



JUNOS™ Software

Access Privilege Configuration Guide

Release 8.5

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JUNOS™ Software Access Privilege Configuration Guide

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Configuring Access Privileges

Chapter 1

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About This Guide

This preface provides the following guidelines for using the *JUNOS™ Software Access Privilege Configuration Guide*:

- Objectives on page ix
- Audience on page x
- Supported Routing Platforms on page x
- Documentation Conventions on page x
- List of Technical Publications on page xii
- Documentation Feedback on page xvi
- Requesting Support on page xvi

Objectives

This guide describes how to configure access privileges for login classes in order to restrict the commands and statements available to users who manage your router. It also provides a list of permission flags and their corresponding command-line interface (CLI) operational mode commands and configuration statements.



NOTE: This guide documents Release 8.5 of the JUNOS software. For additional information about the JUNOS software—either corrections to or information that might have been omitted from this guide—see the software release notes at <http://www.juniper.net/>.

For information about configuration statements and guidelines related to the commands described in this reference, see the following configuration guides:

- *JUNOS CLI User Guide*
- *JUNOS Software Installation and Upgrade Guide*
- *JUNOS System Basics Configuration Guide*
- *JUNOScript API Guide*
- *JUNOS Network Management Configuration Guide*

Audience

This guide is designed for network administrators who are configuring and monitoring a Juniper Networks M-series, MX-series, T-series, or J-series routing platform.

To use this guide, you need to know how to use the JUNOS command-line interface (CLI) operational mode commands and configuration statements. For more information about the JUNOS operational commands and configuration statements, see the *JUNOS CLI User Guide*.

Supported Routing Platforms

For the features described in this manual, the JUNOS software currently supports the following routing platforms:

- J-series
- M-series
- MX-series
- T-series

Documentation Conventions

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

Table 1: Notice Icons



Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.

Table 2 on page x defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the <code>configure</code> command: user@host> configure
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active

Table 2: Text and Syntax Conventions (continued)

Convention	Description	Examples
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces important new terms. Identifies book names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>JUNOS System Basics Configuration Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<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@# set system domain-name <i>domain-name</i>
Plain text like this	Represents names of configuration statements, commands, files, and directories; IP addresses; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Enclose optional keywords or variables.	stub <default-metric <i>metric</i> >;
(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.	broadcast multicast (<i>string1</i> <i>string2</i> <i>string3</i>)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Enclose a variable for which you can substitute one or more values.	community name members [<i>community-ids</i>]
Indentation and braces ({ })	Identify 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.	
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> In the Logical Interfaces box, select All Interfaces. To cancel the configuration, click Cancel.
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web selections.	In the configuration editor hierarchy, select Protocols > Ospf .

List of Technical Publications

Table 3 on page xii lists the software and hardware guides and release notes for Juniper Networks J-series, M-series, MX-series, and T-series routing platforms and describes the contents of each document. Table 4 on page xv lists the books included in the *Network Operations Guide* series.

Table 3: Technical Documentation for Supported Routing Platforms

Book	Description
JUNOS Internet Software for Supported Routing Platforms	
<i>Class of Service</i>	Provides an overview of the class-of-service (CoS) functions of the JUNOS software and describes how to configure CoS features, including configuring multiple forwarding classes for transmitting packets, defining which packets are placed into each output queue, scheduling the transmission service level for each queue, and managing congestion through the random early detection (RED) algorithm.
<i>CLI User Guide</i>	Describes how to use the JUNOS command-line interface (CLI) to configure, monitor, and manage Juniper Networks routing platforms. This material was formerly covered in the <i>JUNOS System Basics Configuration Guide</i> .
<i>Feature Guide</i>	Provides a detailed explanation and configuration examples for several of the most complex features in the JUNOS software.
<i>High Availability Guide</i>	Provides an overview of hardware and software resources that ensure a high level of continuous routing platform operation and describes how to configure high availability (HA) features such as nonstop routing (NSR) and graceful Routing Engine switchover (GRES).
<i>MPLS Applications</i>	Provides an overview of traffic engineering concepts and describes how to configure traffic engineering protocols.
<i>Multicast Protocols</i>	Provides an overview of multicast concepts and describes how to configure multicast routing protocols.
<i>Network Interfaces</i>	Provides an overview of the network interface functions of the JUNOS software and describes how to configure the network interfaces on the routing platform.
<i>Network Management</i>	Provides an overview of network management concepts and describes how to configure various network management features, such as SNMP and accounting options.
<i>Policy Framework</i>	Provides an overview of policy concepts and describes how to configure routing policy, firewall filters, and forwarding options.
<i>Routing Protocols</i>	Provides an overview of routing concepts and describes how to configure routing, routing instances, and unicast routing protocols.

Table 3: Technical Documentation for Supported Routing Platforms (continued)

Book	Description
<i>Secure Configuration Guide for Common Criteria and JUNOS-FIPS</i>	Provides an overview of secure Common Criteria and JUNOS-FIPS protocols for the JUNOS Internet software and describes how to install and configure secure Common Criteria and JUNOS-FIPS on a routing platform.
<i>Services Interfaces</i>	Provides an overview of the services interfaces functions of the JUNOS software and describes how to configure the services interfaces on the router.
<i>Software Installation and Upgrade Guide</i>	Provides a description of JUNOS software components and packaging, and includes detailed information about how to initially configure, reinstall, and upgrade the JUNOS system software. This material was formerly covered in the <i>JUNOS System Basics Configuration Guide</i> .
<i>System Basics</i>	Describes Juniper Networks routing platforms, and provides information about how to configure basic system parameters, supported protocols and software processes, authentication, and a variety of utilities for managing your router on the network.
<i>VPNs</i>	Provides an overview and describes how to configure Layer 2 and Layer 3 virtual private networks (VPNs), virtual private LAN service (VPLS), and Layer 2 circuits. Provides configuration examples.
JUNOS References	
<i>Hierarchy and RFC Reference</i>	Describes the JUNOS configuration mode commands. Provides a hierarchy reference that displays each level of a configuration hierarchy, and includes all possible configuration statements that can be used at that level. This material was formerly covered in the <i>JUNOS System Basics Configuration Guide</i> .
<i>Interfaces Command Reference</i>	Describes the JUNOS software operational mode commands you use to monitor and troubleshoot interfaces.
<i>Routing Protocols and Policies Command Reference</i>	Describes the JUNOS software operational mode commands you use to monitor and troubleshoot routing policies and protocols, including firewall filters.
<i>System Basics and Services Command Reference</i>	Describes the JUNOS software operational mode commands you use to monitor and troubleshoot system basics, including commands for real-time monitoring and route (or path) tracing, system software management, and chassis management. Also describes commands for monitoring and troubleshooting services such as class of service (CoS), IP Security (IPSec), stateful firewalls, flow collection, and flow monitoring.
<i>System Log Messages Reference</i>	Describes how to access and interpret system log messages generated by JUNOS software modules and provides a reference page for each message.
J-Web User Guide	
<i>J-Web Interface User Guide</i>	Describes how to use the J-Web graphical user interface (GUI) to configure, monitor, and manage Juniper Networks routing platforms.

Table 3: Technical Documentation for Supported Routing Platforms (continued)

Book	Description
JUNOS API and Scripting Documentation	
<i>JUNOScript API Guide</i>	Describes how to use the JUNOScript application programming interface (API) to monitor and configure Juniper Networks routing platforms.
<i>JUNOS XML API Configuration Reference</i>	Provides reference pages for the configuration tag elements in the JUNOS XML API.
<i>JUNOS XML API Operational Reference</i>	Provides reference pages for the operational tag elements in the JUNOS XML API.
<i>NETCONF API Guide</i>	Describes how to use the NETCONF API to monitor and configure Juniper Networks routing platforms.
<i>JUNOS Configuration and Diagnostic Automation Guide</i>	Describes how to use the commit script and self-diagnosis features of the JUNOS software. This guide explains how to enforce custom configuration rules defined in scripts, how to use commit script macros to provide simplified aliases for frequently used configuration statements, and how to configure diagnostic event policies.
Hardware Documentation	
<i>Hardware Guide</i>	Describes how to install, maintain, and troubleshoot routing platforms and components. Each platform has its own hardware guide.
<i>PIC Guide</i>	Describes the routing platform's Physical Interface Cards (PICs). Each platform has its own PIC guide.
JUNOScope Documentation	
<i>JUNOScope Software User Guide</i>	Describes the JUNOScope software graphical user interface (GUI), how to install and administer the software, and how to use the software to manage routing platform configuration files and monitor routing platform operations.
J-series Routing Platform Documentation	
<i>Getting Started Guide</i>	Provides an overview, basic instructions, and specifications for J-series routing platforms. The guide explains how to prepare your site for installation, unpack and install the router and its components, install licenses, and establish basic connectivity. Use the Getting Started Guide for your router model.
<i>Basic LAN and WAN Access Configuration Guide</i>	Explains how to configure the interfaces on J-series Services Routers for basic IP routing with standard routing protocols, ISDN backup, and digital subscriber line (DSL) connections.
<i>Advanced WAN Access Configuration Guide</i>	Explains how to configure J-series Services Routers in virtual private networks (VPNs) and multicast networks, configure data link switching (DLSw) services, and apply routing techniques such as policies, stateless and stateful firewall filters, IP Security (IPSec) tunnels, and class-of-service (CoS) classification for safer, more efficient routing.

Table 3: Technical Documentation for Supported Routing Platforms (continued)

Book	Description
<i>Administration Guide</i>	Shows how to manage users and operations, monitor network performance, upgrade software, and diagnose common problems on J-series Services Routers.
Release Notes	
<i>JUNOS Release Notes</i>	Summarize new features and known problems for a particular software release, provide corrections and updates to published JUNOS, JUNOScript, and NETCONF manuals, provide information that might have been omitted from the manuals, and describe upgrade and downgrade procedures.
<i>Hardware Release Notes</i>	Describe the available documentation for the routing platform and summarize known problems with the hardware and accompanying software. Each platform has its own release notes.
<i>JUNOScope Release Notes</i>	Contain corrections and updates to the published JUNOScope manual, provide information that might have been omitted from the manual, and describe upgrade and downgrade procedures.
<i>J-series Services Router Release Notes</i>	Briefly describe Services Router features, identify known hardware problems, and provide upgrade and downgrade instructions

Table 4: JUNOS Internet Software Network Operations Guides

Book	Description
<i>Baseline</i>	Describes the most basic tasks for running a network using Juniper Networks products. Tasks include upgrading and reinstalling JUNOS software, gathering basic system management information, verifying your network topology, and searching log messages.
<i>Interfaces</i>	Describes tasks for monitoring interfaces. Tasks include using loopback testing and locating alarms.
<i>MPLS</i>	Describes tasks for configuring, monitoring, and troubleshooting an example MPLS network. Tasks include verifying the correct configuration of the MPLS and RSVP protocols, displaying the status and statistics of MPLS running on all routing platforms in the network, and using the layered MPLS troubleshooting model to investigate problems with an MPLS network.
<i>MPLS Log Reference</i>	Describes MPLS status and error messages that appear in the output of the show mpls lsp extensive command. The guide also describes how and when to configure Constrained Shortest Path First (CSPF) and RSVP trace options, and how to examine a CSPF or RSVP failure in a sample network.
<i>Hardware</i>	Describes tasks for monitoring M-series and T-series routing platforms.

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Part 1

Configuring Access Privileges

- Configuring and Customizing Access Privileges on page 3
- User Permission Flags on page 13

Chapter 1

Configuring and Customizing Access Privileges

This chapter provides information about how you can configure user access privileges. It covers the use of permission flags for configuring user access privilege levels, and the use of regular expressions for configuring access to individual commands and statements.

- Using Permission Flags to Configure Access on page 3
- Allowing or Denying Individual Commands on page 6

Using Permission Flags to Configure Access

Each top-level command-line interface (CLI) operational mode command and each configuration statement is associated with an access privilege level. Users can execute only those commands and configure and view only those statements for which they have access privileges. The privilege level for each command and statement is listed along with other details. The access privileges for each login class are defined by one or more *permission flags*. Table 5 on page 4 lists permission flags and their associated commands and statements.

To configure access privilege levels, include the `permissions` statement at the `[edit system login class class-name]` hierarchy level:

```
[edit system login class class-name]  
permissions [ permissions ];
```

permissions specifies one or more of the permission flags listed in Table 5 on page 4. Permission flags are not cumulative, so you must list all the bits needed for each login class, including `view` to display information and `configure` to enter configuration mode. Two forms of permissions control the individual parts of the configuration:

- Plain form—Provides read-only capability for that permission type; for example, `interface`.
- Form that ends in `-control`—Provides read and write capability for that permission type; for example, `interface-control`.

Table 5: Login Class Permission Flags

Permission Flag	Description
access	Can view the access configuration in configuration mode using the show configuration operational mode command.
access-control	Can view and configure access information at the [edit access] hierarchy level.
admin	Can view user account information in configuration mode and with the show configuration command.
admin-control	Can view user accounts and configure them at the [edit system login] hierarchy level.
all	Has all permissions.
clear	Can clear (delete) information learned from the network that is stored in various network databases using the clear commands.
configure	Can enter configuration mode using the configure command.
control	Can perform all control-level operations—all operations configured with the -control permission flags.
field	Reserved for field (debugging) support.
firewall	Can view the firewall filter configuration in configuration mode.
firewall-control	Can view and configure firewall filter information at the [edit firewall] hierarchy level.
floppy	Can read from and write to the removable media.
flow-tap	Can view the flow-tap configuration in configuration mode.
flow-tap control	Can view the flow-tap configuration in configuration mode and can configure flow-tap configuration information at the [edit services flow-tap] hierarchy level.
flow-tap-operation	Can make flow-tap requests to the router. For example, a Dynamic Tasking Control Protocol (DTCP) client must authenticate itself to JUNOS as an administrative user. That account must have flow-tap-operation permission. NOTE: flow-tap operation is not included in the all permission.
interface	Can view the interface configuration in configuration mode and with the show configuration operational mode command.
interface-control	Can view the interface configuration in configuration mode and with the show configuration operational mode command.
maintenance	Can perform system maintenance, including starting a local shell on the router and becoming the superuser in the shell using the su root command, and can halt and reboot the router using the request system commands.
network	Can access the network by entering the ping , SSH , telnet , and traceroute commands.
reset	Can restart software processes using the restart command and can configure whether software processes are enabled or disabled at the [edit system processes] hierarchy level.

Table 5: Login Class Permission Flags (continued)

Permission Flag	Description
rollback	Can use the rollback command to return to a previously committed configuration other than the most recently committed one.
routing	Can view general routing, routing protocol, and routing policy configuration information in configuration and operational modes.
routing-control	Can view general routing, routing protocol, and routing policy configuration information and configure general routing at the [edit routing-options] hierarchy level, routing protocols at the [edit protocols] hierarchy level, and routing policy at the [edit policy-options] hierarchy level.
secret	Can view passwords and other authentication keys in the configuration.
secret-control	Can view passwords and other authentication keys in the configuration and can modify them in configuration mode.
security	Can view security configuration in configuration mode and with the show configuration operational mode command.
security-control	Can view and configure security information at the [edit security] hierarchy level.
shell	Can start a local shell on the router by entering the start shell command.
snmp	Can view Simple Network Management Protocol (SNMP) configuration information in configuration and operational modes.
snmp-control	Can view SNMP configuration information and modify SNMP configuration at the [edit snmp] hierarchy level.
system	Can view system-level information in configuration and operational modes.
system-control	Can view system-level configuration information and configure it at the [edit system] hierarchy level.
trace	Can view trace file settings in configuration and operational modes.
trace-control	Can view trace file settings and configure trace file properties.
view	Can use various commands to display current systemwide, routing table, and protocol-specific values and statistics. Cannot view secret configuration.

Example: Configuring Access Privilege Levels

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

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

```

        permissions [ configure snmp snmp-control ];
    }
}

```

Allowing or Denying 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 would otherwise be permitted or not allowed by a privilege level specified in the **permissions** statement. For information about CLI commands, see the *JUNOS CLI User Guide*.



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

Expressions used to allow and deny commands for users on RADIUS/TACACS+ servers have been simplified. Instead of a single, long expression with multiple commands (For example, **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-command**, **deny-command**, and **user-permissions**.

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

This section describes how to define a user's access privileges to individual operational and configuration mode commands. It contains the following topics:

- Specifying Operational Mode Commands on page 6
- Specifying Configuration Mode Commands on page 9

Specifying Operational Mode Commands

You can specify extended regular expressions with the **allow-commands** and **deny-commands** statements to define a user's access privileges to individual operational commands. Doing so takes precedence over login class permission flags set for a user. You can include one **deny-commands** statement and one **allow-commands** statement in each login class.

To explicitly allow an individual operational mode command that would otherwise be denied, include the **allow-commands** statement at the **[edit system login class *class-name*]** hierarchy level:

```

[edit system login class class-name]
  allow-command "regular-expression";

```

To explicitly deny an individual operational mode command that would otherwise be allowed, include the `deny-commands` statement at the `[edit system login class class-name]` hierarchy level:

```
[edit system login class class-name]
deny-command "regular-expression";
```

If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks. Regular expressions are not case-sensitive.

Use extended regular expressions to specify which operational mode commands are denied or allowed. You specify these regular expressions in the `allow-commands` and `deny-commands` statements at the `[edit system login class]` hierarchy level, or by specifying attributes specific to JUNOS in your TACACS+ or RADIUS authentication server configuration. You must specify that these regular expressions are sent as the value of Juniper vendor-specific attributes. If regular expressions are received during TACACS+ or RADIUS authentication, they merge with any regular expressions configured on the local router. For information about TACACS+ or RADIUS authentication, see the *JUNOS System Basics Configuration Guide*.

Command regular expressions implement the extended (modern) regular expressions as defined in POSIX 1003.2. Table 6 on page 7 lists common regular expression operators.

Table 6: Common Regular Expression Operators to Allow or Deny Operational Mode Commands

Operator	Match...
	One of two or more terms separated by the pipe. Each term must be a complete standalone expression enclosed in parentheses (), with no spaces between the pipe and the adjacent parentheses. For example, <code>(show system alarms) (show system software)</code> .
^	At the beginning of an expression, used to denote where the command begins, and where there might be some ambiguity.
\$	Character at the end of a command. Used to denote a command that must be matched exactly up to that point. For example, <code>allow-commands "show interfaces\$"</code> means that the user can issue the <code>show interfaces</code> command but cannot issue the <code>show interfaces detail</code> or <code>show interfaces extensive</code> command.
[]	Range of letters or digits. To separate the start and end of a range, use a hyphen (-).
()	A group of commands, indicating a complete, standalone expression to be evaluated; the result is then evaluated as part of the overall expression. Parentheses must always be used in conjunction with pipe operators as explained above.

If a regular expression contains a syntax error, it becomes invalid, and although the user can log in, the permission granted or denied by the regular expression does not take effect. When regular expressions configured on TACACS+ or RADIUS servers are merged with regular expressions configured on the router and the final expression has a syntax error, the overall result is an invalid regular expression. If a regular

expression does not contain any operators, all varieties of the command are allowed. For example, if the following statement is included in the configuration, the user can issue the commands `show interfaces detail` and `show interfaces extensive` in addition to showing an individual interface:

```
allow-commands "show interfaces"
```

Example: Defining Access Privileges to Individual Operational Mode Commands

The following examples define user access privileges to individual operational mode commands.

If the following statement is included in the configuration and the user does not have the `configure` login class permission flag, the user can enter configuration mode:

```
[edit system login class class-name]
user@host# set allow-commands configure
```

If the following statement is included in the configuration and the user does not have the `configure` login class permission flag, the user can enter configuration exclusive mode:

```
[edit system login class class-name]
user@host# set allow-commands "configure exclusive"
```



NOTE: You cannot use runtime variables. In the following example, the runtime variable `1.2.3.4` cannot be used:

```
[edit system login class class-name]
user@host# set deny "show bgp neighbor 1.2.3.4"
```

Example: Configuring Access Privileges to Individual Operational Mode Commands

Configure permissions for individual operational mode commands:

```
[edit]
system {
  login {
    # This login class has operator privileges and the additional ability to
    # reboot the router.
    class operator-and-boot {
      permissions [ clear network reset trace view ];
      allow-commands "request system reboot";
    }
    # This login class has operator privileges but can't use any command that
    # begins with "set."
    class operator-no-set {
      permissions [ clear network reset trace view ];
      deny-commands "^set";
    }
  }
}
```

```

}
# This login class has operator privileges and can install software but not
# view bgp information; and can invoke show route without specifying commands
# or arguments under it.
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";
}
}
}

```

Specifying Configuration Mode Commands

You can specify extended regular expressions with the `allow-configuration` and `deny-configuration` attributes to define user access privileges to parts of the configuration hierarchy or individual configuration mode commands. Doing so overrides any login class permission flags set for a user. You can also use wildcards to restrict access. When you define access privileges to parts of the configuration hierarchy or individual configuration mode commands, do the following:

- Specify the full paths in the extended regular expressions with the `allow-configuration` and `deny-configuration` attributes.
- Enclose parentheses around an extended regular expression that connects two or more expressions with the pipe `|` symbol. For example:

```

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

```



NOTE: Each expression separated by a pipe `|` symbol must be a complete standalone expression, and must be enclosed with parentheses `()`. Do not use spaces between regular expressions separated by parentheses and connected with the pipe `|` symbol. You cannot define access to keywords such as `set`, `edit`, or `activate`.

For more information about how to use wildcards, see Table 7 on page 10.

To explicitly allow an individual configuration mode command that would otherwise be denied, include the `allow-configuration` statement at the `[edit system login class class-name]` hierarchy level:

```

[edit system login class class-name]
allow-configuration "regular-expression";

```

To explicitly deny an individual configuration mode command that would otherwise be allowed, include the `deny-configuration` statement at the `[edit system login class class-name]` hierarchy level:

```

[edit system login class class-name]
deny-configuration "regular-expression";

```

If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks. Regular expressions are not case-sensitive.

You can include one `deny-configuration` and one `allow-configuration` statement in each login class.

Use extended regular expressions to specify which configuration mode commands are denied or allowed. You specify these regular expressions in the `allow-configuration` and `deny-configuration` statements at the `[edit system login class]` hierarchy level, or by specifying attributes, that are specific to JUNOS, in your TACACS+ or RADIUS authentication server's configuration. You must specify that these regular expressions are sent as the value of Juniper vendor-specific attributes. If regular expressions are received during TACACS+ or RADIUS authentication, they merge with any regular expressions configured on the local router. For information about TACACS+ or RADIUS authentication, see the *JUNOS System Basics Configuration Guide*.

Command regular expressions implement the extended (modern) regular expressions, as defined in POSIX 1003.2. Table 7 on page 10 lists common regular expression operators.

Table 7: Configuration Mode Commands—Common Regular Expression Operators

Operator	Match...
	One of two or more terms separated by the pipe. Each term must be a complete standalone expression enclosed in parentheses (), with no spaces between the pipe and the adjacent parentheses. For example, <code>(show system alarms) (show system software)</code> .
^	At the beginning of an expression, used to denote where the command begins, and where there might be some ambiguity.
\$	Character at the end of a command. Used to denote a command that must be matched exactly up to that point. For example, <code>allow-commands "show interfaces\$"</code> means that the user can issue the <code>show interfaces</code> command but cannot issue the <code>show interfaces detail</code> or <code>show interfaces extensive</code> command.
[]	Range of letters or digits. To separate the start and end of a range, use a hyphen (-).
()	A group of commands indicating a complete, standalone expression to be evaluated; the result is then evaluated as part of the overall expression. Parentheses must always be used in conjunction with pipe operators as explained above.
*	Zero or more terms.
+	One or more terms.
.	Any character except for a space " ".

Example: Defining Access Privileges to Individual Configuration Mode Commands

The following examples show how to configure access privileges to individual configuration mode commands.

If the following statement is included in the configuration and the user's login class permission flag is set to all, the user cannot configure telnet parameters:

```
[edit system login class class-name]
user@host# set deny-configuration "system services telnet"
```

If the following statement is included in the configuration and the user's login class permission flag is set to all, the user cannot issue login class commands within any login class whose name begins with the letter *m*:

```
[edit system login class class-name]
user@host# set deny-configuration "system login class m.*"
```

If the following statement is included in the configuration and the user's login class permission flag is set to all, the user cannot issue configuration mode commands at the system login class or system services hierarchy levels:

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

Example: Configuring Access Privileges to Individual Configuration Mode Commands

Configure permissions for individual configuration mode commands:

```
[edit]
system {
  login {
    # This login class has operator privileges and the additional ability to
    # issue commands at the system services hierarchy.
    class only-system-services {
      permissions [ configure ];
      allow-configuration "system services";
    }
    # This login class has operator privileges but can't issue any system
    # services commands.
    class all-except-system-services {
      permissions [ all ];
      deny-configuration "system services";
    }
  }
}
```


Chapter 2

User Permission Flags

This chapter provides details about the permission flags that grant access to operational mode commands and configuration statements.



NOTE: Only permission flags that grant a specific set of access privileges are listed in this chapter. Those permission flags that provide no access, or provide access to all commands and statements do not appear in this list. For a complete list of permission flags, please see Table 5 on page 4.

Permission flags are used to grant a user access to operational commands and configuration statements. By specifying a specific permission flag on that user's login class at the [edit system login class] hierarchy level, you grant the user access to the corresponding commands and configuration statements. To grant access to all commands and configuration statements, use the **all** permission flag.

For permission flags that grant access to configuration statements, the flag grants read-only privilege to that configuration. For example, the **interface** permission 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 above example, **interface-control** grants read-write access to the [edit interfaces] hierarchy level.



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.

The permission flags that effect access to operational mode commands and configuration statements are listed in alphabetical order below. Each permission flag is listed with the operational commands and configuration statements for which that flag grants access.

- access on page 14
- admin on page 14
- clear on page 15
- configure on page 18
- control on page 18

- firewall on page 18
- flow-tap on page 18
- interface on page 19
- maintenance on page 19
- network on page 22
- reset on page 23
- routing on page 23
- secret on page 25
- security on page 26
- shell on page 27
- snmp on page 27
- system on page 27
- trace on page 28
- view on page 31

access

	Can view access configuration in configuration mode.
Commands	No associated CLI commands.
Statements	[edit access]

admin

	Can view user account information in configuration mode.
Commands	show system audit
Statements	[edit system] [edit system accounting] [edit system diag-port-authentication] [edit system login] [edit system pic-console-authentication] [edit system root-authentication] [edit system services ssh protocol-version] [edit system services ssh root-login]

clear

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

Commands

```

clear
clear arp
<clear-arp-table>
clear bfd
clear bfd adaptation
clear bfd adaptation address
clear bfd adaptation discriminator
clear bfd session
clear bfd session address
clear bfd session discriminator
clear bgp
clear bgp damping
clear bgp neighbor
clear bgp table
clear bridge
clear bridge mac-table
<clear-bridge-mac-table>
clear bridge mac-table interface
<clear-bridge-interface-mac-table>
clear cli
clear cli logical-router
clear dhcp
clear dhcp relay
clear dhcp relay binding
<clear-dhcp-relay-binding-information>
clear dhcp relay binding all
clear dhcp relay binding interface
clear dhcp relay statistics
<clear-dhcp-relay-statistics-information>
clear dhcp server
clear dhcp server binding
<clear-dhcp-server-binding-information>
clear dhcp server binding all
clear dhcp server binding interface
clear dhcp server statistics
<clear-server-statistics-information>
clear esis
clear esis adjacency
clear esis statistics
clear firewall
clear firewall all
clear helper
clear helper statistics
<clear-helper-statistics-information>
clear igmp
clear igmp membership
clear igmp snooping
clear igmp snooping membership
clear igmp snooping statistics
clear igmp statistics
clear ike

```

```
clear ike security-associations
clear ilmi
clear ilmi statistics
clear interfaces
clear interfaces interface-set
clear interfaces interface-set statistics
clear interfaces interface-set statistics all
clear interfaces interval
clear interfaces mac-database
clear interfaces mac-database statistics
clear interfaces mac-database statistics all
clear interfaces statistics
clear interfaces statistics all
clear ipsec
clear ipsec security-associations
clear ipv6
clear ipv6 neighbors
<clear-ipv6-nd-information>
clear ipv6 neighbors all
clear isis
clear isis adjacency
clear isis database
clear isis overload
clear isis statistics
clear ldp
clear ldp neighbor
clear ldp session
clear mld
clear mld membership
clear mld statistics
clear mpls
clear mpls lsp
clear mpls traceroute
clear mpls traceroute database
clear mpls traceroute database ldp
clear msdp
clear msdp cache
clear msdp statistics
clear multicast
clear multicast bandwidth-admission
clear multicast scope
clear multicast sessions
clear multicast statistics
clear network-access
clear network-access requests
clear network-access requests pending
<clear-authentication-pending-table>
clear network-access requests statistics
<clear-authentication-statistics>
clear oam
clear oam ethernet
clear oam ethernet connectivity-fault-management
clear oam ethernet connectivity-fault-management statistics
clear oam ethernet link-fault-management
clear oam ethernet link-fault-management state
clear oam ethernet link-fault-management statistics
```

```
clear oam ethernet link-fault-management statistics action-profile
clear ospf
clear ospf database
clear ospf io-statistics
clear ospf neighbor
clear ospf overload
clear ospf statistics
clear ospf3
clear ospf3 database
clear ospf3 io-statistics
clear ospf3 neighbor
clear ospf3 statistics
clear pgm
clear pgm negative-acknowledgments
clear pgm source-path-messages
clear pgm statistics
clear pim
clear pim join
clear pim register
clear pim statistics
clear ppp
clear ppp statistics
<clear-ppp-statistics-information>
clear pppoe
clear pppoe sessions
clear pppoe statistics
clear pppoe statistics interfaces
clear rip
clear rip general-statistics
clear rip statistics
clear ripng
clear ripng general-statistics
clear ripng statistics
clear rsvp
clear rsvp session
clear rsvp statistics
clear services ipsec-vpn ike
clear services ipsec-vpn ike security-associations
clear snmp
clear snmp statistics
clear spanning-tree
clear spanning-tree statistics
clear spanning-tree statistics interface
clear spanning-tree statistics routing-instance
clear system
<clear-dhcp-binding-information>
<clear-dhcp-conflict-information>
<clear-dhcp-statistics-information>
clear tgm
clear vpls
clear vpls mac-address
clear vpls mac-table
<clear-vpls-mac-table>
clear vpls mac-table interface
<clear-vpls-interface-mac-table>
clear vrrp
```

```
clear vrrp interface
request services ipsec-vpn ipsec
request services ipsec-vpn ipsec switch
request services ipsec-vpn ipsec switch tunnel
```

Statements No associated configuration statements.

configure

Can enter configuration mode.

Commands configure
request snmp

Statements No associated configuration statements.

control

Can perform all control-level operations; can modify any configuration.

Commands test
test configuration

Statements No associated configuration statements.

firewall

Can view firewall filter configuration in configuration mode.

Commands show firewall
<get-firewall-information>
show firewall counter
<get-firewall-counter-information>
show firewall filter
<get-firewall-filter-information>
show firewall log
<get-firewall-log-information>
show firewall prefix-action-stats
<get-firewall-prefix-action-information>
show policer

Statements [edit firewall]

flow-tap

Can view the flow-tap configuration in configuration mode.

Commands	No associated CLI commands.
Statements	[edit services flow-tap] [edit system services flow-tap-dtcp]

interface

Can view interface configuration in configuration mode

Commands	No associated CLI commands.
Statements	[edit accounting-options] [edit chassis] [edit class-of-service] [edit class-of-service interfaces] [edit forwarding-options] [edit interfaces] [edit logical-routers forwarding-options] [edit logical-routers routing-instances instance system services dhcp-local-server] [edit logical-routers system services dhcp-local-server] [edit routing-instances instance system services dhcp-local-server] [edit services logging] [edit system services dhcp-local-server]

maintenance

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 reboot <clear-reboot> clear tgm fpc <clear-tgm-media-gateway-controller> file archive monitor traffic request chassis cb request chassis cfeb request chassis cfeb master request chassis fabric request chassis fabric plane request chassis feb <request-feb> request chassis fpc request chassis mcs request chassis pcg request chassis pic request chassis redundancy request chassis redundancy feb <request-redundancy-feb> request chassis scg request chassis sfm request chassis sfm master
-----------------	--

```
request chassis sib
request chassis spmb
request chassis ssb
request chassis ssb master
request chassis synchronization
request chassis synchronization switch
request mpls
request mpls lsp
request mpls lsp adjust-autobandwidth
request security
request security certificate
request security certificate enroll
request security key-pair
request security pki
request security pki ca-certificate
request security pki ca-certificate enroll
request security pki ca-certificate load
request security pki crl
request security pki crl load
request security pki generate-certificate-request
request security pki generate-key-pair
request security pki local-certificate
request security pki local-certificate enroll
request security pki local-certificate load
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 support
request support information
request system
request system certificate
request system certificate add
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 firmware
request system firmware downgrade
request system firmware downgrade feb
request system firmware downgrade fpc
request system firmware downgrade pic
request system firmware downgrade scb
request system firmware downgrade sfm
request system firmware downgrade spmb
request system firmware downgrade ssb
request system firmware upgrade
request system firmware upgrade feb
request system firmware upgrade fpc
request system firmware upgrade pic
```

```

request system firmware upgrade scb
request system firmware upgrade sfm
request system firmware upgrade spmb
request system firmware upgrade ssb
request system halt
<request-halt>
request system license
request system license add
request system license delete
<request-license-delete>
request system license save
request system logout
request system partition
request system partition abort
request system partition hard-disk
request system power-off
<request-power-off>
request system power-on
request system power-on other-routing-engine
request system reboot
<request-reboot>
request system scripts
request system scripts convert
request system scripts convert slax-to-xslt
request system scripts convert xslt-to-slax
request system services
request system services web-management
request system services web-management task
request system services web-management task close
<request-background-task-close>
request system services web-management task close mgd-execute-as-user
request system services web-management task signal
<request-background-task-signal>
request system services web-management task signal mgd-execute-as-user
request system services web-management task start
request system services web-management task start junoscript
<request-background-task-start-junoscript>
request system services web-management task start junoscript mgd-execute-as-user
request system snapshot
<request-snapshot>
request system software
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 rollback
<request-package-rollback>
request system software validate
<request-package-validate>
request system storage
request system storage cleanup
<request-system-storage-cleanup>
request system zeroize
set date

```

```

set date ntp
set tgm
set tgm fpc
<set-tgm-media-gateway-controller>
show services fips
start shell
start shell user
test

```

Statements

```

[edit event-options]
[edit security ipsec internal]
[edit system processes daemon-process command]
[edit system scripts]
[edit system scripts commit]
[edit system scripts op]

```

network

Can access the network 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 mpls
ping mpls l2circuit
ping mpls l2circuit interface
ping mpls l2circuit virtual-circuit
ping mpls l2vpn
ping mpls l2vpn instance
ping mpls l2vpn interface
ping mpls l3vpn
ping mpls ldp
ping mpls lsp-end-point
ping mpls rsvp
request routing-engine
request routing-engine login
request routing-engine login 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 mrimfo
ssh
telnet
traceroute
<traceroute>
traceroute clns
traceroute ethernet

```

traceroute monitor
 traceroute mpls
 traceroute mpls ldp

Statements No associated configuration statements.

reset

Can restart software processes, and can configure whether software processes are enabled or disabled.

Commands request chassis cfeb master switch
 request chassis cfeb master switch 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 routing
 restart web-management

Statements No associated configuration statements.

routing

Can view general routing, routing protocol, and routing policy configuration information.

Commands No associated CLI commands.

Statements [edit bridge-domains]
 [edit bridge-domains domain multicast-snooping-options]
 [edit bridge-domains domain multicast-snooping-options traceoptions]
 [edit logical-routers policy-options]
 [edit logical-routers protocols]
 [edit logical-routers protocols bgp group neighbor traceoptions]
 [edit logical-routers protocols bgp group traceoptions]
 [edit logical-routers protocols bgp traceoptions]
 [edit logical-routers protocols dvmrp traceoptions]
 [edit logical-routers protocols esis traceoptions]
 [edit logical-routers protocols igmp traceoptions]
 [edit logical-routers protocols isis traceoptions]
 [edit logical-routers protocols l2circuit traceoptions]
 [edit logical-routers protocols ldp traceoptions]
 [edit logical-routers protocols mld traceoptions]
 [edit logical-routers protocols msdp group peer traceoptions]
 [edit logical-routers protocols msdp group traceoptions]
 [edit logical-routers protocols msdp peer traceoptions]
 [edit logical-routers protocols msdp traceoptions]
 [edit logical-routers protocols ospf traceoptions]
 [edit logical-routers protocols ospf3 traceoptions]

```

[edit logical-routers protocols pim traceoptions]
[edit logical-routers protocols rip traceoptions]
[edit logical-routers protocols ripng traceoptions]
[edit logical-routers protocols router-advertisement traceoptions]
[edit logical-routers protocols router-discovery traceoptions]
[edit logical-routers protocols rsvp traceoptions]
[edit logical-routers routing-instances]
[edit logical-routers routing-instances instance bridge-domains]
[edit logical-routers routing-instances instance bridge-domains domain
  multicast-snooping-options]
[edit logical-routers routing-instances instance bridge-domains domain
  multicast-snooping-options traceoptions]
[edit logical-routers routing-instances instance multicast-snooping-options]
[edit logical-routers routing-instances instance multicast-snooping-options traceoptions]
[edit logical-routers routing-instances instance protocols]
[edit logical-routers routing-instances instance protocols bgp group neighbor
  traceoptions]
[edit logical-routers routing-instances instance protocols bgp group traceoptions]
[edit logical-routers routing-instances instance protocols bgp traceoptions]
[edit logical-routers routing-instances instance protocols esis traceoptions]
[edit logical-routers routing-instances instance protocols isis traceoptions]
[edit logical-routers routing-instances instance protocols l2vpn traceoptions]
[edit logical-routers routing-instances instance protocols ldp traceoptions]
[edit logical-routers routing-instances instance protocols msdp group peer traceoptions]
[edit logical-routers routing-instances instance protocols msdp group traceoptions]
[edit logical-routers routing-instances instance protocols msdp peer traceoptions]
[edit logical-routers routing-instances instance protocols msdp traceoptions]
[edit logical-routers routing-instances instance protocols mvpn traceoptions]
[edit logical-routers routing-instances instance protocols ospf traceoptions]
[edit logical-routers routing-instances instance protocols ospf3 traceoptions]
[edit logical-routers routing-instances instance protocols pim traceoptions]
[edit logical-routers routing-instances instance protocols rip traceoptions]
[edit logical-routers routing-instances instance protocols router-discovery traceoptions]
[edit logical-routers routing-instances instance protocols vpls traceoptions]
[edit logical-routers routing-instances instance routing-options]
[edit logical-routers routing-instances instance routing-options multicast traceoptions]
[edit logical-routers routing-instances instance routing-options traceoptions]
[edit logical-routers routing-options]
[edit logical-routers routing-options multicast traceoptions]
[edit logical-routers routing-options traceoptions]
[edit multicast-snooping-options]
[edit multicast-snooping-options traceoptions]
[edit policy-options]
[edit protocols]
[edit protocols bgp group neighbor traceoptions]
[edit protocols bgp group traceoptions]
[edit protocols bgp traceoptions]
[edit protocols dvmrp traceoptions]
[edit protocols esis traceoptions]
[edit protocols igmp traceoptions]
[edit protocols isis traceoptions]
[edit protocols l2circuit traceoptions]
[edit protocols ldp traceoptions]
[edit protocols mld traceoptions]
[edit protocols msdp group peer traceoptions]
[edit protocols msdp group traceoptions]

```

```

[edit protocols msdp peer traceoptions]
[edit protocols msdp traceoptions]
[edit protocols ospf traceoptions]
[edit protocols ospf3 traceoptions]
[edit protocols pim traceoptions]
[edit protocols rip traceoptions]
[edit protocols ripng traceoptions]
[edit protocols router-advertisement traceoptions]
[edit protocols router-discovery traceoptions]
[edit protocols rsvp traceoptions]
[editrouting-instances]
[edit routing-instances instance bridge-domains]
[edit routing-instances instance bridge-domains domain multicast-snooping-options]
[edit routing-instances instance bridge-domains domain multicast-snooping-options
  traceoptions]
[edit routing-instances instance multicast-snooping-options]
[edit routing-instances instance multicast-snooping-options traceoptions]
[edit routing-instances instance protocols]
[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 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 ospf3 traceoptions]
[edit routing-instances instance protocols pim traceoptions]
[edit routing-instances instance protocols rip traceoptions]
[edit routing-instances instance protocols router-discovery traceoptions]
[edit routing-instances instance protocols vpls traceoptions]
[edit routing-instances instance routing-options]
[edit routing-instances instance routing-options multicast traceoptions]
[edit routing-instances instance routing-options traceoptions]
[editrouting-options]
[edit routing-options multicast traceoptions]
[edit routing-options traceoptions]

```

secret

Can view passwords and other authentication keys in the configuration.

Commands No associated CLI commands.

Statements [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 access radius-server secret]
[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-routers interfaces interface unit ppp-options chap default-chap-secret]
[edit logical-routers interfaces interface unit ppp-options pap default-password]
[edit logical-routers interfaces interface unit ppp-options pap local-password]
[edit system accounting destination radius server secret]
[edit system accounting destination tacplus server secret]
[edit system radius-server secret]
[edit system services outbound-ssh application-id secret]
[edit system tacplus-server secret]

```

security

Can view security configuration.

Commands	<pre> clear security clear security pki clear security pki ca-certificate clear security pki certificate-request clear security pki crl clear security pki local-certificate request security request security certificate request security certificate enroll request security key-pair request security pki request security pki ca-certificate request security pki ca-certificate enroll request security pki ca-certificate load request security pki crl request security pki crl load request security pki generate-certificate-request request security pki generate-key-pair request security pki local-certificate request security pki local-certificate enroll request security pki local-certificate load request system set-encryption-key show security show security pki show security pki ca-certificate show security pki certificate-request show security pki crl show security pki local-certificate </pre>
Statements	<pre> [edit security] </pre>

shell

Can start a local shell on the router.

Commands start shell
 start shell user

snmp

Can view Simple Network Management Protocol (SNMP) configuration.

Commands No associated CLI commands.

Statements [edit snmp]

system

Can view system-level configuration information.

Commands request chassis synchronization
 request chassis synchronization switch
 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 service-deployment
 <get-service-deployment-service-information>

Statements [edit applications]
 [edit forwarding-options helpers bootp]
 [edit forwarding-options helpers domain]
 [edit forwarding-options helpers port]
 [edit forwarding-options helpers tftp]
 [edit logical-routers]
 [edit logical-routers routing-instances instance forwarding-options helpers bootp]
 [edit logical-routers routing-instances instance forwarding-options helpers domain]
 [edit logical-routers routing-instances instance forwarding-options helpers port]
 [edit logical-routers routing-instances instance forwarding-options helpers tftp]
 [edit logical-routers routing-instances instance routing-options fate-sharing]
 [edit logical-routers routing-options fate-sharing]
 [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 system]
[edit system archival]
[edit system backup-router]
[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 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 max-configurations-on-flash]
[edit system mirror-flash-on-disk]
[edit system name-server]
[edit system no-multicast-echo]
[edit system no-redirects]
[edit system ports auxiliary log-out-on-disconnect]
[edit system ports console log-out-on-disconnect]
[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]

```

trace

Can view trace file settings and configure trace file properties.

Commands	clear log monitor monitor interface monitor interface traffic monitor label-switched-path monitor list monitor start monitor stop show log show log user <get-syslog-events>
Statements	[edit bridge-domains domain multicast-snooping-options traceoptions]

```

[edit bridge-domains domain protocols igmp-snooping traceoptions]
[edit forwarding-options dhcp-relay traceoptions]
[edit jnx-example traceoptions]
[edit logical-routers forwarding-options dhcp-relay traceoptions]
[edit logical-routers protocols bgp group neighbor traceoptions]
[edit logical-routers protocols bgp group traceoptions]
[edit logical-routers protocols bgp traceoptions]
[edit logical-routers protocols dvmrp traceoptions]
[edit logical-routers protocols esis traceoptions]
[edit logical-routers protocols igmp traceoptions]
[edit logical-routers protocols isis traceoptions]
[edit logical-routers protocols l2circuit traceoptions]
[edit logical-routers protocols lacp traceoptions]
[edit logical-routers protocols layer2-control traceoptions]
[edit logical-routers protocols ldp traceoptions]
[edit logical-routers protocols mld traceoptions]
[edit logical-routers protocols mpls label-switched-path oam traceoptions]
[edit logical-routers protocols mpls label-switched-path primary oam traceoptions]
[edit logical-routers protocols mpls label-switched-path secondary oam traceoptions]
[edit logical-routers protocols mpls oam traceoptions]
[edit logical-routers protocols msdp group peer traceoptions]
[edit logical-routers protocols msdp group traceoptions]
[edit logical-routers protocols msdp peer traceoptions]
[edit logical-routers protocols msdp traceoptions]
[edit logical-routers protocols oam ethernet connectivity-fault-management traceoptions]
[edit logical-routers protocols oam ethernet link-fault-management traceoptions]
[edit logical-routers protocols ospf traceoptions]
[edit logical-routers protocols ospf3 traceoptions]
[edit logical-routers protocols pim traceoptions]
[edit logical-routers protocols ppp monitor-session]
[edit logical-routers protocols ppp traceoptions]
[edit logical-routers protocols rip traceoptions]
[edit logical-routers protocols ripng traceoptions]
[edit logical-routers protocols router-advertisement traceoptions]
[edit logical-routers protocols router-discovery traceoptions]
[edit logical-routers protocols rsvp traceoptions]
[edit logical-routers routing-instances instance bridge-domains domain
    multicast-snooping-options traceoptions]
[edit logical-routers routing-instances instance bridge-domains domain protocols
    igmp-snooping traceoptions]
[edit logical-routers routing-instances instance forwarding-options dhcp-relay
    traceoptions]
[edit logical-routers routing-instances instance multicast-snooping-options traceoptions]
[edit logical-routers routing-instances instance protocols bgp group neighbor
    traceoptions]
[edit logical-routers routing-instances instance protocols bgp group traceoptions]
[edit logical-routers routing-instances instance protocols bgp traceoptions]
[edit logical-routers routing-instances instance protocols esis traceoptions]
[edit logical-routers routing-instances instance protocols igmp-snooping traceoptions]
[edit logical-routers routing-instances instance protocols isis traceoptions]
[edit logical-routers routing-instances instance protocols l2vpn traceoptions]
[edit logical-routers routing-instances instance protocols ldp traceoptions]
[edit logical-routers routing-instances instance protocols msdp group peer traceoptions]
[edit logical-routers routing-instances instance protocols msdp group traceoptions]
[edit logical-routers routing-instances instance protocols msdp peer traceoptions]
[edit logical-routers routing-instances instance protocols msdp traceoptions]

```

```

[edit logical-routers routing-instances instance protocols mvpn traceoptions]
[edit logical-routers routing-instances instance protocols ospf traceoptions]
[edit logical-routers routing-instances instance protocols ospf3 traceoptions]
[edit logical-routers routing-instances instance protocols pim traceoptions]
[edit logical-routers routing-instances instance protocols rip traceoptions]
[edit logical-routers routing-instances instance protocols router-discovery traceoptions]
[edit logical-routers routing-instances instance protocols vpls traceoptions]
[edit logical-routers routing-instances instance routing-options multicast traceoptions]
[edit logical-routers routing-instances instance routing-options traceoptions]
[edit logical-routers routing-instances instance system services dhcp-local-server
  traceoptions]
[edit logical-routers routing-options multicast traceoptions]
[edit logical-routers routing-options traceoptions]
[edit logical-routers system services dhcp-local-server traceoptions]
[edit multicast-snooping-options traceoptions]
[edit protocols bgp group neighbor traceoptions]
[edit protocols bgp group traceoptions]
[edit protocols bgp traceoptions]
[edit protocols dvmrp traceoptions]
[edit protocols esis traceoptions]
[edit protocols igmp traceoptions]
[edit protocols isis traceoptions]
[edit protocols l2circuit traceoptions]
[edit protocols lacp traceoptions]
[edit protocols layer2-control traceoptions]
[edit protocols ldp traceoptions]
[edit protocols mld 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 oam ethernet connectivity-fault-management traceoptions]
[edit protocols oam ethernet link-fault-management traceoptions]
[edit protocols ospf traceoptions]
[edit protocols ospf3 traceoptions]
[edit protocols pim traceoptions]
[edit protocols ppp monitor-session]
[edit protocols ppp traceoptions]
[edit protocols rip traceoptions]
[edit protocols ripng traceoptions]
[edit protocols router-advertisement traceoptions]
[edit protocols router-discovery traceoptions]
[edit protocols rsvp traceoptions]
[edit routing-instances instance bridge-domains domain multicast-snooping-options
  traceoptions]
[edit routing-instances instance bridge-domains domain protocols igmp-snooping
  traceoptions]
[edit routing-instances instance forwarding-options dhcp-relay 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 ospf3 traceoptions]
[edit routing-instances instance protocols pim traceoptions]
[edit routing-instances instance protocols rip 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-instances instance system services dhcp-local-server traceoptions]
[edit routing-options multicast traceoptions]
[edit routing-options traceoptions]
[edit services adaptive-services-pics traceoptions]
[edit services l2tp traceoptions]
[edit services logging traceoptions]
[edit services pgcp traceoptions]
[edit system accounting traceoptions]
[edit system processes general-authentication-service traceoptions]
[edit system services dhcp traceoptions]
[edit system services dhcp-local-server traceoptions]
[edit system services outbound-ssh traceoptions]
[edit system services service-deployment traceoptions]

```

view

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

Commands	<pre> clear dlsd clear dlsd reachability clear ipv6 router-advertisement clear isdn clear isdn q921 clear isdn q921 statistics clear isdn q931 clear isdn q931 statistics clear ldp statistics clear ldp statistics interface clear passive-monitoring <clear-passive-monitoring> clear passive-monitoring statistics <clear-passive-monitoring-statistics> clear services clear services cos clear services cos statistics </pre>
-----------------	--

```
clear services crtp
clear services crtp statistics
clear services dynamic-flow-capture
clear services dynamic-flow-capture criteria
<clear-services-dynamic-flow-capture-criteria>
clear services dynamic-flow-capture sequence-number
<clear-services-dynamic-flow-capture-sequence-number>
clear services flow-collector
<clear-services-flow-collector-information>
clear services flow-collector statistics
<clear-services-flow-collector-statistics>
clear services ids
clear services ids destination-table
clear services ids pair-table
clear services ids source-table
clear services ipsec-vpn
clear services ipsec-vpn certificates
clear services ipsec-vpn certificates service-set
clear services ipsec-vpn ipsec
clear services ipsec-vpn ipsec security-associations
clear services ipsec-vpn ipsec statistics
clear services l2tp
clear services l2tp multilink
clear services l2tp session
clear services l2tp tunnel
clear services l2tp user
clear services service-sets
clear services service-sets statistics
clear services service-sets statistics packet-drops
<clear-service-set-packet-drop-statistics>
clear services stateful-firewall
clear services stateful-firewall flows
<clear-service-sfw-flow-table-information>
clear services stateful-firewall sip-call
<clear-service-sfw-sip-call-information>
clear services stateful-firewall sip-register
<clear-service-sfw-sip-register-information>
clear services stateful-firewall statistics
request snmp
request snmp spoof-trap
<request-snmp-spoof-trap>
request tgm
request tgm login
request tgm login fpc
show
show accounting
show accounting profile
<get-accounting-profile-information>
show accounting records
<get-accounting-record-information>
show aps
show aps group
show aps interface
show arp
<get-arp-table-information>
show as-path
```

```

show as-path domain
show bfd
show bfd session
<get-bfd-session-information>
show bfd session address
show bfd session discriminator
show bgp
show bgp group
<get-bgp-group-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 replication
show bgp summary
<get-bgp-summary-information>
show bridge
show bridge domain
<get-bridge-instance-information>
show bridge domain operational
show bridge flood
show bridge flood event-queue
<get-bridge-domain-event-queue-information>
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 mac-table
<get-bridge-mac-table>
show bridge mac-table interface
<get-bridge-interface-mac-table>
show bridge statistics
<get-bridge-statistics-information>
show chassis
show chassis alarms
<get-alarm-information>
show chassis cfeb
<get-cfeb-information>
show chassis craft-interface
<get-craft-information>
show chassis environment
<get-environment-information>
show chassis environment cb
<get-environment-cb-information>
show chassis environment feb

```

```
<get-environment-feb-information>
show chassis environment fpc
<get-environment-fpc-information>
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 pem
<get-environment-pem-information>
show chassis environment routing-engine
<get-environment-re-information>
show chassis environment scg
<get-environment-scg-information>
show chassis environment sfm
<get-environment-sfm-information>
show chassis environment sib
<get-environment-sib-information>
show chassis ethernet-switch
show chassis ethernet-switch errors
show chassis ethernet-switch statistics
show chassis fabric
show chassis fabric feb
show chassis fabric fpcs
<get-fm-fpc-state-information>
show chassis fabric map
show chassis fabric plane
<get-fm-plane-state-information>
show chassis fabric plane-location
show chassis fabric sibs
<get-fm-sib-state-information>
show chassis fabric summary
<get-fm-state-information>
show chassis fabric topology
show chassis feb
<get-feb-brief-information>
show chassis feb detail
<get-feb-information>
show chassis firmware
<get-firmware-information>
show chassis forwarding
<get-fwdd-information>
show chassis fpc
<get-fpc-information>
show chassis fpc pic-status
<get-pic-information>
show chassis fpc-feb-connectivity
<get-fpc-feb-connectivity-information>
show chassis hardware
<get-chassis-inventory>
show chassis lccs
<get-fru-information>
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 pic
<get-pic-detail>
show chassis power-ratings
<get-power-management>
show chassis redundancy
show chassis redundancy feb
<get-feb-redundancy-information>
show chassis redundancy feb errors
<get-feb-redundancy-error-information>
show chassis redundancy feb redundancy-group
<get-feb-redundancy-group-information>
show chassis routing-engine
<get-route-engine-information>
show chassis routing-engine bios
show chassis scb
<get-scb-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 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 master
show chassis temperature-thresholds
<get-temperature-threshold-information>
show class-of-service
<get-cos-information>
show class-of-service adaptive-shaper
<get-cos-adaptive-shaper-information>
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 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 forwarding-class
<get-cos-forwarding-class-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 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 policer
<get-cos-policer-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 shaper
<get-cos-shaper-table-map-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 rewrite-rule
<get-cos-rewrite-information>
show class-of-service routing-instance
<get-cos-routing-instance-map-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 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 directory
show cli history
show configuration
show connections
show dhcp
show dhcp relay

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show dhcp relay binding
<get-dhcp-relay-binding-information>
show dhcp relay binding interface
show dhcp relay statistics
<get-dhcp-relay-statistics-information>
show dhcp server
show dhcp server binding
<get-dhcp-server-binding-information>
show dhcp server binding interface
show dhcp server statistics
<get-dhcp-server-statistics-information>
show dialer
show dialer defaults
<get-dialer-defaults-information>
show dialer interfaces
show dialer pools
show dlsw
show dlsw capabilities
<get-dlsw-capabilities-list>
show dlsw circuits
<get-dlsw-circuit-list>
show dlsw peers
<get-dlsw-peer-list>
show dlsw reachability
<get-dlsw-reachability-list>
show dvmrp
show dvmrp interfaces
<get-dvmrp-interfaces-information>
show dvmrp neighbors
<get-dvmrp-neighbors-information>
show dvmrp prefix
<get-dvmrp-prefix-information>
show dvmrp prunes
<get-dvmrp-prunes-information>
show dynamic-tunnels
show dynamic-tunnels database
show esis
show esis adjacency
<get-esis-adjacency-information>
show esis interface
<get-esis-interface-information>
show esis statistics
<get-esis-statistics-information>
<get-event-summary>
show helper
show helper statistics
<get-helper-statistics-information>
show igmp
show igmp group
<get-igmp-group-information>
show igmp interface
<get-igmp-interface-information>
show igmp snooping
show igmp snooping interface
<get-igmp-snooping-interface-information>
show igmp snooping membership
```

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<get-igmp-snooping-membership-information>  
show igmp snooping statistics  
<get-igmp-snooping-statistics-information>  
show igmp statistics  
<get-igmp-statistics-information>  
show ike  
show ike security-associations  
<get-ike-security-associations-information>  
show ilmi  
show ilmi interface  
show ilmi statistics  
show interfaces  
<get-interface-information>  
show interfaces controller  
show interfaces destination-class  
<get-destination-class-statistics>  
show interfaces destination-class all  
show interfaces diagnostics  
show interfaces diagnostics optics  
<get-interface-optics-diagnostics-information>  
show interfaces filters  
<get-interface-filter-information>  
show interfaces interface-set  
show interfaces interface-set queue  
<get-interface-set-queue-information>  
show interfaces interval  
show interfaces mac-database  
<get-mac-database>  
show interfaces policers  
<get-interface-policer-information>  
show interfaces queue  
<get-interface-queue-information>  
show interfaces redundancy  
show interfaces routing  
show interfaces source-class  
<get-source-class-statistics>  
show interfaces source-class all  
show ipsec  
show ipsec certificates  
<get-certificates-information>  
show ipsec certificates crl  
<get-crl-information>  
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 isdn  
show isdn calls
```

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show isdn history
show isdn q921
show isdn q921 statistics
show isdn q931
show isdn q931 statistics
show isdn status
show isis
show isis adjacency
<get-isis-adjacency-information>
show isis authentication
<get-isis-authentication-information>
show isis database
<get-isis-database-information>
show isis hostname
<get-isis-hostname-information>
show isis interface
<get-isis-interface-information>
show isis overview
<get-isis-overview-information>
show isis route
<get-isis-route-information>
show isis spf
<get-isis-spf-information>
show isis spf brief
show isis spf log
show isis spf results
show isis statistics
<get-isis-statistics-information>
show l2-learning
show l2-learning global-information
show l2-learning instance
show l2-learning interface
show l2circuit
show l2circuit connections
<get-l2ckt-connection-information>
show l2cpd
show l2cpd task
show l2cpd task io
show l2cpd task memory
show l2cpd task replication
show l2vpn
show l2vpn connections
<get-l2vpn-connection-information>
show lacp
show lacp interfaces
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>
show ldp path
<get-ldp-path-information>
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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 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 llc2
show llc2 redundancy
show llc2 redundancy interface
show llc2 redundancy interface statistics
show llc2 redundancy mac-translation
show llc2 redundancy track
show mld
show mld group
<get-mld-group-information>
show mld interface
<get-mld-interface-information>
show mld statistics
<get-mld-statistics-information>
show mpls
show mpls admin-groups
<get-mpls-admin-group-information>
show mpls call-admission-control
<get-mpls-call-admission-control-information>
show mpls cspf
<get-mpls-cspf-information>
show mpls diffserv-te
<get-mpls-diffserv-te-information>
show mpls interface
<get-mpls-interface-information>
show mpls lsp
<get-mpls-lsp-information>
show mpls lsp defaults
<get-mpls-lsp-defaults-information>
show mpls path
<get-mpls-path-information>
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show mpls traceroute
show mpls traceroute database
show mpls traceroute database ldp
show msdp
show msdp source
<get-msdp-source-information>
show msdp source-active
<get-msdp-source-active-information>
show msdp statistics
<get-msdp-statistics-information>
show multicast
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 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 route
<get-multicast-snooping-route-information>
show multicast statistics
<get-multicast-statistics-information>
show multicast usage
<get-multicast-usage-information>
show mvpn
show mvpn c-multicast
show mvpn instance
<get-mvpn-instance-information>
show mvpn neighbor
show network-access
show network-access address-assignment
show network-access address-assignment pool
<get-address-assignment-pool-table>
show network-access requests
show network-access requests pending
<get-authentication-pending-table>
show network-access requests statistics
<get-authentication-statistics>
show ntp
show ntp associations
show ntp status
show oam
show oam ethernet
show oam ethernet connectivity-fault-management
show oam ethernet connectivity-fault-management forwarding-state
show oam ethernet connectivity-fault-management forwarding-state instance
```

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show oam ethernet connectivity-fault-management forwarding-state interface
show oam ethernet connectivity-fault-management interfaces
show oam ethernet connectivity-fault-management mep-database
show oam ethernet connectivity-fault-management path-database
show oam ethernet link-fault-management
show ospf
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 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
<get-ospf3-overview-information>
show ospf3 route
<get-ospf3-route-information>
show ospf3 statistics
<get-ospf3-statistics-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 pfe
show pfe cfeb
show pfe feb
show pfe fpc
show pfe fwdd
```

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show pfe lcc
show pfe next-hop
show pfe route
show pfe route inet6
show pfe route inet6 table
show pfe route ip
show pfe route ip table
show pfe scb
show pfe sfm
show pfe ssb
show pfe statistics
show pfe statistics ip
show pfe statistics ip6
show pfe statistics traffic
<get-pfe-statistics>
show pfe terse
<get-pfe-information>
show pgm
show pgm negative-acknowledgments
<get-pgm-nak>
show pgm source-path-messages
<get-pgm-source-path-messages>
show pgm statistics
<get-pgm-statistics>
show pim
show pim bootstrap
<get-pim-bootstrap-information>
show pim interfaces
<get-pim-interfaces-information>
show pim join
<get-pim-join-information>
show pim mdt
<get-pim-mdt-information>
show pim neighbors
<get-pim-neighbors-information>
show pim rps
<get-pim-rps-information>
show pim source
<get-pim-source-information>
show pim statistics
<get-pim-statistics-information>
show policy
show policy conditions
show policy damping
show ppp
show ppp address-pool
<get-ppp-address-pool-inforamation>
show ppp interface
<get-ppp-interface-information>
show ppp statistics
<get-ppp-statistics-information>
show ppp summary
<get-ppp-summary-information>
show pppoe
show pppoe interfaces
<get-pppoe-interface-information>
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show pppoe statistics
<get-pppoe-statistics-information>
show pppoe version
<get-pppoe-version>
show rip
show rip general-statistics
<get-rip-general-statistics-information>
show rip neighbor
<get-rip-neighbor-information>
show rip statistics
<get-rip-statistics-information>
show ripng
show ripng general-statistics
show ripng neighbor
show ripng statistics
show route
<get-route-information>
show route export
<get-rlexport-table-information>
show route export instance
<get-rlexport-instance-information>
show route export vrf-target
<get-rlexport-target-information>
show route flow
show route flow validation
<get-rtflow-dep-information>
show route forwarding-table
<get-forwarding-table-information>
show route instance
<get-instance-information>
show route instance operational
<get-operational-routing-instance-information>
show route martians
show route resolution
show route resolution summary
show route resolution unresolved
show route summary
<get-route-summary-information>
show rsvp
show rsvp interface
<get-rsvp-interface-information>
show rsvp neighbor
<get-rsvp-neighbor-information>
show rsvp session
<get-rsvp-session-information>
show rsvp statistics
<get-rsvp-statistics-information>
show rsvp version
<get-rsvp-version-information>
show sap
show sap listen
<get-sap-listen-information>
show services
show services accounting
<get-service-accounting-information>
show services accounting aggregation
```

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<get-service-accounting-aggregation-information>
show services accounting aggregation as
<get-service-accounting-aggregation-as-information>
show services accounting aggregation destination-prefix
<get-service-accounting-aggregation-destination-prefix-information>
show services accounting aggregation protocol-port
<get-service-accounting-aggregation-protocol-port-information>
show services accounting aggregation source-destination-prefix
<get-service-accounting-aggregation-source-destination-prefix-information>
show services accounting aggregation source-prefix
<get-service-accounting-aggregation-source-prefix-information>
show services accounting aggregation template
<get-service-accounting-aggregation-template-information>
show services accounting errors
<get-service-accounting-errors-information>
show services accounting flow
<get-service-accounting-flow-information>
show services accounting flow-detail
<get-service-accounting-flow-detail>
show services accounting memory
<get-service-accounting-memory-information>
show services accounting packet-size-distribution
<get-packet-distribution-information>
show services accounting status
<get-service-accounting-status-information>
show services accounting usage
<get-service-accounting-usage-information>
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
show services fips
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
<get-services-flow-collector-input-information>

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show services flow-table
show services flow-table statistics
<get-flow-table-statistics-information>
show services ids
show services ids destination-table
<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 ipsec-vpn
show services ipsec-vpn certificates
show services ipsec-vpn ike
show services ipsec-vpn ike security-associations
<get-ike-services-security-associations-information>
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 multilink
<get-l2tp-multilink-information>
show services l2tp session
<get-l2tp-session-information>
show services l2tp summary
<get-l2tp-summary-information>
show services l2tp tunnel
<get-l2tp-tunnel-information>
show services l2tp user
show services link-services
show services link-services cpu-usage
<get-link-services-cpu-usage>
show services logging
show services logging history
show services logging history client
show services logging logfiles
show services nat
show services nat pool
<get-service-nat-pool-information>
show services pgcp
show services pgcp active-configuration
<get-pgcpd-active-configuration>
show services pgcp gates
<get-service-pgcp-gates>
show services pgcp root-termination
<get-services-pgcpd-root-termination>
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 rpm
show services rpm active-servers
<get-active-servers>
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show services rpm history-results
<get-history-results>
show services rpm probe-results
<get-probe-results>
show services service-identification
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 statistics
show services service-sets statistics packet-drops
<get-service-set-packet-drop-statistics>
show services service-sets summary
<get-service-set-summary-information>
show services stateful-firewall
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 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
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 inform-statistics
<get-snmp-inform-statistics>
show snmp mib
show snmp mib get
<get-snmp-object>
show snmp mib get-next
<next-snmp-object>
show snmp mib walk
<walk-snmp-object>
show snmp rmon
<get-rmon-information>
show snmp rmon alarms
<get-rmon-alarm-information>
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show snmp rmon events
<get-rmon-event-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
show spanning-tree interface
show spanning-tree mstp
show spanning-tree mstp configuration
show spanning-tree statistics
show spanning-tree statistics interface
show spanning-tree statistics routing-instance
<get-syslog-filenames>
show system
show system alarms
<get-system-alarm-information>
show system autoinstallation
show system autoinstallation status
<get-autoinstallation-status-information>
show system boot-messages
show system buffers
show system certificate
show system commit
<get-commit-information>
show system configuration
show system configuration archival
<get-system-archival>
show system configuration rescue
<get-rescue-information>
show system connections
show system core-dumps
show system directory-usage
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<get-directory-usage-information>
show system firmware
<get-system-firmware-information>
<get-system-information>
show system license
<get-license-summary-information>
show system license installed
<get-license-information>
show system license keys
<get-license-key-information>
show system license usage
<get-license-usage-summary>
show system processes
show system processes brief
show system processes extensive
show system processes summary
show system queues
show system reboot
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 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 statistics
show system statistics bridge
show system statistics vpls
show system storage
<get-system-storage>
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 task
show task io
show task memory
show task replication
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show ted
show ted database
<get-ted-database-information>
show ted link
<get-ted-link-information>
show ted protocol
<get-ted-protocol-information>
show tgm
show tgm dynamic-call-admission-control
<get-tgm-dynamic-cac-information>
show tgm fpc
<get-tgm-information>
show tgm telephony-interface-module
<get-tgm-telephony-interface-module-status>
show version
<get-software-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
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