-flows
  <get-ddos-vxlan-aggregate-flows>
show ddos-protection protocols vxlan culprit-flows
  <get-ddos-vxlan-flows>
show ddos-protection protocols vxlan flow-detection
  <get-ddos-vxlan-flow-parameters>
show ddos-protection protocols vxlan parameters
  <get-ddos-vxlan-parameters>
show ddos-protection protocols vxlan statistics
  <get-ddos-vxlan-statistics>
show ddos-protection protocols vxlan violations
  <get-ddos-vxlan-violations>
show dhcp
show dhcp proxy-client
show dhcp proxy-client binding
show dhcp proxy-client servers
show dhcp proxy-client statistics
  <get-proxy-dhcp-client-statistics-information>
show dhcp relay
show dhcp relay binding
  <get-dhcp-relay-binding-information>

show dhcp relay binding interface
  <get-dhcp-relay-interface-bindings>
show dhcp relay binding lease-time-violation
  <get-dhcp-relay-binding-ltv-information>
show dhcp relay statistics
  <get-dhcp-relay-statistics-information>
show dhcp relay statistics bulk-leasequery-connections
  <get-dhcp-relay-bulk-leasequery-conn-statistics>
show dhcp relay statistics leasequery
  <get-dhcp-relay-leasequery-statistics>

show dhcp server
show dhcp server binding
  <get-dhcp-server-binding-information>

show dhcp server binding interface
  <get-dhcp-relay-binding-interface>
show dhcp server binding lease-time-violation

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<get-dhcp-server-binding-ltv-information>
show dhcp server statistics
  <get-dhcp-server-statistics-information>
show dhcp statistics
  <get-dhcp-service-statistics-information>
show dhcp-security
<get-dhcp-security-arp-inspection-statistics>
show dhcp-security binding
<get-dhcp-security-binding>
show dhcp-security binding interface
<get-dhcp-security-binding-interface>
show dhcp-security binding ip-address
<get-dhcp-security-binding-ip-address>
show dhcp-security binding ip-source-guard
<get-dhcp-security-ip-source-guard>
show dhcp-security binding statistics
<get-dhcp-security-binding-statistics>
show dhcp-security binding vlan
get-dhcp-security-binding-vlan
show dhcp-security ipv6
show dhcp-security ipv6 binding
<get-dhcpv6-security-binding>
show dhcp-security ipv6 binding interface
<get-dhcpv6-security-binding-interface>
show dhcp-security ipv6 binding ipv6-address
<get-dhcpv6-security-binding-ip-address>
show dhcp-security ipv6 binding vlan
<get-dhcpv6-security-binding-vlan>
show dhcp-security ipv6 statistics
<get-dhcp-ipv6-statistics>
show dhcp-security neighbor-discovery-inspection
show dhcp-security neighbor-discovery-inspection statistics
<get-dhcp-security-nd-inspection-statistics>
show dhcp-security neighbor-discovery-inspection statistics interface
<get-dhcp-security-ndi-interface>
show dhcp-security statistics
<get-dhcp-security-statistics>

show dhcpv6
show dhcpv6 client
show dhcpv6 client binding
get-dhcpv6-client-binding-information
show dhcpv6 client binding interface
<get-dhcpv6-client-binding-information-by-interface>
show dhcpv6 client statistics
<get-dhcpv6-client-statistics-information>
show dhcpv6 proxy-client
show dhcpv6 proxy-client binding
show dhcpv6 proxy-client statistics
  <get-proxy-dhcpv6-client-statistics-information>
show dhcpv6 relay
show dhcpv6 relay binding
  <get-dhcpv6-relay-binding-information>
show dhcpv6 relay binding interface
<get-dhcpv6-relay-binding-interface>
show dhcpv6 relay binding lease-time-violation
<get-dhcpv6-relay-binding-ltv-information>
show dhcpv6 relay statistics
  <get-dhcpv6-relay-statistics-information>
show dhcpv6 relay statistics bulk-leasequery-connections
<get-dhcpv6-relay-bulk-leasequery-conn-statistics>
```



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show dhcpv6 relay statistics leasequery
<get-dhcpv6-relay-leasequery-statistics>
show dhcpv6 server
show dhcpv6 server binding
  <get-dhcpv6-server-binding-information>

show dhcpv6 server binding interface
<get-dhcpv6-server-binding-interface>
show dhcpv6 server binding lease-time-violation
<get-dhcpv6-server-binding-ltv-information>
show dhcpv6 server statistics
  <get-dhcpv6-server-statistics-information>
show dhcpv6 server statistics bulk-leasequery-connections
<get-dhcpv6-server-bulk-leasequery-conn-statistics>
show dhcpv6 statistics
  <get-dhcpv6-service-statistics-information>
show diagnostics
show diagnostics tdr
<get-tdr-interface-information>
show diagnostics tdr interface
<get-tdr-interface-status>
show diameter
  <get-diameter-information>
show diameter function
  <get-diameter-function-information>
show diameter function statistics
  <get-diameter-function-statistics>
show diameter instance
  <get-diameter-instance-information>
show diameter network-element
  <get-diameter-network-element-information>
show diameter network-element map
  <get-diameter-network-element-map-information>
show diameter peer
  <get-diameter-peer-information>
show diameter peer map
  <get-diameter-peer-map-information>
show diameter peer statistics
  <get-diameter-peer-statistics>
show diameter route
  <get-diameter-route-information>
show dot1x
show dot1x accounting-attributes
get-dot1x-accounting-attributes
show dot1x accounting-attributes interface
<get-dot1x-interface-accounting-attributes>
show dot1x authentication-failed-users
  <get-dot1x-authentication-failed-users>
show dot1x interface
  <get-dot1x-interface-information>
show dot1x static-mac-address
  <get-dot1x-static-mac-addresses>
show dot1x static-mac-address interface
  <get-dot1x-interface-mac-addresses>
show dvmp
show dvmp interfaces
  <get-dvmp-interfaces-information>
show dvmp neighbors
  <get-dvmp-neighbors-information>
show dvmp prefix
  <get-dvmp-prefix-information>

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show dvmrp prunes
  <get-dvmrp-prunes-information>
show dynamic-profile
  <get-dynamic-profile>
show dynamic-profile session
  <get-dynamic-profile-session-information>
show dynamic-tunnels
show dynamic-tunnels database
  <get-dynamic-tunnels-database>
show ethernet-switching mac-learning-log
  <get-ethernet-switching-log-information>
show ethernet-switching mac-notification
  <get-ethernet-switching-mac-notification-information>
show ethernet-switching flood next-hops
show ethernet-switching flood next-hops satellite
  <get-satellite-control-composite-next-hop>
show ethernet-switching flood satellite
  <get-satellite-control-flood>
show ethernet-switching nh-learn-entity
  <get-l2-learning-nh-learn-entries>
show ethernet-switching redundancy-groups
  <get-ethernet-switching-redundancy-groups>
show ethernet-switching satellite
show ethernet-switching satellite device
  <get-satellite-device-db>
show ethernet-switching satellite events
  <get-satellite-control-history-information>
show ethernet-switching satellite logging
  <get-satellite-control-logging-information>
show ethernet-switching satellite summary
  <get-satellite-control-bridge-summary>
show ethernet-switching table satellite
  <get-satellite-control-bridge-mac-table>
show ethernet-switching vxlan-tunnel-end-point esi
  <get-ethernet-switching-vxlan-esi-info>
show ethernet-switching vxlan-tunnel-end-point remote
  <get-ethernet-switching-vxlan-rvtep-info>
show ethernet-switching vxlan-tunnel-end-point remote esi
  <get-ethernet-switching-vxlan-esi-info>
show ethernet-switching vxlan-tunnel-end-point remote vtep-source-interface
  <get-ethernet-switching-vxlan-remote-svtep-ip-information>
show ethernet-switching vxlan-tunnel-end-point source ip
  <get-ethernet-switching-vxlan-svtep-ip-information>
show ephemeral-configuration
show esis
show esis adjacency
  <get-esis-adjacency-information>
show esis interface
  <get-esis-interface-information>
show esis statistics
  <get-esis-statistics-information>
show event-options
show event-options event-scripts
show event-options event-scripts policies
  <get-event-scripts-policies>
  <get-event-summary>
show evpn
show evpn arp-table
  <get-evpn-arp-table>
show evpn flood
  <get-evpn-flood-information>
```

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show evpn flood event-queue
<get-evpn-event-queue-information>
show evpn flood route
show evpn flood route all-ce-flood
<get-evpn-all-ce-flood-route-information>
show evpn flood route all-flood
<get-evpn-all-flood-route-information>
show evpn flood route alt-root-flood
<get-evpn-alt-root-flood-route-information>
show evpn flood route ce-flood
<get-evpn-ce-flood-route-information>
show evpn flood route mlp-flood
<get-evpn-mlp-flood-route-information>
show evpn flood route re-flood
<get-evpn-re-flood-route-information>
show evpn instance
<get-evpn-instance-information>
show evpn mac-table
<get-evpn-mac-table>
show evpn mac-table interface
<get-evpn-interface-mac-table>
show evpn peer-gateway-macs
<get-evpn-peer-gateway-mac>
show evpn statistics
<get-evpn-statistics-information>
show extensible-subscriber-services
show extensible-subscriber-services accounting
<get-extensible-subscriber-services-accounting>
show extensible-subscriber-services counters
<get-extensible-subscriber-services-counters>
show extensible-subscriber-services dictionary
<get-extensible-subscriber-services-dictionary>
show extensible-subscriber-services services
<get-extensible-subscriber-services-services>
show extensible-subscriber-services sessions
<get-extensible-subscriber-services-sessions>
show extension-provider
show extension-provider system
show extension-provider system connections
<get-mspinfo-connections>
show extension-provider system packages
<get-mspinfo-packages>
show extension-provider system processes
<get-mspinfo-processes>
show extension-provider system processes brief
<get-mspinfo-processes-brief>
show extension-provider system processes extensive
<get-mspinfo-processes-extensive>
show extension-provider system uptime
<get-mspinfo-uptime>
show extension-provider system virtual-memory
<get-core-key-list>
<get-fabric-summary-information>
<get-key-vg-binding>
<get-mac-ip-binding-information>
<get-mc-ccpc-cache-ccpc-select>
<get-mc-ccpc-cache-root-candidates>
<get-mc-ccpc-cache-spf>
<get-mc-ccpc-src-mod-filters>
<get-mc-edge-cache-ccpc-select>
<get-mc-edge-map-to-key-binding>
```

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<get-mc-edge-key-to-map-binding>
<get-mc-edge-vg-portmap>
<get-mc-nsf>
<get-mc-root-cache-trunk>
  <get-mc-root-key-to-map-binding>
<get-layer2-group-membership-entries>
<get-layer3-group-membership-entries>
<get-layer3-multicast-pending-routes>
<get-layer3-multicast-receivers>
  <get-mc-root-map-to-key-binding>
  <get-mc-root-vg-pfemap>
<get-fabric-multicast-statistics>
<get-mc-vccpdf-adjacency-database>
<get-mspinfo-virtual-memory>
get-fabric-statistics
get-fabric-summary-information
  <get-vlan-domain-map-information>
show fabric multicast dirty-key-info
<get-mc-dirty-key-info>
show fabric multicast edge corekey-ifls-filters
<get-mc-edge-corekey-ifls-filters>
show fabric multicast edge ine-ifls-filters
<get-mc-edge-ine-ifls-filters>
show fabric multicast edge src-mod-filters
<get-mc-edge-src-mod-filters>
show fabric multicast graph
show fabric multicast graph core-tree
<get-fabric-multicast-graph>
show fabric multicast steal-key-info
<get-mc-steal-key-info>
show forwarding-options
show forwarding-options enhanced-hash-key
show forwarding-options enhanced-hash-key fpc
show forwarding-options hyper-mode
<get forwarding-options hyper-mode>
show forwarding-options next-hop-group
<get-forwarding-options-next-hop-group>
show forwarding-options port-mirroring
<get-forwarding-options-port-mirroring>
show helper
show helper statistics
  <get-helper-statistics-information>
show hfrr
show hfrr profiles
show iccp
  <get-inter-chassis-control-protocol-information>
show igmp
show igmp group
  <get-igmp-group-information>
show igmp interface
  <get-igmp-interface-information>
show igmp output-group
  <get-igmp-output-group-information>
show igmp snooping
show igmp snooping interface
  <get-igmp-snooping-interface-information>
show igmp snooping interface bridge-domain
<get-igmp-snooping-bridge-domain-interface>
show igmp snooping membership
  <get-igmp-snooping-membership-information>
show igmp snooping membership bridge-domain
```

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show igmp snooping options
<get-igmp-snooping-options-information>
show igmp snooping options
get-igmp-snooping-options-information
show igmp snooping statistics
  <get-igmp-snooping-statistics-information>
show igmp snooping statistics bridge-domain
<get-igmp-snooping-bridge-domain-membership>
show igmp statistics
  <get-igmp-statistics-information>

show ike
show ike security-associations
  <get-ike-security-associations-information>

show ilmi
<get-ilmi-information>
show ilmi interface
<get-ilmi-interface-information>
show ilmi statistics
<get-ilmi-statistics>
show ingress-replication
  <get-ingress-replication-information>
show interfaces
  <get-interface-information>
show interfaces anchor-group
show interfaces controller
<get-interface-controller-information>
show interfaces destination-class
  <get-destination-class-statistics>

show interfaces destination-class all
<get-all-destination-class-statistics>
show interfaces diagnostics
show interfaces diagnostics optics
  <get-interface-optics-diagnostics-information>
show interfaces diagnostics optics satellite
<show-interface-optics-diagnostics-satellite>
show interfaces distribution-list
<get-distribution-list-information>

show interfaces far-end-interval
  <show-interfaces-far-end-interval>
show interfaces filters
  <get-interface-filter-information>

show interfaces forwarding-class-counters
<get-interface-fc-counters-information>

show interfaces interface-set
<get-interface-set-information>
show interfaces interface-set queue
  <get-interface-set-queue-information>

show interfaces interval
  <show-interfaces-interval>
show interfaces load-balancing
  <interface-load-balancing>
show interfaces mac-database
  <get-mac-database>
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show interfaces mc-ae
  <get-mc-ae-interface-information>
show interfaces mc-ae revertive-info
  <get-mc-ae-revertive-information>
show interfaces policers
  <get-interface-policer-information>

show interfaces queue
  <get-interface-queue-information>

show interfaces redundancy
  <get-redundancy-status>
show interfaces redundancy detail
  <get-redundancy-status-details>
show interfaces routing
show interfaces source-class
  <get-source-class-statistics>

show interfaces source-class all
  <get-all-source-class-statistics>
show interfaces targeting
  <get-targeting-information>
show interfaces transport
  <get-interface-transport-information>
show interfaces transport optics
  <get-interface-transport-optics-information>
show interfaces transport optics interval
  <get-interface-transport-optics-interval-information>
show interfaces voq
  <get-interface-voq-information>
show ipsec
show ipsec redundancy
show ipsec redundancy interface
  <get-ipsec-pic-redundancy-information>

show ipsec redundancy security-associations
  <get-ipsec-tunnel-redundancy-information>

show ipsec security-associations
  <get-security-associations-information>

show ipv6
show ipv6 neighbors
  <get-ipv6-nd-information>

show ipv6 router-advertisement
  <get-ipv6-ra-information>

show isis
show isis adjacency
  <get-isis-adjacency-information>

show isis authentication
  <get-isis-authentication-information>

show isis backup
show isis backup coverage
  <get-isis-backup-coverage-information>

show isis backup label-switched-path
  <get-isis-backup-lsp-information>
```

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show isis backup spf

show isis backup spf results
  <get-isis-backup-spf-results-information>
show isis bgp-orr
  <get-isis-bgprr-information>

show isis context-identifier
  <get-isis-context-identifier-information>

show isis context-identifier identifier
  <get-isis-context-identifier-origin-information>
show isis database
  <get-isis-database-information>

show isis hostname
  <get-isis-hostname-information>

show isis interface
  <get-isis-interface-information>
show isis interface-group
  <get-isis-interface-group-information>
show isis layer2-map
  <get-isis-layer2-map-information>

show isis overview
  <get-isis-overview-information>

show isis route
  <get-isis-route-information>

show isis spf
show isis spf brief
  <get-isis-spf-results-brief-information>

show isis spf log
  <get-isis-spf-log-information>

show isis spf results
  <get-isis-spf-results-information>

show isis statistics
  <get-isis-statistics-information>

show l2-learning
show l2-learning backbone-instance
  <get-l2-learning-backbone-instance>
show l2-learning evpn
show l2-learning evpn arp-statistics
  <get-evpn-arp-statistics>
show l2-learning evpn arp-statistics interface
  <get-evpn-arp-statistics-interface>
show l2-learning global-information
  <get-l2-learning-global-information>
show l2-learning global-mac-count
  <get-l2-learning-global-mac-count>
show l2-learning instance
  <get-l2-learning-routing-instances>
show l2-learning interface
  <get-l2-learning-interface-information>
```

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show l2-learning mac-move-buffer
<get-l2-learning-mac-move-buffer-information>
show l2-learning provider-instance
<get-l2-learning-provider-instance>
show l2-learning redundancy-groups
<get-l2-learning-redundancy-groups>
show l2-learning remote-backbone-edge-bridges
<get-l2-learning-remote-backbone-edge-bridges>
show l2-learning vxlan-tunnel-end-point
show l2-learning vxlan-tunnel-end-point esi
<get-l2-learning-vxlan-esi-info>show l2-learning vxlan-tunnel-end-point remote
<get-l2-learning-vxlan-rvtep-info>
show l2-learning vxlan-tunnel-end-point remote ip
<get-l2-learning-vxlan-rvtep-ip-information>
show l2-learning vxlan-tunnel-end-point remote mac-table
<get-l2-learning-vxlan-rvtep-mactable-information>
show l2-learning vxlan-tunnel-end-point remote vtep-source-interface
<get-l2-learning-vxlan-remote-svtep-ip-information>
show l2-learning vxlan-tunnel-end-point source
<get-l2-learning-vxlan-svtep-info>
show l2-learning vxlan-tunnel-end-point source ip
<get-l2-learning-vxlan-svtep-ip-information>
show l2circuit
show l2circuit auto-sensing
<get-l2ckt-pw-auto-sensing-information>
show l2circuit connections
<get-l2ckt-connection-information>

show l2cpd
show l2cpd task
<get-l2cpd-task-information>
show l2cpd task io
<get-l2cpd-tasks-io-statistics>
show l2cpd task memory
<get-l2cpd-task-memory>
show l2cpd task replication
<get-l2cpd-replication-information>
show l2vpn
show l2vpn connections
<get-l2vpn-connection-information>

show lacp
show lacp interfaces
<get-lacp-interface-information>
show lacp statistics
show lacp statistics interfaces
<get-lacp-interface-statistics>
show lacp timeouts
show ldp
show ldp database
<get-ldp-database-information>

show ldp fec-filters
<get-ldp-fec-filters-information>

show ldp interface
<get-ldp-interface-information>

show ldp neighbor
<get-ldp-neighbor-information>
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show ldp oam
<get-ldp-oam-information>
show ldp overview
  <get-ldp-overview-information>
show ldp p2mp
show ldp p2mp fec
  <get-ldp-p2mp-fec-information>
show ldp p2mp path
  <get-ldp-p2mp-path-information>
show ldp p2mp tunnel
<get-ldp-p2mp-tunnel-information>
show ldp path
  <get-ldp-path-information>

show ldp rib-groups
<get-ldp-rib-groups-information>
show ldp route
  <get-ldp-route-information>

show ldp session
  <get-ldp-session-information>

show ldp statistics
  <get-ldp-statistics-information>

show ldp traffic-statistics
  <get-ldp-traffic-statistics-information>

show link-management
  <get-lm-information>

show link-management peer
  <get-lm-peer-information>

show link-management routing
  <get-lm-routing-information>

show link-management routing peer
  <get-lm-routing-peer-information>

show link-management routing resource
  <get-lm-routing-resource-information>

show link-management routing te-link
  <get-lm-routing-te-link-information>

show lldp
  <get-lldp-information>

show lldp detail
  <get-lldp-information-detail>

show lldp local-information
  <get-lldp-local-info>

show lldp neighbors
  <get-lldp-neighbors-information>

show lldp neighbors interface
  <get-lldp-interface-neighbors>
show lldp remote-global-statistics
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<get-lldp-remote-global-statistics>

show lldp statistics
  <get-lldp-statistics-information>

show lldp statistics interface
  <get-lldp-interface-statistics>
show loop-detect
show loop-detect interface
  <get-loop-detect-interface-information>
show loop-detect statistics
show loop-detect statistics interface
  <get-loop-detect-interface-statistics-information>
show link-management statistics
  <get-lm-statistics-information>

show link-management statistics peer
  <get-lm-peer-statistics>

show link-management te-link
  <get-lm-te-link-information>

show mac-rewrite
show mac-rewrite interface
  <get-mac-rewrite-interface-information>
show mld
show mld group
  <get-mld-group-information>

show mld interface
  <get-mld-interface-information>

show mld output-group
  <get-mld-output-group-information>

show mld snooping
show mld snooping interface
  <get-mld-snooping-interface-information>
show mld snooping interface bridge-domain
  <get-mld-snooping-bridge-domain-interface>
show mld snooping interface vlan
  <get-mld-snooping-vlan-interface>
show mld snooping membership
  <get-mld-snooping-membership-information>
show mld snooping membership bridge-domain
  <get-mld-snooping-bridge-domain-membership>
show mld snooping membership vlan
  <get-mld-snooping-vlan-membership>
show mld snooping statistics
  <get-mld-snooping-statistics-information>
show mld snooping statistics bridge-domain
  <get-mld-snooping-bridge-domain-statistics>
show mld snooping statistics vlan
  <get-mld-snooping-vlan-statistics>
show mld statistics
  <get-mld-statistics-information>

show mobile-ip
show mobile-ip home-agent
show mobile-ip home-agent binding
  <get-mip-binding-information>
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show mobile-ip home-agent binding ip-address
  <get-ip-mip-binding-information>

show mobile-ip home-agent binding nai
  <get-nai-mip-binding-information>

show mobile-ip home-agent binding summary
  <get-summary-mip-binding-information>

show mobile-ip home-agent interface
  <get-mip-ha-interface-information>

show mobile-ip home-agent overview
  <get-mip-ha-overview-information>

show mobile-ip home-agent traffic
  <get-mip-ha-traffic-information>

show mobile-ip home-agent virtual-network
  <get-mip-ha-virtual-network-information>

show mobile-ip tunnel
  <get-mip-tunnel-information>
show mobile-ip wimax
show mobile-ip wimax release
  <get-mip-wimax-release-information>

show mpls
show mpls admin-groups
  <get-mpls-admin-group-information>

show mpls admin-groups-extended
  <get-mpls-admin-group-extended-information>
show mpls association
show mpls association iif
  <get-mpls-association-iif-information>
show mpls association oif
  <get-mpls-association-oif-information>
show mpls association path
  <get-mpls-association-path-information>
show mpls call-admission-control
  <get-mpls-call-admission-control-information>

show mpls context-identifier
  <get-mpls-context-identifier-information>
show mpls correlation
show mpls correlation label
  <get-mpls-correlation-label-information>
show mpls correlation nexthop-id
  <get-mpls-correlation-nexthop-information>

show network-access address-assignment preserved
  <get-address-assignment-preserved-table>
show network-access domain-map
show network-access domain-map statistics
  <get-domain-map-statistics>
show mpls cspf
  <get-mpls-cspf-information>

show mpls diffserv-te
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<get-mpls-diffserv-te-information>
show mpls egress-protection
show mpls interface
    <get-mpls-interface-information>
show mpls label
    <get mpls-label-space>
show mpls label usage
    <get mpls-label-space-usage>

show mpls lsp
    <get-mpls-lsp-information>

show mpls lsp autobandwidth
    <get-mpls-lsp-autobandwidth>
show mpls srlg
    <get-mpls-srlg-information>
show oam ethernet fnp
show oam ethernet fnp interface
show oam ethernet fnp messages
show oam ethernet fnp status
    <get-fnp-status>
show mpls lsp defaults
    <get-mpls-lsp-defaults-information>

show mpls path
    <get-mpls-path-information>

show mpls static-lsp
    <get-mpls-static-lsp-information>
show mpls traceroute
show mpls traceroute database
show mpls traceroute database ldp
    <get-mpls-traceroute-database-ldp>
show msdp
    <get-msdp-information>
show msdp source
    <get-msdp-source-information>

show msdp source-active
    <get-msdp-source-active-information>

show msdp statistics
    <get-msdp-statistics-information>
show multi-chassis
show multi-chassis mc-lag
show multi-chassis mc-lag configuration-consistency
    <get-mclag-config-consistency-information>
show multi-chassis mc-lag configuration-consistency global-config
    <get-mclag-global-config-consistency-information>
show multi-chassis mc-lag configuration-consistency icl-config
    <get-mclag-icl-config-consistency-information>
show multi-chassis mc-lag configuration-consistency
list-of-parameters<get-mclag-config-consistency-information-params>
show multi-chassis mc-lag configuration-consistency mcae-config
    <get-mclag-config-consistency-information-mcae>
show multi-chassis mc-lag configuration-consistency vlan-config
    <get-mclag-vlan-config-consistency-information>
show multi-chassis mc-lag configuration-consistency vrrp-config
    <get-mclag-vrrp-config-consistency-information>
show multicast
show multicast backup-pe-groups
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<get-multicast-backup-pe-groups-information>

show multicast backup-pe-groups address
<get-multicast-backup-pe-address-information>

show multicast backup-pe-groups group
<get-multicast-backup-pe-group-information>
show multicast ecid-mapping
show multicast ecid-mapping satellite
<get-satellite-control-ecid>
show multicast flow-map
<get-multicast-flow-maps-information>

show multicast interface
<get-multicast-interface-information>

show multicast next-hops
<get-multicast-next-hops-information>
show multicast next-hops satellite
<get-satellite-control-next-hop>

show multicast pim-to-igmp-proxy
<get-multicast-pim-to-igmp-proxy-information>

show multicast pim-to-mld-proxy
<get-multicast-pim-to-mld-proxy-information>

show multicast route
<get-multicast-route-information>

show multicast rpf
<get-multicast-rpf-information>

show multicast scope
<get-multicast-scope-information>

show multicast sessions
<get-multicast-sessions-information>

show multicast snooping
show multicast snooping next-hops
<get-multicast-snooping-next-hops-information>

show multicast snooping next-hops satellite
<get-satellite-control-indirect-next-hop>
show multicast snooping route
<get-multicast-snooping-route-information>
show multicast snooping route satellite
get-satellite-control-multicast

show multicast statistics
<get-multicast-statistics-information>
show multicast statistics satellite
<get-satellite-control-statistics>
show multicast summary
show multicast summary satellite
<get-satellite-control-summary>

show multicast usage
<get-multicast-usage-information>
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show mvpn
show mvpn c-multicast
<get-mvpn-c-multicast-route>
show mvpn instance
  <get-mvpn-instance-information>

show mvpn neighbor
<get-mvpn-neighbor-information>
show mvpn suppressed
get-mvpn-suppressed-information
show mvrp
  <get-mvrp-information>

show mvrp applicant-state
  <get-mvrp-applicant-information>

show mvrp dynamic-vlan-memberships
  <get-mvrp-dynamic-vlan-memberships>

show mvrp interface
  <get-mvrp-interface-information>

show mvrp registration-state
  <get-mvrp-registration-state>

show mvrp statistics
  <get-mvrp-interface-statistics>

show network-access
show network-access aaa
show network-access aaa radius-servers
<get-radius-servers-table>
show network-access aaa statistics
  <get-aaa-module-statistics>

show network-access aaa statistics address-assignment
show network-access aaa statistics address-assignment client
<get-address-assignment-client-statistics>
show network-access aaa statistics address-assignment pool
<get-address-assignment-pool-statistics>
show network-access aaa subscribers
  <get-aaa-subscriber-table>

show network-access aaa subscribers session-id

show network-access aaa subscribers statistics
  <get-aaa-subscriber-statistics>

show network-access aaa terminate-code
  <get-aaa-terminate-code>
show network-access aaa terminate-code aaa
  <get-aaa-terminate-code-aaa>
show network-access aaa terminate-code dhcp
  <get-aaa-terminate-code-dhcp>
show network-access aaa terminate-code l2tp
  <get-aaa-terminate-code-l2tp>
show network-access aaa terminate-code ppp
  <get-aaa-terminate-code-ppp>
show network-access aaa terminate-code reverse
  <get-aaa-terminate-code-reverse>
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show network-access aaa terminate-code reverse aaa
  <get-aaa-terminate-code-reverse-aaa>
show network-access aaa terminate-code reverse dhcp
  <get-aaa-terminate-code-reverse-dhcp>
show network-access aaa terminate-code reverse l2tp
  <get-aaa-terminate-code-reverse-l2tp>
show network-access aaa terminate-code reverse ppp
  <get-aaa-terminate-code-reverse-ppp>
show network-access address-assignment
show network-access address-assignment pool
  <get-address-assignment-pool-table>
show network-access nasreq
show network-access nasreq statistics
get-nasreq-counters
show network-access ocs
show network-access ocs state
  <get-ocs-state-information>
show network-access ocs statistics
  <get-ocs-statistics-information>
show network-access pcrf
show network-access pcrf state
  <get-pcrf-state-information>
show network-access pcrf statistics
  <get-pcrf-statistics-information>

show network-access requests
show network-access requests pending
  <get-authentication-pending-table>

show network-access requests statistics
  <get-authentication-statistics>

show network-access securid-node-secret-file
  <get-node-secret-file-table>

show nonstop-routing
  <get-nonstop-routing-information>

show ntp
show ntp associations
show ntp status
show oam
show oam ethernet
show oam ethernet connectivity-fault-management sla-iterator-history
  <get-cfm-iterator-history>
show oam ethernet connectivity-fault-management
show oam ethernet connectivity-fault-management adjacencies
  <get-cfm-adjacency-information>
show oam ethernet connectivity-fault-management delay-statistics
  <get-cfm-delay-statistics>

show oam ethernet connectivity-fault-management forwarding-state
show oam ethernet connectivity-fault-management forwarding-state instance
  <get-cfm-forwarding-state-instance-information>

show oam ethernet connectivity-fault-management forwarding-state interface
  <get-cfm-forwarding-state-interface-information>

show oam ethernet connectivity-fault-management interfaces
  <get-cfm-interfaces-information>
show oam ethernet connectivity-fault-management loss-statistics
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<get-cfm-loss-statistics>
show oam ethernet connectivity-fault-management mep-database
<get-cfm-mep-database>

show oam ethernet connectivity-fault-management mep-statistics
<get-cfm-mep-statistics>

show oam ethernet connectivity-fault-management mip
<get-cfm-mip-information>

show oam ethernet connectivity-fault-management path-database
<get-cfm-linktrace-path-database>

show oam ethernet connectivity-fault-management policer
<get-evc-information>

show oam ethernet connectivity-fault-management sla-iterator-statistics
<get-cfm-iterator-statistics>
show oam ethernet evc
<get-evc-information>
show oam ethernet link-fault-management
<get-lfmd-information>

show oam ethernet lmi
<get-elmi-information>

show oam ethernet lmi statistics
<get-elmi-statistics>

show openflow
show openflow capability
show openflow controller
show openflow filters
show openflow flows
show openflow interfaces
show openflow statistics
show openflow statistics flows
show openflow statistics interfaces
show openflow statistics packet
show openflow statistics packet in
show openflow statistics packet out
show openflow statistics queue
show openflow statistics summary
show openflow statistics tables
show openflow summary
show openflow switch

show ospf
show ospf backup
show ospf backup coverage
<get-ospf-backup-coverage-information>

show ospf backup lsp
<get-ospf-backup-lsp-information>

show ospf backup neighbor
<get-ospf-backup-neighbor-information>

show ospf backup spf
<get-ospf-backup-spf-information>
show ospf bgp-orr
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<get-ospf-bgprr-information>

show ospf context-identifier
  <get-ospf-context-id-information>

show ospf database
  <get-ospf-database-information>

show ospf interface
  <get-ospf-interface-information>

show ospf io-statistics
  <get-ospf-io-statistics-information>

show ospf log
  <get-ospf-log-information>

show ospf neighbor
  <get-ospf-neighbor-information>

show ospf overview
  <get-ospf-overview-information>

show ospf route
  <get-ospf-route-information>

show ospf statistics
  <get-ospf-statistics-information>

show ospf3
show ospf3 backup
show ospf3 backup coverage
  <get-ospf3-backup-coverage-information>

show ospf3 backup lsp
  <get-ospf3-backup-lsp-information>

show ospf3 backup neighbor
  <get-ospf3-backup-neighbor-information>

show ospf3 backup spf
  <get-ospf3-backup-spf-information>
show ospf3 bgp-orr
  <get-ospf-bgprr-information>

show ospf3 database
  <get-ospf3-database-information>

show ospf3 interface
  <get-ospf3-interface-information>

show ospf3 io-statistics
  <get-ospf3-io-statistics-information>

show ospf3 log
  <get-ospf3-log-information>

show ospf3 neighbor
  <get-ospf3-neighbor-information>

show ospf3 overview
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<get-ospf3-overview-information>

show ospf3 route
<get-ospf3-route-information>

show ospf3 statistics
<get-ospf3-statistics-information>
show overlay
<get-cloud-analytics-overlay-information>
show overlay vxlan
<get-cloud-analytics-overlay-vxlan-information>
show overlay vxlan vni
<get-application-monitor-overlay-vxlan-information>
show overlay vxlan vtep
<get-application-monitor-overlay-vtep-information>
show ovsdb
show ovsdb commit
show ovsdb commit failures
<get-ovsdb-commit-failure-information>

show ovsdb tunnels
<get-ovsdb-tunnels-information>
show ovsdb virtual-tunnel-end-point
<get-ovsdb-vtep-information>
show passive-monitoring
<get-passive-monitoring-information>

show passive-monitoring error
<get-passive-monitoring-error-information>

show passive-monitoring flow
<get-passive-monitoring-flow-information>

show passive-monitoring memory
<get-passive-monitoring-memory-information>

show passive-monitoring status
<get-passive-monitoring-status-information>

show passive-monitoring usage
<get-passive-monitoring-usage-information>
show path-computation-client
show path-computation-client active-pce
show path-computation-client lsp-retry-pending
<get-path-computation-client-lsp-retry-pending>
show path-computation-client statistics
show performance-monitoring
show performance-monitoring mpls
show performance-monitoring mpls lsp
<get-pm-mpls-lsp-information>
show pfe
show pfe cfeb
show pfe data
<get-pfe-data>
show pfe feb
show pfe filter
show pfe filter hw
show pfe filter hw summary
show pfe fpc
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show pfe next-hop
show pfe pfem
show pfe pfem detail
show pfe pfem extensive
show pfe route
show pfe route clnp
show pfe route clnp table
show pfe route inet6
show pfe route inet6 hw
show pfe route inet6 hw host
show pfe route inet6 hw lpm
show pfe route inet6 hw multicast

show pfe route inet6 table
show pfe route ip
show pfe route ip table
show pfe route iso
show pfe route iso table
show pfe scb
show pfe sfm
show pfe ssb
show pfe statistics
show pfe statistics exceptions
show pfe statistics fabric
show pfe statistics ip
show pfe route ip hw
show pfe route ip hw host
show pfe route ip hw lpm
show pfe route ip hw multicast
show pfe route summary
show pfe route summary hw
show pfe statistics ip6
show pfe statistics traffic
    <get-pfe-statistics>
show pfe statistics traffic bandwidth
    <get-pfe-traffic-statistics-bandwidth>

show pfe statistics traffic cpu
show pfe statistics traffic cpu fpe
show pfe statistics traffic detail
    <get-pfe-traffic-statistics>
show pfe statistics traffic egress-queues
show pfe statistics traffic egress-queues fpc
show pfe statistics traffic multicast
show pfe statistics traffic multicast fpcshow pfe statistics traffic protocol
show pfe tcam
show pfe tcam app
    <get-pfe-tcam-app-list>
show pfe tcam app bd-dtag-validate
    <get-pfe-tcam-app-list-bd-dtag-validate>
show pfe tcam app bd-dtag-validate detail
show pfe tcam app bd-dtag-validate list-related-apps
show pfe tcam app bd-dtag-validate list-shared-apps
show pfe tcam app bd-dtag-validate shared-usage
show pfe tcam app bd-dtag-validate shared-usage detail
show pfe tcam app bd-tpid-swap
    <get-pfe-tcam-app-list-bd-tpid-swap>
show pfe tcam app bd-tpid-swap detail
show pfe tcam app bd-tpid-swap list-related-apps
show pfe tcam app bd-tpid-swap list-shared-apps
show pfe tcam app bd-tpid-swap shared-usage

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show pfe tcam app bd-tpid-swap shared-usage detail
show pfe tcam app cfm-bd-filter
<get-pfe-tcam-app-list-cfm-bd-filter>
show pfe tcam app cfm-bd-filter detail
show pfe tcam app cfm-bd-filter list-related-apps
show pfe tcam app cfm-bd-filter list-shared-apps
show pfe tcam app cfm-bd-filter shared-usage
show pfe tcam app cfm-bd-filter shared-usage detail
show pfe tcam app cfm-filter
<get-pfe-tcam-app-list-cfm-filter>
show pfe tcam app cfm-filter list-related-apps
show pfe tcam app cfm-filter list-shared-apps
show pfe tcam app cfm-filter shared-usage
show pfe tcam app cfm-filter shared-usage detail
show pfe tcam app cfm-vpls-filter
<get-pfe-tcam-app-list-cfm-vpls-filter>
show pfe tcam app cfm-vpls-filter detail
show pfe tcam app cfm-vpls-filter list-related-apps
show pfe tcam app cfm-vpls-filter list-shared-apps
show pfe tcam app cfm-vpls-filter shared-usage
show pfe tcam app cfm-vpls-filter shared-usage detail
show pfe tcam app cfm-vpls-ift-filter
<get-pfe-tcam-app-list-cfm-vpls-ift-filter>
show pfe tcam app cfm-vpls-ift-filter detail
show pfe tcam app cfm-vpls-ift-filter list-related-apps
show pfe tcam app cfm-vpls-ift-filter list-shared-apps
show pfe tcam app cfm-vpls-ift-filter shared-usage
show pfe tcam app cfm-vpls-ift-filter shared-usage detail
  show pfe tcam app cos-fc
<get-pfe-tcam-app-list-cos-fc>
show pfe tcam app cos-fc detail
show pfe tcam app cos-fc list-related-apps
show pfe tcam app cos-fc list-shared-apps
show pfe tcam app cos-fc shared-usage
show pfe tcam app cos-fc shared-usage detail
show pfe tcam app fw-ccc-in
<get-pfe-tcam-app-list-fw-ccc-in>
show pfe tcam app fw-ccc-in detail
show pfe tcam app fw-ccc-in list-related-apps
show pfe tcam app fw-ccc-in list-shared-apps
show pfe tcam app fw-ccc-in shared-usage
show pfe tcam app fw-ccc-in shared-usage detail
  show pfe tcam app fw-family-out
<get-pfe-tcam-app-list-fw-family-out>
show pfe tcam app fw-family-out detail
show pfe tcam app fw-family-out list-related-apps
show pfe tcam app fw-family-out list-shared-apps
show pfe tcam app fw-family-out shared-usage
show pfe tcam app fw-family-out shared-usage detail
show pfe tcam app fw-fbf
<get-pfe-tcam-app-list-fw-fbf>
show pfe tcam app fw-fbf detail
show pfe tcam app fw-fbf list-related-apps
show pfe tcam app fw-fbf list-shared-apps
show pfe tcam app fw-fbf shared-usage
show pfe tcam app fw-fbf shared-usage detail
  show pfe tcam app fw-fbf-inet6
<get-pfe-tcam-app-list-fw-fbf-inet6>
show pfe tcam app fw-fbf-inet6 detail
show pfe tcam app fw-fbf-inet6 list-related-apps
show pfe tcam app fw-fbf-inet6 list-shared-apps
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show pfe tcam app ing-out-iff
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show services captive-portal-content-delivery profile
  <get-cpcd-profile>
show services captive-portal-content-delivery rule
  <get-cpcd-rule>
show services captive-portal-content-delivery ruleset
  <get-cpcd-rule-set>
show services captive-portal-content-delivery sset
  <get-cpcd-service-set>
show services captive-portal-content-delivery statistics
  <get-cpcd-pic-statistics>
show services captive-portal-content-delivery statistics interface
show services capture
  <get-service-capture>
show services cos
show services cos statistics
  <get-service-cos-statistics-information>

show services cos statistics diffserv
  <get-service-cos-diffserv-statistics>

show services cos statistics forwarding-class
  <get-service-cos-forwarding-class-statistics>

show services crtp
  <get-service-crtp-params-information>

show services crtp extensive
  <get-service-crtp-extensive-information>

show services crtp flows
  <get-service-crtp-flow-table-information>

show services dynamic-flow-capture
show services dynamic-flow-capture content-destination
  <get-services-dynamic-flow-capture-content-destination-information>

show services dynamic-flow-capture control-source
  <get-services-dynamic-flow-capture-control-source-information>

show services dynamic-flow-capture statistics
  <get-services-dfc-statistics-information>
show extension-service
show extension-service status
  <jet-application-status>
show services fips
show system commit synchronize-server pending-jobs
  <get-pending-commit-sync-jobs>
show services fips pic
show services fips pic status
  <get-fips-pic-status-information>

show services flow-collector
  <get-services-flow-collector-information>

show services flow-collector file
  <get-services-flow-collector-file-information>

show services flow-collector input
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<get-services-flow-collector-input-information>

show services flow-table
show services flow-table statistics
  <get-flow-table-statistics-information>

show services flows
  <get-service-msp-flow-table-information>

show services ggsn
show services ggsn diagnostics
show services ggsn diagnostics pdp
  <get-pdp-diagnostics-per-apn>

show services ggsn statistics
  <get-ggsn-statistics>

show services ggsn statistics apn
  <get-ggsn-apn-statistics-information>

show services ggsn statistics charging
  <get-ggsn-charging-statistics-information>

show services ggsn statistics gtp
  <get-ggsn-gtp-statistics-information>

show services ggsn statistics gtp-prime
  <get-ggsn-gtp-prime-statistics-information>

show services ggsn statistics imsi
  <get-ggsn-imsi-user-information>

show services ggsn statistics l2tp-tunnel
  <get-ggsn-l2tp-tunnel-statistics-information>

show services ggsn statistics msisdn
show services ggsn statistics radius
  <get-ggsn-radius-statistics-information>

show services ggsn statistics sgsn
  <get-ggsn-sgsn-statistics-information>

show services ggsn status
  <get-ggsn-interface-information>

show services ggsn trace
show services ggsn trace all
  <get-ggsn-trace>

show services ggsn trace imsi
  <get-ggsn-imsi-trace>

show services ggsn trace msisdn
  <get-ggsn-msisdn-trace>
show services ha
  <get-service-ha-info>
show services hcm
show services hcm pic-statistics
  <get-service-hcm-pic-statistics-information>
show services ids
show services ids destination-table
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<get-service-ids-destination-table-information>

show services ids pair-table
<get-service-ids-pair-table-information>

show services ids source-table
<get-service-ids-source-table-information>

show services inline
show services inline ip-reassembly
show services inline ip-reassembly statistics
show services inline nat
show services inline nat mappings
show services inline nat mappings nptv6
<get-inline-nat-mapping-nptv6-information>
show services inline nat pool
<get-inline-nat-pool-information>
show services inline nat statistics
<get-inline-nat-statistics-information>
show services inline software
show services inline software statistics
<get-inline-service-sw-statistics-information>
show services inline stateful-firewall
show services inline stateful-firewall flows
<get-inline-sfw-flow-table-information>
show services inline stateful-firewall statistics
<get-inline-sfw-statistics-information>
show services ipsec-vpn
show services ipsec-vpn ike
show services ipsec-vpn ike security-associations
<get-ike-services-security-associations-information>

show services ipsec-vpn ike statistics
<get-ike-services-statistics>
show services ipsec-vpn ipsec
show services ipsec-vpn ipsec security-associations
<get-services-security-associations-information>

show services ipsec-vpn ipsec statistics
<get-services-ipsec-statistics-information>

show services l2tp
show services l2tp client
<get-l2tp-client-information>
show services l2tp destination
<get-l2tp-destination-information>
show services l2tp destination lockout
<get-services-l2tp-destination-lockout>
show services l2tp disconnect-cause-summary<
<get-l2tp-disconnect-cause-summary>
show services l2tp multilink
<get-l2tp-multilink-information>

show services l2tp radius
show services l2tp radius accounting
show services l2tp radius accounting servers
<get-services-l2tp-radius-accounting-servers-information>

show services l2tp radius accounting statistics
<get-services-l2tp-radius-accounting-statistics-information>
```

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show services l2tp radius authentication
show services l2tp radius authentication servers
    <get-services-l2tp-radius-authentication-servers-information>

show services l2tp radius authentication statistics
    <get-services-l2tp-radius-authentication-statistics-information>

show services l2tp radius servers
    <get-services-l2tp-radius-authentication-accounting-servers-information>

show services l2tp radius statistics
    <get-services-l2tp-radius-authentication-accounting-statistics-information>

show services l2tp session
    <get-l2tp-session-information>
show services l2tp session-limit-group
    <get-l2tp-session-limit-group-information>

show services l2tp summary
    <get-l2tp-summary-information>

show services l2tp tunnel
    <get-l2tp-tunnel-information>
show services l2tp tunnel-group
    <get-l2tp-tunnel-group-information>

show services l2tp user
    <get-l2tp-user-information>
show services link-services
show services link-services cpu-usage
    <get-link-services-cpu-usage>

show services local-policy-decision-function
show services local-policy-decision-function flows
show services local-policy-decision-function flows interface
    <get-local-policy-decision-function-flows-interface>
show services local-policy-decision-function flows subscriber
    <get-local-policy-decision-function-flows-subscriber>
show services local-policy-decision-function statistics
show services local-policy-decision-function statistics interface
    <get-local-policy-decision-function-statistics-interface>
show services local-policy-decision-function statistics subscriber
    <get-local-policy-decision-function-statistics-subscriber>
show services logging
show services logging history
show services logging history client
show services logging logfiles
show services mobile
show services mobile hcm
show services mobile hcm statistics
show services nat
show services nat ipv6-multicast-interfaces
    <get-service-nat-ipv6-multicast-information>

show services nat deterministic-nat
show services nat deterministic-nat internal-host
show services nat deterministic-nat nat-port-block
show services nat mappings
    <get-service-nat-mapping-address-pooling-paired>
show services nat mappings brief
    <get-service-nat-mapping-brief>
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show services nat mappings detail
show services nat mappings endpoint-independent
  <get-service-nat-mapping-endpoint-independent>
show services nat mappings brief
  <get-service-nat-mapping-brief>
show services nat mappings detail
  <get-service-nat-mapping-detail>
show services nat mappings pcg
show services nat mappings summary
  <get-service-nat-mapping-summary>
show services nat pool
  <get-service-nat-pool-information>
show services pcg
show services pgcp
show services pgcp active-configuration
  <get-pgcpd-active-configuration>

show services pgcp active-configuration gateway
  <get-service-pgcp-active-configuration-gateway>

show services pgcp conversations
  <get-service-pgcp-conversation-information>

show services pgcp conversations gateway
  <get-service-pgcp-conversation-information-gateway>

show services pgcp flows
  <get-service-pgcp-flow-table-information>

show services pgcp flows gateway
  <get-service-pgcp-flow-table-information-gateway>

show services pgcp gate
  <get-service-pgcp-gate>

show services pgcp gate gateway
  <get-service-pgcp-gate-gateway>

show services pgcp gates
  <get-service-pgcp-gates>

show services pgcp gates gateway
  <get-service-pgcp-gates-gateway>

show services pgcp root-termination
  <get-services-pgcpd-root-termination>

show services pgcp root-termination gateway
  <get-services-pgcpd-root-termination-gateway>

show services pgcp statistics
  <get-service-pgcp-statistics>

show services pgcp statistics gateway
  <get-service-pgcp-statistics-gateway>

show services pgcp terminations
  <get-service-pgcp-terminations>

show services pgcp terminations gateway
  <get-service-pgcp-terminations-gateway>
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show services redundancy-group
<get-services-redundancy-group-information>
show services redundancy-group rg-id
<get-services-redundancy-group-id-information>

show services rpm
show services rpm active-servers
<get-active-servers>

show services rpm history-results
<get-history-results>

show services rpm probe-results
<get-probe-results>

show services rpm twamp
<twamp-information>
show services rpm twamp client
<twamp-client-information>
show services rpm twamp client connection
<twamp-client-connection-information>
show services rpm twamp client history-results
<twamp-get-history-results>
show services rpm twamp client probe-results
<twamp-get-probe-results>
show services rpm twamp client session
<twamp-client-test-session>
show services rpm twamp server
<twamp-server-information>
show services rpm twamp server connection
<twamp-server-connection-information>
show services rpm twamp server session
<twamp-server-session-information>
show services server-load-balance
show services server-load-balance external-manager
show services server-load-balance external-manager information
show services server-load-balance external-manager statistics
<get-external-manager-statistics-information>
show services server-load-balance hash-table
<get-hash-table-information>
show services server-load-balance health-monitor
show services server-load-balance health-monitor information
<get-real-server-health-monitor-information>
show services server-load-balance health-monitor statistics
<get-real-server-health-monitor-statistics-information>
show services server-load-balance real-server
show services server-load-balance real-server statistics
<get-real-server-statistics-information>
show services server-load-balance real-server-group
show services server-load-balance real-server-group information
<get-real-server-group-information>
show services server-load-balance real-server-group statistics
<get-real-server-group-statistics-information>
show services server-load-balance sticky
<get-sticky-table-information>
show services server-load-balance virtual-server
show services server-load-balance virtual-server information
<get-virtual-server-information>
show services server-load-balance virtual-server statistics
<get-virtual-server-statistics-information>
show services service-identification
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show services service-identification header-redirect
show services service-identification header-redirect statistics
  <get-header-redirect-set-statistics-information>

show services service-identification statistics
  <get-service-identification-statistics-information>

show services service-identification uri-redirect
show services service-identification uri-redirect statistics
  <get-uri-redirect-set-statistics-information>

show services service-sets
show services service-sets cpu-usage
  <get-service-set-cpu-statistics>

show services service-sets memory-usage
  <get-service-set-memory-statistics>

show services service-sets memory-usage zone
show services service-sets plug-ins
  <get-service-set-plugin-summary>

show services service-sets statistics
show services service-sets statistics drop-flow-limit
  <get-service-set-drop-flow-statistics>
show services service-sets statistics jflow-log
  <get-service-set-jflow-log-statistics>
show services service-sets statistics packet-drops
  <get-service-set-packet-drop-statistics>

show services service-sets statistics syslog
  <get-service-set-syslog-statistics>
show services service-sets statistics tcp
  <get-service-set-tcp-tracker-statistics>
show services service-sets statistics tcp-mss
  <get-service-set-tcp-mss-statistics>

show services service-sets summary
  <get-service-set-summary-information>

show services sessions
  <get-msp-session-table>
show services sessions analysis
  <show-service-msp-session-analysis-information>
show services sessions count
  <get-service-msp-sess-count-information>
show services sessions utilization
  <get-services-sessions-utilization>

show services software
  <get-service-software-table-information>

show services software flows
  <get-service-fwnat-flow-table-information>

show services software statistics
  <get-service-software-statistics-information>

show services stateful-firewall
show services stateful-firewall flow-analysis
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<get-service-flow-analysis-information>
show services stateful-firewall conversations
<get-service-sfw-conversation-information>

show services stateful-firewall flows
<get-service-sfw-flow-table-information>
show services stateful-firewall redundancy-statistics
<get-service-sfw-redundancy-statistics>

show services stateful-firewall sip-call
<get-service-sfw-sip-call-information>

show services stateful-firewall sip-register
<get-service-sfw-sip-register-information>

show services stateful-firewall statistics
<get-service-sfw-statistics-information>

show services stateful-firewall statistics application-protocol
<et-sfw-application-protocol-statistics>
show services stateful-firewall subscriber-analysis
<get-service-subs-analysis-information>
show services subscriber
show services subscriber bandwidth
show services subscriber bandwidth client-id
<get-services-subscriber-bandwidth-by-session-id>
show services subscriber bandwidth interface
<get-services-subscriber-bandwidth-by-interface>
show services subscriber bandwidth ip-address
<get-services-subscriber-bandwidth-by-ip-address>
show services subscriber bandwidth service-interface
<get-services-subscriber-bandwidth-by-service-interface>
show services subscriber dynamic-policies
<get-services-subscriber-dynamic-policies>
show services subscriber flows
<get-services-subscriber-flows>
show services subscriber sessions
<get-services-subscriber-session>
show services subscriber statistics
<get-services-subscriber-statistics>
show services traffic-detection-function
show services traffic-detection-function hcm
show services traffic-detection-function hcm statistics
<get-service-tdf-hcm-sessions-stats>
show services traffic-detection-function sessions
<get-service-tdf-sessions-information>
show services unified-access-control
show services unified-access-control authentication-table
<get-uac-auth-table>
show services unified-access-control counters
<get-uac-counters>
show services unified-access-control policies
<get-uac-policies>
show services unified-access-control roles
<get-uac-role-entries>
show services unified-access-control status
<get-uac-status>
show services video-monitoring
<get-service-video-monitoring-information>
show services video-monitoring mdi
<get-service-video-monitoring-mdi-information>
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show services video-monitoring mdi alarms
<get-services-video-monitoring-mdi-alarms-information>
show services video-monitoring mdi alarms errors
<get-services-video-monitoring-mdi-alarms-errors-information>
show services video-monitoring mdi alarms stats
<get-services-video-monitoring-mdi-alarms-stats-information>
show services video-monitoring mdi errors
<get-service-video-monitoring-mdi-errors-information>
show services video-monitoring mdi flow
<get-service-video-monitoring-mdi-flows-information>
show services video-monitoring mdi stats
<get-service-video-monitoring-mdi-stats-information>
show shmlog
show shmlog entries
<show-shmlog-entries>
show snmp
show snmp health-monitor
<get-health-monitor-information>

show snmp health-monitor alarms
<get-health-monitor-alarm-information>

show snmp health-monitor logs
<get-health-monitor-log-information>
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>
show snmp health-monitor routing-engine history memory
<get-routing-engine-memory-history>
show snmp health-monitor routing-engine history open-files-count
<get-routing-engine-fd-history>
show snmp health-monitor routing-engine history process-count
<get-routing-engine-pcount-history>
show snmp health-monitor routing-engine history storage
<get-routing-engine-storage-history>
show snmp health-monitor routing-engine history temperature
<get-routing-engine-temperature-history>
show snmp health-monitor routing-engine status
<get-health-monitor-routing-engine-information>
show snmp health-monitor routing-engine status detail

show snmp inform-statistics
<get-snmp-inform-statistics>

show snmp mib
show snmp mib get
<get-snmp-object>

show snmp mib get-next
<get-next-snmp-object>

show snmp mib walk
<get-walk-snmp-object>

show snmp proxy
show snmp rmon
<get-rmon-information>

show snmp rmon alarms
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<get-rmon-alarm-information>

show snmp rmon events
  <get-rmon-event-information>

show snmp rmon history
  <get-rmon-history-information>

show snmp rmon logs
  <get-rmon-log-information>

show snmp statistics
  <get-snmp-information>

show snmp v3
  <get-snmp-v3-information>

show snmp v3 access
  <get-snmp-v3-access-information>

show snmp v3 community
  <get-snmp-v3-community-information>

show snmp v3 general
  <get-snmp-v3-general-information>

show snmp v3 groups
  <get-snmp-v3-group-information>

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

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

show snmp v3 target
  <get-snmp-v3-target-information>

show snmp v3 target address
  <get-snmp-v3-target-address-information>

show snmp v3 target parameters
  <get-snmp-v3-target-parameters-information>

show snmp v3 users
  <get-snmp-v3-usm-user-information>

show spanning-tree
show spanning-tree bridge
  <get-stp-bridge-information>
show spanning-tree interface
  <get-stp-interface-information>
show spanning-tree mstp
show spanning-tree mstp configuration
  <get-mstp-configuration-information>
show spanning-tree statistics
  <get-stp-interface-statistics>
show spanning-tree statistics bridge
show spanning-tree statistics interface
show spanning-tree statistics routing-instance
  <get-stp-routing-instance-statistics>
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show spanning-tree stp-buffer
show spanning-tree stp-buffer see-all
show ssl-certificates
<get-ssl-certificate-information>
show static-subscribers
show static-subscribers sessions
<show subscribers
    <get-subscribers>
show subscribers summary
    <get-subscribers-summary>
<get-syslog-filenames>

show synchronous-ethernet
show synchronous-ethernet esmc
show synchronous-ethernet esmc statistics
show synchronous-ethernet esmc transmit
show synchronous-ethernet global-information
show system
show system alarms
    <get-system-alarm-information>

show system auto-snapshot
show system boot-messages
show system buffers
show system certificate
show system commit
    <get-commit-information>
show system commit revision
<get-commit-revision-information>
show system commit server
<get-commit-server-information>
show system commit ephemeral
<get-ephemeral-commit-information>
show system commit server queue
<get-commit-server-queue-information>
show system commit synchronize-server
show system configuration
show system configuration archival
    <get-system-archival>

show system configuration rescue
    <get-rescue-information>

show system connections
show system core-dumps
<get-system-core-dumps>
show system core-dumps core-file-info
    <get-core-file-information>

show system core-dumps kernel-crashinfo
show system core-dumps satellite
<get-core-file-satellite>
show system core-dumps transfer-status
show system diagnostics
show system diagnostics inventory
show system diagnostics usage
show system directory-usage
    <get-directory-usage-information>

show system firmware
    <get-system-firmware-information>
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show system khms-stats

show system license
  <get-license-summary-information>

show system license installed
  <get-license-information>
show system license key-content
show system license keys
  <get-license-key-information>

show system license usage
  <get-license-usage-summary>
show system login
show system login lockout
  <get-system-login-lockout-information>
show system memory
<show system processes
show system processes brief
show system processes esc-node
show system processes extensive
show system processes health
  <get-process-health-information>

show system processes providers
show system processes host-processes detail
show system processes providers
show system processes resource-limits
<get-system-process-resource-limits>
show system processes summary
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
  <get-dhcp-global-information>

show system services dhcp pool
  <get-dhcp-pool-information>

show system services dhcp statistics
  <get-dhcp-statistics-information>

show system services reverse
  <get-system-services-reverse-information>
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show system services service-deployment
  <get-service-deployment-service-information>

show system snapshot
  <get-snapshot-information>

show system software
show system software backup
  <get-package-backup-information>
  <get-software-installation-status>
show system software recovery-package
show system software rollback
  <show-package-rollback>

show system statistics
  <get-statistics-information>

show system statistics bridge
  <get-system-bridge-statistics>
show system statistics extended
show system statistics vpls
show system storage
  <get-system-storage>
show system storage partitions
  <get-system-storage-partitions>
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>.
show system subscriber-management route
  <get-subscriber-management-route>
show system subscriber-management route next-hop
  <get-subscriber-management-route-nh>
show system subscriber-management route prefix
show system subscriber-management route summary
  <get-subscriber-management-route-summary>
show system subscriber-management statistics
  <get-subscriber-management-statistics>
show system subscriber-management summary
show system switchover
  <get-switchover-information>

show system uptime
  <get-system-uptime-information>

show system users
  <get-system-users-information>

show system virtual-memory
show system yang
show system yang package
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<get-system-yang-packages>
show task
show task io
show task logical-system-mux
<get-lrmuxd-task-information>
show task logical-system-mux io
<get-lrmuxd-tasks-io-statistics>
show task logical-system-mux memory
<get-lrmuxd-task-memory>
show task memory
show task replication
<get-routing-task-replication-state>
show task snooping
show task snooping io
show task snooping memory
<get-snooping-task-memory-information>
show ted
show ted database
    <get-ted-database-information>

show ted link
    <get-ted-link-information>

show ted protocol
    <get-ted-protocol-information>
show unified-edge
show unified-edge gateways
show unified-edge ggsn-pgw
show unified-edge ggsn-pgw aaa
show unified-edge ggsn-pgw aaa network-element
show unified-edge ggsn-pgw aaa network-element status
show unified-edge ggsn-pgw aaa network-element-group
show unified-edge ggsn-pgw aaa network-element-group status
show unified-edge ggsn-pgw aaa radius
show unified-edge ggsn-pgw aaa radius statistics
show unified-edge ggsn-pgw aaa statistics
show unified-edge ggsn-pgw address-assignment
show unified-edge ggsn-pgw address-assignment group
show unified-edge ggsn-pgw address-assignment pool
show unified-edge ggsn-pgw address-assignment service-mode
show unified-edge ggsn-pgw address-assignment statistics
show unified-edge ggsn-pgw apn
show unified-edge ggsn-pgw apn service-mode
show unified-edge ggsn-pgw apn statistics
show unified-edge ggsn-pgw call-rate
show unified-edge ggsn-pgw call-rate statistics
show unified-edge ggsn-pgw charging
show unified-edge ggsn-pgw charging global
show unified-edge ggsn-pgw charging global statistics
show unified-edge ggsn-pgw charging local-persistent-storage
show unified-edge ggsn-pgw charging local-persistent-storage statistics
show unified-edge ggsn-pgw charging path
show unified-edge ggsn-pgw charging path statistics
show unified-edge ggsn-pgw charging path status
show unified-edge ggsn-pgw charging service-mode
show unified-edge ggsn-pgw charging transfer
show unified-edge ggsn-pgw charging transfer statistics
show unified-edge ggsn-pgw charging transfer status
show unified-edge ggsn-pgw charging trigger-profile
show unified-edge ggsn-pgw gtp
show unified-edge ggsn-pgw gtp peer
```

```
show unified-edge ggsn-pgw gtp peer count
show unified-edge ggsn-pgw gtp peer history
show unified-edge ggsn-pgw gtp peer statistics
show unified-edge ggsn-pgw gtp statistics
show unified-edge ggsn-pgw ip-reassembly
show unified-edge ggsn-pgw ip-reassembly statistics
show unified-edge ggsn-pgw resource-manager
show unified-edge ggsn-pgw resource-manager clients
show unified-edge ggsn-pgw service-mode
show unified-edge ggsn-pgw statistics
show unified-edge ggsn-pgw statistics traffic-class
show unified-edge ggsn-pgw status
show unified-edge ggsn-pgw status gtp-peer
show unified-edge ggsn-pgw status preemption-list
show unified-edge ggsn-pgw status session-state
show unified-edge ggsn-pgw subscribers
show unified-edge ggsn-pgw subscribers charging
show unified-edge ggsn-pgw subscribers traffic-class
show unified-edge ggsn-pgw system
show unified-edge ggsn-pgw system interfaces
show unified-edge ggsn-pgw system interfaces service-mode
show unified-edge sgw
show unified-edge sgw call-rate
show unified-edge sgw call-rate statistics
show unified-edge sgw charging
show unified-edge sgw charging global
show unified-edge sgw charging global statistics
show unified-edge sgw charging local-persistent-storage
show unified-edge sgw charging local-persistent-storage statistics
show unified-edge sgw charging path
show unified-edge sgw charging path statistics
show unified-edge sgw charging path status
show unified-edge sgw charging service-mode
show unified-edge sgw charging transfer
show unified-edge sgw charging transfer statistics
show unified-edge sgw charging transfer status
show unified-edge sgw charging trigger-profile
show unified-edge sgw gtp
show unified-edge sgw gtp peer
show unified-edge sgw gtp peer count
show unified-edge sgw gtp peer history
show unified-edge sgw gtp peer statistics
show unified-edge sgw gtp statistics
show unified-edge sgw idle-mode-buffering
show unified-edge sgw idle-mode-buffering statistics
show unified-edge sgw ip-reassembly
show unified-edge sgw ip-reassembly statistics
show unified-edge sgw resource-manager
show unified-edge sgw resource-manager clients
show unified-edge sgw service-mode
show unified-edge sgw statistics
show unified-edge sgw status
show unified-edge sgw status gtp-peer
show unified-edge sgw status preemption-list
show unified-edge sgw status session-state
show unified-edge sgw subscribers
show unified-edge sgw subscribers charging
show unified-edge sgw system
show unified-edge sgw system interfaces
show unified-edge sgw system interfaces service-mode
<get-mobile-serving-gateway-interface-service-mode>
```

```
show unified-edge tdf
show unified-edge tdf aaa
show unified-edge tdf aaa radius
show unified-edge tdf aaa radius client
show unified-edge tdf aaa radius client statistics
<radius-client-statistics>
show unified-edge tdf aaa radius client status
show unified-edge tdf aaa radius network-element
show unified-edge tdf aaa radius network-element statistics
<get-aaa-radius-element-statistics>
show unified-edge tdf aaa radius network-element status>
<get-aaa-radius-element-status>
show unified-edge tdf aaa radius server
show unified-edge tdf aaa radius server statistics
radius-server-statistics
show unified-edge tdf aaa radius server status
<get-aaa-radius-server-status>
show unified-edge tdf aaa radius snoop-segment
show unified-edge tdf aaa radius snoop-segment statistics
<radius-snoop-segment-statistics>
show unified-edge tdf aaa statistics
<get-tdf-gateway-aaa-statistics>
show unified-edge tdf address-assignment
show unified-edge tdf address-assignment pool
<get-tdf-gateway-sm-ippool-pool-information>
show unified-edge tdf address-assignment service-mode
<get-tdf-address-assign-service-mode>
show unified-edge tdf address-assignment statistics
<get-tdf-gateway-sm-ippool-statistics>
show unified-edge tdf call-admission-control
show unified-edge tdf call-admission-control statistics
<get-tdf-cac-statistics>
show unified-edge tdf call-rate
show unified-edge tdf call-rate statistics
<get-tdf-call-rate-statistics>
show unified-edge tdf diameter
show unified-edge tdf diameter network-element
show unified-edge tdf diameter network-element statistics
<get-diameter-network-element-statistics>
show unified-edge tdf diameter network-element status
<get-diameter-network-element-status>
show unified-edge tdf diameter pcc-gx
show unified-edge tdf diameter pcc-gx statistics
<get-diameter-statistics-gx>
show unified-edge tdf diameter peer
show unified-edge tdf diameter peer statistics
<get-gateway-diameter-peer-statistics>
show unified-edge tdf diameter peer status
<get-diameter-peer-status>
show unified-edge tdf domain
show unified-edge tdf domain service-mode
<get-mobile-gateways-domain-service-mode>
show unified-edge tdf domain statistics
<get-mobile-gateways-domain-statistics>
show unified-edge tdf resource-manager
show unified-edge tdf resource-manager clients
<get-mobile-gateway-tdf-client-status-information>
show unified-edge tdf service-mode
<get-tdf-gateway-service-mode>
show unified-edge tdf statistics
<get-tdf-statistics>
```

```
show unified-edge tdf status
<get-tdf-gateway-status>
show unified-edge tdf status subscriber-state
<get-tdf-gateways-status-state>
show unified-edge tdf subscribers
<get-tdf-gateway-subscribers>
show unified-edge tdf subscribers data-plane
<get-tdf-gateway-subscriber-dataplane-statistics>
show unified-edge tdf subscribers stuck
<get-tdf-gateway-stuck-subscribers>
show unified-edge tdf system
show unified-edge tdf system interfaces
<get-tdf-interfaces-information>
show unified-edge tdf system interfaces service-mode
<get-mobile-tdf-interface-service-mode>
show version
    <get-software-information>

show virtual-chassis
show virtual-chassis active-topology
<get-virtual-chassis-active-topology>
show virtual-chassis device-topology
<get-virtual-chassis-device-topology>
show virtual-chassis fast-failover
<get-virtual-chassis-fast-failover>
show virtual-chassis heartbeat
<get-virtual-chassis-heartbeat-information>
show virtual-chassis login
<get-virtual-chassis-login>
show virtual-chassis mode
<get-virtual-chassis-mode-information>
show virtual-chassis protocol
show virtual-chassis protocol adjacency
<get-virtual-chassis-adjacency-information>
show virtual-chassis protocol database
<get-virtual-chassis-database-information>
show virtual-chassis protocol interface
<get-virtual-chassis-interface-information>
show virtual-chassis protocol route
<get-virtual-chassis-route-information>
show virtual-chassis protocol statistics
<get-virtual-chassis-statistics-information>
show virtual-chassis status
<get-virtual-chassis-information>
show virtual-chassis vc-path
<get-virtual-chassis-packet-path>
show virtual-chassis vc-port
<get-virtual-chassis-port-information>
show virtual-chassis vc-port diagnostics
show virtual-chassis vc-port diagnostics optics
<get-virtual-chassis-optics-diagnostics>
show virtual-chassis vc-port lag-hash
<get-virtual-chassis-port-lag-hash-information>
show virtual-chassis vc-port statistics
<get-virtual-chassis-port-statistics>
show vlans
<get-vlan-information>
show vlans operational
<get-operational-vlan-instance-information>
show vlans satellite
<get-satellite-control-bridge-domain>
```

```
show vmhost
show vmhost bridge
<get-vmhost-bridge-information>
show vmhost crash
<get-vmhost-crash-information>
show vmhost hardware
<get-vmhost-hardware>
show vmhost information
<get-vmhost-information>
show vmhost logs
<get-vmhost-logs-information>
show vmhost management-if
<get-vmhost-management-if-info>
show vmhost netstat
<get-vmhost-netstat>
show vmhost processes
<get-vmhost-processes-information>
show vmhost resource-usage
<get-vmhost-resource-usage-information>
show vmhost snapshot
<get-vmhost-snapshot-information>
show vmhost status
<get-vmhost-staus>
show vmhost uptime
<get-vmhost-uptime>
show vmhost version
<get-vmhost-version-information>

show vpls
show vpls connections
    <get-vpls-connection-information>

show vpls flood
show vpls flood event-queue
    <get-vpls-event-queue-information>

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

show vpls flood route all-flood
    <get-vpls-all-flood-route-information>

show vpls flood route alt-root-flood
    <get-vpls-alt-root-flood-route-information>

show vpls flood route ce-flood
    <get-vpls-ce-flood-route-information>

show vpls flood route mlp-flood
    <get-vpls-mlp-flood-route-information>

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

show vpls mac-table
    <get-vpls-mac-table>

show vpls mac-table interface
    <get-vpls-interface-mac-table>
```

```

show vpls statistics
  <get-vpls-statistics-information>

show vrrp
show vrrp interface
show vrrp track
test interface
test interface fd1-line-loop
test interface fd1-line-loop ansi
test interface fd1-line-loop ansi initiate
test interface fd1-line-loop ansi terminate
test interface fd1-line-loop bellcore
test interface fd1-line-loop bellcore initiate
test interface fd1-line-loop bellcore terminate
test interface fd1-payload-loop
test interface fd1-payload-loop ansi
test interface fd1-payload-loop ansi initiate
test interface fd1-payload-loop ansi terminate
test interface fd1-payload-loop bellcore
test interface fd1-payload-loop bellcore initiate
test interface fd1-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
test msdp dependent-peers
test msdp rpf-peer
test policy
<

```

#### Configuration Hierarchy Levels

```

[edit dynamic-profiles routing-instances instance services mobile-ip home-agent
enable-service]
[edit logical-systems routing-instances instance services mobile-ip home-agent
enable-service]
[edit logical-systems services mobile-ip home-agent enable-service]
[edit routing-instances instance services mobile-ip home-agent enable-service]
[edit services mobile-ip home-agent enable-service]

```

#### Related Documentation

- [Access Privilege User Permission Flags Overview on page 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)

- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)

## 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 76](#)
- [Understanding Junos OS Access Privilege Levels on page 7](#)
- [Example: Configuring User Permissions with Access Privilege Levels on page 37](#)
- [Example: Configuring User Permissions with Access Privileges for Operational Mode Commands on page 42](#)
- [Example: Configuring User Permissions with Access Privileges for Configuration Statements and Hierarchies on page 54](#)



## CHAPTER 5

# Configuring Authentication Methods

- [Configuring RADIUS Server Authentication on page 291](#)
- [Example: Configuring a RADIUS Server for System Authentication on page 294](#)
- [Configuring TACACS+ Authentication on page 297](#)
- [Example: Configuring a TACACS+ Server for System Authentication on page 299](#)
- [Example: Configuring Authentication Order on page 302](#)

## 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
```

The source address is a valid IPv4 or IPv6 address configured on one of the router or switch interfaces. This configuration sets a fixed address as the source address for locally generated IP packets.

Server address is a unique IPv4 or IPv6 address that is assigned to a particular server and used to route information to the server. If the Junos OS device has several interfaces that can reach the RADIUS server, assign an IP address that Junos OS can use for all its communication with the RADIUS server.

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 $9$ABC123ABC123
```

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 295](#)
- [Overview on page 295](#)
- [Configuration on page 295](#)
- [Verification on page 296](#)

## 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 302](#).
  - Configure a user. See [“Example: Configuring New Users” on page 15](#).
  - Configure local user template accounts. See [“Example: Creating Template Accounts” on page 19](#).
- 

## 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 299](#)
  - [Understanding Login Classes on page 3](#)

## Configuring TACACS+ Authentication

**Supported Platforms** SRX 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 297](#)
- [Specifying a Source Address for the Junos OS to Access External TACACS+ Servers on page 298](#)
- [Configuring the Same Authentication Service for Multiple TACACS+ Servers on page 298](#)
- [Configuring Juniper Networks Vendor-Specific TACACS+ Attributes on page 299](#)

## 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 297](#).



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:

```
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 299](#)

## 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 300](#)
- [Overview on page 300](#)

- [Configuration on page 300](#)
- [Verification on page 302](#)

## 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.

```
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.  

```
[edit system]
user@host# set tacplus-server address 172.16.98.24
```
2. Specify the shared secret (password) of the TACACS+ server.  

```
[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 302](#).
- Configure a user. See [“Example: Configuring New Users” on page 15](#).
- Configure local user template accounts. See [“Example: Creating Template Accounts” on page 19](#).

## 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 operational mode, enter the **show system tacplus-server** command.

**Related Documentation**

- [Understanding User Authentication Methods on page 12](#)
- [Understanding User Accounts on page 6](#)
- [Example: Configuring a RADIUS Server for System Authentication on page 294](#)
- [Understanding Login Classes on page 3](#)

## Example: Configuring Authentication Order

---

**Supported Platforms** [SRX Series, vSRX](#)

This example shows how to configure authentication order.

- [Requirements on page 302](#)
- [Overview on page 302](#)
- [Configuration on page 302](#)
- [Verification on page 304](#)

## 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 RADIUS server. See [“Example: Configuring a RADIUS Server for System Authentication” on page 294](#).
- Configure a TACACS+ server. See [“Example: Configuring a TACACS+ Server for System Authentication” on page 299](#).
- Configure a user. See [“Example: Configuring New Users” on page 15](#).
- Configure template accounts. See [“Example: Creating Template Accounts” on page 19](#).

## Verification

Confirm that the configuration is working properly.

### Verifying the Authentication Order Configuration

<b>Purpose</b>	Verify that the authentication order has been configured.
<b>Action</b>	From operational mode, enter the <b>show system authentication-order</b> command.
<b>Related Documentation</b>	<ul style="list-style-type: none"><li>• <a href="#">Understanding User Authentication Methods on page 12</a></li><li>• <a href="#">Understanding User Accounts on page 6</a></li><li>• <a href="#">Understanding Login Classes on page 3</a></li></ul>

## PART 2

# Configuring Remote Access to an SRX Series Appliances

- [Configuring Secure Web Access on page 307](#)
- [Setting up USB Modems for Remote Management on page 315](#)
- [Configuring Telnet and SSH Access to an SRX Series Appliance on page 333](#)





## CHAPTER 6

# Configuring Secure Web Access

- [Secure Web Access Overview on page 307](#)
- [Generating an SSL Certificate Using the openssl Command on page 308](#)
- [Generating a Self-Signed SSL Certificate on page 308](#)
- [Manually Generating Self-Signed SSL Certificates on page 309](#)
- [Configuring Device Addresses on page 309](#)
- [Enabling Access Services on page 310](#)
- [Example: Configuring Secure Web Access on page 311](#)
- [Adding, Editing, and Deleting Certificates on the Device on page 313](#)

## 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 308](#)
- [Generating a Self-Signed SSL Certificate on page 308](#)
- [Configuring Device Addresses on page 309](#)
- [Example: Configuring Secure Web Access on page 311](#)

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## Generating an SSL Certificate Using the openssl Command

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**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.



**NOTE:** Run this command on a LINUX or UNIX device because Juniper Networks Services Gateways do not support the **openssl** command.

```
% 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**.

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.

**Related Documentation**

- [Secure Web Access Overview on page 307](#)

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## Generating a Self-Signed SSL Certificate

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**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 startup 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 308](#)

## 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 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 308](#)

## 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 310](#)

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## Enabling Access Services

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**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 309](#)

## 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 311](#)
- [Overview on page 311](#)
- [Configuration on page 312](#)
- [Verification on page 313](#)

### 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-----\nMIICXQIBAAKBgQC/C5UI4frNqbi
      qPwbTiOkJvqoDw2YgYse0Z5zzVJyErgSg954T\nEuHM67Ck8hAOrCnb0YO+SY
      Y5rCXLf4+2s8k9EypLtYRw/Ts66DZoXI4viqE7HSsK\n5sQw/UDBlw7/MJ+OpA
      ... KYiFf4CbBBbjlMQJOHFudW6ISVBslONkzX+FT\ni95ddka6ilRnArEb4VFCRh+
      eIQBdp1UjziYf7NuzDx4Z\n -----END RSA PRIVATE KEY-----\n-----BEGIN
      CERTIFICATE-----\nMIIDjDCCAvWgAwIBAgIBADANBgkqhkiG9w0BAQQ ...
      FADCBkTElMAkGAIUEBhMCdXMx\nCzAJBgNVBAGTAzAmNhMRlWEAYDVQQHEWlzdW5ue
      HB1YnMxDTALBgNVBAMTBGpucHlXJDAiBgkqhkiG9w0BCQEWFW5iaGFyZ2F2YUB
      fLUYAnBYmsYWOH\n -----END CERTIFICATE-----\n"; ## SECRET-DATA
    }
  }
}
```

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 313](#)
- [Verifying a Secure Access Configuration on page 313](#)

### 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 307](#)
  - [Generating an SSL Certificate Using the openssl Command on page 308](#)
  - [Generating a Self-Signed SSL Certificate on page 308](#)
  - [Configuring Device Addresses on page 309](#)

## 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 308](#)



## CHAPTER 7

# Setting up USB Modems for Remote Management

- [USB Modem Interface Overview on page 315](#)
- [USB Modem Configuration Overview on page 318](#)
- [Example: Configuring a USB Modem Interface on page 321](#)
- [Example: Configuring a Dialer Interface on page 324](#)
- [Example: Configuring a Dialer Interface for USB Modem Dial-In on page 327](#)
- [Configuring a Dial-Up Modem Connection Remotely on page 329](#)
- [Connecting to the Device Remotely on page 330](#)
- [Modifying USB Modem Initialization Commands on page 331](#)
- [Resetting USB Modems on page 332](#)

## USB Modem Interface Overview

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### 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, 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. Modem 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 US Robotics 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 **umdn0**. 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 317](#) describes the commands. For more information about these commands, see the documentation for your modem.

**Table 8: Default Modem Initialization Commands**

Modem Command	Description
<b>AT</b>	Attention. Informs the modem that a command follows.
<b>S7=45</b>	Instructs the modem to wait 45 seconds for a telecommunications service provider (carrier) signal before terminating the call.
<b>S0=0</b>	Disables the auto answer feature, whereby the modem automatically answers calls.
<b>V1</b>	Displays result codes as words.
<b>&amp;C1</b>	Disables reset of the modem when it loses the carrier signal.
<b>E0</b>	Disables the display on the local terminal of commands issued to the modem from the local terminal.
<b>Q0</b>	Enables the display of result codes.

Table 8: Default Modem Initialization Commands (*continued*)

Modem Command	Description
<b>&amp;Q8</b>	Enables Microcom Networking Protocol (MNP) error control mode.
<b>%C0</b>	Disables data compression.

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 **S0=0** and the device's **init-command-string** command includes **S0=2**, the device applies **S0=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

Release	Description
15.1X49-D10	Starting with Junos OS Release 15.1X49-D10, USB modems are no longer supported for dial backup on SRX300, SRX320, SRX340, SRX345, SRX550HM devices.

#### Related Documentation

- [USB Modem Configuration Overview on page 318](#)
- [Example: Configuring a USB Modem Interface on page 321](#)
- [Example: Configuring a Dialer Interface for USB Modem Dial-In on page 327](#)

## USB Modem Configuration Overview

Supported Platforms [SRX Series](#)



**NOTE:** Starting with Junos OS Release 15.1X49-D10, 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 320](#) for a summarized description of the procedure.

Table 9: Configuring Branch Office and Head Office Routers for USB Modem Backup Connectivity

Router Location	Configuration Requirement	Procedure
Branch Office	Configure the logical dialer interface on the branch office router for USB modem dial backup.	To configure the logical dialer interface, see <a href="#">"Example: Configuring a USB Modem Interface" on page 321</a> .
	Configure the dialer interface <b>dl0</b> on the branch office router using one of the following backup methods: <ul style="list-style-type: none"> <li>Configure the dialer interface <b>dl0</b> as the backup interface on the branch office router's primary T1 interface <b>t1-1/0/0</b>.</li> <li>Configure a dialer filter on the branch office router's dialer interface.</li> <li>Configure a dialer watch on the branch office router's dialer interface.</li> </ul>	Configure the dialer interface using one of the following backup methods: <ul style="list-style-type: none"> <li>To configure <b>dl0</b> as a backup for <b>t1-1/0/0</b> see <a href="#">Example: Configuring Dialer Interfaces and Backup Methods for USB Modem Dial Backup</a>.</li> <li>To configure a dialer filter on <b>dl0</b>, see <a href="#">Example: Configuring Dialer Interfaces and Backup Methods for USB Modem Dial Backup</a>.</li> <li>To configure a dialer watch on <b>dl0</b>, see <a href="#">Example: Configuring Dialer Interfaces and Backup Methods for USB Modem Dial Backup</a>.</li> </ul>
Head Office	Configure dial-in on the dialer interface <b>dl0</b> on the head office router.	To configure dial-in on the head office router, see <a href="#">"Example: Configuring a Dialer Interface for USB Modem Dial-In" on page 327</a> .

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 320](#) for a list of available incoming map options.

Table 10: Incoming Map Options

Option	Description
<b>accept-all</b>	Dialer interface accepts all incoming calls.  You can configure the <b>accept-all</b> option for only one of the dialer interfaces associated with a USB modem physical interface. The dialer interface with the <b>accept-all</b> 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)

Option	Description
caller	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.

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

Release	Description
15.1X49-D10	Starting with Junos OS Release 15.1X49-D10, USB modems are no longer supported for dial backup on SRX300, SRX320, SRX340, and SRX345 devices.

Related Documentation

- [USB Modem Interface Overview on page 315](#)
- [Example: Configuring a USB Modem Interface on page 321](#)

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, USB modems are no longer supported for dial backup on SRX300, SRX320, SRX340, and SRX345 devices.

- [Requirements on page 321](#)
- [Overview on page 322](#)
- [Configuration on page 322](#)
- [Verification on page 323](#)

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 E0 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**

Release	Description
15.1X49-D10	Starting with Junos OS Release 15.1X49-D10, USB modems are no longer supported for dial backup on SRX300, SRX320, SRX340, and SRX345 devices.

**Related Documentation**

- [USB Modem Configuration Overview on page 318](#)
- [USB Modem Interface Overview on page 315](#)
- [Example: Configuring a Dialer Interface for USB Modem Dial-In on page 327](#)

## 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 324](#)
- [Overview on page 324](#)
- [Configuration on page 325](#)
- [Verification on page 326](#)

### 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.

```
set interfaces dl0 description USB-modem-remote-management encapsulation ppp
set interfaces dl0 unit 0 dialer-options pool usb-modem-dialer-pool
set interfaces dl0 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.

```
[edit]
user@host# set interfaces dl0
```

2. Add a description and configure PPP encapsulation.

```
[edit interfaces dl0]
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.

```
[edit interfaces dl0]
user@host# set unit 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 d10 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 d10** 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 d10
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 d10 extensive** command. The output shows a summary of dialer interface information.

```
Physical interface: d10, 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, Runt: 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 d10.0 (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
NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured,
mpls: Not-configured
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

```

- Related Documentation**
- [USB Modem Interface Overview on page 315](#)
  - [USB Modem Configuration Overview on page 318](#)
  - [Example: Configuring a USB Modem Interface on page 321](#)
  - [Example: Configuring a Dialer Interface for USB Modem Dial-In on page 327](#)

## 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, USB modems are no longer supported for dial-in to a dialer interface on SRX300, SRX320, SRX340, and SRX345 devices.

- [Requirements on page 328](#)
- [Overview on page 328](#)
- [Configuration on page 329](#)
- [Verification on page 329](#)

## 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 d10.

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 d10 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 d10
```
2. Configure the incoming map options.  

```
[edit]  
user@host# edit unit 0 dialer-options incoming-map caller 4085551515
```
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 d10** command.

Release History Table	Release	Description
	15.1X49-D10	Starting with Junos OS Release 15.1X49-D10, 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 318](#)
  - [Example: Configuring a USB Modem Interface on page 321](#)

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.
3. On the PC or laptop computer, select **Start>Settings>Control Panel>Network Connections**. The Network Connections page appears.
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 315](#)
- [USB Modem Configuration Overview on page 318](#)
- [Connecting to the Device Remotely on page 330](#)

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## 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 315](#)
- [USB Modem Configuration Overview on page 318](#)
- [Configuring a Dial-Up Modem Connection Remotely on page 329](#)

## 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 315](#)
- [USB Modem Configuration Overview on page 318](#)
- [Resetting USB Modems on page 332](#)

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## Resetting USB Modems

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**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 315](#)
- [USB Modem Configuration Overview on page 318](#)
- [Modifying USB Modem Initialization Commands on page 331](#)

## CHAPTER 8

# Configuring Telnet and SSH Access to an SRX Series Appliance

- [Securing the Console Port Configuration Overview on page 333](#)
- [Configuring Password Retry Limits for Telnet and SSH Access on page 334](#)
- [Configuring Reverse Telnet and Reverse SSH on page 335](#)
- [Example: Controlling Management Access on SRX Series Devices on page 336](#)
- [Example: Configuring a Filter to Block Telnet and SSH Access on page 339](#)
- [The telnet Command on page 344](#)
- [The ssh Command on page 346](#)
- [Configuring Outbound SSH Service on page 347](#)

## Securing the Console Port Configuration Overview

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### 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 344](#)
- [The ssh Command on page 346](#)
- [Configuring Password Retry Limits for Telnet and SSH Access on page 334](#)
- [Configuring Reverse Telnet and Reverse SSH on page 335](#)

---

## Configuring Password Retry Limits for Telnet and SSH Access

**Supported Platforms**   [SRX Series, vSRX](#)

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 344](#)
- [The ssh Command on page 346](#)
- [Configuring Reverse Telnet and Reverse SSH on page 335](#)

---

## Configuring Reverse Telnet and Reverse SSH

Supported Platforms [SRX Series](#)

To configure reverse telnet and reverse ssh on SRX1500, SRX5400, SRX5600, and SRX5800 devices:

1. Enable reverse telnet.

```
[edit]
user@host# set system services reverse telnet
```

2. Specify the port to be used for reverse telnet. If you do not specify a port, 2900 is the default port that is used.

```
[edit]
user@host# set system services reverse telnet port 5000
```

3. Enable reverse ssh to encrypt the connection between the device and the client.

```
[edit]
user@host# set system services reverse ssh
```

4. Specify the port for reverse ssh. If you do not specify a port, 2901 is the default port that is used.

```
[edit]
user@host# set system services reverse ssh port 6000
```

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

#### Related Documentation

- [The telnet Command on page 344](#)
- [The ssh Command on page 346](#)
- [Configuring Password Retry Limits for Telnet and SSH Access on page 334](#)

---

## 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 336](#)
- [Overview on page 336](#)
- [Configuration on page 337](#)
- [Verification on page 339](#)

### 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

- [Configuring an IP Address List to Restrict Management Access to a Device on page 337](#)

### Configuring an IP Address List to Restrict Management Access to a Device

**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
set firewall filter manager-ip term block_non_manager from source-prefix-list manager-ip
except
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;
        }
        source-prefix-list {
          manager-ip except;
        }
      }
      protocol tcp;
      destination-port [ ssh https telnet http ];
    }
    then {
      discard;
    }
  }
  term accept_everything_else {
    then accept;
  }
}

user@host# show configuration interfaces
lo0 {
  unit 0 {
    family inet {
      filter {

```



```
        input manager-ip;
    }
}
}

user@host# show configuration interfaces lo0
unit 0 {
  family inet {
    filter {
      input manager-ip;
    }
  }
}
```

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

## 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

**Related Documentation**

- [Securing the Console Port Configuration Overview on page 333](#)

## Example: Configuring a Filter to Block Telnet and SSH Access

---

**Supported Platforms** [SRX Series, vSRX](#)

- [Requirements on page 339](#)
- [Overview on page 340](#)
- [Configuration on page 340](#)
- [Verification on page 342](#)

## 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 340](#)
- [Apply the Firewall Filter to the Loopback Interface on page 341](#)
- [Confirm and Commit Your Candidate Configuration on page 341](#)

### 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
set firewall family inet filter local_acl term terminal_access_denied from port ssh
set firewall family inet filter local_acl term terminal_access_denied from port telnet
set firewall family inet filter local_acl term terminal_access_denied then log
set firewall family inet filter local_acl term terminal_access_denied then reject
set firewall family inet filter local_acl term default-term then accept
set interfaces lo0 unit 0 family inet filter input local_acl
set interfaces lo0 unit 0 family inet address 127.0.0.1/32
```

---

### 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
```

### Confirm and Commit Your Candidate Configuration

#### Step-by-Step Procedure

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.

```
[edit]
user@myhost# commit
```

## Verification

Confirm that the configuration is working properly.

- [Verifying Accepted Packets on page 342](#)
- [Verifying Logged and Rejected Packets on page 343](#)

---

### 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.

```
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.

```
user@host-A> ssh myhost
user@myhosts'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.

```
user@host-A> telnet myhost
Trying 192.168.249.71...
Connected to myhost-fxp0.example.net.
Escape character is '^['.

host (tty0)

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.

- Action** 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
...						

## The telnet Command

**Supported Platforms** [SRX Series, vSRX](#)

You can use the CLI **telnet** 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.

SRX100	SRX210 SRX220	SRX240	SRX300 SRX320 SRX340	SRX345	SRX1500
3	3	5	3	5	5

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 345 describes the **telnet** command options.

**Table 11: CLI telnet Command Options**

Option	Description
<b>8bit</b>	Use an 8-bit data path.
<b>bypass-routing</b>	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.
<b>host</b>	Open a Telnet session to the specified hostname or IP address.
<b>inet</b>	Force the Telnet session to an IPv4 destination.
<b>interface <i>source-interface</i></b>	Open a Telnet session to a host on the specified interface. If you do not include this option, all interfaces are used.
<b>no-resolve</b>	Suppress the display of symbolic names.
<b>port <i>port</i></b>	Specify the port number or service name on the host.
<b>routing-instance <i>routing-instance-name</i></b>	Use the specified routing instance for the Telnet session.
<b>source address</b>	Use the specified source address for the Telnet session.

- Related Documentation**
- [The ssh Command on page 346](#)
  - [Configuring Password Retry Limits for Telnet and SSH Access on page 334](#)
  - [Configuring Reverse Telnet and Reverse SSH on page 335](#)

## The ssh Command

**Supported Platforms** [SRX Series, vSRX](#)

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.

SRX100	SRX210 SRX220	SRX240	SRX300 SRX320 SRX340	SRX345	SRX1500
3	3	5	3	5	5

[Table 12 on page 346](#) describes the **ssh** command options.

**Table 12: CLI ssh Command Options**

Option	Description
<b>bypass-routing</b>	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.
<b>host</b>	Open an SSH connection to the specified hostname or IP address.
<b>inet</b>	Force the SSH connection to an IPv4 destination.
<b>interface source-interface</b>	Open an SSH connection to a host on the specified interface. If you do not include this option, all interfaces are used.
<b>routing-instance routing-instance-name</b>	Use the specified routing instance for the SSH connection.
<b>source address</b>	Use the specified source address for the SSH connection.
<b>v1</b>	Force SSH to use version 1 for the connection.
<b>v2</b>	Force SSH to use version 2 for the connection.

- Related Documentation**
- [The telnet Command on page 344](#)
  - [Configuring Password Retry Limits for Telnet and SSH Access on page 334](#)



- [Configuring Reverse Telnet and Reverse SSH on page 335](#)

## 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 347](#)
- [Sending the Public SSH Host Key to the Outbound SSH Client on page 348](#)
- [Configuring Keepalive Messages for Outbound SSH Connections on page 349](#)
- [Configuring a New Outbound SSH Connection on page 349](#)
- [Configuring the Outbound SSH Client to Accept NETCONF as an Available Service on page 349](#)
- [Configuring Outbound SSH Clients on page 350](#)

### 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\n  
MSG-VER: V1\r\n  
DEVICE-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\n  
MSG-VER: V1\r\n  
DEVICE-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:

```
[edit system services outbound-ssh client client-id]
secret password;
```

The following message is sent by the device when the **secret** attribute is configured:

```
MSG-ID: DEVICE-CONN-INFO\r\n
MSG-VER: V1\r\n
DEVICE-ID: <device-id>\r\n
HOST-KEY: <public-hot-key>\r\n
HMAC: <HMAC(pub-SSH-host-key, <secret>>)>\r\n
```

## 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:

```
[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:

```
[edit system services outbound-ssh 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 349](#).

## 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:

```
[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:

```
[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 353](#)



## CHAPTER 9

# Configuring DNS Server Caching, DNSSEC, and DNS Proxy

- [DNS Overview on page 353](#)
- [Example: Configuring the TTL Value for DNS Server Caching on page 354](#)
- [DNSSEC Overview on page 355](#)
- [Example: Configuring DNSSEC on page 355](#)
- [Example: Configuring Keys for DNSSEC on page 356](#)
- [Example: Configuring Secure Domains and Trusted Keys for DNSSEC on page 356](#)
- [DNS Proxy Overview on page 358](#)
- [Configuring the Device as a DNS Proxy on page 363](#)

## DNS Overview

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**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 353](#)
- [DNS Server Caching on page 354](#)

## 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 354](#)
- [DNSSEC Overview on page 355](#)

---

## 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 354](#)
- [Overview on page 354](#)
- [Configuration on page 354](#)
- [Verification on page 355](#)

## 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 353](#)

## 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.

### Related Documentation

- [DNS Overview on page 353](#)
- [Example: Configuring Keys for DNSSEC on page 356](#)
- [Example: Configuring Secure Domains and Trusted Keys for DNSSEC on page 356](#)

## 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 to DNS. If the name server IP address is not set, DNS will handle all queries instead of to DNSSEC.

The following example shows how to set the server IP address to 127.0.0.1:

```
[edit]
user@host# set system name-server 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]
set system services dns dnssec disable
```

**Related Documentation**

- [DNSSEC Overview on page 355](#)

---

## Example: Configuring Keys for DNSSEC

**Supported Platforms** [SRX Series, vSRX](#)

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.

**Related Documentation**

- [DNSSEC Overview on page 355](#)
- [Example: Configuring Secure Domains and Trusted Keys for DNSSEC on page 356](#)

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## 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 356](#)
- [Overview on page 356](#)
- [Configuration on page 357](#)

### 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 355](#) 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.

```
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 div.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.

```
dns {
  dnssec {
    trusted-keys {
      key domain1.net.ABC123ABCh; ## SECRET-DATA
    }
  }
  dlv {
    domain domain2.net trusted-anchor dlv.isc.org;
```

```
    }  
    secure-domains {  
        domain1.net;  
        domain2.net;  
    }  
}
```

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

- Related Documentation**
- [DNSSEC Overview on page 355](#)
  - [Example: Configuring Keys for DNSSEC on page 356](#)

---

## 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 name server that it has detected until the hostname is resolved.

- [DNS Proxy Cache on page 358](#)
- [DNS Proxy with Split DNS on page 358](#)
- [Dynamic Domain Name System Client on page 361](#)

### 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.

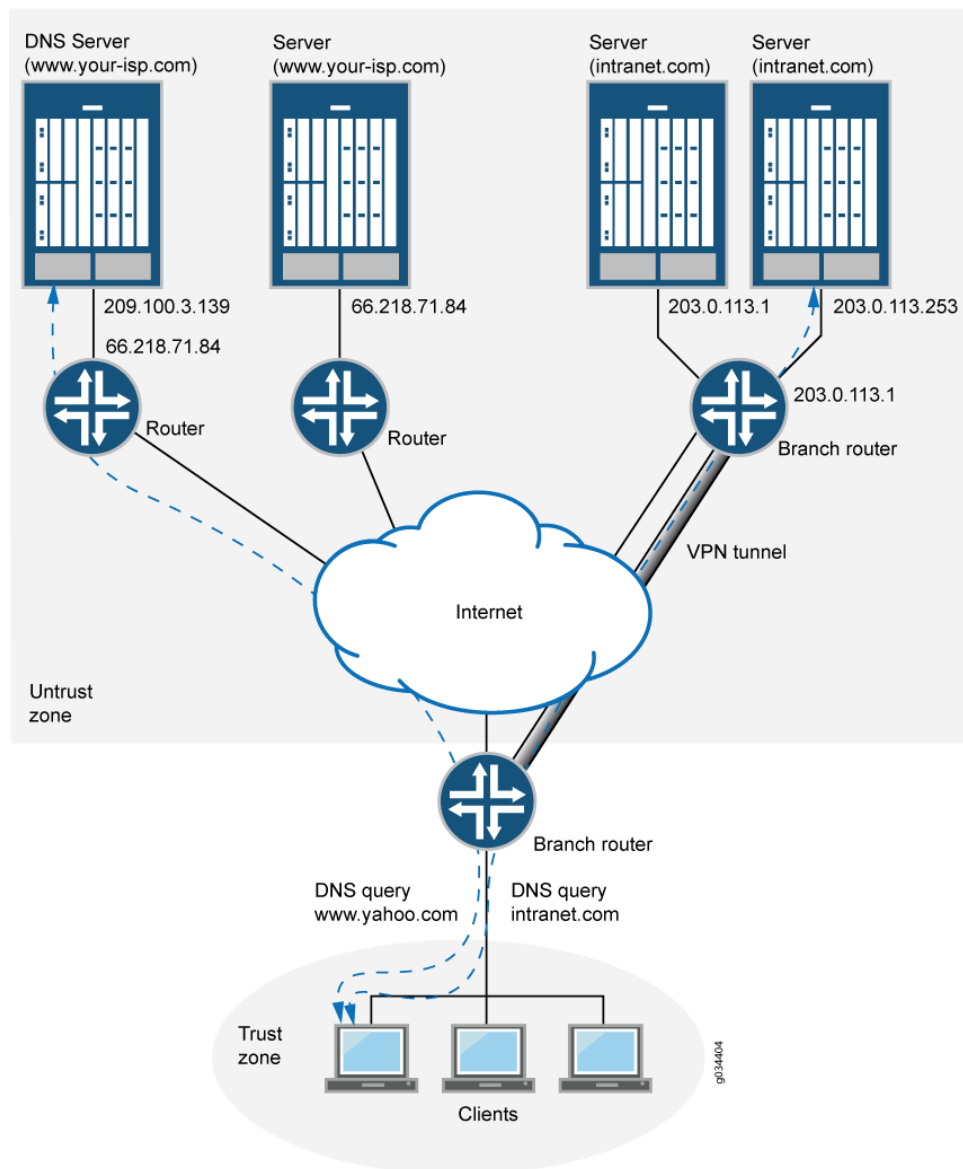
You can configure the transport method used to resolve a given domain name—for example, when the device connects to the corporate network through an IPsec VPN or any other secure tunnel. When you configure a secure VPN tunnel to transport the domain names belonging to the corporate network, the DNS resolution 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 360](#) shows how the split DNS proxy works in a corporate network.

Figure 5: DNS Proxy with Split DNS



In the corporate network shown in [Figure 5 on page 360](#), 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.

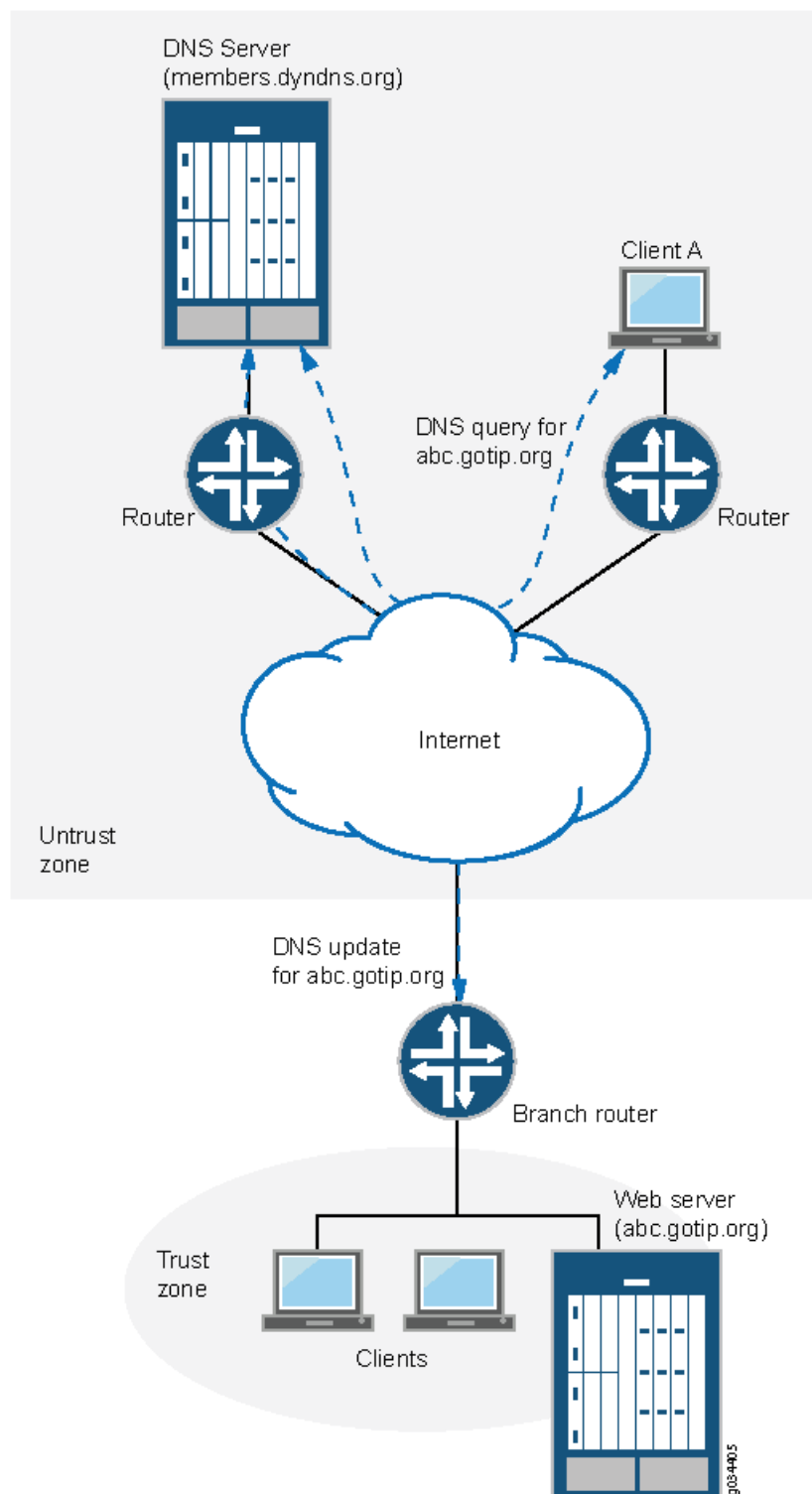
## Dynamic Domain Name System Client

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 362](#) illustrates how the DDNS client works.

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 362](#) 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 363](#)

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## Configuring the Device as a DNS Proxy

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**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 1.1.0/24
```

- 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 11.1.0/24
```

- 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 363](#)



## PART 4

# Configuring DHCP Access Service for IP Address Management

- [Understanding DHCP Services on page 369](#)
- [Configuring a DHCP Local Server on page 377](#)
- [Configuring a DHCP Client on page 391](#)
- [Configuring a DHCP Relay Agent on page 401](#)
- [Configuring a DHCPv6 Local Server on page 409](#)
- [Configuring a DHCPv6 Client on page 421](#)
- [Configuring DHCP in Cluster Mode on page 431](#)



## CHAPTER 10

# Understanding DHCP Services

- [DHCP Overview on page 369](#)
- [DHCP Server, Client, and Relay Agent Overview on page 372](#)
- [DHCP Settings and Restrictions Overview on page 373](#)
- [Understanding Cascaded DHCPv6 Prefix Delegating on page 374](#)

## 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

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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.



**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 377](#)
- [Understanding DHCP Client Operation on page 391](#)
- [Understanding DHCP Relay Agent Operation on page 401](#)

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## DHCP Server, Client, and Relay Agent Overview

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**Supported Platforms**   [SRX Series, vSRX](#)

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 378](#)
- [Understanding DHCP Server Operation on page 377](#)
- [Understanding DHCP Client Operation on page 391](#)
- [Understanding DHCP Relay Agent Operation on page 401](#)
- [DHCP Settings and Restrictions Overview on page 373](#)

## 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 373](#)
- [DHCP Conflict Detection and Resolution on page 374](#)
- [DHCP Interface Restrictions on page 374](#)

### 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 372](#)
- [Understanding DHCP Server Operation on page 377](#)
- [Understanding DHCP Client Operation on page 391](#)
- [Understanding DHCP Relay Agent Operation on page 401](#)

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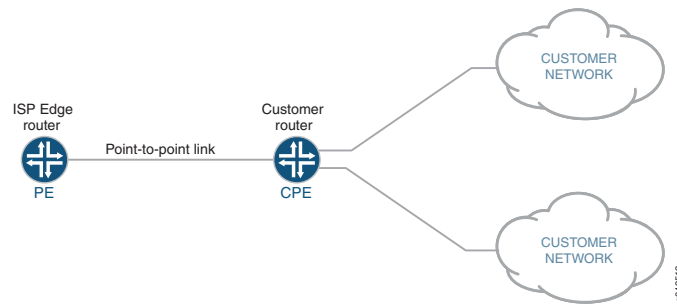
## Understanding Cascaded DHCPv6 Prefix Delegating

### 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



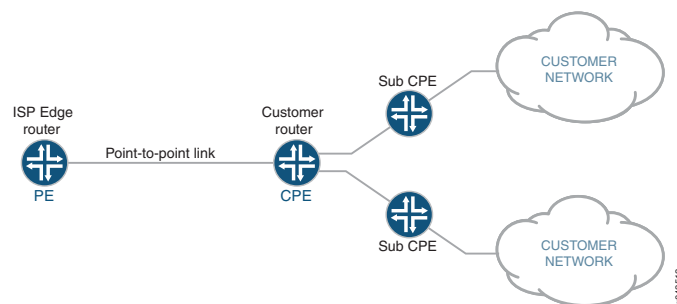
The topology in [Figure 7 on page 375](#) shows an SRX Series device acting as the CPE. The WAN interface links to the provider edge (PE) device and the LAN interfaces link to the customer networks. The service provider delegates a prefix (delegated-prefix) and an IPv6 address (cpe-wan-ipv6-address) 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.

Figure 8: Sub-prefix Delegation



There can be multi-level sub prefix delegations, see [Figure 8 on page 375](#). 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.

**Related  
Documentation**



## CHAPTER 11

# Configuring a DHCP Local Server

- [Understanding DHCP Server Operation on page 377](#)
- [DHCP Server Configuration Overview on page 378](#)
- [Minimum DHCP Local Server Configuration on page 379](#)
- [Configuring Address-Assignment Pools on page 380](#)
- [Configuring an Address-Assignment Pool Name and Addresses on page 381](#)
- [Configuring a Named Address Range for Dynamic Address Assignment on page 381](#)
- [Configuring Static Address Assignments on page 382](#)
- [Enabling TCP/IP Propagation on a DHCP Local Server on page 383](#)
- [Verifying and Managing DHCP Local Server Configuration on page 383](#)
- [Example: Configuring the Device as a DHCP Server on page 384](#)

## 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 377](#)
- [Compatibility with Autoinstallation on page 378](#)
- [Chassis Cluster Support on page 378](#)

## 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 372](#)
- [Example: Configuring the Device as a DHCP Server on page 384](#)
- [Understanding DHCP Client Operation on page 391](#)
- [Understanding DHCP Relay Agent Operation on page 401](#)

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## 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 378](#) provides the settings and values for the sample DHCP server configuration.

**Table 13: Sample DHCP Server Configuration Settings**

Setting	Sample Value
<b>DHCP Subnet Configuration</b>	
Address pool subnet address	192.168.2.0/24



Table 13: Sample DHCP Server Configuration Settings (*continued*)

Setting	Sample Value
High address in the pool range	192.168.2.254
Low address in the pool range	192.168.2.2
Address pool default lease time, in seconds	1,209,600 (14 days)
Address pool maximum lease time, in seconds	2,419,200 (28 days)
Domain search suffixes	mycompany.net mylab.net
Address to exclude from the pool	192.168.2.33
DNS server address	192.168.10.2
Identifier code for router solicitation address option	32
Type choice for router solicitation address option	ip address
IP address for router solicitation address option	192.168.2.33
<b>DHCP MAC Address Configuration</b>	
Static binding MAC address	01:03:05:07:09:0B
Fixed address	192.168.2.50

**Related  
Documentation**

- [DHCP Server, Client, and Relay Agent Overview on page 372](#)
- [Understanding DHCP Server Operation on page 377](#)
- [Understanding DHCP Client Operation on page 391](#)
- [Understanding DHCP Relay Agent Operation on page 401](#)
- [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.

```
[edit access]
address-assignment {
```

```
pool acmenetwork family inet {
  network 192.168.1.0/24;
}

edit system services
dhcp-local-server {
  group mobileusers {
    interface ge-1/0/1.0
  }
}

edit interfaces 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 380](#)

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## 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 381](#).
2. (Optional) Configure named ranges (subsets) of addresses.  
See [“Configuring a Named Address Range for Dynamic Address Assignment” on page 381](#).
3. (Optional; IPv4 only) Create static address bindings.  
See [“Configuring Static Address Assignments” on page 382](#).
4. (Optional) Configure attributes for DHCP clients.  
See [“Configuring DHCP Client-Specific Attributes for Address-Assignment Pools” on page 392](#).

- Related Documentation**
- [Configuring an Address-Assignment Pool Name and Addresses on page 381](#)

## Configuring an Address-Assignment Pool Name and Addresses

**Supported Platforms** [SRX Series, vSRX](#)

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.

- Related Documentation**
- [Configuring Address-Assignment Pools on page 380](#)

## Configuring a Named Address Range for Dynamic Address Assignment

**Supported Platforms** [SRX Series, vSRX](#)

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.

To create a named range within an IPv4 address-assignment pool:

1. Specify the name of the address-assignment pool.  

```
[edit access]
user@host# edit address-assignment pool blr-pool family inet
```
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.

**Related  
Documentation**

- [Configuring Address-Assignment Pools on page 380](#)

## 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
```



**NOTE:** 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 380](#)

## 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
  }
}
```

**Related Documentation**

- [Minimum DHCP Local Server Configuration on page 379](#)

## 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>`

- Related Documentation**
- [Minimum DHCP Local Server Configuration on page 379](#)

---

## 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 385](#)
- [Overview on page 385](#)
- [Configuration on page 385](#)
- [Verification on page 388](#)

## 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, 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 192.168.2.1/24
set system services dhcp-local-server group g1 interface ge-0/0/2.0
set access address-assignment pool p1 family inet network 192.168.2.0/24
set access address-assignment pool p1 family inet range r1 low 192.168.2.2
set access address-assignment pool p1 family inet range r1 high 192.168.2.254
set access address-assignment pool p1 family inet dhcp-attributes maximum-lease-time
  2419200
set access address-assignment pool p1 family inet dhcp-attributes name-server
  192.168.10.2
```

**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 192.168.2.0/24 address-range
low 192.168.2.2 high 192.168.2.254
```

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 388](#)
- [Verifying DHCP Server Operation on page 389](#)

### 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
30.1.1.20	00:12:1e:a9:7b:81	dynamic	2007-05-11 11:14:43 PDT

```
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
  DHCPFORCERENEW         0
  DHCPLEASEUNASSIGNED    0
  DHCPLEASEUNKNOWN       0
  DHCPLEASEACTIVE        0
  DHCPLEASEQUERYDONE     0
```

### Release History Table

Release	Description
15.1X49-D60	Starting with Junos OS Release 15.1X49-D60, the legacy DHCPD (DHCP daemon) configuration on all SRX Series devices is being deprecated, and only the new JDHCP CLI is supported.

### Related Documentation

- [DHCP Server, Client, and Relay Agent Overview on page 372](#)
- [Understanding DHCP Server Operation on page 377](#)
- [Understanding DHCP Relay Agent Operation on page 401](#)
- [DHCP Settings and Restrictions Overview on page 373](#)



## CHAPTER 12

# Configuring a DHCP Client

- [Understanding DHCP Client Operation on page 391](#)
- [Minimum DHCP Client Configuration on page 391](#)
- [Configuring DHCP Client-Specific Attributes for Address-Assignment Pools on page 392](#)
- [Configuring Optional DHCP Client Attributes on page 393](#)
- [Verifying and Managing DHCP Client Configuration on page 394](#)
- [Example: Configuring the Device as a DHCP Client on page 394](#)

## 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 372](#)
  - [Understanding DHCP Relay Agent Operation on page 401](#)
  - [DHCP Settings and Restrictions Overview on page 373](#)

## 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.

```
[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 393](#)

## 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.

```
[edit access]
user@host# edit address-assignment pool blr-pool family inet
```

2. Configure optional DHCP client attributes.

```
[edit access address-assignment pool blr-pool family inet]
user@host# set dhcp-attributes maximum-lease-time 2419200
user@host# set dhcp-attributes name-server 192.168.10.2
user@host# set dhcp-attributes boot-file boot-file.txt
```

```
user@host# set dhcp-attributes boot-file boot-server example.com
```



**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 380](#)

## 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.

```
[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
```



**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 391](#)

---

## 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:  
`user@host> show dhcp client binding`
  - To display DHCP client statistics:  
`user@host> show dhcp client statistics`
  - To clear the binding state of a DHCP client from the client table on the DHCP client:  
`user@host> clear dhcp client binding`
  - To clear all DHCP client statistics:  
`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>`

- Related Documentation**
- [Example: Configuring the Device as a DHCP Client on page 394](#)

---

## 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 395](#)
- [Overview on page 395](#)
- [Configuration on page 396](#)
- [Verification on page 398](#)

## 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, 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.

```
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]
user@host# set vendor-id ether
```

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 398](#)

### 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
```

IP address	Hardware address	Expires	State	Interface
192.168.2.2	88:a2:5e:0a:d6:03	2419093	BOUND	ge-0/0/2.

```
user@host> show dhcp client statistics
```

Packets dropped:

Total	2
Send error	2

Messages received:

BOOTREPLY	6
DHCP OFFER	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

Release	Description
15.1X49-D60	Starting with Junos OS Release 15.1X49-D60, the legacy DHCPD (DHCP daemon) configuration on all SRX Series devices is being deprecated and only the new JDHCP CLI is supported.

### Related Documentation

- [DHCP Server, Client, and Relay Agent Overview on page 372](#)
- [Understanding DHCP Server Operation on page 377](#)

- [Understanding DHCP Client Operation on page 391](#)
- [DHCP Settings and Restrictions Overview on page 373](#)



## CHAPTER 13

# Configuring a DHCP Relay Agent

- [Understanding DHCP Relay Agent Operation on page 401](#)
- [Minimum DHCP Relay Agent Configuration on page 401](#)
- [Verifying and Managing DHCP Relay Configuration on page 402](#)
- [Example: Configuring the Device as a BOOTP or DHCP Relay Agent on page 403](#)

## 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 372](#)
- [Understanding DHCP Server Operation on page 377](#)
- [DHCP Settings and Restrictions Overview on page 373](#)

## 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.

```
[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 402](#)

---

## 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:

```
user@host> show dhcp relay binding
```

- To display DHCP relay agent statistics:

```
user@host> show dhcp relay statistics
```

- To clear the binding state of DHCP relay agent clients:

```
user@host> clear dhcp relay binding
```

- To clear all DHCP relay agent statistics:

```
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>`



- clear dhcp relay binding routing instance <routing-instance name>
- clear dhcp relay statistics routing instance <routing-instance name>



**NOTE:** On all SRX Series devices, DHCP relay is unable to update the binding status based on DHCP\_RENEW and DHCP\_RELEASE messages.

#### Related Documentation

- [Minimum DHCP Relay Agent Configuration on page 401](#)

## 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 403](#)
- [Overview on page 403](#)
- [Configuration on page 404](#)
- [Verification on page 407](#)

### 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 4 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 20 and specify the minimum number of seconds as 400 before requests are forwarded. You enable the no listen option. Finally, you enable VPN encryption to allow client requests to pass through the VPN tunnel.



**WARNING:** Starting with Junos OS Release 15.1X49-D60, 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.

```
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 20
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.
8. Add a new server. Next to Server, click **Add new Entry**.
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.
12. Add a new interface. Next to Interface, click **Add new entry**.
13. In the Interface name box, type the interface name. For example, type **ge-0/0/0**.
14. In the Client response TTL box, type **30**.
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 **20**.
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**.

#### 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 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
```
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 20
```

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
```

**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 20;
        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
                   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

```

### Release History Table

Release	Description
15.1X49-D60	Starting with Junos OS Release 15.1X49-D60, the legacy DHCPD (DHCP daemon) configuration on all SRX Series devices is being deprecated and only the new JDHCP CLI is supported.

**Related Documentation**

- [DHCP Server, Client, and Relay Agent Overview on page 372](#)
- [Understanding DHCP Relay Agent Operation on page 401](#)

- [DHCP Settings and Restrictions Overview on page 373](#)

# Configuring a DHCPv6 Local Server

- [DHCPv6 Server Overview on page 409](#)
- [Creating a Security Policy for DHCPv6 on page 410](#)
- [Example: Configuring DHCPv6 Server Options on page 411](#)
- [Example: Configuring an Address-Assignment Pool on page 414](#)
- [Configuring a Named Address Range for Dynamic Address Assignment on page 416](#)
- [Configuring Address-Assignment Pool Linking on page 417](#)
- [Configuring DHCP Client-Specific Attributes on page 417](#)
- [Configuring an Address-Assignment Pool for Router Advertisement on page 418](#)
- [Understanding DHCPv6 Client and Server Identification on page 419](#)

## 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 411](#)
- [Example: Configuring an Address-Assignment Pool on page 414](#)
- [Configuring a Named Address Range for Dynamic Address Assignment on page 416](#)
- [Creating a Security Policy for DHCPv6 on page 410](#)

---

## 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.

**Related  
Documentation**

- [DHCPv6 Server Overview on page 409](#)



- [Example: Configuring DHCPv6 Server Options on page 411](#)
- [Example: Configuring an Address-Assignment Pool on page 414](#)

## 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 411](#)
- [Overview on page 411](#)
- [Configuration on page 411](#)
- [Verification on page 413](#)

### 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.X49-D70, 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.

```
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
```

**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.  

```
[edit]
user@host# edit system services dhcp-local-server dhcpv6
```
2. Set a default limit for all DHCPv6 groups.  

```
[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.  

```
[edit]
user@host# edit system services dhcp-local-server dhcpv6 dynamic-server
```
4. Specify a group name and interface.  

```
[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.  

```
[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.  

```
[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.  

```
[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

- |                |   |
|----------------|---|
| <b>Purpose</b> | Verify that the client address bindings and statistics for the DHCPv6 local server have been configured   |
| <b>Action</b>  | <p>From operational mode, enter these commands:</p> <ul style="list-style-type: none"> <li>• <b>show dhcpv6 server binding</b> command to display the address bindings in the client table on the DHCPv6 local server.</li> <li>• <b>show dhcpv6 server statistics</b> command to display the DHCPv6 local server statistics.</li> <li>• <b>clear dhcpv6 server bindings all</b> command to clear all DHCPv6 local server bindings. You can clear all bindings or clear a specific interface, or routing instance.</li> <li>• <b>clear dhcpv6 server statistics</b> command to clear all DHCPv6 local server statistics.</li> </ul> |

## Release History Table

Release	Description
15.1X49-D70	Starting with Junos OS Release 15.X49-D70, you can add the option <b>dynamic-server</b> to dynamically support prefix and attributes that are updated by the WAN server.

## Related Documentation

- [DHCPv6 Server Overview on page 409](#)
- [Example: Configuring an Address-Assignment Pool on page 414](#)
- [Configuring a Named Address Range for Dynamic Address Assignment on page 416](#)
- [Creating a Security Policy for DHCPv6 on page 410](#)

## 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 414](#)
- [Overview on page 414](#)
- [Configuration on page 414](#)
- [Verification on page 416](#)

## 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:db8:3000:1::/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
  32001: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 409](#)
- [Example: Configuring DHCPv6 Server Options on page 411](#)
- [Configuring a Named Address Range for Dynamic Address Assignment on page 416](#)
- [Creating a Security Policy for DHCPv6 on page 410](#)

## 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 417](#)

## 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 381](#)

## 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 418 describes the DHCPv6 client attributes for configuring IPv6 address-assignment pools.

**Table 14: DHCPv6 Attributes**

Attribute	Description	DHCPv6 Option
<b>dns-server</b>	IPv6 address of DNS server to which clients can send DNS queries	23
<b>grace-period</b>	Grace period offered with the lease	—
<b>maximum-lease-time</b>	Maximum lease time allowed by the DHCPv6 server	—
<b>option</b>	User-defined options	—
<b>sip-server-address</b>	IPv6 address of SIP outbound proxy server	22
<b>sip-server-domain-name</b>	Domain name of the SIP outbound proxy server	21

**Related Documentation**

- [Configuring a Named Address Range for Dynamic Address Assignment on page 416](#)

## 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 416](#)

## 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-ll)

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-ll 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 421](#)



## CHAPTER 15

# Configuring a DHCPv6 Client

- [DHCPv6 Client Overview on page 421](#)
- [Minimum DHCPv6 Client Configuration on page 422](#)
- [Configuring Optional DHCPv6 Client Attributes on page 423](#)
- [Configuring Nontemporary Address Assignment on page 425](#)
- [Configuring Identity Associations for Nontemporary Addresses and Prefix Delegation on page 425](#)
- [Configuring Auto-Prefix Delegation on page 426](#)
- [Configuring the DHCPv6 Client Rapid Commit Option on page 427](#)
- [Configuring a DHCPv6 Client in Autoconfig Mode on page 427](#)
- [Configuring TCP/IP Propagation on a DHCPv6 Client on page 428](#)

## 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 422](#)

---

## 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 421](#)

## 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 422](#)

## 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
```

**Related Documentation**

- [Minimum DHCPv6 Client Configuration on page 422](#)

## 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
```

**Related Documentation**

- [Minimum DHCPv6 Client Configuration on page 422](#)

---

## Configuring Auto-Prefix Delegation

---

**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 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 422](#)
- [Configuring Optional DHCPv6 Client Attributes on page 423](#)

## 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 on page 421](#)

## 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 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 interface on which to configure router advertisement.

```
[edit protocols router-advertisement]
user@host# set interface ge-0/0/1.0
```

**Related  
Documentation**

- [Minimum DHCPv6 Client Configuration on page 422](#)
- [Configuring Optional DHCPv6 Client Attributes on page 423](#)

---

## 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**

- [DHCPv6 Client Overview on page 421](#)
- [Minimum DHCPv6 Client Configuration on page 422](#)



## CHAPTER 16

# Configuring DHCP in Cluster Mode

- [Example: Configuring the Device as a DHCP Server in Chassis Cluster Mode on page 431](#)
- [Example: Configuring the Device as a DHCP Client in Chassis Cluster Mode on page 436](#)

### 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 431](#)
- [Overview on page 431](#)
- [Configuration on page 432](#)
- [Verification on page 435](#)

### 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, 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
set interfaces reth1 unit 0 family inet address 10.1.1.1/24
```

Configure the DHCP client:

```
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-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

Release	Description
15.1X49-D60	Starting with Junos OS Release 15.1X49-D60, the legacy DHCPD (DHCP daemon) configuration on all SRX Series devices has been deprecated and only the new DHCP CLI is supported.

**Related Documentation**

- [Understanding DHCP Server Operation on page 377](#)

## 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 436](#)
- [Overview on page 437](#)
- [Configuration on page 437](#)
- [Verification on page 440](#)

### 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;
    node 1 priority 1;
}
redundancy-group 1 {
    node 0 priority 100;
    node 1 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
  DHCPPOFFER          1
  DHCPACK              2
  DHCPNAK              0
  DHCPFORCERENEW      0

```

```

Messages sent:
  BOOTREQUEST         0
  DHCPDECLINE          0
  DHCPDISCOVER         5
  DHCPREQUEST          8
  DHCPINFORM           0
  DHCPRELEASE          1
  DHCPRENEW            0
  DHCPREBIND           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 391](#)
-





## PART 5

# Managing System Files

- [Performing File Management Tasks on page 445](#)



# Performing File Management Tasks

- [File Management Overview on page 445](#)
- [Decrypting Configuration Files on page 446](#)
- [Encrypting Configuration Files on page 446](#)
- [Modifying the Encryption Key on page 448](#)
- [Cleaning Up Files in J-Web on page 448](#)
- [Cleaning Up Files with the CLI on page 449](#)
- [Deleting Files on page 450](#)
- [Deleting the Backup Software Image on page 451](#)
- [Downloading Files on page 451](#)
- [Configuring RADIUS System Accounting on page 452](#)
- [Managing Accounting Files on page 455](#)

## 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 448](#)
- [Cleaning Up Files with the CLI on page 449](#)
- [Managing Accounting Files on page 455](#)
- [Encrypting Configuration Files on page 446](#)
- [Decrypting Configuration Files on page 446](#)

## 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 446](#)

## 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 447](#).



**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

| CLI Command                                            | Description                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>request system set-encryption-key</b>               | Sets the encryption key and enables default configuration file encryption: <ul style="list-style-type: none"> <li>• AES encryption for the Canada and U.S. version of Junos OS</li> <li>• DES encryption for the international version of Junos OS</li> </ul>                                                                                    |
| <b>request system set-encryption-key algorithm des</b> | Sets the encryption key and specifies configuration file encryption by DES.                                                                                                                                                                                                                                                                      |
| <b>request system set-encryption-key unique</b>        | Sets the encryption key and enables default configuration file encryption with a unique encryption key that includes the chassis serial number of the device. <p>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.</p> |
| <b>request system set-encryption-key des unique</b>    | 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]
user@host# commit
commit complete
```

- Related Documentation**
- [Managing Accounting Files on page 455](#)
  - [Decrypting Configuration Files on page 446](#)

## 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 455](#)
  - [Encrypting Configuration Files on page 446](#)
  - [Decrypting Configuration Files on page 446](#)

## 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 455](#)
- [Encrypting Configuration Files on page 446](#)
- [Decrypting Configuration Files on page 446](#)
- [Cleaning Up Files with the CLI on page 449](#)

## 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.

```
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 448](#)
- [Managing Accounting Files on page 455](#)
- [Encrypting Configuration Files on page 446](#)
- [Decrypting Configuration Files on page 446](#)

---

## 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**.

#### Related Documentation

- [Managing Accounting Files on page 455](#)

## 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 450](#)

## 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 455](#)

---

## 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 452](#)
2. [Specifying RADIUS Server Accounting and Auditing Events on page 453](#)
3. [Configuring RADIUS Server Accounting on page 453](#)

## 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
- **interactive-commands**—Audit interactive commands (any command-line input)

## Configuring RADIUS Server Accounting

To configure RADIUS server accounting, include the **server** statement at the **[edit system accounting destination radius]** hierarchy level:

```

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, 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.

```
[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:

```
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;
      }
    }
  }
}
```

Release History Table

| Release | Description                                                                                                                                       |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 14.1    | Starting with Junos OS Release 14.1, you can configure the <b>enhanced-accounting</b> 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
```

3. Store accounting log files in the DRAM file.

```
[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 459](#)





## CHAPTER 18

# Managing Junos OS Licenses

- [Junos OS Feature License Keys on page 459](#)
- [Software Feature Licenses for SRX Series Devices on page 461](#)
- [Displaying License Keys in J-Web on page 473](#)
- [Downloading License Keys on page 473](#)
- [Generating a License Key on page 474](#)
- [Saving License Keys on page 474](#)
- [Updating License Keys on page 475](#)
- [Example: Adding a New License Key on page 475](#)
- [Example: Deleting a License Key on page 478](#)

## Junos OS Feature License Keys

---

**Supported Platforms**   [SRX Series, vSRX](#)

This section contains the following topics:

- [License Key Components on page 459](#)
- [License Management Fields Summary on page 460](#)

### 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:

```
XXXXXXXXXX xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx  
          xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx xxxxxx  
          xxxxxx xxxxxx xxx
```

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 460](#).

**Table 16: Summary of License Management Fields**

| Field Name                | Definition                                                                                                                                                                                                                                                                             |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Feature Summary</b>    |                                                                                                                                                                                                                                                                                        |
| Feature                   | Name of the licensed feature: <ul style="list-style-type: none"> <li>• <b>Features</b>—Software feature licenses.</li> <li>• <b>All features</b>—All-inclusive licenses</li> </ul>                                                                                                     |
| Licenses Used             | 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.                                                                             |
| Licenses Installed        | Number of licenses installed on the device for the particular feature.                                                                                                                                                                                                                 |
| Licenses Needed           | 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.                                                            |
| <b>Installed Licenses</b> |                                                                                                                                                                                                                                                                                        |
| ID                        | Unique alphanumeric ID of the license.                                                                                                                                                                                                                                                 |
| State                     | <b>Valid</b> —The installed license key is valid.<br><br><b>Invalid</b> —The installed license key is not valid.                                                                                                                                                                       |
| Version                   | Numeric version number of the license key.                                                                                                                                                                                                                                             |
| Group                     | If the license defines a group license, this field displays the group definition.<br><br>If the license requires a group license, this field displays the required group definition.<br><br><b>NOTE:</b> Because group licenses are currently unsupported, this field is always blank. |
| Enabled Features          | Name of the feature that is enabled with the particular license.                                                                                                                                                                                                                       |
| Expiry                    | Verify that the expiration information for the license is correct.<br><br>For Junos OS, only permanent licenses are supported. If a license has expired, it is shown as invalid.                                                                                                       |

- Related Documentation**
- [Generating a License Key on page 474](#)
  - [Updating License Keys on page 475](#)
  - [Saving License Keys on page 474](#)

- [Downloading License Keys on page 473](#)

## 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. [Table 17 on page 461](#) describes the Junos OS features that require licenses.

**Table 17: Junos OS Feature Licenses**

| Junos OS License Requirements                              |        |        |        |        |        |        |        |        |         |              |         |         |              |
|------------------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------------|---------|---------|--------------|
| Feature                                                    | SRX100 | SRX110 | SRX210 | SRX220 | SRX240 | SRX550 | SRX650 | SRX400 | SRX1500 | SRX3000 line | SRX650M | SRX1500 | SRX5000 line |
| Access Manager                                             | X      | X      | X      | X      | X      | X      | X      |        |         |              | X       |         |              |
| BGP Route Reflectors                                       |        |        |        |        |        |        | X      |        |         |              |         |         |              |
| Dynamic VPN                                                | X      | X      | X      | X      | X      | X      | X      |        |         |              | X       |         |              |
| IDP Signature Update*                                      | X *    | X      | X *    | X *    | X *    | X      | X      | X      | X       | X            | X       | X       | X            |
| Application Signature Update (Application Identification)* | X      | X      | X      | X      | X      | X      | X      | X      |         | X            | X       |         | X            |
| Juniper-Kaspersky Antivirus*                               | X      | X      | X      | X      | X      | X      | X      |        |         |              | X       |         |              |
| Juniper-Sophos Antivirus*                                  | X      | X      | X      | X      | X      | X      | X      | X      | X       | X            | X       | X       | X            |
| Juniper-Sophos Antispam*                                   | X      | X      | X      | X      | X      | X      | X      | X      | X       | X            | X       | X       | X            |
| Juniper-Enhanced Web filtering*                            | X      | X      | X      | X      | X      | X      | X      | X      | X       | X            | X       | X       | X            |
| Juniper-Websense Web filtering*                            | X      | X      | X      | X      | X      | X      | X      |        |         |              | X       |         |              |
| Logical Systems                                            |        |        |        |        |        |        |        | X      |         | X            |         |         | X            |
| SRX100 Memory Upgrade                                      | X      |        |        |        |        |        |        |        |         |              |         |         |              |

Table 17: Junos OS Feature Licenses (*continued*)

| Junos OS License Requirements |        |        |        |        |        |        |        |        |         |              |         |        |              |
|-------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------------|---------|--------|--------------|
| Feature                       | SRX100 | SRX110 | SRX210 | SRX220 | SRX240 | SRX550 | SRX650 | SRX400 | SRX1500 | SRX3000 line | SRX550M | SRX650 | SRX5000 line |
| UTM                           | X*     | X      | X*     | X      | X*     | X      | X      |        | X       |              | X       | X      | X            |

Table 18 on page 462 lists the licenses you can purchase for each SRX Series software feature. Each license allows you to run the specified advanced software features on a single device. Platform support depends on the Junos OS release in your installation.

For information about how to purchase a software license, contact your Juniper Networks sales representative at <http://www.juniper.net/in/en/contact-us/>.

Table 18: Junos OS Feature License Model Number for SRX Series Devices

| Licensed Software Feature                                                       | Supported Devices | Model Number       |
|---------------------------------------------------------------------------------|-------------------|--------------------|
| Memory Software License<br>(Upgrades SRX100B model from 512-MB RAM to 1-GB RAM) | SRX100            | SRX100-MEM-LIC-UPG |
| Advanced BGP License                                                            | SRX650 only       | SRX-BGP-ADV-LTU    |

**Table 18: Junos OS Feature License Model Number for SRX Series Devices (*continued*)**

| Licensed Software Feature                                           | Supported Devices          | Model Number         |
|---------------------------------------------------------------------|----------------------------|----------------------|
| Application Security and IDP updates (1 year, 3 years, and 5 years) | SRX100                     | SRX100-APPSEC-A-1    |
|                                                                     |                            | SRX100-APPSEC-A-3    |
|                                                                     |                            | SRX100-APPSEC-A-5    |
|                                                                     | SRX210, SRX220, and SRX240 | SRX2XX-APPSEC-A-1    |
|                                                                     |                            | SRX2XX-APPSEC-A-3    |
|                                                                     |                            | SRX2XX-APPSEC-A-5    |
|                                                                     | SRX550                     | SRX550-APPSEC-A-1    |
|                                                                     |                            | SRX550-APPSEC-A-3    |
|                                                                     |                            | SRX550-APPSEC-A-5    |
|                                                                     | SRX650                     | SRX650-APPSEC-A-1    |
|                                                                     |                            | SRX650-APPSEC-A-3    |
|                                                                     |                            | SRX650-APPSEC-A-5    |
|                                                                     | SRX1400                    | SRX1400-APPSEC-A-1   |
|                                                                     |                            | SRX1400-APPSEC-A-3   |
|                                                                     |                            | SRX1400-APPSEC-A-1-R |
|                                                                     |                            | SRX1400-APPSEC-A-3-R |
|                                                                     | SRX3400                    | SRX3400-APPSEC-A-1   |
|                                                                     |                            | SRX3400-APPSEC-A-3   |
|                                                                     | SRX3600                    | SRX3600-APPSEC-A-1   |
|                                                                     |                            | SRX3600-APPSEC-A-3   |
|                                                                     | SRX5400                    | SRX5400-APPSEC-1     |
|                                                                     |                            | SRX5400-APPSEC-3     |
|                                                                     |                            | SRX5400-APPSEC-5     |
|                                                                     | SRX5600                    | SRX5600-APPSEC-A-1   |
|                                                                     |                            | SRX5600-APPSEC-A-3   |
|                                                                     |                            | SRX5600-APPSEC-A-5   |
|                                                                     | SRX5800                    |                      |

Table 18: Junos OS Feature License Model Number for SRX Series Devices (*continued*)

| Licensed Software Feature                  | Supported Devices         | Model Number       |
|--------------------------------------------|---------------------------|--------------------|
|                                            |                           | SRX5800-APPSEC-A-1 |
|                                            |                           | SRX5800-APPSEC-A-3 |
|                                            |                           | SRX5800-APPSEC-A-5 |
| IDP updates (1 year, 3 years, and 5 years) | SRX100, SRX110            | SRX1XX-IDP         |
|                                            |                           | SRX1XX-IDP-3       |
|                                            |                           | SRX1XX-IDP-5       |
|                                            | SRX210, SRX220, SRX240    | SRX2XX-IDP         |
|                                            |                           | SRX2XX-IDP-3       |
|                                            |                           | SRX2XX-IDP-5       |
|                                            | SRX550                    | SRX550-IDP         |
|                                            |                           | SRX550-IDP-3       |
|                                            |                           | SRX550-IDP-5       |
|                                            | SRX650                    | SRX650-IDP         |
|                                            |                           | SRX650-IDP-3       |
|                                            |                           | SRX650-IDP-5       |
| IDP subscription (1 year and 3 years)      | SRX1500                   | SRX1500-IPS-1      |
|                                            |                           | SRX1500-IPS-3      |
|                                            | SRX3400, SRX3600          | SRX3K-IDP          |
|                                            |                           | SRX3K-IDP-3        |
|                                            | SRX5400, SRX5600, SRX5800 | SRX5K-IDP          |
|                                            |                           | SRX5K-IDP-3        |
|                                            |                           | SRX5K-IDP-3-R      |
|                                            |                           | SRX5K-IDP-R        |

**Table 18: Junos OS Feature License Model Number for SRX Series Devices (*continued*)**

| Licensed Software Feature                                          | Supported Devices      | Model Number  |
|--------------------------------------------------------------------|------------------------|---------------|
| Juniper-Kaspersky Antivirus updates (1 year, 3 years, and 5 years) | SRX100, SRX110         | SRX1XX-K-AV   |
|                                                                    |                        | SRX1XX-K-AV-3 |
|                                                                    |                        | SRX1XX-K-AV-5 |
|                                                                    | SRX210, SRX220, SRX240 | SRX2XX-K-AV   |
|                                                                    |                        | SRX2XX-K-AV-3 |
|                                                                    |                        | SRX2XX-K-AV-5 |
|                                                                    | SRX550                 | SRX550-K-AV   |
|                                                                    |                        | SRX550-K-AV-3 |
|                                                                    |                        | SRX550-K-AV-5 |
|                                                                    | SRX650                 | SRX650-K-AV   |
|                                                                    |                        | SRX650-K-AV-3 |
|                                                                    |                        | SRX650-K-AV-5 |
| Juniper-Sophos Antivirus updates (1 year, 3 years, and 5 years)    | SRX100, SRX110         | SRX1XX-S-AV   |
|                                                                    |                        | SRX1XX-S-AV-3 |
|                                                                    |                        | SRX1XX-S-AV-5 |
|                                                                    | SRX210, SRX220, SRX240 | SRX2XX-S-AV   |
|                                                                    |                        | SRX2XX-S-AV-3 |
|                                                                    |                        | SRX2XX-S-AV-5 |
|                                                                    | SRX550                 | SRX550-S-AV   |
|                                                                    |                        | SRX550-S-AV-3 |
|                                                                    |                        | SRX550-S-AV-5 |
|                                                                    | SRX650                 | SRX650-S-AV   |
|                                                                    |                        | SRX650-S-AV-3 |
|                                                                    |                        | SRX650-S-AV-5 |

**Table 18: Junos OS Feature License Model Number for SRX Series Devices (*continued*)**

| Licensed Software Feature                                       | Supported Devices      | Model Number   |
|-----------------------------------------------------------------|------------------------|----------------|
| Juniper-Sophos Antivirus updates (1 year, 3 years, and 5 years) | SRX1400                | SRX1400-S-AV-1 |
|                                                                 |                        | SRX1400-S-AV-3 |
|                                                                 |                        | SRX1400-S-AV-5 |
|                                                                 | SRX3400                | SRX3400-S-AV-1 |
|                                                                 |                        | SRX3400-S-AV-3 |
|                                                                 |                        | SRX3400-S-AV-5 |
|                                                                 | SRX3600                | SRX3600-S-AV-1 |
|                                                                 |                        | SRX3600-S-AV-3 |
|                                                                 |                        | SRX3600-S-AV-5 |
|                                                                 | SRX5400                | SRX5400-S-AV-1 |
|                                                                 |                        | SRX5400-S-AV-3 |
|                                                                 |                        | SRX5400-S-AV-5 |
| Juniper-Sophos Antivirus updates (1 year)                       | SRX5600                | SRX5600-S-AV-1 |
|                                                                 | SRX5800                | SRX5800-S-AV-1 |
| Juniper-Sophos Antispam updates (1 year, 3 years, and 5 years)  | SRX100, SRX110         | SRX1XX-S2-AS   |
|                                                                 |                        | SRX1XX-S2-AS-3 |
|                                                                 |                        | SRX1XX-S2-AS-5 |
|                                                                 | SRX210, SRX220, SRX240 | SRX2XX-S2-AS   |
|                                                                 |                        | SRX2XX-S2-AS-3 |
|                                                                 |                        | SRX2XX-S2-AS-5 |
|                                                                 | SRX550                 | SRX550-S2-AS   |
|                                                                 |                        | SRX550-S2-AS-3 |
|                                                                 |                        | SRX550-S2-AS-5 |
|                                                                 | SRX650                 | SRX650-S2-AS   |
|                                                                 |                        | SRX650-S2-AS-3 |
|                                                                 |                        | SRX650-S2-AS-5 |



**Table 18: Junos OS Feature License Model Number for SRX Series Devices (*continued*)**

| Licensed Software Feature                                      | Supported Devices      | Model Number    |
|----------------------------------------------------------------|------------------------|-----------------|
| Juniper-Sophos Antispam updates (1 year, 3 years, and 5 years) | SRX1400                | SRX1400-S-AV-1  |
|                                                                |                        | SRX1400-S-AV-3  |
|                                                                |                        | SRX1400-S-AV-5  |
|                                                                | SRX3400                | SRX3400-S-AV-1  |
|                                                                |                        | SRX3400-S-AV-3  |
|                                                                |                        | SRX3400-S-AV-5  |
|                                                                | SRX3600                | SRX3600-S-AV-1  |
|                                                                |                        | SRX3600-S-AV-3  |
|                                                                |                        | SRX3600-S-AV-5  |
|                                                                | SRX5400                | SRX5400-S-AV-1  |
|                                                                |                        | SRX5400-S-AV-3  |
|                                                                |                        | SRX5400-S-AV-5  |
| Juniper-Sophos Antispam updates (1 year, 3 years, and 5 years) | SRX5600                | SRX5600-S-AV-1  |
|                                                                | SRX5800                | SRX5800-S-AV-1  |
| Juniper-Enhanced Web filtering (1 year, 3 years, and 5 years)  | SRX100, SRX110         | SRX1XX-W-EWF    |
|                                                                |                        | SRX1XX-W-EWF-3  |
|                                                                |                        | SRX1XX-W-EWF-5  |
|                                                                | SRX210, SRX220, SRX240 | SRX2XX-W-EWF    |
|                                                                |                        | SRX2XX-W-EWF-3  |
|                                                                |                        | SRX2XX-W-EWF-5  |
|                                                                | SRX550                 | SRX550-W-EWF    |
|                                                                |                        | SRX550-W-EWF-3  |
|                                                                |                        | SRX550-W-EWF-5  |
|                                                                | SRX650                 | SRX650-W-EWF    |
|                                                                |                        | SRX5650-W-EWF-3 |
|                                                                |                        | SRX650-W-EWF-5  |

**Table 18: Junos OS Feature License Model Number for SRX Series Devices (*continued*)**

| Licensed Software Feature                                                                                                                     | Supported Devices      | Model Number     |
|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|
| Juniper-Enhanced Web filtering<br>(1 year, 3 years, and 5 years)                                                                              | SRX1400                | SRX1400-W-EWF-1  |
|                                                                                                                                               |                        | SRX1400-W-EWF-3  |
|                                                                                                                                               |                        | SRX1400-W-EWF-5  |
|                                                                                                                                               | SRX3400                | SRX3400-W-EWF-1  |
|                                                                                                                                               |                        | SRX3400-W-EWF-3  |
|                                                                                                                                               |                        | SRX3400-W-EWF-5  |
|                                                                                                                                               | SRX3600                | SRX3600-W-EWF-1  |
|                                                                                                                                               |                        | SRX3600-W-EWF-3  |
|                                                                                                                                               |                        | SRX3600-W-EWF-5  |
|                                                                                                                                               | SRX5400                | SRX5400-W-EWF-1  |
|                                                                                                                                               |                        | SRX5400-W-EWF-3  |
|                                                                                                                                               |                        | SRX5400-W-EWF-5  |
| Juniper-Enhanced Web filtering<br>(1 year)                                                                                                    | SRX5600                | SRX5600-W-EWF-1  |
|                                                                                                                                               | SRX5800                | SRX5800-W-EWF-1  |
| Enterprise Bundle—Kaspersky<br>Antivirus, Enhanced Web<br>Filtering, Sophos Antispam,<br>AppSecure, and IDP (1 year, 3<br>years, and 5 years) | SRX100, SRX110         | SRX1XX-SMB4-CS   |
|                                                                                                                                               |                        | SRX1XX-SMB4-CS-3 |
|                                                                                                                                               |                        | SRX1XX-SMB4-CS-5 |
|                                                                                                                                               | SRX210, SRX220, SRX240 | SRX2XX-SMB4-CS   |
|                                                                                                                                               |                        | SRX2XX-SMB4-CS-3 |
|                                                                                                                                               |                        | SRX2XX-SMB4-CS-5 |
|                                                                                                                                               | SRX550                 | SRX550-SMB4-CS   |
|                                                                                                                                               |                        | SRX550-SMB4-CS-3 |
|                                                                                                                                               |                        | SRX550-SMB4-CS-5 |
|                                                                                                                                               | SRX650                 | SRX650-SMB4-CS   |
|                                                                                                                                               |                        | SRX650-SMB4-CS-3 |
|                                                                                                                                               |                        | SRX650-SMB4-CS-5 |

**Table 18: Junos OS Feature License Model Number for SRX Series Devices (*continued*)**

| Licensed Software Feature                                                                                                               | Supported Devices      | Model Number       |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------|
| Enterprise Bundle—includes Sophos Antivirus, Enhanced Web Filtering, Sophos Antispam, AppSecure, and IDP (1 year, 3 years, and 5 years) | SRX100, SRX110         | SRX1XX-S-SMB4-CS   |
|                                                                                                                                         |                        | SRX1XX-S-SMB4-CS-3 |
|                                                                                                                                         |                        | SRX1XX-S-SMB4-CS-5 |
|                                                                                                                                         | SRX210, SRX220, SRX240 | SRX2XX-S-SMB4-CS   |
|                                                                                                                                         |                        | SRX2XX-S-SMB4-CS-3 |
|                                                                                                                                         |                        | SRX2XX-S-SMB4-CS-5 |
|                                                                                                                                         | SRX550                 | SRX550-S-SMB4-CS   |
|                                                                                                                                         |                        | SRX550-S-SMB4-CS-3 |
|                                                                                                                                         |                        | SRX550-S-SMB4-CS-5 |
|                                                                                                                                         | SRX650                 | SRX650-S-SMB4-CS   |
|                                                                                                                                         |                        | SRX650-S-SMB4-CS-3 |
|                                                                                                                                         |                        | SRX650-S-SMB4-CS-5 |
|                                                                                                                                         | SRX1400                | SRX1400-CS-BUN-1   |
|                                                                                                                                         |                        | SRX1400-CS-BUN-3   |
|                                                                                                                                         |                        | SRX1400-CS-BUN-5   |
|                                                                                                                                         | SRX1500                | SRX1500-CS-BUN-1   |
|                                                                                                                                         |                        | SRX1500-CS-BUN-3   |
|                                                                                                                                         | SRX3400                | SRX3400-CS-BUN-1   |
|                                                                                                                                         |                        | SRX3400-CS-BUN-3   |
|                                                                                                                                         |                        | SRX3400-CS-BUN-5   |
|                                                                                                                                         | SRX3600                | SRX3600-CS-BUN-1   |
|                                                                                                                                         |                        | SRX3600-CS-BUN-3   |
|                                                                                                                                         |                        | SRX3600-CS-BUN-5   |
|                                                                                                                                         | SRX5400                | SRX5400-CS-BUN-1   |
|                                                                                                                                         |                        | SRX5400-CS-BUN-3   |
|                                                                                                                                         |                        | SRX5400-CS-BUN-5   |

**Table 18: Junos OS Feature License Model Number for SRX Series Devices (*continued*)**

| Licensed Software Feature                                                                                                               | Supported Devices                                          | Model Number     |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------|
| Enterprise Bundle—includes Sophos Antivirus, Enhanced Web Filtering, Sophos Antispam, AppSecure, and IDP (1 year, 3 years, and 5 years) | SRX1400                                                    | SRX1400-CS-BUN-1 |
|                                                                                                                                         |                                                            | SRX1400-CS-BUN-3 |
|                                                                                                                                         |                                                            | SRX1400-CS-BUN-5 |
|                                                                                                                                         | SRX3400                                                    | SRX3400-CS-BUN-1 |
|                                                                                                                                         |                                                            | SRX3400-CS-BUN-3 |
|                                                                                                                                         |                                                            | SRX3400-CS-BUN-5 |
|                                                                                                                                         | SRX3600                                                    | SRX3600-CS-BUN-1 |
|                                                                                                                                         |                                                            | SRX3600-CS-BUN-3 |
|                                                                                                                                         |                                                            | SRX3600-CS-BUN-5 |
|                                                                                                                                         | SRX5400                                                    | SRX5400-CS-BUN-1 |
|                                                                                                                                         |                                                            | SRX5400-CS-BUN-3 |
|                                                                                                                                         |                                                            | SRX5400-CS-BUN-5 |
| Enterprise Bundle—includes Sophos Antivirus, Enhanced Web Filtering, Sophos Antispam, AppSecure, and IDP (1 year, 3 years, and 5 years) | SRX5400                                                    | SRX5400-CS-BUN-1 |
|                                                                                                                                         |                                                            | SRX5400-CS-BUN-3 |
|                                                                                                                                         |                                                            | SRX5400-CS-BUN-5 |
|                                                                                                                                         | SRX5600                                                    | SRX5600-CS-BUN-1 |
|                                                                                                                                         |                                                            |                  |
|                                                                                                                                         | SRX5800                                                    | SRX5800-CS-BUN-1 |
| Enterprise Bundle—includes Sophos Antivirus, Enhanced Web Filtering, Sophos Antispam, AppSecure, and IDP (1 year)                       | SRX5600                                                    | SRX5600-CS-BUN-1 |
|                                                                                                                                         | SRX5800                                                    | SRX5800-CS-BUN-1 |
| Dynamic VPN Client (5, 10, and 25 simultaneous users)                                                                                   | SRX100, SRX110, SRX210, SRX220, SRX240, SRX550, and SRX650 | SRX-RAC-5-LTU    |
|                                                                                                                                         |                                                            | SRX-RAC-10-LTU   |
|                                                                                                                                         |                                                            | SRX-RAC-25-LTU   |

**Table 18: Junos OS Feature License Model Number for SRX Series Devices (*continued*)**

| Licensed Software Feature                                                                                                                                                                                                                                                                                                                                                                                                                       | Supported Devices                                                        | Model Number           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------|
| Dynamic VPN Service (5, 10, 25, and 50 simultaneous users)                                                                                                                                                                                                                                                                                                                                                                                      | SRX100, SRX110, SRX210, SRX220, SRX240, SRX550, SRX650                   | SRX-RAC-5-LTU          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SRX100, SRX110, SRX210, SRX220, SRX240, SRX550, SRX650                   | SRX-RAC-10-LTU         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SRX100, SRX110, SRX210, SRX220, SRX240, SRX550, SRX650                   | SRX-RAC-25-LTU         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SRX210, SRX220, SRX240, SRX550, SRX650                                   | SRX-RAC-50-LTU         |
| Dynamic VPN Service (100 and 150 simultaneous users)                                                                                                                                                                                                                                                                                                                                                                                            | SRX220, SRX240, SRX550, SRX650                                           | SRX-RAC-100-LTU        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                          | SRX-RAC-150-LTU        |
| Dynamic VPN Service (250 simultaneous users)                                                                                                                                                                                                                                                                                                                                                                                                    | SRX240, SRX550, SRX650<br><i>NOTE:</i> Requires Junos OS 11.2R3 or later | SRX-RAC-250-LTU        |
| Dynamic VPN Service (500 simultaneous users)                                                                                                                                                                                                                                                                                                                                                                                                    | SRX550, SRX650<br><i>NOTE:</i> Requires Junos OS 11.2R3 or later         | SRX-RAC-500-LTU        |
| Express Path License (formerly known as <i>services offloading</i> )<br><br><i>NOTE:</i> Starting with Junos OS Release 12.3X48-D10, the Express Path license is no longer required to enable the Express Path (formerly known as <i>services offloading</i> ) functionality. Prior to Junos OS Release 12.3X48-D10, Express Path was a licensed software feature. Your previously acquired Express Path license will not be effective anymore. | SRX1400                                                                  | SRX1K-SVCS-OFFLOAD-RTU |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SRX3400, SRX3600                                                         | SRX3K-SVCS-OFFLOAD-RTU |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SRX5400, SRX5600, SRX5800                                                | SRX5K-SVCS-OFFLOAD-RTU |
| Memory Software License (Upgrades SRX100B model from 512-MB RAM to 1-GB RAM)                                                                                                                                                                                                                                                                                                                                                                    | SRX100                                                                   | SRX100-MEM-LIC-UPG     |
| Advanced BGP License                                                                                                                                                                                                                                                                                                                                                                                                                            | SRX650 only                                                              | SRX-BGP-ADV-LTU        |

**Table 18: Junos OS Feature License Model Number for SRX Series Devices (*continued*)**

| Licensed Software Feature                                     | Supported Devices | Model Number     |
|---------------------------------------------------------------|-------------------|------------------|
| Logical Systems License<br>(incremental 1, 5, and 25 numbers) | SRX1400           | SRX-1400-LSYS-1  |
|                                                               |                   | SRX-1400-LSYS-25 |
|                                                               |                   | SRX-1400-LSYS-5  |
|                                                               | SRX3400           | SRX-3400-LSYS-1  |
|                                                               |                   | SRX-3400-LSYS-5  |
|                                                               |                   | SRX-3400-LSYS-25 |
|                                                               | SRX3600           | SRX-3600-LSYS-1  |
|                                                               |                   | SRX-3600-LSYS-5  |
|                                                               |                   | SRX-3600-LSYS-25 |
|                                                               | SRX5400           | SRX-5400-LSYS-1  |
|                                                               |                   | SRX-5400-LSYS-5  |
|                                                               |                   | SRX-5400-LSYS-25 |
|                                                               | SRX5600           | SRX-5600-LSYS-1  |
|                                                               |                   | SRX-5600-LSYS-5  |
|                                                               |                   | SRX-5600-LSYS-25 |
|                                                               | SRX5800           | SRX-5800-LSYS-1  |
|                                                               |                   | SRX-5800-LSYS-5  |
|                                                               |                   | SRX-5800-LSYS-25 |
| Sky Advanced Threat protection<br>(1 year, 3 years)           | SRX1500           | SRX1500-ATP-1    |
|                                                               |                   | SRX1500-ATP-3    |
| Command and Control feeds (1 year, 3 years)                   | SRX1500           | SPOT-CC-1500-1Y  |
|                                                               |                   | SPOT-CC-1500-3Y  |

**Release History Table**

| Release     | Description                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12.3X48-D10 | Starting with Junos OS Release 12.3X48-D10, the Express Path license is no longer required to enable the Express Path (formerly known as services offloading) functionality. |

**Related Documentation**

- [License Enforcement](#)
- [Junos OS Feature License Keys on page 459](#)
- [Working with License Keys for SRX Series Devices](#)

## 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 459](#)
- [Generating a License Key on page 474](#)
- [Example: Adding a New License Key on page 475](#)
- [Example: Deleting a License Key on page 478](#)
- [Downloading License Keys on page 473](#)

## 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 459](#)
- [Generating a License Key on page 474](#)
- [Example: Adding a New License Key on page 475](#)

- [Example: Deleting a License Key on page 478](#)

---

## 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 475](#)
- [Example: Deleting a License Key on page 478](#)
- [Updating License Keys on page 475](#)
- [Downloading License Keys on page 473](#)

---

## 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 459](#)
- [Generating a License Key on page 474](#)



- [Example: Adding a New License Key on page 475](#)
- [Example: Deleting a License Key on page 478](#)
- [Downloading License Keys on page 473](#)

## Updating License Keys

**Supported Platforms** [SRX Series, vSRX](#)

To update a license key from the device:

1. From operational mode, do one of the following tasks:

- Update the license keys automatically.

```
user@host> request system license update
```



**NOTE:** The `request system license update` command will always use the default Juniper license server <https://ae1.juniper.net>

You can only use this command to update subscription-based licenses (such as UTM).

- Update the trial license keys automatically.

```
user@host>request system license update trial
```

**Related Documentation**

- [Junos OS Feature License Keys on page 459](#)
- [Generating a License Key on page 474](#)
- [Example: Adding a New License Key on page 475](#)
- [Example: Deleting a License Key on page 478](#)
- [Downloading License Keys on page 473](#)

## Example: Adding a New License Key

**Supported Platforms** [SRX Series, vSRX](#)

This example shows how to add a new license key.

- [Requirements on page 476](#)
- [Overview on page 476](#)
- [Configuration on page 476](#)
- [Verification on page 477](#)

## 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:

|                | Licenses<br>used | Licenses<br>installed | Licenses<br>needed | Expiry    |
|----------------|------------------|-----------------------|--------------------|-----------|
| Feature name   |                  |                       |                    |           |
| bgp-reflection | 0                | 1                     | 0                  | permanent |

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
```

```
XXXXXXXXXX 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 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 459](#)
  - [Generating a License Key on page 474](#)
  - [Example: Deleting a License Key on page 478](#)
  - [Updating License Keys on page 475](#)
  - [Downloading License Keys on page 473](#)

---

## Example: Deleting a License Key

**Supported Platforms** [SRX Series, vSRX](#)

This example shows how to delete a license key.

- [Requirements on page 479](#)
- [Overview on page 479](#)
- [Configuration on page 479](#)
- [Verification on page 480](#)

## 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 480](#)

### 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 474](#)
- [Example: Adding a New License Key on page 475](#)
- [Updating License Keys on page 475](#)
- [Downloading License Keys on page 473](#)

## PART 7

# Configuration Statements and Operational Commands

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## CHAPTER 19

# 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 {
            inet {
                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 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;
}
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 79](#)

## allow-configuration

---

|                          |                                                                                                                                                                                                                 |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | SRX Series                                                                                                                                                                                                      |
| Syntax                   | allow-configuration " <i>regular-expression</i> ";                                                                                                                                                              |
| Hierarchy Level          | [edit system login class <i>class-name</i> ]                                                                                                                                                                    |
| Release Information      | Statement introduced before Junos OS Release 7.4.<br>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 <b>permissions</b> statement do not grant such access by default.                           |
| Default                  | If you omit this statement and the <b>deny-configuration</b> statement, users can edit only those commands for which they have access privileges through the <b>permissions</b> statement.                      |
| Options                  | <i>regular-expression</i> —Extended (modern) regular expression as defined in POSIX 1003.2.<br>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.<br>admin-control—To add this statement to the configuration.                                                                                                 |

## allow-configuration-regexps

---

|                          |                                                                                                                                                                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | SRX Series                                                                                                                                                                                                                                                                                              |
| Syntax                   | allow-configuration-regexps " <i>regular expression 1</i> " " <i>regular expression 2</i> ";                                                                                                                                                                                                            |
| Hierarchy Level          | [edit system login class <i>class-name</i> ]                                                                                                                                                                                                                                                            |
| 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 <b>permissions</b> statement allow that access.<br><br>The statement <b>deny-configuration-regexps</b> takes precedence if it is used in the same login class definition. |
| Default                  | If you do not configure this statement or the <b>deny-configuration-regexps</b> statement, users can edit only those commands for which they have access privileges set with the <b>permissions</b> statement.                                                                                          |
| Options                  | <i>regular expression</i> —Extended (modern) regular expression as defined in POSIX 1003.2.<br>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.<br>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 542](#)

## authentication-order

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | EX Series, M Series, SRX Series, T Series                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Syntax</b>                   | authentication-order [ <i>method1 method2...</i> ];                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.<br>Statement introduced in Junos OS Release 9.0 for EX Series switches.                                                                                                                                                                                                                                                                                                           |
| <b>Description</b>              | 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.                                                                                                                                                              |
| <b>Default</b>                  | If you do not include the <b>authentication-order</b> statement, users are verified based on their configured passwords.                                                                                                                                                                                                                                                                                                            |
| <b>Options</b>                  | One or more of the following authentication methods listed in the order in which they must be tried: <ul style="list-style-type: none"><li>• <b>password</b>—Use the password configured for the user with the <b>authentication</b> statement at the [edit system login user] hierarchy level.</li><li>• <b>radius</b>—Use RADIUS authentication services.</li><li>• <b>tacplus</b>—Use TACACS+ authentication services.</li></ul> |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                   |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Understanding User Authentication Methods on page 12</a></li></ul>                                                                                                                                                                                                                                                                                                              |

---

## 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 542](#)

## 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 Level** `system`—To view this statement in the configuration.  
`system-control`—To add this statement to the configuration.

**Related Documentation**

- [ntp on page 542](#)

## **broadcast-client**

---

|                                 |                                                                                                                                     |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a>                                                                                                          |
| <b>Syntax</b>                   | <code>broadcast-client;</code>                                                                                                      |
| <b>Hierarchy Level</b>          | [edit system <i>ntp</i> ]                                                                                                           |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.                                                                                   |
| <b>Description</b>              | Configure the SRX Series device to listen for broadcast messages on the local network to discover other servers on the same subnet. |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                   |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">ntp on page 542</a></li></ul>                                                   |

## ciphers

|                            |                                                                                                   |
|----------------------------|---------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b> | MX Series, PTX Series, SRX Series, vSRX                                                           |
| <b>Syntax</b>              | ciphers [ cipher-1 cipher-2 cipher-3 ...]                                                         |
| <b>Hierarchy Level</b>     | [edit system services ssh]                                                                        |
| <b>Release Information</b> | Statement introduced in Junos OS Release 11.2.                                                    |
| <b>Description</b>         | 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-cbc**—128-bit Advanced Encryption Standard (AES) in 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 ]
```

|                                 |                                                                                                                                                             |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                           |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Configuring SSH Service for Remote Access to the Router or Switch</i></li> <li>• <i>key-exchange</i></li> </ul> |

- [macs on page 539](#)

## connection-limit

|                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>                                                                                                                                                                                                                                                                                        | <a href="#">SRX Series</a> , <a href="#">vSRX</a>                                                                                                                                                                                                                                                                                                                                        |
| <b>Syntax</b>                                                                                                                                                                                                                                                                                                     | connection-limit <i>limit</i> ;                                                                                                                                                                                                                                                                                                                                                          |
| <b>Hierarchy Level</b>                                                                                                                                                                                                                                                                                            | [edit system services finger]<br>[edit system services ftp]<br>[edit system services netconf ssh]<br>[edit system services ssh]<br>[edit system services telnet]<br>[edit system services xnm-clear-text]<br>[edit system services xnm-ssl]                                                                                                                                              |
| <b>Release Information</b>                                                                                                                                                                                                                                                                                        | Statement introduced in Junos OS Release 11.4.                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b>                                                                                                                                                                                                                                                                                                | 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).                                                                                                                                                                                                          |
| <b>Options</b>                                                                                                                                                                                                                                                                                                    | <p><i>limit</i>—Maximum number of established connections per protocol (either IPv6 or IPv4).</p> <p>On SRX5400, SRX5600, and SRX5800 devices, the range and default value are as follows:</p> <p><b>Range:</b> 1 through 250</p> <p><b>Default:</b> 75</p> <p>On SRX300, SRX320, SRX340, and SRX345, and SRX550M devices, the range is as follows:</p> <p><b>Range:</b> 1 through 5</p> |
| <div>  <p><b>NOTE:</b> 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.</p> </div> |                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Required Privilege Level</b>                                                                                                                                                                                                                                                                                   | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                        |

## client-ia-type

---

|                          |                                                                                                                              |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | <a href="#">SRX Series, vSRX</a>                                                                                             |
| Syntax                   | <pre>client-ia-type {<br/>  ia-na;<br/>  ia-pd;<br/>}</pre>                                                                  |
| Hierarchy Level          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet6 dhcpv6-client]                           |
| Release Information      | Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.               |
| Description              | Configure the DHCPv6 client identity association type.                                                                       |
| Options                  | <b>ia-na</b> — Identity association for nontemporary address<br><br><b>ia-pd</b> —Identity association for prefix delegation |
| Required Privilege Level | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.      |
| Related Documentation    | <ul style="list-style-type: none"><li>• <a href="#">DHCPv6 Client Overview on page 421</a></li></ul>                         |

## client-identifier (dhcp-client)

---

|                          |                                                                                                                                                                                                           |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | <a href="#">SRX Series, vSRX</a>                                                                                                                                                                          |
| Syntax                   | <pre>client-identifier {<br/>  user-id {ascii <i>ascii</i> hexadecimal <i>hexadecimal</i>;<br/>  use-interface-description {logical  device};<br/>  prefix [host-name routing-instance-name];<br/>}</pre> |
| Hierarchy Level          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> dhcp-client]                                                                                                  |
| Release Information      | Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.                                                                                    |
| Description              | The DHCP server identifies a client by a client-identifier value.                                                                                                                                         |
| Options                  | The remaining statements are explained separately. See <a href="#">CLI Explorer</a> .                                                                                                                     |
| Required Privilege Level | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                                                   |
| Related Documentation    | <ul style="list-style-type: none"><li>• <a href="#">DHCPv6 Client Overview on page 421</a></li></ul>                                                                                                      |



## client-identifier (dhcpv6-client)

|                                 |                                                                                                                                                                                                                                                                           |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a>                                                                                                                                                                                                                                                |
| <b>Syntax</b>                   | client-identifier duid-type (duid-ll   duid-llt   vendor);                                                                                                                                                                                                                |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> dhcpv6-client]                                                                                                                                                                |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.                                                                                                                                                    |
| <b>Description</b>              | The DHCPv6 server identifies a client by a client-identifier value.                                                                                                                                                                                                       |
| <b>Options</b>                  | <p><b>duid-type</b>—The DHCPv6 client is identified by a DHCP unique identifier (DUID).</p> <p><b>duid-ll</b>—Link Layer address.</p> <p><b>duid-llt</b>—Link Layer address plus time.</p> <p><b>vendor</b>—Vendor-assigned unique ID based on the enterprise number.</p> |
| <b>Required Privilege Level</b> | <p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>                                                                                                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">DHCPv6 Client Overview on page 421</a></li> </ul>                                                                                                                                                                    |

## client-list-name (SNMP)

|                                 |                                                                                                                                                                                                                                                          |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | client-list-name <i>client-list-name</i> ;                                                                                                                                                                                                               |
| <b>Hierarchy Level</b>          | [edit snmp community <i>community-name</i> ]                                                                                                                                                                                                             |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 8.5.                                                                                                                                                                                                            |
| <b>Description</b>              | 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. |
| <b>Options</b>                  | <b>client-list-name</b> — Name of the client list. Client list is the list of IP address prefixes defined with the <b>prefix-list</b> statement in the policy-options hierarchy.                                                                         |
| <b>Required Privilege Level</b> | <p>snmp—To view this statement in the configuration.</p> <p>snmp-control—To add this statement to the configuration.</p>                                                                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Understanding the SNMP Implementation in Junos OS</a></li> <li>• <a href="#">Standard SNMP MIBs Supported by Junos OS</a></li> </ul>                                                                |

## client-type

---

|                          |                                                                                                                                                                               |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | <a href="#">SRX Series</a> , <a href="#">vSRX</a>                                                                                                                             |
| Syntax                   | client-type (autoconfig   statefull);                                                                                                                                         |
| Hierarchy Level          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> 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                  | <ul style="list-style-type: none"><li>• autoconfig—Autoconfig client type for router advertisement</li><li>• statefull— Stateful client type for address assignment</li></ul> |
| Required Privilege Level | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                       |
| Related Documentation    | <ul style="list-style-type: none"><li>• <a href="#">DHCPv6 Client Overview on page 421</a></li></ul>                                                                          |

## deny-configuration

---

|                          |                                                                                                                                                                                                                     |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | <a href="#">SRX Series</a>                                                                                                                                                                                          |
| Syntax                   | deny-configuration " <i>regular-expression</i> ";                                                                                                                                                                   |
| Hierarchy Level          | [edit system login class]                                                                                                                                                                                           |
| Release Information      | Statement introduced before Junos OS Release 7.4.<br>Statement introduced in Junos OS Release 11.2 for SRX Series devices.                                                                                          |
| Description              | Explicitly deny configuration access to the specified levels in the hierarchy even if the permissions set with the <b>permissions</b> statement grant such access by default.                                       |
| Default                  | If you omit this statement and the <b>allow-configuration</b> statement, users can edit those levels in the configuration hierarchy for which they have access privileges through the <b>permissions</b> statement. |
| Options                  | <b>regular-expression</b> —Extended (modern) regular expression as defined in POSIX 1003.2.<br>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.<br>admin-control—To add this statement to the configuration.                                                                                                     |

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## deny-configuration-regexps

---

|                                 |                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax</b>                   | deny-configuration-regexps " <i>regular expression 1</i> " " <i>regular expression 2</i> ";                                                                                                                                                                                                                                                               |
| <b>Hierarchy Level</b>          | [edit system login class <i>class-name</i> ]                                                                                                                                                                                                                                                                                                              |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.2.<br>Statement introduced in Junos OS Release 11.2 for SRX Series devices.                                                                                                                                                                                                                                   |
| <b>Description</b>              | Explicitly deny configuration access to specified hierarchies using regular expressions even if the permissions set with the <b>permissions</b> statement allow that access.<br><br>Expressions configured with this statement take precedence over <b>allow-configuration-regexps</b> if the two statements are used in the same login class definition. |
| <b>Default</b>                  | If you do not configure this statement or the <b>deny-configuration-regexps</b> statement, users can edit only those commands for which they have access privileges set with the <b>permissions</b> statement.                                                                                                                                            |
| <b>Options</b>                  | <i>regular expression</i> —Extended (modern) regular expression as defined in POSIX 1003.2.<br>If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks.                                                                                                                                           |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>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` *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*;  
 }

|                                 |                                                                                                                                                            |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Hierarchy Level</b>          | [edit access address-assignment pool <i>pool-name</i> family inet]                                                                                         |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 10.4.                                                                                                             |
| <b>Description</b>              | Configure attributes for IPv4 address pools that can be used by different clients. The DHCP attributes for this statement uses standard IPv4 DHCP options. |
| <b>Required Privilege Level</b> | access—To view this statement in the configuration.<br>access-control—To add this statement to the configuration.                                          |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">DHCP Server, Client, and Relay Agent Overview on page 372</a></li></ul>                                |

## 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 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 372](#)

## 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);
  }
  lease-time (length | infinite);
  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** The remaining statements are explained separately. See [CLI Explorer](#).

**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 372](#)



## 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 traceoptions.



**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 372](#)

## dhcpcv6 (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 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 372](#)



## dhcpv6-client

**Supported Platforms** [SRX Series, vSRX](#)

**Syntax**

```
dhcpv6-client {
  client-ia-type {
    ia-na;
    ia-pd;
  }
  client-identifier duid-type (duid-ll | duid-llt | 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](#).

**Required Privilege** interface—To view this statement in the configuration.

**Level** interface-control—To add this statement to the configuration.

- Related Documentation**
- [DHCP Server, Client, and Relay Agent Overview on page 372](#)
  - [Minimum DHCPv6 Client Configuration on page 422](#)

---

## disable (System Services)

---

- Supported Platforms** [SRX Series, vSRX](#)
- Syntax** disable;
- Hierarchy Level** [edit system services dns dnssec]
- Release Information** Statement introduced in Junos OS Release 10.2 .
- 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 372](#)

---

## 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 372](#)

## 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 380](#)
- [address-assignment \(Access\) on page 486](#)

## 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>;  
          ia-na-pool <ia-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 Level** 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 507](#)
- [dhcp-client on page 506](#)

## family (Security Forwarding Options)

**Supported Platforms** [SRX Series](#), [vSRX](#)

**Syntax**

```
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);  
 dfc (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.

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



## 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** `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;
}

```

**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](#).

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

- |                              |                                                                                                                                                                                                      |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Related Documentation</b> | <ul style="list-style-type: none"><li>• <a href="#">DHCP Server, Client, and Relay Agent Overview on page 372</a></li><li>• <a href="#">DHCP Server Configuration Overview on page 378</a></li></ul> |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## host (SSH Known Hosts)

**Supported Platforms** [SRX Series, vSRX](#)

**Syntax** `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;  
     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 dsa-key***—Digital Signature Algorithm (DSA) for SSH version 2
  - ***ecdsa-sha2-nistp256-key ecdsa-sha2-nistp256-key***—Elliptic Curve Digital Signature Algorithm (ECDSA)
  - ***ecdsa-sha2-nistp384-key ecdsa-sha2-nistp384-key***—Elliptic Curve Digital Signature Algorithm (ECDSA)
  - ***ecdsa-sha2-nistp521-key ecdsa-sha2-nistp521-key***—Elliptic Curve Digital Signature Algorithm (ECDSA)
  - ***rsa-key rsa-key***—RSA public key algorithm, which supports encryption and digital signatures for SSH version 1 and SSH version 2
  - ***rsa1-key rsa1-key***—RSA public key algorithm, which supports encryption and digital signatures for SSH version 1

**Required Privilege Level** 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 308](#)
  - [Generating a Self-Signed SSL Certificate on page 308](#)

## hostkey-algorithm

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | M Series, MX Series, SRX Series, vSRX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Syntax</b>                   | hostkey-algorithm ( <i>algorithm</i>   <i>no-algorithm</i> );                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Hierarchy Level</b>          | [edit system services ssh]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.2.<br>( <i>algorithm</i>   <i>no-algorithm</i> ) statements introduced in Junos OS Release 12.2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b>              | Allow or disallow a host-key signature algorithm for the SSH host to use to authenticate another host.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Options</b>                  | <p><i>algorithm</i>—Allow the following host-key signature algorithms:</p> <ul style="list-style-type: none"> <li>ssh-ecdsa—Allow generation of an ECDSA host-key.</li> <li>ssh-dss—Allow generation of a 1024-bit DSA host-key.</li> </ul> <p> <b>NOTE:</b> DSA keys are not supported in FIPS, so the ssh-dss option is not available on systems operating in FIPS mode.</p> <p>ssh-rsa—Allow generation of an RSA host-key.</p> <p><i>no-algorithm</i>—Do not allow the following host-key signature algorithms:</p> <ul style="list-style-type: none"> <li>no-ssh-dss—Do not allow generation of a 1024-bit Digital Signature Algorithm (DSA) host-key.</li> <li>no-ssh-ecdsa—Do not allow generation of an Elliptic Curve Digital Signature Algorithm (ECDSA) host-key.</li> <li>no-ssh-rsa—Do not allow generation of an RSA host-key.</li> </ul> |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><a href="#">Generating an SSL Certificate Using the openssl Command on page 308</a></li> <li><a href="#">Generating a Self-Signed SSL Certificate on page 308</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## idle-timeout (System)

---

|                                 |                                                                                                                                                                                                        |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series, vSRX                                                                                                                                                                                       |
| <b>Syntax</b>                   | idle-timeout <i>idle-timeout</i> ;                                                                                                                                                                     |
| <b>Hierarchy Level</b>          | [edit system login]                                                                                                                                                                                    |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 16.1 for the M Series, MX Series, and PTX Series.<br>Statement introduced in Junos OS Release 15.1X49-D70 for the vSRX, SRX4100, SRX4200 and SRX1500 devices. |
| <b>Description</b>              | 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 <b>idle-timeout</b> .                        |
| <b>Options</b>                  | <i>idle-timeout</i> — Maximum idle time before logout.<br><b>Range:</b> 1 through 60 minutes                                                                                                           |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>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 Level** 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 372](#)
  - [DHCP Server Configuration Overview on page 378](#)



---

## interfaces (ARP)

---

**Supported Platforms** [SRX Series, vSRX](#)

**Syntax**

```
interfaces {  
    interface-name {  
        aging-timer minutes;  
    }  
}
```

**Hierarchy Level** [edit system arp]

**Release Information** Statement introduced before Junos OS Release 9.4.

**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 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 372](#)
- [DHCP Server Configuration Overview on page 378](#)

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

**Range:** 10 KB through 1 GB

**Default:** 128 KB

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

|                                 |                                                                             |
|---------------------------------|-----------------------------------------------------------------------------|
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.                      |
|                                 | interface-control—To add this statement to the configuration.               |
| <b>Related Documentation</b>    | • <a href="#">DHCP Server, Client, and Relay Agent Overview on page 372</a> |
|                                 | • <a href="#">DHCP Server Configuration Overview on page 378</a>            |

## 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]

**Release Information** Statement introduced in Junos OS Release 11.1.

**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** system—To view this statement in the configuration.  
**Level** 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** system—To view this statement in the configuration.  
**Level** 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** interface—To view this statement in the configuration.  
**Level** interface-control—To add this statement to the configuration.

**Related Documentation**

- [DHCP Server, Client, and Relay Agent Overview on page 372](#)

## 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***—Bellcore 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***—Bellcore Vertical Coordinate.

**Required Privilege Level**

|                |                                               |
|----------------|-----------------------------------------------|
| system         | —To view this statement in the configuration. |
| system-control | —To add this statement to the configuration.  |

## lockout-period

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | M Series, MX Series, SRX Series, T Series                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Syntax</b>                   | lockout-period <i>minutes</i> ;                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Hierarchy Level</b>          | [edit system login retry-options]                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 11.2.                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b>              | 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 <b>tries-before-disconnect</b> statement.                                                                                                                                                                                                                                                        |
| <b>Options</b>                  | <i>minutes</i> —Amount of time before the user can attempt to log in after being locked out.<br><b>Default:</b> Off<br><b>Range:</b> 1 through 43200                                                                                                                                                                                                                                                                                                                 |
| <b>Required Privilege Level</b> | admin—To view this statement in the configuration.<br>admin-control—To add this statement to the configuration.                                                                                                                                                                                                                                                                                                                                                      |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">Limiting the Number of User Login Attempts for SSH and Telnet Sessions</a></li><li>• <a href="#">Handling Authorization Failure on page 30</a></li><li>• <a href="#">Example: Configuring System Retry Options on page 31</a></li><li>• <a href="#">retry-options</a></li><li>• <a href="#">clear system login lockout on page 601</a></li><li>• <a href="#">show system login lockout on page 684</a></li></ul> |



## macs

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b> | MX Series, PTX Series, SRX Series, vSRX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax</b>              | macs [ <i>algorithm1 algorithm2...</i> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Hierarchy Level</b>     | [edit system services ssh]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b> | Statement introduced in Junos OS Release 11.2.<br>SHA-2 options introduced in Junos OS Release 12.1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Description</b>         | Specify the set of message authentication code (MAC) algorithms that the SSH server can use to authenticate messages.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Options</b>             | <p>Specify one or more of the following MAC algorithms to authenticate messages:</p> <ul style="list-style-type: none"> <li>• <b>hmac-md5</b>—Hash-based MAC using Message-Digest 5 (MD5)</li> <li>• <b>hmac-md5-96</b>—96-bits of hash-based MAC using MD5</li> <li>• <b>hmac-md5-96-etm@openssh.com</b>—96-bits of hash-based Encrypt-then-MAC using MD5</li> <li>• <b>hmac-md5-etm@openssh.com</b>—Hash-based Encrypt-then-MAC using MMD5</li> <li>• <b>hmac-ripemd160</b>—Hash-based MAC using RIPEMD</li> <li>• <b>hmac-ripemd160-etm@openssh.com</b>—Hash-based Encrypt-then-MAC using RIPEMD</li> <li>• <b>hmac-sha1</b>—Hash-based MAC using secure hash algorithm-1 (SHA-1)</li> <li>• <b>hmac-sha1-96</b>—96-bits of hash-based MAC using SHA-1</li> <li>• <b>hmac-sha1-96-etm@openssh.com</b>—96-bits of hash-based Encrypt-then-MAC using SHA-1</li> <li>• <b>hmac-sha1-etm@openssh.com</b>—Hash-based Encrypt-then-MAC using SHA-1</li> <li>• <b>hmac-sha2-256</b>—256-bits of hash-based MAC using secure hash algorithm-2 (SHA-2)</li> <li>• <b>hmac-sha2-256-etm@openssh.com</b>—Hash-based Encrypt-then-Mac using SHA-2</li> <li>• <b>hmac-sha2-512</b>—512-bits of hash-based MAC using SHA-2</li> <li>• <b>hmac-sha2-512-etm@openssh.com</b>—Hash-based Encrypt-then-Mac using SHA-2</li> <li>• <b>umac-128-etm@openssh.com</b>—Encrypt-then-MAC using UMAC-128 algorithm specified in RFC4418</li> <li>• <b>umac-128@openssh.com</b>—UMAC-128 algorithm specified in RFC4418</li> <li>• <b>umac-64-etm@openssh.com</b>—Encrypt-then-MAC using UMAC-64 algorithm specified in RFC4418</li> <li>• <b>umac-64@openssh.com</b>—UMAC-64 algorithm specified in RFC4418</li> </ul> |



**NOTE:** 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 496](#)

---

## 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**

- [The ssh Command on page 346](#)

## multicast-client

---

|                                 |                                                                                                                                                                  |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a>                                                                                                                                       |
| <b>Syntax</b>                   | multicast-client <address>;                                                                                                                                      |
| <b>Hierarchy Level</b>          | [edit system ntp]                                                                                                                                                |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.                                                                                                                |
| <b>Description</b>              | For NTP, configure the SRX Series device to listen for multicast messages on the local network to discover other servers on the same subnet.                     |
| <b>Options</b>                  | <b>address</b> —(Optional) One or more IP addresses. If you specify addresses, the SRX Series device joins those multicast groups.<br><b>Default:</b> 224.0.1.1. |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">ntp on page 542</a></li> </ul>                                                                              |

## name-server (Access)

---

|                                 |                                                                                                                   |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | name-server <i>address</i>                                                                                        |
| <b>Hierarchy Level</b>          | [edit access address-assignment pool <name> family (inet   inet6) xauth-attributes]                               |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 10.4.                                                                    |
| <b>Description</b>              | Specify the DNS server IP address for an address-assignment pool.                                                 |
| <b>Required Privilege Level</b> | access—To view this statement in the configuration.<br>access-control—To add this statement to the configuration. |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">address-assignment (Access) on page 486</a></li> </ul>       |

## neighbor-discovery-router-advertisement (Access)

---

|                                 |                                                                                                                   |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series, vSRX                                                                                                  |
| <b>Syntax</b>                   | neighbor-discovery-router-advertisement <i>ndra-pool-name</i> ;                                                   |
| <b>Hierarchy Level</b>          | [edit access address-assignment]                                                                                  |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 10.4.                                                                    |
| <b>Description</b>              | Configure the name of the address-assignment pool used to assign the router advertisement prefix.                 |
| <b>Options</b>                  | <i>ndra-pool-name</i> —Name of the address assignment pool.                                                       |
| <b>Required Privilege Level</b> | access—To view this statement in the configuration.<br>access-control—To add this statement to the configuration. |
| <b>Related Documentation</b>    |                                                                                                                   |

## ntp

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Syntax</b>                   | <pre>ntp {<br/>  authentication-key <i>key-number</i> type <i>md5</i> value <i>&lt;password&gt;</i>;<br/>  boot-server <i>&lt;address&gt;</i>;<br/>  broadcast <i>&lt;address&gt;</i> <i>&lt;key key-number&gt;</i> <i>&lt;routing-instance routing-instance-name&gt;</i> <i>&lt;version value&gt;</i> <i>&lt;ttl value&gt;</i>;<br/>  broadcast-client;<br/>  multicast-client <i>&lt;address&gt;</i>;<br/>  peer <i>address</i> <i>&lt;key key-number&gt;</i> <i>&lt;version value&gt;</i> <i>&lt;prefer&gt;</i>;<br/>  server <i>address</i> <i>&lt;key key-number&gt;</i> <i>&lt;version value&gt;</i> <i>&lt;prefer&gt;</i>;<br/>  source-address <i>source-address</i> <i>&lt;routing-instance routing-instance-name&gt;</i>;<br/>  trusted-key [<i>key-numbers</i>];<br/>}</pre> |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Release Information</b>      | Statement introduced before Junos OS Release 7.4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Description</b>              | Configure Network Time Protocol (NTP) on the SRX Series device.<br><br>The remaining statements are explained separately.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>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;
    services netconf;
  }
  traceoptions {
    file filename <files number> <match regex> <size size> <world-readable |
      no-world-readable>;
    flag flag;
    no-remote-trace;
  }
}
```

**Hierarchy Level** [edit system services]

**Release Information** Statement introduced in Junos OS Release 10.4.  
Support for IPv6 address added in Junos OS Release 12.1X47-D15.

**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.

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

|                              |                                                                |
|------------------------------|----------------------------------------------------------------|
| <b>Related Documentation</b> | • <a href="#">traceoptions (Outbound SSH) on page 570</a>      |
|                              | • <a href="#">Configuring Outbound SSH Service on page 347</a> |

## overrides (System Services DHCP)

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | SRX Series, vSRX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Syntax                   | <pre>overrides {   interface-client-limit <i>number</i>; }</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Hierarchy Level          | <pre>[edit system services dhcp-local-server dhcpv6] [edit system services dhcp-local-server dhcpv6 group <i>group-name</i>] [edit system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i>]</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Release Information      | Statement introduced in Junos OS Release 10.4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Description              | <p>Override the default configuration settings for the extended DHCP local server. Specifying the <b>overrides</b> statement with no subordinate statements removes all DHCP local server overrides at that hierarchy level.</p> <ul style="list-style-type: none"> <li>To override global DHCP local server configuration options, include the <b>overrides</b> statement and its subordinate statements at the <b>[edit system services dhcp-local-server]</b> hierarchy level.</li> <li>To override configuration options for a named group of interfaces, include the statements at the <b>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i>]</b> hierarchy level.</li> <li>To override configuration options for a specific interface within a named group of interfaces, include the statements at the <b>[edit system services dhcp-local-server dhcpv6 group <i>group-name</i> interface <i>interface-name</i>]</b> hierarchy level.</li> <li>Use the DHCPv6 hierarchy levels to override DHCPv6 configuration options.</li> </ul> |
| Options                  | <p><b>interface-client-limit <i>number</i></b>—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.</p> <p><b>Range:</b> 1 through 500,000</p> <p><b>Default:</b> No limit</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Required Privilege Level | <p>system—To view this statement in the configuration.</p> <p>system-control—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Related Documentation    | <ul style="list-style-type: none"> <li><a href="#">DHCP Server, Client, and Relay Agent Overview on page 372</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## 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 Level**

system—To view this statement in the configuration.

system-control—To add this statement to the configuration.

**Related Documentation**

- [ntp on page 542](#)



---

## 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 Level** interface—To view this statement in the configuration.  
interface-control—To add this statement to the configuration.

**Related Documentation**

## 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.

**Level** system-control—To add this statement to the configuration.

---

## proxy

---

**Supported Platforms** [SRX Series, vSRX](#)

**Syntax**

```
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 551](#)

## 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]

**Release Information** Statement introduced in Junos OS Release 8.5. Support for IPv6 source address added in Junos OS Release 12.1X47-D15 for SRX1500, SRX5400, SRX5600, and SRX5800 devices.

**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 421](#)
- [Understanding DHCPv6 Client and Server Identification on page 419](#)

## 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 372](#)
- [DHCP Server Configuration Overview on page 378](#)

---

## 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)

|                                 |                                                                                                                                                                                              |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series, vSRX                                                                                                                                                                             |
| <b>Syntax</b>                   | retransmission-attempts <i>number</i> ;                                                                                                                                                      |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> dhcp-client]                                                                                     |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.                                                                       |
| <b>Description</b>              | Specify the number of times the device attempts to retransmit a Dynamic Host Control Protocol (DHCP) packet fallback.                                                                        |
| <b>Options</b>                  | <b>number</b> —Number of attempts to retransmit the packet.<br><br><b>Range:</b> 0 through 6                                                                                                 |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                                      |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Understanding DHCP Client Operation on page 391</a></li> <li>• <a href="#">Minimum DHCP Client Configuration on page 391</a></li> </ul> |

## retransmission-attempt (dhcpv6-client)

|                                 |                                                                                                                                                                                                           |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series                                                                                                                                                                                                |
| <b>Syntax</b>                   | retransmission-attempt <i>number</i> ;                                                                                                                                                                    |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> dhcpv6-client]                                                                                                |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.                                                                                            |
| <b>Description</b>              | 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. |
| <b>Options</b>                  | <b>number</b> —Number of retransmit attempts                                                                                                                                                              |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.                                                                                   |
| <b>Related Documentation</b>    |                                                                                                                                                                                                           |

## 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 419](#)

## 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.  |

## single-connection

---

|                                 |                                                                                                                                                                                                   |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series, vSRX                                                                                                                                                                                  |
| <b>Syntax</b>                   | single-connection;                                                                                                                                                                                |
| <b>Hierarchy Level</b>          | [edit system accounting destination tacplus server <i>server-address</i> ]<br>[edit system tacplus-server <i>server-address</i> ]                                                                 |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 8.5.                                                                                                                                                     |
| <b>Description</b>              | 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. |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>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** system—To view this statement in the configuration.

**Level** system-control—To add this statement to the configuration.

**Related Documentation**

- [ntp on page 542](#)

## server-address (dhcp-client)

---

|                          |                                                                                                                         |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | <a href="#">SRX Series</a> , <a href="#">vSRX</a>                                                                       |
| Syntax                   | server address <i>ip-address</i> ;                                                                                      |
| Hierarchy Level          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> 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                  | <i>ip-address</i> —DHCP server address.                                                                                 |
| Required Privilege Level | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration. |
| Related Documentation    |                                                                                                                         |

## source-address (NTP, RADIUS, System Logging, or TACACS+)

---

|                          |                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | <a href="#">SRX Series</a>                                                                                                                                                                                                                                                                                                                                               |
| Syntax                   | source-address <i>source-address</i> <routing-instance <i>routing-instance-name</i> >;                                                                                                                                                                                                                                                                                   |
| Hierarchy Level          | [edit system accounting destination radius server <i>server-address</i> ],<br>[edit system accounting destination tacplus server <i>server-address</i> ],<br>[edit system <i>ntp</i> ],<br>[edit system <i>radius-server</i> <i>server-address</i> ],<br>[edit system <i>syslog</i> ],<br>[edit system <i>tacplus-server</i> <i>server-address</i> ]                     |
| 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                  | <i>source-address</i> —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 <b>host</b> <i>hostname</i> statements at the [edit system <b>syslog</b> ] hierarchy level, but not for messages directed to the other Routing Engine. |
| Required Privilege Level | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                                                                                                                                                                        |
| Related Documentation    | <ul style="list-style-type: none"><li>• <a href="#">ntp on page 542</a></li></ul>                                                                                                                                                                                                                                                                                        |

## ssh-known-hosts

**Supported Platforms** [SRX Series, vSRX](#)

**Syntax**

```
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;
    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 Level**

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                   | <pre>static-subscribers {<br/>  disable;<br/>}</pre>                                                                       |
| 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                  | <b>disable</b> —Disable the static subscribers process.                                                                    |
| Required Privilege Level | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.          |

## statistics-service

---

|                          |                                                                                                                                                                                                                                 |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | SRX Series, vSRX                                                                                                                                                                                                                |
| Syntax                   | <pre>statistics-service {<br/>  command <i>binary-file-path</i>;<br/>  disable;<br/>}</pre>                                                                                                                                     |
| 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                  | <ul style="list-style-type: none"><li>• <b>command <i>binary-file-path</i></b>—Path to the binary process.</li><li>• <b>disable</b>—Disable the Packet Forwarding Engine (PFE) statistics service management process.</li></ul> |
| Required Privilege Level | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                                               |



---

## subscriber-management

---

**Supported Platforms** [SRX Series, vSRX](#)

**Syntax**

```
subscriber-management {  
    command binary-file-path;  
    disable;  
}
```

**Hierarchy Level** [edit system processes]

**Release Information** Statement introduced in Junos OS Release 8.5.

**Description** Specify the subscriber management process.

- Options**
- **command *binary-file-path***—Path to the binary process.
  - **disable**—Disable the subscriber management process.

**Required Privilege Level**

|                |                                               |
|----------------|-----------------------------------------------|
| system         | —To view this statement in the configuration. |
| system-control | —To add this statement to the configuration.  |

## 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**

```
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 Level**

|                |                                               |
|----------------|-----------------------------------------------|
| 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 299](#)

## tacplus-options

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | EX Series, M Series, MX Series, OCX1100, PTX Series, QFabric System, QFX Series standalone switches, SRX Series, T Series                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Syntax</b>                   | <pre>tacplus-options {   (exclude-cmd-attribute   no-cmd-attribute-value);   enhanced-accounting;   service-name <i>service-name</i>;   timestamp-and-timezone; }</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Hierarchy Level</b>          | [edit system]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Release Information</b>      | <p>Statement introduced before Junos OS Release 7.4.</p> <p>Statement introduced in Junos OS Release 9.0 for EX Series switches.</p> <p><b>no-cmd-attribute-value</b> and <b>exclude-cmd-attribute</b> options introduced in Junos OS Release 9.3.</p> <p>Statement introduced in Junos OS Release 11.1 for QFX Series.</p> <p><b>timestamp-and-timezone</b> option introduced in Junos OS Release 12.2.</p> <p><b>enhanced-accounting</b> option introduced in Junos OS Release 14.1.</p> <p>Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.</p>                                                                                                                                                                                                                                                                                                                                            |
| <b>Description</b>              | Configure TACACS+ options for authentication and accounting.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Options</b>                  | <p><b>enhanced-accounting</b>—View the attribute values of a logged in user.</p> <p><b>exclude-cmd-attribute</b>—Exclude the <b>cmd</b> attribute value completely from start and stop accounting records to enable logging of accounting records in the correct log file on a TACACS+ server.</p> <p><b>no-cmd-attribute-value</b>—Set the <b>cmd</b> 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.</p> <p><b>service-name <i>service-name</i></b>—Name of the authentication service used when you configure multiple TACACS+ servers to use the same authentication service.</p> <p><b>Default:</b> <b>junos-exec</b></p> <p><b>timestamp-and-timezone</b>—Include this statement if you want start time, stop time, and timezone attributes included in start/stop accounting records.</p> |
| <b>Required Privilege Level</b> | <p><b>system</b>—To view this statement in the configuration.</p> <p><b>system-control</b>—To add this statement to the configuration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">Configuring the Same Authentication Service for Multiple TACACS+ Servers on page 298</a></li> <li>• <i>Configuring TACACS+ System Accounting</i></li> <li>• <i>Junos OS Authentication Order for RADIUS, TACACS+, and Password Authentication</i></li> <li>• <i>enhanced-accounting</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

## tacplus-server

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

**Syntax** `tacplus-server server-address {  
     port port-number;  
     secret password;  
     single-connection;  
     source-address source-address;  
     timeoutseconds;  
 }`

**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 Level** 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 299](#)

## 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.

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

|                              |                                                                                         |
|------------------------------|-----------------------------------------------------------------------------------------|
| <b>Related Documentation</b> | <ul style="list-style-type: none"><li>• <i>Displaying Log and Trace Files</i></li></ul> |
|------------------------------|-----------------------------------------------------------------------------------------|

## traceoptions (System Services DHCP)

**Supported Platforms** SRX Series, vSRX

**Syntax**

```
traceoptions {
  file {
    filename;
    files number;
    size maximum-file-size;
    (world-readable | no-world-readable);
  }
  flag flag;
  no-remote-trace;
}
```

**Hierarchy Level** [edit routing-instances *routing-instance-name* system services dhcp-local-server],  
[edit system services dhcp-local-server]  
[edit system processes dhcp-service]

**Release Information** Statement introduced in Junos OS Release 10.4.

**Description** Configure extended DHCP local server tracing operations for DHCP processes.

- 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

- **match regular-expression**—(Optional) Refine the output to include lines that contain the regular expression.
- **size maximum-file-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:** **xk** to specify KB, **xm** to specify MB, or **xg** to specify GB

**Range:** 10 KB through 1 GB

**Default:** 128 KB

- **world-readable**—(Optional) Enable unrestricted file access.
- **no-world-readable**—(Optional) Disable unrestricted file access.
- **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.
- **database**—Trace database operations.
- **dhcpv6-general**—Trace operations for DHCPv6.
- **dhcpv6-io**—Trace input/output operations for DHCPv6.
- **dhcpv6-packet**—Trace DHCPv6 packet decoding operations.
- **dhcpv6-packet-option**—Trace DHCPv6 option decoding operations.
- **dhcpv6-rpd**—Trace routing protocol process operations.
- **dhcpv6-session-db**—Trace session database operations for DHCPv6.
- **dhcpv6-state**—Trace changes in state for DHCPv6 operations.
- **fwd**—Trace firewall process operations.
- **general**—Trace miscellaneous general operations.
- **ha**—Trace high-availability related operations.
- **interface**—Trace interface operations.
- **io**—Trace input/output operations.
- **packet**—Trace packet decoding operations.
- **packet- option**—Trace DHCP option decoding operations.
- **performance**—Trace DHCP performance measurement operations.
- **profile**—Trace DHCP profile operations.
- **rpd**—Trace routing protocol process operations.
- **rtsock**—Trace routing socket operations.
- **session-db**—Trace session database operations.
- **state**—Trace changes in state.
- **statistics**—Trace changes in statistics.
- **ui**—Trace changes in user interface operations.
- **no remote-trace**—Disable remote tracing.

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

**Related Documentation**

## 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 542](#)

## 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

---

|                                 |                                                                                                                         |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a>                                                                                              |
| <b>Syntax</b>                   | update-router-advertisement (interface <i>interface-name</i> );                                                         |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> dhcpv6-client]              |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.          |
| <b>Description</b>              | Specify the interface used to delegate prefixes.                                                                        |
| <b>Options</b>                  | <b>interface <i>interface-name</i></b> —Interface on which to delegate prefixes                                         |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration. |
| <b>Related Documentation</b>    |                                                                                                                         |

## update-server (dhcp-client)

---

|                                 |                                                                                                                         |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a> , <a href="#">vSRX</a>                                                                       |
| <b>Syntax</b>                   | update-server;                                                                                                          |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> dhcp-client]                |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.  |
| <b>Description</b>              | Propagate DHCP options to a local DHCP server.                                                                          |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration. |
| <b>Related Documentation</b>    |                                                                                                                         |

## update-server (dhcpv6-client)

---

|                                 |                                                                                                                         |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series                                                                                                              |
| <b>Syntax</b>                   | update-server;                                                                                                          |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> dhcpv6-client]              |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX550M, and SRX1500 devices.          |
| <b>Description</b>              | Propagate TCP/IP settings to the DHCPv6 server.                                                                         |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration. |
| <b>Related Documentation</b>    |                                                                                                                         |

## usb-control

---

|                                 |                                                                                                                                                                                                            |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series, vSRX                                                                                                                                                                                           |
| <b>Syntax</b>                   | usb-control {<br>command <i>binary-file-path</i> ;<br>disable;<br>}                                                                                                                                        |
| <b>Hierarchy Level</b>          | [edit system processes]                                                                                                                                                                                    |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 8.5 for SRX300, SRX320, SRX340, SRX345, and SRX550M devices.                                                                                                      |
| <b>Description</b>              | Specify the universal serial bus (USB) supervise process.                                                                                                                                                  |
| <b>Options</b>                  | <ul style="list-style-type: none"> <li>• <b>command <i>binary-file-path</i></b>—Path to the binary process.</li> <li>• <b>disable</b>—Disable the universal serial bus (USB) supervise process.</li> </ul> |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                                          |

## use-interface

---

|                                 |                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a> , <a href="#">vSRX</a>                                                                          |
| <b>Syntax</b>                   | use-interface-description {logical   device};                                                                              |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> dhcp-client client-identifier] |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.     |
| <b>Description</b>              | The description configured at the physical or logical interface level is used for client identification.                   |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.    |
| <b>Related Documentation</b>    |                                                                                                                            |

## user-id

---

|                                 |                                                                                                                            |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a> , <a href="#">vSRX</a>                                                                          |
| <b>Syntax</b>                   | user-id {ascii <i>ascii</i> hexadecimal <i>hexadecimal</i> };                                                              |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> dhcp-client client-identifier] |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.     |
| <b>Description</b>              | Specify an ASCII or hexadecimal user ID for the Dynamic Host Configuration Protocol (DHCP) client.                         |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration.    |
| <b>Related Documentation</b>    |                                                                                                                            |



## vendor-id

---

|                                 |                                                                                                                         |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a> , <a href="#">vSRX</a>                                                                       |
| <b>Syntax</b>                   | vendor-id <i>vendor-id</i> ;                                                                                            |
| <b>Hierarchy Level</b>          | [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> dhcp-client]                |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.  |
| <b>Description</b>              | Configure a vendor class ID for the Dynamic Host Configuration Protocol (DHCP) client.                                  |
| <b>Options</b>                  | vendor-id—Vendor class ID.                                                                                              |
| <b>Required Privilege Level</b> | interface—To view this statement in the configuration.<br>interface-control—To add this statement to the configuration. |
| <b>Related Documentation</b>    |                                                                                                                         |

## vpn (Forwarding Options)

---

|                                 |                                                                                                                                                                                       |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Syntax</b>                   | vpn;                                                                                                                                                                                  |
| <b>Hierarchy Level</b>          | [edit forwarding-options helpers bootp]                                                                                                                                               |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 9.0.                                                                                                                                         |
| <b>Description</b>              | 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. |
| <b>Required Privilege Level</b> | system—To view this statement in the configuration.<br>system-control—To add this statement to the configuration.                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><a href="#">DHCP Server, Client, and Relay Agent Overview on page 372</a></li> </ul>                                                           |

## 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.

**Level** 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 webserver for your device.

**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-timout** *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.

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

|                              |                                                                                                                                      |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>Related Documentation</b> | <ul style="list-style-type: none"><li>• <i>Firewall User Authentication Overview</i></li><li>• <i>Dynamic VPN Overview</i></li></ul> |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|





## CHAPTER 20

# 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)
- clear dhcpv6 server statistics (Local Server)
- clear security ssh key-pair-identity
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- file archive
- file checksum md5
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- request system decrypt password
- request system download abort

- [request system download clear](#)
- [request system download pause](#)
- [request system download resume](#)
- [request system download start](#)
- [request system firmware upgrade](#)
- [request system license update](#)
- [request system power-off fpc](#)
- [request system services dhcp](#)
- [request system snapshot \(Maintenance\)](#)
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- [request system reboot](#)
- [request system software rollback \(SRX Series\)](#)
- [request system zeroize](#)
- [restart \(Reset\)](#)
- [Restart Commands Overview on page 645](#)
- [show chassis routing-engine \(View\)](#)
- [show cli authorization](#)
- [show dhcp client binding](#)
- [show dhcp client statistics](#)
- [show dhcp relay binding](#)
- [show dhcp relay statistics](#)
- [show dhcp server binding](#)
- [show dhcp server statistics](#)
- [show dhcpv6 client binding](#)
- [show dhcpv6 client statistics](#)
- [show dhcpv6 server binding \(View\)](#)
- [show dhcpv6 server statistics \(View\)](#)
- [show firewall \(View\)](#)
- [show security ssh key-pair-identity](#)
- [show system autorecovery state](#)
- [show system download](#)
- [show system license \(View\)](#)
- [show system login logout](#)
- [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>]

**Release Information** Statement introduced in Junos OS Release 12.1X44-D10 for for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**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 650](#)

**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 653](#)

**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 Level** clear

**Related Documentation** • [show dhcp relay binding on page 655](#)

**Output Fields** This command produces no output.

---

## 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 657](#)

**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>

**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 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 Level** clear

**Related Documentation** • [show dhcp server binding on page 659](#)

**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 661](#)

**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*]

**Release Information** Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**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 663](#)

**Output Fields** This command produces no output.

---

## clear dhcpv6 client statistics

---

|                                 |                                                                                                                                                                                                                                                |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a>                                                                                                                                                                                                                     |
| <b>Syntax</b>                   | clear dhcpv6 client statistics<br>routing-instance <i>routing-instance-name</i>                                                                                                                                                                |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.                                                                                                                         |
| <b>Description</b>              | Clear all DHCPv6 client statistics.                                                                                                                                                                                                            |
| <b>Options</b>                  | <b>routing-instance <i>routing-instance-name</i></b> —(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. |
| <b>Required Privilege Level</b> | clear                                                                                                                                                                                                                                          |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">show dhcpv6 client statistics on page 665</a></li></ul>                                                                                                                                    |
| <b>Output Fields</b>            | 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 667](#)

---

## clear dhcpv6 server statistics (Local Server)

---

**Supported Platforms** [SRX Series](#)

**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 671](#)

## clear security ssh key-pair-identity

---

**Supported Platforms** [SRX Series, vSRX](#)

**Syntax** clear security ssh key-pair-identity<*identity-name*>; *all*

**Release Information** Command introduced in Junos OS Release 15.1X49-D70.

**Description** Clear private and public SSH key pair for the specified files.

- Options**
- **identity-name**—Identity name.
  - **all**— Clear all the key-pair files.

**Required Privilege Level** clear

- Related Documentation**
- [request security ssh key-pair-identity generate on page 618](#)
  - [show security ssh key-pair-identity on page 676](#)

**List of Sample Output** [clear security ssh key-pair-identity sample on page 600](#)

**Output Fields**

### 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 logout

---

|                                 |                                                                                                                                                             |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | EX Series, M Series, MX Series, PTX Series, T Series                                                                                                        |
| <b>Syntax</b>                   | clear system login logout<br><all><br><user <i>username</i> >                                                                                               |
| <b>Release Information</b>      | Command introduced in Junos OS Release 11.2.                                                                                                                |
| <b>Description</b>              | Unlock the user account locked as a result of invalid login attempts.                                                                                       |
| <b>Options</b>                  | <b>all</b> —Clear all locked user accounts.<br><br><b>user <i>username</i></b> —Clear the specified locked user account.                                    |
| <b>Required Privilege Level</b> | clear                                                                                                                                                       |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">lockout-period on page 538</a></li><li>• <a href="#">show system login logout on page 684</a></li></ul> |
| <b>Output Fields</b>            | This command produces no output.                                                                                                                            |

## file archive

---

|                          |                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | <a href="#">SRX Series</a>                                                                                                                                                                                                                                                                                                                         |
| Syntax                   | <code>file archive destination <i>destination</i> source <i>source</i> &lt;compress&gt;</code>                                                                                                                                                                                                                                                     |
| 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                  | <b>destination <i>destination</i></b> —Name of the created archive. Specify the destination as a URL or filename.<br><br><b>source <i>source</i></b> — Path of directory to archive.<br><br><b>compress</b> —(Optional) Compress the archived file with the GNU zip (gzip) compression utility. The compressed files have the suffix <b>.tgz</b> . |
| Required Privilege Level | maintenance                                                                                                                                                                                                                                                                                                                                        |
| Related Documentation    | <ul style="list-style-type: none"><li>• <a href="#">Administration Guide for Security Devices</a></li></ul>                                                                                                                                                                                                                                        |
| List of Sample Output    | <a href="#">file archive (Multiple Files) on page 602</a><br><a href="#">file archive (Single File) on page 602</a><br><a href="#">file archive (with Compression) on page 603</a>                                                                                                                                                                 |
| 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 605](#)
- [file checksum sha-256 on page 606](#)

**List of Sample Output** [file checksum md5 on page 604](#)

**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 604](#)
- [file checksum sha-256 on page 606](#)

**List of Sample Output** [file checksum sha1 on page 605](#)

**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/commitscript.slax) = ba9e47120c7ce55cff29afd73eacd370e162c676
```

## 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 605](#)
- [file checksum md5 on page 604](#)

**List of Sample Output** [file checksum sha-256 on page 606](#)

**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

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series, vSRX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Syntax</b>                   | file compare (files <i>from-file to-file</i> ) <context   unified> <ignore-white-space>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Description</b>              | <p>Compare two local files and describe the differences between them in default, context, or unified output styles:</p> <ul style="list-style-type: none"> <li>• <b>default</b>—In the first line of output, <b>c</b> means lines were changed between the two files, <b>d</b> means lines were deleted between the two files, and <b>a</b> 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 (&lt;) in front of output lines refers to the first file. A right angle bracket (&gt;) in front of output lines refers to the second file.</li> <li>• <b>context</b>—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 (-).</li> <li>• <b>unified</b>—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.</li> </ul> |
| <b>Options</b>                  | <p><b>files <i>from-file</i></b>—Names of files to compare.</p> <p><b>files <i>to-file</i></b>—Names of files to compare against.</p> <p><b>context</b>—(Optional) Display output in context format.</p> <p><b>ignore-white-space</b>—(Optional) Ignore changes in the amount of white space.</p> <p><b>unified</b>—(Optional) Display output in unified format.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Required Privilege Level</b> | none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Administration Guide for Security Devices</i></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>List of Sample Output</b>    | <p><a href="#">file compare files on page 608</a></p> <p><a href="#">file compare files context on page 608</a></p> <p><a href="#">file compare files unified on page 608</a></p> <p><a href="#">file compare files unified ignore-white-space on page 608</a></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Output Fields</b>            | 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-passwordSECRET;
    }
```

### 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 `ssl3-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 ssl3-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 ssl3-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>.

**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 610](#)
- [Copy a Configuration File Between Routing Engines on page 611](#)
- [Copy a Log File Between Routing Engines on page 611](#)
- [Copy a File Using FTP on page 611](#)
- [Copy a File Using FTP and Requiring a Password on page 611](#)
- [Copy a File Using Secure Copy on page 611](#)

## 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 mypc:/c/junipero/tmp
```

```
...transferring.file..... |          0 KB |    0.3 kB/s | ETA: 00:00:00 | 100%
```



### Copy a Configuration File Between Routing Engines

The following sample command copies a configuration file from Routing Engine 0 to Routing Engine 1:

```
user@host> file copy /config/juniper.conf re1:/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:

```
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:

```
user@host> file copy filename ftp://hostname/filename
```

In the following example, `/config/juniper.conf` is the local file and `hostname` is the FTP server:

```
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:

```
root@host> file copy filename ftp://user@hostname/filename
```

In the following example, `/config/juniper.conf` is the local file and `hostname` is the FTP server:

```
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:

```
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:

```
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      | <a href="#">SRX Series</a>                                                                                             |
| Syntax                   | <code>file delete path</code><br><code>&lt;purge&gt;</code>                                                            |
| Release Information      | Command introduced before Junos OS Release 7.4.                                                                        |
| Description              | Delete a path on the device.                                                                                           |
| Options                  | <b>path</b> —Name of the path to delete.<br><br><b>purge</b> —(Optional) Overwrite regular files before deleting them. |
| Required Privilege Level | maintenance                                                                                                            |
| Related Documentation    | <ul style="list-style-type: none"><li>• <i>Administration Guide for Security Devices</i></li></ul>                     |
| List of Sample Output    | <a href="#">file delete on page 612</a>                                                                                |
| 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

|                                 |                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a>                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax</b>                   | <code>file list path</code><br><detail   recursive>                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | Command introduced before Junos OS Release 7.4.                                                                                                                                                                                                                                                                                                    |
| <b>Description</b>              | Display a list of paths on the device.                                                                                                                                                                                                                                                                                                             |
| <b>Options</b>                  | <p><b>path</b>—(Optional) Display a list of paths.</p> <p><b>detail   recursive</b>—(Optional) Display detailed output or descend recursively through the directory hierarchy, respectively.</p>                                                                                                                                                   |
| <b>Additional Information</b>   | 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 <b>file list</b> command. To view files within a specific directory, include a slash followed by the directory and, optionally, subdirectory name after the <b>file list</b> command. |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                                                                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Administration Guide for Security Devices</i></li> </ul>                                                                                                                                                                                                                                               |
| <b>List of Sample Output</b>    | <a href="#">file list on page 613</a>                                                                                                                                                                                                                                                                                                              |
| <b>Output Fields</b>            | 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      | <a href="#">SRX Series</a>                                                                         |
| Syntax                   | <code>file rename <i>source destination</i></code>                                                 |
| Release Information      | Command introduced before Junos OS Release 7.4.                                                    |
| Description              | Rename a file on the device.                                                                       |
| Options                  | <i>destination</i> —New name for the file.<br><i>source</i> —Original name of the file.            |
| Required Privilege Level | maintenance                                                                                        |
| Related Documentation    | <ul style="list-style-type: none"><li>• <i>Administration Guide for Security Devices</i></li></ul> |
| List of Sample Output    | <a href="#">file rename on page 614</a>                                                            |
| Output Fields            | When you enter this command, you are provided feedback on the status of your request.              |

## Sample Output

### file rename

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      | <a href="#">SRX Series</a>                                                                                                             |
| Syntax                   | file show <i>filename</i><br><encoding (base64   raw)>                                                                                 |
| Release Information      | Command introduced before Junos OS Release 7.4.                                                                                        |
| Description              | Display the contents of a file.                                                                                                        |
| Options                  | <i>filename</i> —Name of a file.<br><br>encoding (base64   raw)—(Optional) Encode file contents with base64 encoding or show raw text. |
| Required Privilege Level | maintenance                                                                                                                            |
| Related Documentation    | <ul style="list-style-type: none"> <li>• <i>Administration Guide for Security Devices</i></li> </ul>                                   |
| List of Sample Output    | <a href="#">file show on page 615</a>                                                                                                  |
| Output Fields            | When you enter this command, you are provided feedback on the status of your request.                                                  |

## Sample Output

### file show

```

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>

**Release Information** Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.

**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 617](#)

**Output Fields** This command produces no output.

## request dhcpv6 client renew

---

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax</b>                   | request dhcpv6 client renew<br>[all   interface <i>interface-name</i> ]<br>routing-instance < <i>routing-instance-name</i> >                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Description</b>              | Initiate a renew request for the specified DHCPv6 clients if they are in the bound state.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Options</b>                  | <p><b>all</b>—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.</p> <p><b>interface-name <i>interface-name</i></b>—Initiate renew requests for DHCPv6 clients on the specified interface.</p> <p><b>routing-instance <i>routing-instance-name</i></b>—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.</p> |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Output Fields</b>            | 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. The private key can be used to connect to a remote server if the **passphrase** is not known.



**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 676](#)
- [clear security ssh key-pair-identity on page 600](#)

**List of Sample Output** [request security ssh key-pair-identity generate on page 618](#)

**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

```
user@host> request security ssh key-pair-identity generate sample passphrase identity-name
Created SSH key sample
```



## 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 Level** maintenance

**Related Documentation** [• show system autorecovery state on page 677](#)

**List of Sample Output** [request system autorecovery state save on page 620](#)  
[request system autorecovery state recover on page 620](#)  
[request system autorecovery state clear on page 620](#)

**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 bsdlablel 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 bsdlablel 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 626](#)
- [request system download pause on page 624](#)
- [request system download resume on page 625](#)
- [request system download clear on page 623](#)

**List of Sample Output** [request system download abort on page 622](#)

**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

**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** Delete the history of completed and aborted downloads.

**Required Privilege Level** maintenance

**Related Documentation**

- [request system download start on page 626](#)
- [request system download pause on page 624](#)
- [request system download resume on page 625](#)
- [request system download abort on page 622](#)

**List of Sample Output** [request system download clear on page 623](#)

**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 626](#)
- [request system download resume on page 625](#)
- [request system download abort on page 622](#)
- [request system download clear on page 623](#)

**List of Sample Output** [request system download pause on page 624](#)

**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](#), [LN 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 626](#)
- [request system download pause on page 624](#)
- [request system download abort on page 622](#)
- [request system download clear on page 623](#)

**List of Sample Output** [request system download resume on page 625](#)

**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

---

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | EX Series, LN Series, SRX Series, vSRX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Syntax                   | <code>request system download start (sftp-url   delay   identity-file   login   max-rate   passphrase   save as )</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Release Information      | <p>Command introduced in Junos OS Release 11.2 for SRX300, SRX320, SRX340, SRX345, and SRX550M devices.</p> <p>Command introduced in Junos OS Release 13.2X50-D15 for EX Series switches.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Description              | Create a download instance and identify it with a unique integer called the download ID.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Options                  | <p><b>sftp-url</b>—(Required) The FTP or HTTP URL location of the file to be downloaded securely.</p> <p><b>delay</b>—(Optional) The number of hours after which the download should start (range from 1 through 48 hours).</p> <p><b>identity-file</b>—(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.</p> <p><b>login</b>—(Optional) The username and password for the server in the format <b>username:password</b>.</p> <p><b>max-rate</b>—(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.</p> <p><b>passphrase</b>—(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.</p> <p><b>save-as</b>—(Optional) The filename to be used for saving the file in the <b>/var/tmp</b> location.</p> |
| Required Privilege Level | maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Related Documentation    | <ul style="list-style-type: none"><li>• <a href="#">request system download pause on page 624</a></li><li>• <a href="#">request system download resume on page 625</a></li><li>• <a href="#">request system download abort on page 622</a></li><li>• <a href="#">request system download clear on page 623</a></li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| List of Sample Output    | <a href="#">request system download start on page 627</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 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

|                                 |                                                                                                                                                                                                                                      |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series, vSRX</a>                                                                                                                                                                                                     |
| <b>Syntax</b>                   | request system firmware upgrade                                                                                                                                                                                                      |
| <b>Release Information</b>      | Command introduced in Junos OS Release 10.2.                                                                                                                                                                                         |
| <b>Description</b>              | Upgrade firmware on a system.                                                                                                                                                                                                        |
| <b>Options</b>                  | <p><b>fpc</b>—Upgrade FPC ROM monitor.</p> <p><b>pic</b>—Upgrade PIC firmware.</p> <p><b>re</b>—Upgrade baseboard BIOS/FPGA. There is an active BIOS image and a backup BIOS image.</p> <p><b>vcpu</b>—Upgrade VCPU ROM monitor.</p> |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                          |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><a href="#">request system license update on page 629</a></li> </ul>                                                                                                                          |
| <b>List of Sample Output</b>    | <a href="#">request system firmware upgrade on page 628</a>                                                                                                                                                                          |
| <b>Output Fields</b>            | 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
              version      version
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
              version      version
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

```

## request system license update

|                                 |                                                                                                                              |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series, vSRX</a>                                                                                             |
| <b>Syntax</b>                   | request system license update                                                                                                |
| <b>Release Information</b>      | Command introduced in Junos OS Release 9.5.                                                                                  |
| <b>Description</b>              | Start autoupdating license keys from the LMS server.                                                                         |
| <b>Options</b>                  | <b>trial</b> —Starts autoupdating trial license keys from the LMS server.                                                    |
| <b>Required Privilege Level</b> | maintenance                                                                                                                  |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">show system license (View) on page 681</a></li> </ul>                   |
| <b>List of Sample Output</b>    | <a href="#">request system license update on page 629</a><br><a href="#">request system license update trial on page 629</a> |
| <b>Output Fields</b>            | 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://ae1.juniper.net
has been sent, use show system license to check status.
```

## request system power-off fpc

---

|                                 |                                                                                                                                                                                                                                                             |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a>                                                                                                                                                                                                                                  |
| <b>Syntax</b>                   | request system (halt   power-off   reboot) power-off fpc                                                                                                                                                                                                    |
| <b>Release Information</b>      | Command introduced in Junos OS Release 11.4.                                                                                                                                                                                                                |
| <b>Description</b>              | Bring Flexible PIC Concentrators (FPCs) offline before Routing Engines are shut down.                                                                                                                                                                       |
| <b>Options</b>                  | <ul style="list-style-type: none"><li>• <b>halt</b>—Bring FPC offline and then halt the system.</li><li>• <b>power-off</b>—Bring FPC offline and then power off the system.</li><li>• <b>reboot</b>—Bring FPC offline and then reboot the system.</li></ul> |
| <b>Required Privilege Level</b> | maintenance                                                                                                                                                                                                                                                 |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"><li>• <a href="#">request system reboot on page 637</a></li></ul>                                                                                                                                                         |
| <b>List of Sample Output</b>    | <a href="#">request system halt power-off fpc on page 630</a><br><a href="#">request system power-off power-off fpc on page 630</a><br><a href="#">request system reboot power-off fpc on page 630</a>                                                      |
| <b>Output Fields</b>            | 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

---

**Supported Platforms** [SRX Series, vSRX](#)

**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 685](#)

**Output Fields** This command produces no output.

## request system snapshot (Maintenance)

---

**Supported Platforms** [SRX Series, vSRX](#)

**Syntax** 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.



**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.

---

- **external**— Copies the snapshot to an external storage device. This option is available for the compact flash on the SRX650 Services Gateway.
- **node**—(Optional) Specify the archive data and executable areas of a specific node.
  - **node-id**—Specify for node (0, 1).
  - **all**—Specify for all nodes.
  - **local**—Specify for local nodes.
  - **primary**— Specify for primary nodes.
- **partition**—(Default) Specify that the target media should be repartitioned before the backup is saved to it.



**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    | <ul style="list-style-type: none"> <li>• <i>Backing Up the Current Installation (SRX Series Devices)</i></li> </ul>                                                                                                                                                                                          |
| List of Sample Output    | <a href="#">request system snapshot media hard-disk on page 633</a><br><a href="#">request system snapshot media usb (when usb device is missing on page 633</a><br><a href="#">request system snapshot media compact-flash on page 634</a><br><a href="#">request system snapshot partition on page 634</a> |
| 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 (da1s1a)...
Running newfs (47MB) on usb media /config partition (da1s1e)...
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/dals1a' to '/dev/da0s1a' .. (this may take a few minutes)
Copying '/dev/dals1e' to '/dev/da0s1e' .. (this may take a few minutes)
The following filesystems were archived: / /config
```



## request system software abort in-service-upgrade (ICU)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series, vSRX                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Syntax</b>                   | request system software abort in-service-upgrade                                                                                                                                                                                                                                                                                                                                                                |
| <b>Release Information</b>      | Command introduced in Junos OS Release 11.2 for SRX300, SRX320, SRX340, SRX345, and SRX550M devices.                                                                                                                                                                                                                                                                                                            |
| <b>Description</b>              | 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 <b>request system in-service-upgrade</b> 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. |
| <b>Options</b>                  | This command has no options.                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>request system software in-service-upgrade (Maintenance)</i></li> </ul>                                                                                                                                                                                                                                                                                             |
| <b>List of Sample Output</b>    | <a href="#">request system software abort in-service-upgrade on page 635</a>                                                                                                                                                                                                                                                                                                                                    |
| <b>Output Fields</b>            | When you enter this command, you are provided feedback on the status of your request.                                                                                                                                                                                                                                                                                                                           |

### Sample Output

#### request system software abort in-service-upgrade

```
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 save 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 637](#)

## 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*— Specifies the time at which to reboot the device . You can specify time in one of the following ways:
    - *now*— Reboots the device immediately. This is the default.
    - *+minutes*— Reboots the device in the number of minutes from now that you specify.
    - *yymmddhhmm*— Reboots 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*— Reboots 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*— Specifies the number of minutes from now to reboot the device. This option is a synonym for the *at +minutes* option
  - *media type*— Specifies the boot device to boot the device from:
    - *disk/internal*— Reboots from the internal media. This is the default.
    - *usb*— Reboots from the USB storage device.
    - *compact flash*— Reboots from the external CompactFlash card.



**NOTE:** The **media** command option is not available on vSRX.

- *message text*— Provides 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 638](#)

## request system software rollback (SRX Series)

---

|                          |                                                                                                                                                              |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported Platforms      | <a href="#">SRX Series</a> , vSRX                                                                                                                            |
| Syntax                   | request system software rollback<br><node-id>                                                                                                                |
| Release Information      | Command introduced in Junos OS Release 10.1.<br>Command introduced in Junos OS Release 15.1X49-D50 for SRX1500 devices.                                      |
| Description              | Revert to the software that was loaded at the last successful <b>request system software add</b> command. Example: <b>request system software rollback</b> . |
| Options                  | <i>node-id</i> —Identification number of the chassis cluster node. It can be 0 or 1.                                                                         |
| Required Privilege Level | maintenance                                                                                                                                                  |
| Related Documentation    | <ul style="list-style-type: none"><li>• <a href="#">request system reboot on page 637</a></li></ul>                                                          |

## 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 637](#)
- [request system software rollback \(SRX Series\) on page 638](#)

**List of Sample Output** [request system zeroize on page 639](#)

### 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+0xca1ee]

Hit [Enter] to boot immediately, or space bar for command prompt.
Booting [/kernel]...
platform_early_bootinit: MAG Series Early Boot Initialization
GDB: debug ports: sio
GDB: current port: sio
KDB: debugger backends: ddb gdb
KDB: current backend: ddb
Copyright (c) 1996-2011, Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1992-2006 The FreeBSD Project.
Copyright (c) 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994
The Regents of the University of California. All rights reserved.
...
output truncated
```

## restart (Reset)

**Supported Platforms** SRX Series, vSRX

**Syntax** restart

```
<application-identification | application-security | audit-process | commitd-service
| chassis-control | class-of-service | database-replication | datapath-trace-service | ddns
| dhcp | dhcp-service | dynamic-flow-capture | disk-monitoring | event-processing |
ethernet-connectivity-fault-management | ethernet-link-fault-management
| extensible-subscriber-services | fipsd | firewall | firewall-authentication-service
| general-authentication-service | gracefully | gprs-process | idp-policy | immediately
| interface-control | ipmi | ipsec-key-management | jflow-service | jnu-management
| jnx-wmicd-service | jsrp-service | kernel-replication | l2-learning | l2cpd-service | lacp
| license-service | logical-system-service | mib-process | mountd-service | named-service
| network-security | network-security-trace | nfsd-service | ntpd-service | pgm
| pic-services-logging | profilerd | pki-service | remote-operations | rest-api | routing | sampling
| sampling-route-record | scc-chassisd | secure-neighbor-discovery | security-intelligence
| security-log | services | service-deployment | simple-mail-client-service | soft | snmp
| static-routed | statistics-service | subscriber-management | subscriber-management-helper
| system-log-vital | tunnel-oamd | uac-service | user-ad-authentication | vrrp
| web-management >
```

**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 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.
- `profillerd`—(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.

**Required Privilege Level**    reset

**Related Documentation**    • [Restart Commands Overview on page 645](#)

List of Sample Output [restart interfaces on page 645](#)

**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 632

**List of Sample Output** [show chassis routing-engine \(Sample 1 - SRX550M\)](#) on page 647  
[show chassis routing-engine \(Sample 2 - vSRX\)](#) on page 647

**Output Fields** [Table 19 on page 646](#) lists the output fields for the `show chassis routing-engine` command. Output fields are listed in the approximate order in which they appear.

**Table 19: show chassis routing-engine Output Fields**

| Field Name           | Field Description                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature          | Routing Engine temperature. (Not available for vSRX deployments.)                                                                                                                                                                                                                                                                                                                                                             |
| CPU temperature      | CPU temperature. (Not available for vSRX deployments.)                                                                                                                                                                                                                                                                                                                                                                        |
| Total memory         | Total memory available on the system.<br><br><b>NOTE:</b> Starting with Junos OS Release 15.1x49-D70, there is a change in the method for calculating the memory utilization by a Routing Engine. The inactive memory is now considered free and is no longer included in the calculation of memory utilization. That is, the value for used memory decreases and results in more memory to be available for other processes. |
| Control plane memory | Memory available for the control plane.                                                                                                                                                                                                                                                                                                                                                                                       |
| Data plane memory    | Memory reserved for data plane processing.                                                                                                                                                                                                                                                                                                                                                                                    |
| CPU utilization      | Current CPU utilization statistics on the control plane core.                                                                                                                                                                                                                                                                                                                                                                 |
| User                 | Current CPU utilization in user mode on the control plane core.                                                                                                                                                                                                                                                                                                                                                               |
| Background           | Current CPU utilization in nice mode on the control plane core.                                                                                                                                                                                                                                                                                                                                                               |
| Kernel               | Current CPU utilization in kernel mode on the control plane core.                                                                                                                                                                                                                                                                                                                                                             |
| Interrupt            | Current CPU utilization in interrupt mode on the control plane core.                                                                                                                                                                                                                                                                                                                                                          |

Table 19: show chassis routing-engine Output Fields (*continued*)

| Field Name         | Field Description                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------|
| Idle               | Current CPU utilization in idle mode on the control plane core.                                                   |
| Model              | Routing Engine model.                                                                                             |
| Start time         | Routing Engine start time.                                                                                        |
| Uptime             | Length of time the Routing Engine has been up (running) since the last start.                                     |
| Last reboot reason | Reason for the last reboot of the Routing Engine.                                                                 |
| Load averages      | The average number of threads waiting in the run queue or currently executing over 1-, 5-, and 15-minute periods. |

## 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

```

## Sample Output

### 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
    Interrupt           6 percent
    Idle                88 percent
  Model                VSRX RE

```

|                    |                                          |
|--------------------|------------------------------------------|
| Start time         | 2015-03-03 07:04:18 UTC                  |
| Uptime             | 2 days, 11 hours, 51 minutes, 11 seconds |
| Last reboot reason | Router rebooted after a normal shutdown. |
| Load averages:     | 1 minute   5 minute   15 minute          |
|                    | 0.07            0.04            0.06     |

## 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.

```
user@host> show cli authorization
Current user: 'root' login: 'boojum' class '(root)'
Permissions:
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
```

**Required Privilege Level** view

## 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 590](#)

**List of Sample Output** [show dhcp client binding on page 651](#)

**Output Fields** [Table 20 on page 650](#) lists the output fields for the **show dhcp client binding** command. Output fields are listed in the approximate order in which they appear.

**Table 20: show dhcp client binding Output Fields**

| Field Name       | Field Description                    |
|------------------|--------------------------------------|
| IP address       | IP address of the DHCP client.       |
| Hardware address | Hardware address of the DHCP client. |
| Server           | IP address of the DHCP server.       |



Table 20: show dhcp client binding Output Fields (*continued*)

| Field Name        | Field Description                                             |
|-------------------|---------------------------------------------------------------|
| Expires           | Number of seconds in which the lease expires.                 |
| State             | State of the address binding table on the DHCP local server.  |
| Interface         | Interface on which the request was received.                  |
| Lease Expires     | Date and time at which the client's IP address lease expires. |
| Lease Expires in  | Number of seconds in which the lease expires.                 |
| Lease Start       | Date and time at which the client's IP address lease started. |
| Vendor Identifier | Vendor identifier.                                            |
| Server Identifier | IP address of the DHCP server.                                |
| Client IP Address | IP address of the DHCP client.                                |

## 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:      00:0a:12:00:12:12
      State:                  BOUND
      Lease Expires:          2010-09-16 14:45:41 UTC
      Lease Expires in:       528 seconds
      Lease Start:            2010-09-16 14:35:41 UTC
      Vendor Identifier:       ether
      Server Identifier:       10.1.1.1
      Client IP Address:       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
```

| 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 |

## show dhcp client statistics

|                                 |                                                                                                                                                                                          |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series, vSRX</a>                                                                                                                                                         |
| <b>Syntax</b>                   | show dhcp client statistics<br><routing-instance <i>routing-instance-name</i> >                                                                                                          |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.                                                                   |
| <b>Description</b>              | Display Dynamic Host Configuration Protocol (DHCP) client statistics.                                                                                                                    |
| <b>Options</b>                  | <b>routing-instance <i>routing-instance-name</i></b> —(Optional) Display the statistics for DHCP clients on the specified routing instance.                                              |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">clear dhcp client statistics on page 591</a></li> </ul>                                                                             |
| <b>List of Sample Output</b>    | <a href="#">show dhcp client statistics on page 654</a>                                                                                                                                  |
| <b>Output Fields</b>            | <a href="#">Table 21 on page 653</a> lists the output fields for the <b>show dhcp client statistics</b> command. Output fields are listed in the approximate order in which they appear. |

Table 21: show dhcp client statistics

| Field Name        | Field Description                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Packets dropped   | 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.                                                                                                                                                                                            |
| Messages received | Number of DHCP messages received. <ul style="list-style-type: none"> <li>• BOOTREPLY—Number of BOOTP protocol data units (PDUs) received</li> <li>• DHCPOFFER—Number of DHCP PDUs of type OFFER received</li> <li>• DHCPACK—Number of DHCP PDUs of type ACK received</li> <li>• DHCPNACK—Number of DHCP PDUs of type NACK received</li> <li>• DHCPFORCERENEW—Number of DHCP PDUs of type FORCERENEW received</li> </ul> |

Table 21: show dhcp client statistics (*continued*)

| Field Name    | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Messages sent | <p>Number of DHCP messages sent.</p> <ul style="list-style-type: none"> <li>• BOOTREQUEST—Number of BOOTP protocol data units (PDUs) transmitted</li> <li>• DHCPDECLINE—Number of DHCP PDUs of type DECLINE transmitted</li> <li>• DHCPDISCOVER—Number of DHCP PDUs of type DISCOVER transmitted</li> <li>• DHCPREQUEST—Number of DHCP PDUs of type REQUEST transmitted</li> <li>• DHCPINFORM—Number of DHCP PDUs of type INFORM transmitted</li> <li>• DHCPRELEASE—Number of DHCP PDUs of type RELEASE transmitted</li> <li>• DHCPRENEW—Number of DHCP PDUs of type RENEW transmitted</li> <li>• DHCPREBIND—Number of DHCP PDUs of type REBIND transmitted</li> </ul> |

## 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 Level** view

**Related Documentation** [• clear dhcp relay binding on page 592](#)

**List of Sample Output** [show dhcp relay binding on page 656](#)

**Output Fields** [Table 22 on page 655](#) lists the output fields for the **show dhcp relay binding** command. Output fields are listed in the approximate order in which they appear.

**Table 22: show dhcp relay binding Output Fields**

| Field Name          | Field Description                            |
|---------------------|----------------------------------------------|
| IP address          | IP address of the DHCP client.               |
| Hardware address    | Hardware address of the DHCP client.         |
| Request received on | Interface on which the request was received. |

Table 22: show dhcp relay binding Output Fields (*continued*)

| Field Name  | Field Description                                             |
|-------------|---------------------------------------------------------------|
| Type        | Type of DHCP packet processing performed on the device.       |
| Obtained at | Date and time at which the client's IP address lease started. |
| Expires at  | Date and time at which the client's IP address lease expires. |
| State       | State of the address binding table on the DHCP local server.  |

## 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

|                                 |                                                                                                                                                                                         |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series, vSRX</a>                                                                                                                                                        |
| <b>Syntax</b>                   | show dhcp relay statistics<br>[<routing-instance>]                                                                                                                                      |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.                                                                  |
| <b>Description</b>              | Display Dynamic Host Configuration Protocol (DHCP) relay statistics.                                                                                                                    |
| <b>Options</b>                  | <b>routing-instance</b> —(Optional) Display the DHCP relay statistics on the specified routing instance.                                                                                |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                    |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <a href="#">clear dhcp relay statistics on page 593</a></li> </ul>                                                                             |
| <b>List of Sample Output</b>    | <a href="#">show dhcp relay statistics on page 657</a>                                                                                                                                  |
| <b>Output Fields</b>            | <a href="#">Table 23 on page 657</a> lists the output fields for the <b>show dhcp relay statistics</b> command. Output fields are listed in the approximate order in which they appear. |

**Table 23: show dhcp relay statistics**

| Field Name        | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Messages received | <p>Number of DHCP messages sent.</p> <ul style="list-style-type: none"> <li>• BOOTREQUEST—Number of BOOTP protocol data units (PDUs) received</li> <li>• DHCPDECLINE—Number of DHCP PDUs of type DECLINE received</li> <li>• DHCPDISCOVER—Number of DHCP PDUs of type DISCOVER received</li> <li>• DHCPREQUEST—Number of DHCP PDUs of type REQUEST received</li> <li>• DHCPINFORM—Number of DHCP PDUs of type INFORM received</li> <li>• DHCPRELEASE—Number of DHCP PDUs of type RELEASE received</li> </ul> |
| Messages sent     | <p>Number of DHCP messages received.</p> <ul style="list-style-type: none"> <li>• BOOTREPLY—Number of BOOTP PDUs transmitted</li> <li>• DHCPOFFER—Number of DHCP PDUs of type OFFER transmitted</li> <li>• DHCPACK—Number of DHCP PDUs of type ACK transmitted</li> <li>• DHCPNACK—Number of DHCP PDUs of type NACK transmitted</li> <li>• DHCPFORCERENEW—Number of DHCP PDUs of type FORCERENEW transmitted</li> </ul>                                                                                      |

## 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>`

**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 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.

`routing-instance routing-instance-name`—(Optional) Display information about active client bindings for DHCP clients on the specified routing instance.

**Required Privilege Level** `view`

**Related Documentation**

- [clear dhcp server binding on page 594](#)

**List of Sample Output** [show dhcp server binding on page 660](#)

**Output Fields** [Table 24 on page 659](#) lists the output fields for the `show dhcp server binding` command. Output fields are listed in the approximate order in which they appear.

**Table 24: show dhcp server binding Output Fields**

| Field Name          | Field Description                            |
|---------------------|----------------------------------------------|
| IP address          | IP address of the DHCP client.               |
| Hardware address    | Hardware address of the DHCP client.         |
| Request received on | Interface on which the request was received. |

Table 24: show dhcp server binding Output Fields (*continued*)

| Field Name  | Field Description                                             |
|-------------|---------------------------------------------------------------|
| Type        | Type of DHCP packet processing performed on the device.       |
| Obtained at | Date and time at which the client's IP address lease started. |
| Expires at  | Date and time at which the client's IP address lease expires. |
| State       | State of the address binding table on the DHCP local server.  |

## Sample Output

### show dhcp server binding

```
user@host> 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

|                                 |                                                                                                                                                                                                                                    |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series, vSRX</a>                                                                                                                                                                                                   |
| <b>Syntax</b>                   | show dhcp server statistics<br><routing-instance>                                                                                                                                                                                  |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X44-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.                                                                                                             |
| <b>Description</b>              | Display Dynamic Host Configuration Protocol (DHCP) local server statistics.                                                                                                                                                        |
| <b>Options</b>                  | <b>routing-instance</b> —(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. |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                               |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><a href="#">clear dhcp server statistics on page 595</a></li> </ul>                                                                                                                         |
| <b>List of Sample Output</b>    | <a href="#">show dhcp server statistics on page 662</a>                                                                                                                                                                            |
| <b>Output Fields</b>            | <a href="#">Table 25 on page 661</a> lists the output fields for the <b>show dhcp server statistics</b> command. Output fields are listed in the approximate order in which they appear.                                           |

**Table 25: show dhcp server statistics**

| Field Name        | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Packets dropped   | 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.                                                                                                                                                                                                                                                              |
| Messages received | Number of DHCP messages sent. <ul style="list-style-type: none"> <li>BOOTREQUEST—Number of BOOTP protocol data units (PDUs) received</li> <li>DHCPDECLINE—Number of DHCP PDUs of type DECLINE received</li> <li>DHCPDISCOVER—Number of DHCP PDUs of type DISCOVER received</li> <li>DHCPREQUEST—Number of DHCP PDUs of type REQUEST received</li> <li>DHCPINFORM—Number of DHCP PDUs of type INFORM received</li> <li>DHCPRELEASE—Number of DHCP PDUs of type RELEASE received</li> </ul> |
| Messages sent     | Number of DHCP messages received. <ul style="list-style-type: none"> <li>BOOTREPLY—Number of BOOTP PDUs transmitted</li> <li>DHCPOFFER—Number of DHCP PDUs of type OFFER transmitted</li> <li>DHCPACK—Number of DHCP PDUs of type ACK transmitted</li> <li>DHCPNACK—Number of DHCP PDUs of type NACK transmitted</li> <li>DHCPFORCERENEW—Number of DHCP PDUs of type FORCERENEW transmitted</li> </ul>                                                                                    |

## Sample Output

### show dhcp server statistics

```
user@host> show dhcp server statistics
Packets dropped:
  Total                      0

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 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 596](#)

**List of Sample Output** [show dhcpv6 client binding on page 664](#)

**Output Fields** [Table 26 on page 663](#) lists the output fields for the `show dhcpv6 client binding` command. Output fields are listed in the approximate order in which they appear.

**Table 26: show dhcpv6 client binding Output Fields**

| Field Name       | Field Description                                              |
|------------------|----------------------------------------------------------------|
| Hardware Address | Hardware address of the DHCPv6 client.                         |
| State            | State of the address-binding table on the DHCPv6 local server. |
| Lease Expires    | Date and time at which the client's IP address lease expires.  |
| Lease Expires in | Number of seconds until the lease expires.                     |
| Lease Start      | Date and time at which the client's IP address lease started.  |
| Client DUID      | The DHCPv6 client's unique identifier.                         |

Table 26: show dhcpv6 client binding Output Fields (*continued*)

| Field Name        | Field Description                                                         |
|-------------------|---------------------------------------------------------------------------|
| Bind type         | The bind type.                                                            |
| Client Type       | The type of DHCPv6 client. The client type can be autoconfig or stateful. |
| Rapid Commit      | Two-message exchange option for address assignment.                       |
| Server IP Address | IP address of the DHCPv6 server.                                          |
| Client IP Address | IP address of the DHCPv6 client.                                          |

## Sample Output

### show dhcpv6 client binding

```

user@host> show dhcpv6 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

```

```

user@host> show dhcpv6 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

|                                 |                                                                                                                                                                                            |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a>                                                                                                                                                                 |
| <b>Syntax</b>                   | show dhcpv6 client statistics<br>routing-instance<routing-instance-name>                                                                                                                   |
| <b>Release Information</b>      | Statement introduced in Junos OS Release 12.1X45-D10 for SRX300, SRX320, SRX340, SRX345, SRX550M, and SRX1500 devices.                                                                     |
| <b>Description</b>              | Display Dynamic Host Configuration Protocol (DHCPv6) client statistics.                                                                                                                    |
| <b>Options</b>                  | routing-instance <routing-instance-name>—(Optional) Display the statistics for DHCPv6 clients on the specified routing instance.                                                           |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                       |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><a href="#">clear dhcpv6 client statistics on page 597</a></li> </ul>                                                                               |
| <b>List of Sample Output</b>    | <a href="#">show dhcpv6 client statistics on page 666</a>                                                                                                                                  |
| <b>Output Fields</b>            | <a href="#">Table 27 on page 665</a> lists the output fields for the <b>show dhcpv6 client statistics</b> command. Output fields are listed in the approximate order in which they appear. |

Table 27: show dhcpv6 client statistics Output Fields

| Field Name             | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dhcpv6 Packets dropped | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Messages sent          | Number of DHCPv6 messages sent. <ul style="list-style-type: none"> <li>DHCPV6_DECLINE—Number of DHCPv6 PDUs of type DECLINE transmitted</li> <li>DHCPV6_SOLICIT—Number of DHCPv6 PDUs of type SOLICIT transmitted</li> <li>DHCPV6_INFORMATION_REQUEST—Number of DHCPv6 PDUs of type INFORMATION REQUEST transmitted</li> <li>DHCPV6_RELEASE—Number of DHCPv6 PDUs of type RELEASE transmitted</li> <li>DHCPV6_REQUEST—Number of DHCPv6 PDUs of type REQUEST transmitted</li> <li>DHCPV6_CONFIRM—Number of DHCPv6 PDUs of type CONFIRM transmitted</li> <li>DHCPV6_RENEW—Number of DHCPv6 PDUs of type RENEW transmitted</li> <li>DHCPV6_REBIND—Number of DHCPv6 PDUs of type REBIND transmitted</li> </ul> |

Table 27: show dhcpv6 client statistics Output Fields (*continued*)

| Field Name        | Field Description                                                                                                                                                                                                                                                                                     |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Messages received | Number of DHCPv6 messages received. <ul style="list-style-type: none"><li>DHCPV6_ADVERTISE—Number of DHCPv6 PDUs of type ADVERTISE received</li><li>DHCPV6_REPLY—Number of DHCPv6 PDUs of type REPLY received</li><li>DHCPV6_RECONFIGURE—Number of DHCPv6 PDUs of type RECONFIGURE received</li></ul> |

## 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 DHCPv6 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 Level** view

**Related Documentation**

- [clear dhcpv6 server binding \(Local Server\) on page 598](#)

**List of Sample Output**

[show dhcpv6 server binding on page 668](#)  
[show dhcpv6 server binding detail on page 669](#)  
[show dhcpv6 server binding interface on page 669](#)  
[show dhcpv6 server binding interface detail on page 669](#)  
[show dhcpv6 server binding prefix on page 670](#)  
[show dhcpv6 server binding session-id on page 670](#)  
[show dhcpv6 server binding summary on page 670](#)

**Output Fields** [Table 28 on page 667](#) lists the output fields for the **show dhcpv6 server binding** command. Output fields are listed in the approximate order in which they appear.

**Table 28: show dhcpv6p server binding Output Fields**

| Field Name                                                                                                                                                                              | Field Description                                                                                    | Level of Output |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-----------------|
| <i>number</i> clients,<br>( <i>number</i> init,<br><i>number</i> bound,<br><i>number</i> selecting,<br><i>number</i> requesting,<br><i>number</i> renewing,<br><i>number</i> releasing) | Summary counts of the total number of DHCPv6 clients and the number of DHCPv6 clients in each state. | <b>summary</b>  |

Table 28: show dhc6p server binding Output Fields (*continued*)

| Field Name                       | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Level of Output               |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Prefix</b>                    | Client's DHCPv6 prefix.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>brief</b><br><b>detail</b> |
| <b>Session Id</b>                | Session ID of the subscriber session.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>brief</b><br><b>detail</b> |
| <b>Expires</b>                   | Number of seconds in which lease expires.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>brief</b><br><b>detail</b> |
| <b>State</b>                     | State of the address binding table on the DHCPv6 local server: <ul style="list-style-type: none"> <li>• <b>BOUND</b>—Client has active IP address lease.</li> <li>• <b>INIT</b>—Initial state.</li> <li>• <b>RELEASE</b>—Client is releasing IP address lease.</li> <li>• <b>RECONFIGURE</b>—Client has received reconfigure message from server.</li> <li>• <b>RENEWING</b>—Client sending request to renew IP address lease.</li> <li>• <b>REQUESTING</b>—Client requesting a DHCPv6 server.</li> <li>• <b>SELECTING</b>—Client receiving offers from DHCPv6 servers.</li> </ul> | <b>brief</b><br><b>detail</b> |
| <b>Interface</b>                 | Interface on which the DHCPv6 request was received.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>brief</b>                  |
| <b>Client DUID</b>               | Client's DHCP Unique Identifier (DUID).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>brief</b>                  |
| <b>Lease expires</b>             | Date and time at which the client's IP address lease expires.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>detail</b>                 |
| <b>Lease expires in</b>          | Number of seconds in which lease expires.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>detail</b>                 |
| <b>Lease Start</b>               | Date and time at which the client's address lease was obtained.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>detail</b>                 |
| <b>Incoming Client Interface</b> | Client's incoming interface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>detail</b>                 |
| <b>Server IP Address</b>         | IP address of DHCPv6 server.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>detail</b>                 |
| <b>Server Interface</b>          | Interface of DHCPv6 server.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>detail</b>                 |
| <b>Client Id length</b>          | Length of the DHCPv6 client ID, in bytes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>detail</b>                 |
| <b>Client Id</b>                 | ID of the DHCPv6 client.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>detail</b>                 |
| <b>Server Id</b>                 | ID type and ID of the DHCPv6 server.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>detail</b>                 |

## Sample Output

### show dhc6p server binding

```
user@host> show dhc6p server binding
```

| Prefix                     | Session Id                             | Expires | State | Interface  | Client DUID |
|----------------------------|----------------------------------------|---------|-------|------------|-------------|
| 2001:bd8:1111:2222::/64 6  | LL_TIME0x1-0x2e159c0-00:10:94:00:00:01 | 86321   | BOUND | ge-1/0/0.0 |             |
| 2001:bd8:1111:2222::/64 7  | LL_TIME0x1-0x2e159c0-00:10:94:00:00:02 | 86321   | BOUND | ge-1/0/0.0 |             |
| 2001:bd8:1111:2222::/64 8  | LL_TIME0x1-0x2e159c0-00:10:94:00:00:03 | 86321   | BOUND | ge-1/0/0.0 |             |
| 2001:bd8:1111:2222::/64 9  | LL_TIME0x1-0x2e159c1-00:10:94:00:00:04 | 86321   | BOUND | ge-1/0/0.0 |             |
| 2001:bd8:1111:2222::/64 10 | LL_TIME0x1-0x2e159c1-00:10:94:00:00:05 | 86321   | BOUND | ge-1/0/0.0 |             |

### 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:
/0x00010001/0x02e159c0/0x00109400/0x0001      Server Id:
<VENDOR 2198142976/4a4e313132414343374146430000000000000000>

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:
/0x00010001/0x02e159c0/0x00109400/0x0002      Server Id:
<VENDOR 2198142976/4a4e313132414343374146430000000000000000>

```

### 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      Server Id:
<VENDOR 2198142976/4a4e313132414343374146430000000000000000>

```

### 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 599](#)

**List of Sample Output** [show dhcpv6 server statistics on page 673](#)

**Output Fields** [Table 29 on page 672](#) lists the output fields for the `show dhcpv6 server statistics` command. Output fields are listed in the approximate order in which they appear.

Table 29: show dhcpv6 server statistics Output Fields

| Field Name                    | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dhcpv6 Packets dropped</b> | <p>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.</p> <ul style="list-style-type: none"> <li>• <b>Total</b>—Total number of packets discarded by the DHCPv6 local server</li> <li>• <b>Strict Reconfigure</b>—Number of solicit messages discarded because the client does not support reconfiguration</li> <li>• <b>Bad hardware address</b>—Number of packets discarded because an invalid hardware address was specified</li> <li>• <b>Bad opcode</b>—Number of packets discarded because an invalid operation code was specified</li> <li>• <b>Bad options</b>—Number of packets discarded because invalid options were specified</li> <li>• <b>Invalid server address</b>—Number of packets discarded because an invalid server address was specified</li> <li>• <b>No available addresses</b>—Number of packets discarded because there were no addresses available for assignment</li> <li>• <b>No interface match</b>—Number of packets discarded because they did not belong to a configured interface</li> <li>• <b>No routing instance match</b>—Number of packets discarded because they did not belong to a configured routing instance</li> <li>• <b>No valid local address</b>—Number of packets discarded because there was no valid local address</li> <li>• <b>Packet too short</b>—Number of packets discarded because they were too short</li> <li>• <b>Read error</b>—Number of packets discarded because of a system read error</li> <li>• <b>Send error</b>—Number of packets that the DHCPv6 local server could not send</li> </ul> |
| <b>Messages received</b>      | <p>Number of DHCPv6 messages received.</p> <ul style="list-style-type: none"> <li>• <b>DHCPV6_CONFIRM</b>—Number of DHCPv6 CONFIRM PDUs received.</li> <li>• <b>DHCPV6_DECLINE</b>—Number of DHCPv6 DECLINE PDUs received.</li> <li>• <b>DHCPV6_INFORMATION_REQUEST</b>—Number of DHCPv6 INFORMATION-REQUEST PDUs received.</li> <li>• <b>DHCPV6_REBIND</b>—Number of DHCPv6 REBIND PDUs received.</li> <li>• <b>DHCPV6_RELAY_FORW</b>—Number of DHCPv6 RELAY-FORW PDUs received from a relay by the DHCPv6 server.</li> <li>• <b>DHCPV6_RELEASE</b>—Number of DHCPv6 RELEASE PDUs received.</li> <li>• <b>DHCPV6_RENEW</b>—Number of DHCPv6 RENEW PDUs received.</li> <li>• <b>DHCPV6_REQUEST</b>—Number of DHCPv6 REQUEST PDUs received.</li> <li>• <b>DHCPV6_SOLICIT</b>—Number of DHCPv6 SOLICIT PDUs received.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Messages sent</b>          | <p>Number of DHCPv6 messages sent.</p> <ul style="list-style-type: none"> <li>• <b>DHCPV6_ADVERTISE</b>—Number of DHCPv6 ADVERTISE PDUs transmitted.</li> <li>• <b>DHCPV6_REPLY</b>—Number of DHCPv6 ADVERTISE PDUs transmitted.</li> <li>• <b>DHCPV6_RECONFIGURE</b>—Number of DHCPv6 RECONFIGURE PDUs transmitted.</li> <li>• <b>DHCPV6_RELAY_REPL</b>—Number of DHCPv6 RELAY-REPL PDUs sent from DHCPv6 server to DHCPv6 relay.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## 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 150](#)

**List of Sample Output** [show firewall on page 675](#)

**Output Fields** [Table 30 on page 674](#) lists the output fields for the **show firewall** command. Output fields are listed in the approximate order in which they appear.

**Table 30: show firewall Output Fields**

| Field Name    | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Filter</b> | <p>Name of a filter that has been configured with the <b>filter</b> at the <b>[edit firewall]</b> hierarchy level.</p> <p>When an interface-specific filter is displayed, the name of the filter is followed by the full interface name and by either <b>-i</b> for an input filter or <b>-o</b> for an output filter.</p> <p>When dynamic filters are displayed, the name of the filter is followed by the full interface name and by either <b>-in</b> for an input filter or <b>-out</b> for an output filter. When a logical system-specific filter is displayed, the name of the filter is prefixed with two underscore (__) characters and the name of the logical system (for example, __ls1/filter1).</p> |



Table 30: show firewall Output Fields (*continued*)

| Field Name      | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Counters</b> | Display filter counter information: <ul style="list-style-type: none"> <li>• <b>Name</b>—Name of a filter counter that has been configured with the <b>counter</b> firewall filter action.</li> <li>• <b>Bytes</b>—Number of bytes that match the filter term under which the <b>counter</b> action is specified.</li> <li>• <b>Packets</b>—Number of packets that matched the filter term under which the <b>counter</b> action is specified.</li> </ul>                                                                                                                                                 |
| <b>Policers</b> | Display policer information: <ul style="list-style-type: none"> <li>• <b>Name</b>—Name of policer.</li> <li>• <b>Bytes</b>—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.</li> <li>• <b>Packets</b>—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.</li> </ul> |

## Sample Output

### show firewall

```

user@host> show firewall
Filter: ef_path
Counters:
Name          Bytes          Packets
def-count     0              0
video-count   0              0
voice-count    0              0

Filter: __default_bpdu_filter__

Filter: deep
Counters:
Name          Bytes          Packets
deep2         302076         5031

Filter: deep-flood
Counters:
Name          Bytes          Packets
deep_flood_def 302136         5032
deep1         0              0
Policers:
Name          Packets
deep-pol-op-first 0

```

## 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. 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.

**Required Privilege Level** view

- Related Documentation**
- [request security ssh key-pair-identity generate on page 618](#)
  - [clear security ssh key-pair-identity on page 600](#)

**List of Sample Output** [show security ssh key-pair-identity brief on page 676](#)  
[show security ssh key-pair-identity brief sample on page 676](#)

**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 system autorecovery state

|                                 |                                                                                                                                                                                             |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series</a>                                                                                                                                                                  |
| <b>Syntax</b>                   | show system autorecovery state                                                                                                                                                              |
| <b>Release Information</b>      | Command introduced in Junos OS Release 11.2 for SRX300, SRX320, SRX340, SRX345, and SRX550M devices.                                                                                        |
| <b>Description</b>              | Perform checks and show status of all autorecovered items.                                                                                                                                  |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><a href="#">request system autorecovery state on page 619</a></li> </ul>                                                                             |
| <b>List of Sample Output</b>    | <a href="#">show system autorecovery state on page 677</a>                                                                                                                                  |
| <b>Output Fields</b>            | <a href="#">Table 31 on page 677</a> lists the output fields for the <b>show system autorecovery state</b> command. Output fields are listed in the approximate order in which they appear. |

**Table 31: show system autorecovery state Output Fields**

| Field Name           | Field Description                                                                  |
|----------------------|------------------------------------------------------------------------------------|
| File                 | The name of the file on which autorecovery checks are performed.                   |
| Slice                | The disk partition on which autorecovery checks are performed.                     |
| Recovery Information | Indicates whether autorecovery information for the file or slice has been saved.   |
| Integrity Check      | Displays the status of the file's integrity check (passed or failed).              |
| Action / Status      | Displays the status of the item, or the action required to be taken for that item. |

## Sample Output

### show system autorecovery state

```
user@host> show system autorecovery state
```

```
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 Not Saved            Not checked      Requires save
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 |

## show system download

**Supported Platforms** [LN Series](#), [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 Level** view

**Related Documentation**

- [request system download start on page 626](#)
- [Understanding Download Manager for SRX Series Devices](#)

**List of Sample Output** [show system download on page 679](#)  
[show system download 1 on page 680](#)

**Output Fields** [Table 32 on page 679](#) lists the output fields for the **show system download** command. Output fields are listed in the approximate order in which they appear.

**Table 32: show system download Output Fields**

| Field Name | Field Description                                              |
|------------|----------------------------------------------------------------|
| ID         | Displays the download identification number.                   |
| Status     | Displays the state of a particular download.                   |
| Start Time | Displays the start time of a particular download.              |
| Progress   | Displays the percentage of a download that has been completed. |
| URL        | Displays the URL from which the file was downloaded.           |

## Sample Output

### show system download

```

user@host> show system download
Download Status Information:
ID  Status      Start Time      Progress  URL
1   Active      May 4 06:28:36  5%        ftp://ftp-server//tftpboot/1m_file
2   Active      May 4 06:29:07  3%        ftp://ftp-server//tftpboot/5m_file
3   Error       May 4 06:29:22  Unknown   ftp://ftp-server//tftpboot/badfile

```

4   Completed   May 4 06:29:40   100%   ftp://ftp-server//tftpboot/smallfile

#### show system download 1

```
user@host> show system download 1
```

```
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)

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | <a href="#">SRX Series, vSRX</a>                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Syntax</b>                   | show system license<br><installed   keys   status   usage>                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Release Information</b>      | Command introduced in Junos OS Release 9.5. Logical system status option added in Junos OS Release 11.2.                                                                                                                                                                                                                                                                                                                                                 |
| <b>Description</b>              | Display licenses and information about how licenses are used.                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Options</b>                  | <p><b>none</b>—Display all license information.</p> <p><b>installed</b>—(Optional) Display installed licenses only.</p> <p><b>keys</b>—(Optional) Display a list of license keys. Use this information to verify that each expected license key is present.</p> <p><b>status</b>—(Optional) Display license status for a specified logical system or for all logical systems.</p> <p><b>usage</b>—(Optional) Display the state of licensed features.</p> |
| <b>Required Privilege Level</b> | view                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><a href="#">Working with License Keys for SRX Series Devices</a></li> </ul>                                                                                                                                                                                                                                                                                                                                       |
| <b>List of Sample Output</b>    | <a href="#">show system license on page 682</a><br><a href="#">show system license installed on page 682</a><br><a href="#">show system license keys on page 683</a><br><a href="#">show system license usage on page 683</a><br><a href="#">show system license status logical-system all on page 683</a>                                                                                                                                               |
| <b>Output Fields</b>            | <a href="#">Table 33 on page 681</a> lists the output fields for the <b>show system license</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                                                                                                                                                                                         |

**Table 33: show system license Output Fields**

| Field Name           | Field Description                                                                                                                                                                                              |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Feature name</b>  | Name assigned to the configured feature. You use this information to verify that all the features for which you installed licenses are present.                                                                |
| <b>Licenses used</b> | 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. |

Table 33: show system license Output Fields (*continued*)

| Field Name                    | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Licenses installed            | Information about the installed license key: <ul style="list-style-type: none"> <li>• <b>License identifier</b>—Identifier associated with a license key.</li> <li>• <b>License version</b>—Version of a license. The version indicates how the license is validated, the type of signature, and the signer of the license key.</li> <li>• <b>Valid for device</b>—Device that can use a license key.</li> <li>• <b>Features</b>—Feature associated with a license.</li> </ul> |
| 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

### show system license

```
user@host> show system license
```

```
License usage:
```

| Feature name                            | Licenses used | Licenses installed | Licenses needed | Expiry     |
|-----------------------------------------|---------------|--------------------|-----------------|------------|
| av_key_kaspersky_engine<br>01:00:00 IST | 1             | 1                  | 0               | 2012-03-30 |
| wf_key_surfcontrol_cpa<br>01:00:00 IST  | 0             | 1                  | 0               | 2012-03-30 |
| dynamic-vpn                             | 0             | 1                  | 0               | permanent  |
| ax411-wlan-ap                           | 0             | 2                  | 0               | permanent  |

```
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 xxxxxxx xxxxxxx xxxxxxx xxxxxxx xxxxxxx xxxxxxx
xxxxxxx xxxxxxx xxxxxxx xxxxxxx xxxxxxx xxxxxxx xxxxxxx
xxxxxxx xxxxxxx xxx
```

### show system license usage

```
user@host> show system license usage
```

| Feature name            | Licenses<br>used | Licenses<br>installed | Licenses<br>needed | Expiry     |
|-------------------------|------------------|-----------------------|--------------------|------------|
| av_key_kaspersky_engine | 1                | 1                     | 0                  | 2012-03-30 |
| 01:00:00 IST            |                  |                       |                    |            |
| wf_key_surfcontrol_cpa  | 0                | 1                     | 0                  | 2012-03-30 |
| 01:00:00 IST            |                  |                       |                    |            |
| dynamic-vpn             | 0                | 1                     | 0                  | permanent  |
| ax411-wlan-ap           | 0                | 2                     | 0                  | permanent  |

### show system license status logical-system all

```
user@host> show system license status logical-system all
Logical system license status:
```

| logical system name | license status |
|---------------------|----------------|
| root-logical-system | enabled        |
| LSYS0               | enabled        |
| LSYS1               | enabled        |
| LSYS2               | enabled        |

## 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 538](#)
- [clear system login lockout on page 601](#)

**List of Sample Output** [show system login lockout on page 684](#)

**Output Fields** [Table 34 on page 684](#) lists the output fields for the `show system login lockout` command. Output fields are listed in the approximate order in which they appear.

**Table 34: show system login lockout**

| Field Name    | Field Description                       | Level of Output |
|---------------|-----------------------------------------|-----------------|
| User          | Username                                | All levels      |
| Lockout start | Date and time the username was locked   | All levels      |
| Lockout end   | Date and time the username was unlocked | All levels      |

## Sample Output

### show system login lockout

```
user@host> show system login lockout
```

```
User                Lockout start      Lockout end
root                2011-05-11 09:11:15 UTC 2011-05-11 09:13:15 UTC
```

## show system services dhcp client

|                                 |                                                                                                                                                                                                                                                                                        |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | EX Series, LN Series, SRX Series                                                                                                                                                                                                                                                       |
| <b>Syntax</b>                   | <pre>show system services dhcp client &lt; interface-name &gt; &lt;statistics&gt;</pre>                                                                                                                                                                                                |
| <b>Release Information</b>      | <p>Command introduced in Junos OS Release 8.5.</p> <p>Command introduced in Junos OS Release 9.0 for EX Series switches.</p>                                                                                                                                                           |
| <b>Description</b>              | Display information about DHCP clients.                                                                                                                                                                                                                                                |
| <b>Options</b>                  | <ul style="list-style-type: none"> <li>• <b>none</b>—Display DHCP information for all interfaces.</li> <li>• <b>interface-name</b>—(Optional) Display DHCP information for the specified interface.</li> <li>• <b>statistics</b>—(Optional) Display DHCP client statistics.</li> </ul> |
| <b>Required Privilege Level</b> | view and system                                                                                                                                                                                                                                                                        |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>dhcp (Interfaces)</i></li> <li>• <a href="#">request system services dhcp on page 631</a></li> <li>• <i>Administration Guide for Security Devices</i></li> </ul>                                                                           |
| <b>List of Sample Output</b>    | <a href="#">show system services dhcp client on page 686</a><br><a href="#">show system services dhcp client ge-0/0/34.0 on page 687</a><br><a href="#">show system services dhcp client statistics on page 687</a>                                                                    |
| <b>Output Fields</b>            | Table 35 on page 685 lists the output fields for the <b>show system services dhcp client</b> command. Output fields are listed in the approximate order in which they appear.                                                                                                          |

**Table 35: show system services dhcp client Output Fields**

| Field Name             | Field Description                                                      |
|------------------------|------------------------------------------------------------------------|
| Logical Interface Name | Name of the logical interface.                                         |
| Client Status          | State of the client binding.                                           |
| Vendor Identifier      | Vendor ID.                                                             |
| Server Address         | IP address of the DHCP server.                                         |
| Address obtained       | IP address obtained from the DHCP server.                              |
| Lease Obtained at      | Date and time the lease was obtained.                                  |
| Lease Expires in       | (EX Series switches only) Time the current lease expires in (seconds). |

Table 35: show system services dhcp client Output Fields (*continued*)

| Field Name        | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lease Expires at  | Date and time the lease expires.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| DHCP Options      | <ul style="list-style-type: none"> <li>• <b>Name:</b> server-identifier, <b>Value:</b> IP address of the name server.</li> <li>• <b>Name:</b> device, <b>Value:</b> IP address of the name device.</li> <li>• <b>Name:</b> domain-name, <b>Value:</b> Name of the domain.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Packets dropped   | Total packets dropped.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Messages received | <p>Number of the following DHCP messages received:</p> <ul style="list-style-type: none"> <li>• <b>DHCPOFFER</b>—First packet received on a logical interface when DHCP is enabled.</li> <li>• <b>DHCPACK</b>—When received from the server, the client sends an ARP request for that address and adds a (ARP response) timer for 4 seconds and stops the earlier timer added for DHCPACK.</li> <li>• <b>DHCPNAK</b>—When a DHCPNAK is received instead of DHCPACK, the logical interface sends a DHCPDISCOVER packet.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Messages sent     | <p>Number of the following DHCP messages sent:</p> <ul style="list-style-type: none"> <li>• <b>DHCPDECLINE</b>—Packet sent when ARP response is received and there is a conflict. The logical interface sends a new DHCPDISCOVER packet.</li> <li>• <b>DHCPDISCOVER</b>—Packet sent on the interface for which the DHCP client is enabled.</li> <li>• <b>DHCPREQUEST</b>—Packet sent to the DHCP server after accepting the DHCPOFFER. After sending the DHCPREQUEST, the device adds a retransmission-interval timer.</li> <li>• <b>DHCPINFORM</b>—Packet sent to the DHCP server for local configuration parameters.</li> <li>• <b>DHCPRELEASE</b>—Packet sent to the DHCP server to relinquish network address and cancel remaining lease.</li> <li>• <b>DHCPRENEW</b>—Packet sent to the DHCP server to renew the address. The next message to be sent will be a DHCPREQUEST message, which will be unicast directly to the server.</li> <li>• <b>DHCPREBIND</b>—Packet sent to any server to renew the address. The next message to be sent will be a DHCPREQUEST message, which will be broadcast.</li> </ul> |

## 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

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 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:
DHCPPOFFER           0
DHCPACK               8
DHCPNAK               0
Messages sent:
DHCPCDECLINE         0
DHCPDISCOVER         0
DHCPREQUEST           1
DHCPINFORM            0
DHCPRELEASE          0
DHCPRENEW             7
DHCPREBIND            0

```

## show system services dhcp relay-statistics

|                                 |                                                                                                                                                                                                         |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series, vSRX                                                                                                                                                                                        |
| <b>Syntax</b>                   | show system services dhcp relay-statistics                                                                                                                                                              |
| <b>Release Information</b>      | Command introduced in Junos OS Release 8.5 .                                                                                                                                                            |
| <b>Description</b>              | Display information about the DHCP relay.                                                                                                                                                               |
| <b>Required Privilege Level</b> | view and system                                                                                                                                                                                         |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li><i>dhcp</i></li> </ul>                                                                                                                                           |
| <b>List of Sample Output</b>    | <a href="#">show system services dhcp relay-statistics on page 688</a>                                                                                                                                  |
| <b>Output Fields</b>            | <a href="#">Table 36 on page 688</a> lists the output fields for the <b>show system services dhcp relay-statistics</b> command. Output fields are listed in the approximate order in which they appear. |

**Table 36: show system services dhcp relay-statistics Output Fields**

| Field Name        | Field Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Received packets  | Total DHCP packets received.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Forwarded packets | Total DHCP packet forwarded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Dropped packets   | <p>Total DHCP packets dropped for the following reasons:</p> <ul style="list-style-type: none"> <li>• <b>Due to a missing interface in the relay database</b>—Number of packets discarded because they did not belong to a configured interface.</li> <li>• <b>Due to a missing matching routing instance</b>—Number of packets discarded because they did not belong to a configured routing instance.</li> <li>• <b>Due to an error during packet read</b>—Number of packets discarded because of a system read error.</li> <li>• <b>Due to an error during packet send</b>—Number of packets that the DHCP relay application could not send.</li> <li>• <b>Due to an invalid server address</b>—Number of packets discarded because an invalid server address was specified.</li> <li>• <b>Due to a missing valid local address</b>—Number of packets discarded because there was no valid local address.</li> <li>• <b>Due to a missing route to the server or client</b>—Number of packets discarded because there were no addresses available for assignment.</li> </ul> |

## 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 Level** 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 690](#)  
[show system snapshot media usb on page 690](#)

### 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/da1s1a) (primary)
Creation date: Jul 24 16:16:01 2009
JUNOS version on snapshot:
  junos : 10.0I20090723_1017-domestic
Information for snapshot on      usb (/dev/da1s2a) (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)

|                                 |                                                                                                                                                           |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Platforms</b>      | SRX Series, vSRX                                                                                                                                          |
| <b>Syntax</b>                   | show system storage partitions                                                                                                                            |
| <b>Release Information</b>      | Command introduced in Junos OS Release 10.2 .                                                                                                             |
| <b>Description</b>              | Display the partitioning scheme details on SRX300, SRX320, SRX340, SRX345, and SRX550HM devices.                                                          |
| <b>Required Privilege Level</b> | View                                                                                                                                                      |
| <b>Related Documentation</b>    | <ul style="list-style-type: none"> <li>• <i>Example: Installing Junos OS on SRX Series Devices Using the Partition Option</i></li> </ul>                  |
| <b>List of Sample Output</b>    | <a href="#">show system storage partitions (single root partitioning) on page 691</a><br><a href="#">show system storage partitions (USB) on page 691</a> |

### 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: da1s1a
Backup Partition: da1s2a
Currently booted from: active (da1s1a)
```

```
Partitions Information:
Partition  Size  Mountpoint
s1a       293M  /
s2a       293M  altroot
```

|     |      |          |
|-----|------|----------|
| s3e | 24M  | /config  |
| s3f | 342M | /var     |
| s4a | 30M  | recovery |