Junos OS 11.1 Configuration Statements and Commands

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PART 1

Overview

CHAPTER 1

Overview of Configuration Statements and Commands

Configuration Features in the Junos OS

This topic describes the configuration features available in the Junos OS. For more information about displaying and changing router configuration, see the *Junos OS CLI User Guide*.

Configuration Operations

To configure a Juniper Networks device that runs the Junos OS, you define a hierarchy of configuration statements, either by typing them in Junos OS command-line interface (CLI) configuration mode, or by loading a text file that contains the statements in formatted ASCII.

You can also write an application that uses the Junos XML management protocol or NETCONF management protocol to add, modify, or delete configuration information; for more information, see User Interfaces to the Junos OS.

In CLI configuration mode, you issue commands to perform the following operations:

- Activate (commit) a configuration
- Display the current configuration
- Globally search and replace text; you can use regular expressions to locate and replace identifiers and values
- Insert, copy, and delete statements
- Issue operational mode commands

- List the commands that were previously issued during the session
- List the users currently editing the configuration
- Move among the levels of the configuration hierarchy
- Save a configuration to a file
- Verify the syntactic correctness of a configuration before activating it

When you load a text file that contains a configuration, you can commit it immediately to activate the configuration on the router, or you can alter it in CLI configuration mode and commit it later. When loading the file, you can specify that it overwrite the entire configuration or portions of it, or that nonoverlapping portions be merged with the existing configuration.

You can include comments in the configuration to identify or explain particular statement or subhierarchies.

You can copy the contents of currently active file system partitions on the router to standby partitions that are not active.

Configuration Versions

When you change the configuration in CLI configuration mode, your changes are stored in a copy of the currently active configuration. The copy is called the *candidate configuration*. By default, multiple users can edit the candidate configuration at the same time, and all users immediately see the changes made by everyone. Alternatively, you can lock other users out of the candidate configuration as you enter CLI configuration mode, making them unable to change the candidate configuration until you release the lock. For finer-grained control, you can also allow multiple users each to edit nonoverlapping portions of the configuration and to commit only their own changes.

For the candidate configuration to become the *active* configuration running on the router, you must commit it. The candidate file is checked for proper syntax, activated, and saved to a file as the currently active configuration. If the candidate configuration is committed while multiple users are editing it, all changes made by all the users take effect.

In addition to saving the candidate and active configurations, the CLI saves the previous 49 configurations that were committed. You can *roll back* to any of the saved previous versions, making it the candidate configuration and then committing it if desired.

Configuration Groups

Junos *configuration groups* are named collections of configuration statements that are defined at the **[edit groups]** level of the hierarchy and referenced at other locations in the hierarchy. The statements in the configuration group are said to be *inherited* at the referring location and apply at that location as though they were actually typed there. You can apply the same group in multiple locations in the configuration, and apply different sections of one group to different locations.

Related Documentation

- User Interfaces to the Junos OS
- Configuration Mode Commands in the Junos OS on page 5

Configuration Mode Commands in the Junos OS

The complete list of Junos command-line interface (CLI) configuration mode commands follows. You can display the list of commands available at a particular hierarchy level by typing the question mark, as shown in the following example. Some commands are displayed only at certain hierarchy levels or in certain modes (such as private configuration mode).

```
[edit]
user@host# ?
Possible completions:
<[Enter]>    Execute this command
activate     Remove the inactive tag from a statement
annotate     Annotate the statement with a comment
commit       Commit current set of changes
copy         Copy a statement
deactivate   Add the inactive tag to a statement
delete       Delete a data element
edit         Edit a sub-element
exit         Exit from this level
extension    Extension operations
help         Provide help information
insert       Insert a new ordered data element
load         Load configuration from ASCII file
quit         Quit from this level
rename       Rename a statement
replace      Replace character string in configuration
rollback     Roll back to previous committed configuration
run          Run an operational-mode command
save         Save configuration to ASCII file
set          Set a parameter
show         Show a parameter
status       Show users currently editing configuration
top          Exit to top level of configuration
up           Exit one level of configuration
update       Update private database
wildcard     Wildcard operations
```

For information about operational mode commands, see the *Junos OS CLI User Guide* and the Junos command references.

Related Documentation

- Configuration Features in the Junos OS on page 3
- **activate on page 12**
- **annotate on page 13**
- **commit on page 14**
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- **deactivate on page 18**
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- **edit on page 20**
- **exit on page 21**

Notational Conventions Used in Junos OS Configuration Hierarchies

When you are working in Junos OS command-line interface (CLI) configuration mode, the banner on the line preceding the prompt indicates the current hierarchy level. In the following example, the level is **[edit protocols ospf]**:

```
[edit protocols ospf]
user@host#
```

(The Junos OS documentation uses **user@host#** as the standard configuration mode prompt. In an actual CLI session, the prompt shows your user ID and the name of the Juniper Networks device you are working on.)

Use the **set ?** command to display the statements that you can include in the configuration at the current level. The **help apropos** command is also context-sensitive, displaying matching statements only at the current level and below.

NOTE: In this document, statements are listed alphabetically within each hierarchy and subhierarchy. If a subhierarchy is sufficiently long that it might be difficult to determine where it ends and its next peer statement begins, the subhierarchy appears at the end of its parent hierarchy instead of in alphabetical order. In this case, a placeholder appears in its actual alphabetical position.

For example, at the [edit interfaces *interface-name* unit *logical-unit-number*] hierarchy level, the family *family-name* subhierarchy has more than 20 child statements, including several subhierarchies with child statements of their own. The full family *family-name* hierarchy appears at the end of its parent hierarchy ([edit interfaces *interface-name* unit *logical-unit-number*]), and the following placeholder appears at its actual alphabetical position:

family *family-name* {
  ... *the* family *subhierarchy appears after the main* [edit interfaces *interface-name* unit *logical-unit-number*] *hierarchy* ...
}

Another exception to alphabetical order is that the disable statement always appears first in any hierarchy that includes it.

Related Documentation

- Configuration Mode Commands in the Junos OS on page 5

PART 2

Configuration Mode Commands

CHAPTER 2

Command Reference Pages

activate

Syntax activate (*statement* | *identifier*)

Release Information Command introduced before Junos OS Release 7.4.

Description Remove the **inactive:** tag from a statement, effectively adding the statement or identifier back to the configuration. Statements or identifiers that have been activated take effect when you next issue the **commit** command.

Options *identifier*—Identifier from which you are removing the **inactive** tag. It must be an identifier at the current hierarchy level.

statement—Statement from which you are removing the **inactive** tag. It must be a statement at the current hierarchy level.

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- **deactivate on page 18**
- Deactivating and Reactivating Statements and Identifiers in a Junos Configuration

annotate

Syntax annotate *statement* "*comment-string*"

Release Information Command introduced before Junos OS Release 7.4.

Description Add comments to a configuration. You can add comments only at the current hierarchy level.

Any comments you add appear only when you view the configuration by entering the **show** command in configuration mode or the **show configuration** command in operational mode.

NOTE: The Junos OS supports annotation up to the last level in the configuration hierarchy, including onliners. However, annotation of parts (child statements or identifiers within a oneliner) of the onliner is not supported. For example, in the following sample configuration hierarchy, annotation is supported up to the onliner level 1 , but not supported for the metric child statement and its attribute *10*:

```
[edit protocols]
  isis {
    interface ge-0/0/0.0 {
      level 1 metric 10;
    }
  }
}
```

Options ***comment-string***—Text of the comment. You must enclose it in quotation marks. In the comment string, you can include the comment delimiters **/* */** or **#**. If you do not specify any, the comment string is enclosed with the **/* */** comment delimiters. If a comment for the specified ***statement*** already exists, it is deleted and replaced with the new comment.

statement—Statement to which you are attaching the comment.

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- Adding Comments in a Junos Configuration

commit

Syntax commit <<*at* <"string">> <and-quit> <check> <comment <"*comment-string*">> <confirmed> <display detail> <*minutes*> <synchronize<force>>

Release Information Command introduced before Junos OS Release 7.4.

Description Commit the set of changes to the database and cause the changes to take operational effect.

Options **at <"string">**—(Optional) Save software configuration changes and activate the configuration at a future time, or upon reboot.

string is **reboot** or the future time to activate the configuration changes. Enclose the ***string*** value (including **reboot**) in quotation marks (" "). You can specify time in two formats:

- A time value in the form ***hh:mm***[**:*ss***] (hours, minutes, and optionally seconds)—Commit the configuration at the specified time, which must be in the future but before 11:59:59 PM on the day the **commit at** configuration command is issued. Use 24-hour time for the ***hh*** value; for example, **04:30:00** is 4:30:00 AM, and **20:00** is 8:00 PM. The time is interpreted with respect to the clock and time zone settings on the router.
- A date and time value in the form ***yyyy-mm-dd hh:mm***[**:*ss***] (year, month, date, hours, minutes, and, optionally, seconds)—Commit the configuration at the specified day and time, which must be after the **commit at** command is issued. Use 24-hour time for the ***hh*** value. For example, **2003-08-21 12:30:00** is 12:30 PM on August 21, 2003. The time is interpreted with respect to the clock and time zone settings on the router.

For example, **commit at "18:00:00"**. For date and time, include both values in the same set of quotation marks. For example, **commit at "2005-03-10 14:00:00"**.

A *commit check* is performed when you issue the **commit at** configuration mode command. If the result of the check is successful, then the current user is logged out of configuration mode, and the configuration data is left in a read-only state. No other commit can be performed until the scheduled commit is completed.

NOTE: If the Junos OS fails before the configuration changes become active, all configuration changes are lost.

You cannot enter the **commit at** configuration command when there is a pending reboot.

You cannot enter the **request system reboot** command once you schedule a commit operation for a specific time in the future.

You cannot commit a configuration when a scheduled commit is pending. For information about how to use the **clear** command to cancel a scheduled configuration, see the *Junos System Basics and Services Command Reference.*

and-quit—(Optional) Commit the configuration and, if the configuration contains no errors and the commit succeeds, exit from configuration mode.

check—(Optional) Verify the syntax of the configuration, but do not activate it.

comment <"*comment-string*">—(Optional) Add a comment that describes the committed configuration. The comment can be as long as 512 bytes and must be typed on a single line. You cannot include a comment with the c**ommit check** command. Enclose *comment-string* in quotation marks (" "). For example, **commit comment "Includes changes recommended by SW Lab".**

confirmed <*minutes*>—(Optional) Require that the commit be confirmed within the specified amount of time. To confirm a commit, enter either a **commit** or **commit check** command. If the commit is not confirmed within the time limit, the configuration rolls back automatically to the precommit configuration and a broadcast message is sent to all logged-in users. To show when a rollback is scheduled, enter the **show system commit** command. The allowed range is **1** through **65,535** minutes, and the default is **10** minutes.

display detail—(Optional) Monitors the commit process.

NOTE: In Junos OS Release 10.4 and later, if the number of commit details or messages exceeds a page when used with the **| display detail** pipe option, the more pagination option on the screen is no longer available. Instead, the messages roll up on the screen by default, just like using the **commit** command with the **| no more** pipe option.

synchronize <**force**>—(Optional) If your router has two Routing Engines, you can manually direct one Routing Engine to synchronize its configuration with the other by issuing the **commit synchronize** command. The Routing Engine on which you execute this command (request Routing Engine) copies and loads its candidate configuration to the other (responding Routing Engine). Both Routing Engines then perform a syntax check on the candidate configuration file being committed. If no errors are found, the configuration is activated and becomes the current operational configuration on both Routing Engines. The **commit synchronize** command does not work if the responding Routing Engine has uncommitted configuration changes. However, you can enforce commit synchronization on the Routing Engines by using the **force** option. When you issue the **commit synchronize** command with the **force** option from one Routing Engine,the configuration sessions on the other Routing Engine will be terminated and its configuration synchronized with that on the Routing Engine from which you issued the command.

NOTE: When you issue the **commit synchronize** command, you must use the **apply-groups re0** and **re1** commands. For information about how to use groups, see Disabling Inheritance of a Junos Configuration Group.

The responding Routing Engine must use Junos OS Release 5.0 or later.

Required Privilege Level

configure—To enter configuration mode.

NOTE: If you are using Junos OS in a Common Criteria environment, system log messages are created whenever a secret attribute is changed (for example, password changes or changes to the RADIUS shared secret). These changes are logged during the following configuration load operations:

```
load merge
load replace
load override
load update
```

For more information, see the *Secure Configuration Guide for Common Criteria and Junos-FIPS*

Related Documentation

- Verifying a Junos Configuration, Committing a Junos OS Configuration
- Scheduling a Junos Commit Operation
- Deactivating and Reactivating Statements and Identifiers in a Junos Configuration
- Monitoring the Junos Commit Process
- Adding a Comment to Describe the Committed Configuration

copy

Syntax copy *existing-statement* to *new-statement*

Release Information Command introduced before Junos OS Release 7.4.

Description Make a copy of an existing statement in the configuration.

Options *existing-statement*—Statement to copy.

new-statement—Copy of the statement.

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- Copying a Junos Statement in the Configuration

deactivate

Syntax deactivate (*statement* | *identifier*)

Release Information Command introduced before Junos OS Release 7.4.

Description Add the **inactive:** tag to a statement, effectively commenting out the statement or identifier from the configuration. Statements or identifiers marked as inactive do not take effect when you issue the **commit** command.

Options *identifier*—Identifier to which you are adding the **inactive:** tag. It must be an identifier at the current hierarchy level.

statement—Statement to which you are adding the **inactive:** tag. It must be a statement at the current hierarchy level.

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- **activate on page 12**
- **delete on page 19**
- Deactivating and Reactivating Statements and Identifiers in a Junos Configuration.

delete

Syntax delete <*statement-path*> <*identifier*>

Release Information Command introduced before Junos OS Release 7.4.

Description Delete a statement or identifier. All subordinate statements and identifiers contained within the specified statement path are deleted with it.

Deleting a statement or an identifier effectively "unconfigures" or disables the functionality associated with that statement or identifier.

If you do not specify ***statement-path*** or ***identifier***, the entire hierarchy, starting at the current hierarchy level, is removed.

Options ***statement-path***—(Optional) Path to an existing statement or identifier. Include this if the statement or identifier to be deleted is not at the current hierarchy level.

identifier—(Optional) Name of the statement or identifier to delete.

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- **deactivate on page 18**
- Deleting a Statement from a Junos Configuration

edit

Syntax edit *statement-path*

Release Information Command introduced before Junos OS Release 7.4.

Description Move inside the specified statement hierarchy. If the statement does not exist, it is created.

You cannot use the **edit** command to change the value of identifiers. You must use the **set** command.

Options *statement-path*—Path to the statement.

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- **set on page 34**
- Displaying the Current Junos OS Configuration

exit

Syntax exit <configuration-mode>

Release Information Command introduced before Junos OS Release 7.4.

Description Exit the current level of the statement hierarchy, returning to the level prior to the last **edit** command, or exit from configuration mode. The **quit** and **exit** commands are synonyms.

Options none—Return to the previous edit level. If you are at the top of the statement hierarchy, exit configuration mode.

configuration-mode—(Optional) Exit from configuration mode.

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- **top on page 37**
- **up on page 38**
- Displaying the Current Junos OS Configuration

extension (show | delete)

Syntax extension *package-name* (show | delete) <*section*>

Release Information Command introduced in Junos OS Release 8.5.

Description Manage configurations that are contributed by SDK application packages. Use **show** to display user-defined configuration contributed by the named package. If you specify **delete**, all subordinate statements and identifiers contained within the specified statement path (see the ***section*** option) are deleted as well.

NOTE: A configuration defined in any of the native Junos packages is never deleted by the extension *package-name* delete command.

Options ***package-name***—Name of the SDK application package.

section—(Optional) Statement path from which you want the command to act.

Required Privilege Level configure—To enter configuration mode; other required privilege levels depend on where the statement is located in the configuration hierarchy.

help

Syntax

help <(apropos *string* | reference <*statement-name*> | syslog <*syslog-tag*> | tip cli *number* | topic <*word*>)>

Release Information

Command introduced before Junos OS Release 7.4.

Description

Display help about available configuration statements or general information about getting help.

Options

apropos *string*—(Optional) Display statement names and help text that matches the string specified. If the string contains spaces, enclose it in quotation marks (" "). You can also specify a regular expression for the string, using standard UNIX-style regular expression syntax.

reference <*statement-name*>—(Optional) Display summary information for the statement. This information is based on summary descriptions that appear in the Junos configuration guides.

syslog <*syslog-tag*>—(Optional) Display information about system log messages.

tip cli *number*—(Optional) Display a tip about using the CLI. Specify the number of the tip you want to view.

topic <*word*>—(Optional) Display usage guidelines for a topic or configuration statement. This information is based on subjects that appear in the Junos configuration guides.

Entering the **help** command without an option provides introductory information about how to use the **help** command.

Required Privilege Level

configure—To enter configuration mode.

Related Documentation

- Getting Online Help from the Junos OS Command-Line Interface

insert

Syntax insert <*statement-path*> *identifier1* (before | after) *identifier2*

Release Information Command introduced before Junos OS Release 7.4.

Description Insert an identifier in to an existing hierarchy.

Options

after—Place *identifier1* after *identifier2*.

before—Place *identifier1* before *identifier2*.

identifier1—Existing identifier.

identifier2—New identifier to insert.

statement-path—(Optional) Path to the existing identifier.

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- Inserting a New Identifier in a Junos Configuration

load

Syntax

load (factory-default | merge | override | patch | replace | set | update) (*filename* | terminal) <relative>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.

Description

Load a configuration from an ASCII configuration file, from terminal input, or from the factory default. Your current location in the configuration hierarchy is ignored when the load operation occurs.

Options

factory-default—Loads the factory configuration. The factory configuration contains the manufacturer's suggested configuration settings. The factory configuration is the router or switch's first configuration and is loaded when the router or switch is first installed and powered on.

On J Series Services Routers, pressing and holding down the Config button on the router for 15 seconds causes the factory configuration to be loaded and committed. However, this operation deletes all other configurations on the router; using the **load factory-default** command does not.

filename—Name of the file to load. For information about specifying the filename, see Viewing Files and Directories on a Device Running Junos OS.

merge—Combine the configuration that is currently shown in the CLI and the configuration.

override—Discard the entire configuration that is currently shown in the CLI and load the entire configuration. Marks every object as changed.

patch—Change part of the configuration and mark only those parts as changed.

replace—Look for a **replace** tag in ***filename***, delete the existing statement of the same name, and replace it with the configuration.

set—Merge a set of commands with an existing configuration. This option executes the configuration instructions line by line as they are stored in a file or from a terminal. The instructions can contain any configuration mode command, such as **set**, **edit**, **exit**, and **top**.

relative—(Optional) Use the **merge** or **replace** option without specifying the full hierarchy level.

terminal—Use the text you type at the terminal as input to the configuration. Type Ctrl+d to end terminal input.

update—Discard the entire configuration that is currently shown in the CLI, and load the entire configuration. Marks changed objects only.

NOTE: If you are using Junos OS in a Common Criteria environment, system log messages are created whenever a secret attribute is changed (for example, password changes or changes to the RADIUS shared secret). These changes are logged during the following configuration load operations:

```
load merge
load replace
load override
load update
```

For more information, see the *Secure Configuration Guide for Common Criteria and Junos-FIPS* .

Required Privilege Level

configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- Loading a Configuration from a File

quit

Syntax quit <configuration-mode>

Release Information Command introduced before Junos OS Release 7.4.

Description Exit the current level of the statement hierarchy, returning to the level prior to the last **edit** command, or exit from configuration mode. The **quit** and **exit** commands are synonyms.

Options none—Return to the previous edit level. If you are at the top of the statement hierarchy, exit configuration mode.

configuration-mode—(Optional) Exit from configuration mode.

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- **top on page 37**
- **up on page 38**
- Displaying the Current Junos OS Configuration

rename

Syntax rename <*statement-path*> *identifier1* to *identifier2*

Release Information Command introduced before Junos OS Release 7.4.

Description Rename an existing configuration statement or identifier.

Options ***identifier1***—Existing identifier to rename.

identifier2—New name of identifier.

statement-path—(Optional) Path to an existing statement or identifier.

NOTE: For example, to rename interface ge-0/0/0.0 to ge-0/0/10.0 at the following hierarchy level:

```
logical-systems {
  logical-system-abc {
  (...)
    protocols {
      ospf {
        area 0.0.0.0 {
        interface ge-0/1/0.0;
```

Issue the following command:

rename logical-systems *logical-system-abc* protocols ospf area *0.0.0.0* interface *ge-0/1/0.0.0* to *interface ge-0/1/10.0*

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- Renaming an Identifier in a Junos Configuration

replace

Syntax replace pattern ***pattern1*** with ***pattern2*** <upto ***n***>

Release Information Command introduced in Junos OS Release 7.6.

Description Replace identifiers or values in a configuration.

Options ***pattern1***—Text string or regular expression that defines the identifiers or values you want to match.

pattern2—Text string or regular expression that replaces the identifiers and values located with ***pattern1***.

Juniper Networks uses standard UNIX-style regular expression syntax (as defined in POSIX 1003.2). If the regular expression contains spaces, operators, or wildcard characters, enclose the expression in quotation marks. Greedy qualifiers (match as much as possible) are supported. Lazy qualifiers (match as little as possible) are not.

upto ***n***—Number of objects replaced. The value of ***n*** controls the total number of objects that are replaced in the configuration (not the total number of times the pattern occurs). Objects at the same hierarchy level (siblings) are replaced first. Multiple occurrences of a pattern within a given object are considered a single replacement. If you do not specify an **upto** option, all identifiers and values in the configuration that match ***pattern1*** are replaced.

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- Using Global Replace in a Junos Configuration

rollback

Syntax

rollback <*number* | rescue>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.

Description

Return to a previously committed configuration. The software saves the last 50 committed configurations, including the rollback number, date, time, and name of the user who issued the **commit** configuration command.

The currently operational Junos OS configuration is stored in the file **juniper.conf**, and the last three committed configurations are stored in the files **juniper.conf.1**, **juniper.conf.2**, and **juniper.conf.3**. These four files are located in the directory **/config**, which is on the router's flash drive. The remaining 46 previous committed configurations, the files **juniper.conf.4** through **juniper.conf.49**, are stored in the directory **/var/db/config**, which is on the router's hard disk.

During rollback, the configuration you specify is loaded from the associated file. Only objects in the rollback configuration that differ from the previously loaded configuration are marked as changed (equivalent to **load update**).

Options

none—Return to the most recently saved configuration.

number—(Optional) Configuration to return to. The range of values is from **0** through **49**. The most recently saved configuration is number 0, and the oldest saved configuration is number 49. The default is **0**.

rescue—(Optional) Return to the rescue configuration.

Required Privilege Level

rollback—To roll back to configurations other than the one most recently committed.

Related Documentation

- Returning to a Previously Committed Junos OS Configuration
- Creating and Returning to a Rescue Configuration

run

Syntax run *command*

Release Information Command introduced before Junos OS Release 7.4.

Description Run a top-level CLI command without exiting from configuration mode.

Options *command*—CLI top-level command.

Required Privilege Level configure—To enter configuration mode.

Related Documentation

- Understanding Junos OS CLI Configuration Mode

save

Syntax save *filename*

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.

Description Save the configuration to an ASCII file. The contents of the current level of the statement hierarchy (and below) are saved, along with the statement hierarchy containing it. This allows a section of the configuration to be saved, while fully specifying the statement hierarchy.

When saving a file to a remote system, the software uses the **scp/ssh** protocol.

Options ***filename***—Name of the saved file. You can specify a filename in one of the following ways:

- ***filename***—File in the user's home directory (the current directory) on the local flash drive.
- ***path/filename***—File on the local flash drive.
- **/var/*filename*** or **/var/*path/filename***—File on the local hard disk.
- **a:*filename*** or **a:*path/filename***—File on the local drive. The default path is **/** (the root-level directory). The removable media can be in MS-DOS or UNIX (UFS) format.
- ***hostname:/path/filename, hostname:filename, hostname:path/filename,*** or **scp://*hostname/path/filename***—File on an **scp/ssh** client. This form is not available in the worldwide version of Junos OS. The default path is the user's home directory on the remote system. You can also specify ***hostname*** as ***username@hostname***.
- **ftp://*hostname/path/filename***—File on an FTP server. You can also specify ***hostname*** as ***username @hostname*** or ***username :password @hostname***. The default path is the user's home directory. To specify an absolute path, the path must start with the string **%2F**; for example, **ftp://*hostname/%2Fpath/filename***. To have the system prompt you for the password, specify **prompt** in place of the password. If a password is required, and you do not specify the password or **prompt**, an error message is displayed:

  user@host> **file copy ftp://*username*@ftp.*hostname*.net//*filename***

  file copy ftp.***hostname***.net: Not logged in.

  user@host> **file copy ftp://*username*:prompt@ftp*hostname*.net//*filename***

  Password for ***username***@ftp.***hostname***.net:

- **http://*hostname/path/filename***—File on a Hypertext Transfer Protocol (HTTP) server. You can also specify ***hostname*** as ***username@hostname*** or ***username:password@hostname***. If a password is required and you omit it, you are prompted for it.
- **re0:*/path/filename*** or **re1:*/path/filename***—File on a local Routing Engine.

Required Privilege Level

configure—To enter configuration mode.

Related Documentation

- Deactivating and Reactivating Statements and Identifiers in a Junos Configuration

set

Syntax set <*statement-path*> *identifier*

Release Information Command introduced before Junos OS Release 7.4.

Description Create a statement hierarchy and set identifier values. This is similar to **edit** except that your current level in the hierarchy does not change.

Options *identifier*—Name of the statement or identifier to set.

statement-path—(Optional) Path to an existing statement hierarchy level. If that hierarchy level does not exist, it is created.

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- **edit on page 20**
- Displaying the Current Junos OS Configuration

show

Syntax show <*statement-path*> <*identifier*>

Release Information Command introduced before Junos OS Release 7.4.

Description Display the current configuration.

Options none—Display the entire configuration at the current hierarchy level.

identifier—(Optional) Display the configuration for the specified identifier.

statement-path—(Optional) Display the configuration for the specified statement hierarchy path.

Required Privilege Level configure—To enter configuration mode, but other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- show | display inheritance
- show | display omit
- show | display set
- show | display set relative
- show groups junos-defaults
- Displaying the Current Junos OS Configuration

status

Syntax status

Release Information Command introduced before Junos OS Release 7.4.

Description Display the users currently editing the configuration.

Required Privilege Level configure—To enter configuration mode.

- Displaying Users Currently Editing the Configuration.

top

Syntax top <*configuration-command*>

Release Information Command introduced before Junos OS Release 7.4.

Description Return to the top level of configuration command mode, which is indicated by the **[edit]** banner.

Options ***configuration-command***—(Optional) Issue configuration mode commands from the top of the hierarchy.

Required Privilege Level configure—To enter configuration mode.

Related Documentation

- Displaying the Current Junos OS Configuration
- **exit on page 21**
- **up on page 38**

up

Syntax up <*number*> <*configuration-command*>

Release Information Command introduced before Junos OS Release 7.4.

Description Move up one level in the statement hierarchy.

Options none—Move up one level in the configuration hierarchy.

configuration-command—(Optional) Issue configuration mode commands from a location higher in the hierarchy.

number—(Optional) Move up the specified number of levels in the configuration hierarchy.

Required Privilege Level configure—To enter configuration mode.

Related Documentation

- Displaying the Current Junos OS Configuration
- **exit on page 21**
- **top on page 37**

update

Syntax update

Release Information Command introduced in Junos OS Release 7.5.

Description Update private candidate configuration with a copy of the most recently committed configuration, including your private changes.

NOTE: The update command is available only when you are in configure private mode.

Required Privilege Level configure—To enter configuration mode.

Related Documentation

- Updating the configure private Configuration.

wildcard delete

Syntax wildcard delete <***statement-path***> <***identifier***> <***regular-expression***>

Release Information Command introduced before Junos OS Release 7.4.

Description Delete a statement or identifier. All subordinate statements and identifiers contained within the specified statement path are deleted with it.

Deleting a statement or an identifier effectively "unconfigures" or disables the functionality associated with that statement or identifier.

If you do not specify ***statement-path*** or ***identifier***, the entire hierarchy starting at the current hierarchy level is removed.

Options ***identifier***—(Optional) Name of the statement or identifier to delete.

regular-expression—(Optional) The pattern based on which you want to delete multiple items. When you use the **wildcard** command to delete related configuration items, the ***regular-expression*** must be the final statement.

statement-path—(Optional) Path to an existing statement or identifier. Include this if the statement or identifier to be deleted is not at the current hierarchy level.

Required Privilege Level configure—To enter configuration mode. Other required privilege levels depend on where the statement is located in the configuration hierarchy.

Related Documentation

- Example: Using Global Replace in a Junos Configuration—Using the upto Option.

PART 3

Configuration Statement Hierarchies

CHAPTER 3

Top-Level Leaf Statements

Leaf Statements at the [edit] Hierarchy Level

access-profile *profile-name*;
jsrc-partition *partition-name*;

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

CHAPTER 4

[edit access] Through [edit diameter] Hierarchy Levels

[edit access] Hierarchy Level

```
access {
  address-assignment {
    ... the address-assignment subhierarchy appears after the main [edit access] hierarchy
      ...
  }
  address-pool name {
    (address address-or-prefix | address-range low lower-ipv4-address
      high upper-ipv4-address);
    primary-dns server-name;
    primary-wins server-name;
    secondary-dns server-name;
    secondary-wins server-name;
  }
  domain {
    delimiter delimiter-characters;
    map domain-map-name {
      ...the map subhierarchy appears at the end of the [edit access domain] hierarchy ...
    }
    parse-direction (left-to-right | right-to-left);
    map domain-map-name {
      aaa-logical-system logical-system-name <aaa-routing-instance
        routing-instance-name>;
      aaa-routing-instance routing-instance-name;
      access-profile profile-name;
      address-pool pool-name;
      dynamic-profile profile-name;
```

```
        padn destination-address {
            mask destination-mask;
            metric route-metric;
        }
        strip-domain;
        target-logical-system logical-system-name <target-routing-instance
            routing-instance-name>;
        target-routing-instance routing-instance-name;
        tunnel-profile profile-name;
    }
}
firewall-authentication {
    pass-through {
        default-profile profile-name;
        (ftp | http | telnet) {
            banner {
                fail message-text;
                login message-text;
                success message-text;
            }
        }
    }
    traceoptions {
        file filename <files number> <match regular-expression> <size maximum-file-size>
            <world-readable | no-world-readable>;
        flag flag;
        no-remote-trace;
    }
    web-authentication {
        banner {
            success message-text;
        }
        default-profile profile-name;
    }
}
group-profile group-profile-name {
    l2tp {
        interface-id interface-identifier;
        lcp-renegotiation;
        local-chap;
        maximum-sessions-per-tunnel number;
        multilink {
            drop-timeout milliseconds;
            fragment-threshold bytes;
        }
    }
    ppp {
        cell-overhead;
        encapsulation-overhead bytes;
        framed-pool pool-identifier;
        idle-timeout seconds;
        interface-id interface-identifier;
        keepalive seconds;
        primary-dns ipv4-address;
        primary-wins ipv4-address;
        secondary-dns ipv4-address;
```



```
        secondary-wins ipv4-address;
    }
}
ldap-options {
    assemble {
        common-name name;
    }
    base-distinguished-name name;
    revert-interval seconds;
    search {
        admin-search {
            distinguished-name name;
            password password;
        }
        search-filter filter-name;
    }
}
ldap-server server-address {
    port port-number;
    retry attempts;
    routing-instance routing-instance-name;
    source-address address;
    timeout seconds;
}
profile profile-name {
    ... the profile subhierarchy appears after the main [edit access] hierarchy ...
}
radius-disconnect {
    client-address {
        secret password;
    }
}
radius-disconnect-port port-number;
radius-options {
    revert-interval seconds;
}
radius-server server-address {
    accounting-port port-number;
    port port-number;
    retry attempts;
    routing-instance routing-instance-name;
    secret password;
    source-address address;
    timeout seconds;
}
securid-server {
    server-name configuration-file filename;
}
tunnel-profile profile-name {
    tunnel tunnel-id {
        identification name;
        logical-system logical-system-name;
        max-sessions number;
        medium type;
        preference number;
        remote-gateway {
```

```
            address server-ip-address;
            gateway-name server-name;
          }
          routing-instance routing-instance-name;
          secret password;
          source-gateway {
            address client-ip-address;
            gateway-name client-name;
          }
          type tunnel-type;
        }
      }
    }

    access {
      address-assignment {
        location-pool pool-name {
          family inet {
            location index {
              address address;
            }
          }
        }
        neighbor-discovery-router-advertisement ndra-pool-name;
        pool pool-name {
          family (inet | inet6) {
            dhcp-attributes {
              boot-file filename;
              boot-server hostname;
              dns-server {
                ipv6-address;
              }
              domain-name domain-name;
              grace-period seconds;
              maximum-lease-time (seconds | infinite);
              name-server {
                address;
              }
              netbios-node-type (b-node | h-node | m-node | p-node);
              option option-index (array (byte | flag | integer | ip-address | short | string |
                unsigned-integer | unsigned-short) [ type-values ] | byte 8-bit-value |
                flag (false | off | on | true) | integer signed-32-bit-value | ip-address address |
                short signed-16-bit-value | string text-string | unsigned-integer 32-bit-value |
                unsigned-short 16-bit-value);
              option-match {
                option-82 {
                  circuit-id id-number range range-name;
                  remote-id id-number range range-name;
                }
              }
              router {
                address;
              }
              server-identifier ipv4-address;
              sip-server-address {
                ipv6-address;
```



```
                }
                sip-server-domain-name domain-name;
                tftp-server hostname;
                wins-server {
                    address;
                }
            }
            host hostname {
                hardware-address mac-address;
                ip-address ip-address;
            }
            network ip-prefix</prefix-length>;
            prefix ipv6-prefix;
            range name {
                high upper-limit;
                low lower-limit;
                prefix-length prefix-length;
            }
        }
        link pool-name;
    }
  }
}

access {
  profile profile-name {
    accounting {
      accounting-stop-on-access-deny;
      accounting-stop-on-failure;
      coa-immediate-update;
      immediate-update;
      order [ accounting-methods ];
      statistics (time | volume-time);
      update-interval minutes;
    }
    accounting-order radius;
    authentication-order [ ldap password radius securid ];
    authorization-order jsrc;
    client client-name {
      chap-secret chap-secret;
      client-group [ group-names ];
      firewall-user {
        password password;
      }
      group-profile profile-name;
      ike {
        allowed-proxy-pair {
          local local-proxy-address remote remote-proxy-address;
        }
        ike-policy policy-name;
        initiate-dead-peer-detection;
        interface-id interface-id;
        pre-shared-key (ascii-text key-string | hexadecimal key-string);
      }
      l2tp {
        interface-id interface-identifier;
```

```
        lcp-renegotiation;
        local-chap;
        maximum-sessions-per-tunnel number;
        multilink {
            drop-timeout milliseconds;
            fragment-threshold bytes;
        }
        ppp-authentication (chap | pap);
        ppp-profile profile-name;
        shared-secret shared-secret;
    }
    pap-password pap-password;
    ppp {
        cell-overhead;
        encapsulation-overhead bytes;
        framed-ip-address ip-address;
        framed-pool framed-pool;
        idle-timeout seconds;
        interface-id interface-identifier;
        keepalive seconds;
        primary-dns ipv4-address;
        primary-wins ipv4-address;
        secondary-dns ipv4-address;
        secondary-wins ipv4-address;
    }
    user-group-profile profile-name;
}
client-name-filter client-name {
    count number;
    domain-name domain-name;
    separator special-character;
}
ldap-options {
    assemble {
        common-name name;
    }
    base-distinguished-name name;
    revert-interval seconds;
    search {
        admin-search {
            distinguished-name name;
            password password;
        }
        search-filter filter-name;
    }
}
ldap-server server-address {
    port port-number;
    retry attempts;
    routing-instance routing-instance-name;
    source-address address;
    timeout seconds;
}
provisioning-order jsrc;
radius {
    accounting-server [ ip-addresses ];
```



```
attributes {
  exclude {
    accounting-authentic [ accounting-on | accounting-off ];
    accounting-delay-time [ accounting-on | accounting-off ];
    accounting-session-id [ access-request | accounting-on | accounting-off |
      accounting-stop ];
    accounting-terminate-cause [ accounting-off ];
    called-station-id [ access-request | accounting-start | accounting-stop ];
    calling-station-id [ access-request | accounting-start | accounting-stop ];
    class [ accounting-start | accounting-stop ];
    dhcp-gi-address [ access-request | accounting-start | accounting-stop ];
    dhcp-mac-address [ access-request | accounting-start | accounting-stop ];
    dhcp-options  [ access-request | accounting-start | accounting-stop ];
    event-timestamp [ accounting-on | accounting-off | accounting-start |
      accounting-stop ];
    framed-ip-address [ accounting-start | accounting-stop ];
    framed-ip-netmask [ accounting-start | accounting-stop ];
    input-filter [ accounting-start | accounting-stop ];
    input-gigapackets [ accounting-stop ];
    input-gigawords [ accounting-stop ];
    interface-description [ access-request | accounting-start | accounting-stop ];
    nas-identifier [ access-request | accounting-on | accounting-off |
      accounting-start | accounting-stop ];
    nas-port [ access-request | accounting-start | accounting-stop ];
    nas-port-id [ access-request | accounting-start | accounting-stop ];
    nas-port-type [ access-request | accounting-start | accounting-stop ];
    output-filter [ accounting-start | accounting-stop ];
    output-gigapackets [ accounting-stop ];
    output-gigawords [ accounting-stop ];
  }
  ignore {
    framed-ip-netmask;
    input-filter;
    logical-system-routing-instance;
    output-filter;
  }
}
authentication-server [ ip-addresses ];
options {
  accounting-session-id-format (decimal | description);
  client-accounting-algorithm (direct | round-robin);
  client-authentication-algorithm (direct | round-robin);
  ethernet-port-type-virtual;
  interface-description-format {
    exclude-adapter;
    exclude-sub-interface;
  }
  nas-identifier identifier-value;
  nas-port-extended-format {
    adapter-width width;
    port-width width;
    slot-width width;
    stacked-vlan-width width;
    vlan-width width;
  }
  revert-interval interval;
```

```
            vlan-nas-port-stacked-format;
          }
        }
        radius-options {
          revert-interval seconds;
        }
        radius-server server-address {
          accounting-port port-number;
          port port-number;
          retry attempts;
          routing-instance routing-instance-name;
          secret password;
          source-address address;
          timeout seconds;
        }
        session-options {
          client-group [ group-names ];
          client-idle-timeout minutes;
          client-session-timeout minutes;
        }
      }
    }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit accounting-options] Hierarchy Level

```
accounting-options {
  class-usage-profile profile-name {
    destination-classes {
      destination-class-name;
    }
    file filename;
    interval minutes;
    source-classes {
      source-class-name;
    }
  }
  file filename {
    archive-sites {
      site-name;
    }
    files number;
    nonpersistent;
    size bytes;
    start-time time;
    transfer-interval minutes;
  }
  filter-profile profile-name {
    counters {
      counter-name;
    }
    file filename;
    interval minutes;
  }
  interface-profile profile-name {
    fields {
      input-bytes;
      input-errors;
      input-multicast;
      input-packets;
      input-unicast;
      output-bytes;
      output-errors;
      output-multicast;
      output-packets;
      output-unicast;
      rpf-check-bytes;
      rpf-check-packets;
      rpf-check6-bytes;
      rpf-check6-packets;
      unsupported-protocol;
    }
    file filename;
    interval minutes;
  }
  mib-profile profile-name {
    file filename;
    interval minutes;
```

```
        object-names {
            mib-object-name;
        }
        operation (get | get-next | walk);
    }
    policy-decision-statistics-profile profile-name {
        application-aware-access-list-fields {
            address;
            application;
            application-group;
            input-bytes;
            input-interface;
            input-packets;
            mask;
            output-bytes;
            output-packets;
            subscriber-name;
            timestamp;
            vrf-name;
        }
        file filename;
    }
    routing-engine-profile profile-name {
        fields {
            field-name;
        }
        file filename;
        interval minutes;
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit applications] Hierarchy Level

```
applications {
  application application-name {
    application-protocol (bootp | dce-rpc | dce-rpc-portmap | dns | exec | ftp |
      gprs-gtp-c |gprs-gtp-u | gprs-gtp-v0 | gprs-sctp | h323 | icmp | ignore | iiop |
      ike-esp-nat | ip | login | mgcp-ca | mgcp-ua | ms-rpc | netbios | netshow | pptp | q931 |
      ras | realaudio | rpc | rpc-portmap | rsh | rtsp | sccp | shell | sip | snmp | sqlnet |
      sqlnet-v2 | sun-rpc | talk | tftp | traceroute | winframe);
    destination-port port-identifier;
    do-not-translate-A-query-to-AAAA-query;
    do-not-translate-AAAA-query-to-A-query;
    icmp-code value;
    icmp6-code value;
    icmp-type value;
    icmp6-type type-identifier;
    inactivity-timeout (never | seconds);
    learn-sip-register;
    protocol protocol-identifier;
    rpc-program-number number;
    sip-call-hold-timeout seconds;
    snmp-command (get | get-next | get-response | set | trap);
    source-port port-identifier;
    term term-name <alg application-name> <destination-port port-identifier>
      <icmp-code value> <icmp-type type-identifier> <inactivity-timeout (never | seconds)>
      <protocol protocol-identifier> <rpc-program-number number>
      <source-port port-identifier> <uuid hex-value>;
    ttl-threshold number;
    uuid hex-value;
  }
  application-set application-set-name {
    application application-name;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit bridge-domains] Hierarchy Level

```
bridge-domains {
  bridge-domain-name {
    bridge-options {
      ... the bridge-options subhierarchy appears after the main [edit bridge-domains
        bridge-domain-name] hierarchy ...
    }
    description text-description;
    domain-type bridge;
    forwarding-options {
      dhcp-relay {
        ... same statements as in [edit forwarding-options dhcp-relay] Hierarchy Level on
          page 103 ...
      }
      filter {
        input filter-name;
      }
      flood {
        input filter-name;
      }
    }
    interface interface-name;
    multicast-snooping-options {
      ... same statements as in [edit multicast-snooping-options] Hierarchy Level on page 147
        ...
    }
    no-irb-layer-2-copy;
    no-local-switching;
    protocols {
      ... the protocols subhierarchy appears after the main [edit bridge-domains
        bridge-domain-name] hierarchy ...
    }
    routing-interface irb-interface-name;
    vlan-id (all | none | number);
    vlan-id-list [ vlan-id-numbers ];
    vlan-tags outer <tpid.>vlan-id <inner <tpid.>vlan-id>;
  }

  bridge-domain-name {
    bridge-options {
      interface interface-name {
        interface-mac-limit {
          limit;
          packet-action drop;
        }
        no-mac-learning;
        static-mac mac-address {
          vlan-id number;
        }
      }
      interface-mac-limit {
        limit;
        packet-action drop;
```



```
            }
            mac-statistics;
            mac-table-size {
              number-of-addresses;
              packet-action drop;
            }
            no-mac-learning;
          }
        }

        bridge-domain-name {
          protocols {
            igmp-snooping {
              immediate-leave;
              interface interface-name {
                group-limit number;
                host-only-interface;
                immediate-leave;
                multicast-router-interface;
                static {
                  group multicast-ip-address {
                    source multicast-ip-address;
                  }
                }
              }
              proxy {
                source-address ip-address;
              }
              query-interval seconds;
              query-last-member-interval seconds;
              query-response-interval seconds;
              robust-count number;
              traceoptions {
                file filename <files number> <size maximum-file-size> <world-readable |
                  no-world-readable>;
                flag flag <flag-modifier> <disable>;
              }
              vlan vlan-id {
                ... same statements as at the [edit bridge-domains bridge-domain-name protocols
                  igmp-snooping] hierarchy level that appears in this topic, EXCEPT FOR ...
                traceoptions {...}    # NOT valid at this level
                vlan vlan-id {...}    # NOT valid at this level
              }
            }
          }
        }
      }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit chassis] Hierarchy Level

```
chassis {
  aggregated-devices {
    ethernet {
      device-count number;
      lacp {
        link-protection {
          non-revertive;
        }
        system-priority;
      }
    }
    sonet {
      device-count number;
    }
  }
  alarm {
    ds1 {
      ais (ignore | red | yellow);
      ylw (ignore | red | yellow);
    }
    ethernet {
      link-down (ignore | red | yellow);
    }
    integrated-services {
      failure (ignore | red | yellow);
    }
    management-ethernet {
      link-down (ignore | red | yellow);
    }
    serial {
      cts-absent (ignore | red | yellow);
      dcd-absent (ignore | red | yellow);
      dsr-absent (ignore | red | yellow);
      loss-of-rx-clock (ignore | red | yellow);
      loss-of-tx-clock (ignore | red | yellow);
      tm-absent (ignore | red | yellow);
    }
    services {
      hw-down (ignore | red | yellow);
      linkdown (ignore | red | yellow);
      pic-hold-reset (ignore | red | yellow);
      pic-reset (ignore | red | yellow);
      rx-errors (ignore | red | yellow);
      sw-down (ignore | red | yellow);
      tx-errors (ignore | red | yellow);
    }
    sonet {
      (ais-l | ais-p | ber-sd | ber-sf | locd | lol | lop-p | los | pll | plm-p | rfi-l | rfl-p | uneq-p)
        (ignore | red | yellow);
    }
    t3 {
      (ais | exz | ferf | idle | lcv | lof | los | pll | ylw) (ignore | red | yellow);
```

```
    }
  }
  cluster {
    control-link-recovery;
      control-ports {
      fpc slot-number port port-number;
    }
    heartbeat-interval milliseconds;
    heartbeat-threshold number;
    redundancy-group {
      ... the redundancy-group subhierarchy appears at the end of the [edit chassis cluster]
        hierarchy ...
    }
  reth-count number;
    traceoptions {
      file <filename > <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      level severity;
      no-remote-trace;
    }
    redundancy-group group-number {
      gratuitous-arp-count number;
      hold-down-interval seconds;
      interface-monitor {
        interface-name weight number;
      }
      ip-monitoring {
        family {
          inet {
            ipv4-address {
              interface reth index.logical-unit-number secondary-ip-address ipv4-address;
              weight number;
            }
          }
        }
        global-threshold number;
        global-weight number;
        retry-count count;
        retry-interval interval;
      }
      node node-number priority priority-number;
      preempt;
    }
  config-button {
    no-clear;
    no-rescue;
  }
  container-devices {
    device-count number;
  }
  craft-lockout;
  disable-power-management;
  filter;
  fpc slot-number {
    ... the fpc subhierarchy appears after the main [edit chassis] hierarchy ...
```

```
}
fpc-feb-connectivity {
   fpc slot-number feb (slot-number | none);
}
fpc-resync;
lcc index {
   ... the lcc subhierarchy appears after the main [edit chassis] hierarchy ...
}
memory-enhanced {
   filter;
   route;
   vpn-label;
}
network-services (ethernet | ip);
(packet-scheduling | no-packet-scheduling);
pem {
   minimum number;
}
ppp-subscriber-services (disable | enable);
redundancy {
   cfeb slot (always | preferred);
   failover {
      on-disk-failure;
      on-loss-of-keepalives;
   }
   feb {
      redundancy-group group-name {
         description description;
         feb slot-number <backup | primary>;
         no-auto-failover;
      }
   }
   graceful-switchover;
   keepalive-time seconds;
   routing-engine slot-number (backup | disabled | master);
   sfm slot-number (always | preferred);
   ssb slot-number (always | preferred);
}
routing-engine {
   bios {
      no-auto-upgrade;
   }
   on-disk-failure disk-failure-action (halt | reboot);
}
sfm slot-number {
   power off;
}
sib {
   minimum number;
}
(source-route | no-source-route);
synchronization {  # for M Series and T Series routers
   primary (external-a | external-b);
   secondary (external-a | external-b);
   signal-type (e1 | t1);
   switching-mode (non-revertive | revertive);
```



```
        transmitter-enable;
        validation-interval seconds;
        y-cable-line-termination;
    }
    synchronization {  # for MX80 and MX240 routers
        clock-mode (auto-select | free-run);
        esmc-transmit {
            interfaces (all | interface-name);
        }
        hold-interval {
            configuration-change seconds;
            restart seconds;
            switchover seconds;
        }
        network-option (option-1 | option-2);
        quality-mode-enable;
        switchover-mode (revertive | non-revertive);
        source {
            (external-a | external-b) {
                priority number;
                quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
                request (force-switch | lockout);
            }
            interfaces interface-name {
                priority number;
                quality-level (prc | prs |sec | smc | ssu-a | ssu-b | st2 | st3 | st3e | st4 | stu | tnc);
                request (force-switch | lockout);
                wait-to-restore minutes;
            }
        }
    }
    system-domains {
        protected-system-domains psdnumerical-index {
            control-plane-bandwidth-percent percent;
            control-slot-numbers [ slot-numbers ];
            control-system-id control-system-id;
            description description;
            fpcs [ slot-numbers ];
        }
        root-domain-id root-domain-id;
    }
    vrf-mtu-check;
}

chassis {
    fpc slot-number {
        number-of-ports active-ports;
        offline;
        pic slot-number {
            ... the pic subhierarchy appears after the main [edit chassis fpc slot-number] hierarchy
                ...
        }
        port-mirror-instance port-mirror-instance-name;
        power (off  | on);
        sampling-instance instance-name;
    }
```

```
fpc slot-number {
  pic slot-number {
    adaptive-services {
      service-package (layer-2 | layer-3 | ...the following extension-provider subhierarchy
        ...);
      extension-provider {
        control-cores number;
        data-cores number;
        data-flow-affinity {
          hash-key (layer-3 | layer-4);
        }
        forwarding-db-size megabytes;
        object-cache-size megabytes;
        package package-name;
        policy-db-size megabytes;
        syslog {
          facility {
            severity;
            destination (pic-console | routing-engine);
          }
        }
        wired-process-mem-size megabytes;
      }
    }
    aggregate-ports;
    atm-cell-relay-accumulation;
    atm-l2circuit-mode (aal5 | cell | trunk trunk);
    ce1 {
      e1 port-number {
        channel-group group-number timeslots slot-number;
      }
    }
    ct3 {
      port port-number {
        t1 link-number {
          channel-group group-number timeslots slot-number;
        }
      }
    }
    ethernet {
      pic-mode (enhanced-switching | routing | switching);
    }
    fibre-channel {
      port port-number;
      port-range port-range-low port-range-high
    }
    fibre-channel {
      port port-number;
      port-range port-range-low port-range-high
    }
    egress-policer-overhead bytes;
    framing (e1 | e3 | sdh | sonet | t1 | t3);
    idle-cell-format {
      itu-t;
      payload-pattern payload-pattern-byte;
```



```
            }
            ingress-policer-overhead bytes;
            linerate-mode;
            max-queues-per-interface (4 | 8);
            mlfr-uni-nni-bundles number;
            no-concatenate;
            port port-number {
                framing (e1 | e3 | sdh | sonet | t1 | t3);
            }
            port-mirror-instance port-mirror-instance-name;
            q-pic-large-buffer {
                (large-scale | small-scale);
            }
            red-buffer-occupancy {
                weighted-averaged <instant-usage-weight-exponent weight-value>;
            }
            shdsl {
                pic-mode (1-port-atm | 2-port-atm);
            }
            sparse-dlcis;
            traffic-manager {
                egress-shaping-overhead number;
                ingress-shaping-overhead number;
                mode {
                    egress-only;
                    ingress-and-egress;
                    session-shaping;
                }
            }
            tunnel-queuing;
            tunnel-services {
                bandwidth (1g | 10g);
                tunnel-only;
            }
            vtmapping (itu-t | klm);
        }
    }
}

chassis {
    lcc index {
        fpc slot-number {
            ... the fpc subhierarchy appears after the main [edit chassis lcc index] hierarchy ...
        }
        offline;
        online-expected;
    }
}

lcc index {
    fpc slot-number {
        pic slot-number {
            ... the pic subhierarchy appears after the main [edit chassis lcc index fpc slot-number]
                hierarchy ...
        }
        power (off  | on);
```

```
        sampling-instance instance-name;
    }

    fpc slot-number {
        pic slot-number {
            aggregate-ports;
            atm-cell-relay-accumulation;
            atm-l2circuit-mode (aal5 | cell | trunk trunk);
            framing (e1 | e3 | sdh | sonet | t1 | t3);
            idle-cell-format {
                itu-t;
                payload-pattern payload-pattern-byte;
            }
            linerate-mode;
            max-queues-per-interface (4 | 8);
            no-concatenate;
            no-pre-classifier;
            port port-number {
                framing (e1 | e3 | sdh | sonet | t1 | t3);
            }
            q-pic-large-buffer {
                (large-scale | small-scale);
            }
            red-buffer-occupancy {
                weighted-averaged <instant-usage-weight-exponent weight-value>;
            }
            shdsl {
                pic-mode (1-port-atm | 2-port-atm);
            }
            traffic-manager {
                egress-shaping-overhead bytes;
                ingress-shaping-overhead bytes;
                mode {
                    egress-only;
                    ingress-and-egress;
                }
            }
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit class-of-service] Hierarchy Level

```
class-of-service {
  adaptive-shapers {
    adaptive-shaper-name {
      trigger type shaping-rate (bps | percent percentage);
    }
  }
  classifiers {
    type classifier-name {
      forwarding-class class-name {
        loss-priority (high | low | medium-high | medium-low) code-points [ aliases bits ];
      }
      import (classifier-name | default);
    }
  }
  code-point-aliases {
    (dscp | dscp-ipv6 | exp | ieee-802.1 | inet-precedence) {
      alias-name bits;
    }
  }
  copy-plp-all;
  drop-profiles {
    profile-name {
      fill-level percentage drop-probability percentage;
      interpolate {
        drop-probability value;
        fill-level value;
      }
    }
  }
  fabric {
    scheduler-map {
      priority (high | low) scheduler scheduler-name;
    }
  }
  forwarding-class-map {
    map-name {
      class class-name queue-num queue-number <restricted-queue queue-number>;
    }
  }
  forwarding-classes {
    class class-name queue-num queue-number priority (high | low);
    queue queue-number class-name priority (high | low);
  }
  forwarding-policy {
    class class-name {
      classification-override {
        forwarding-class class-name;
      }
    }
    next-hop-map map-name {
      forwarding-class class-name {
        discard;
```

```
        lsp-next-hop [ lsp-regular-expressions ];
        next-hop [ next-hop-names ];
        non-lsp-next-hop;
      }
    }
  }
  fragmentation-maps {
    map-name {
      forwarding-class class-name {
        drop-timeout milliseconds;
        fragment-threshold bytes;
        multilink-class number;
        no-fragmentation;
      }
    }
  }
  host-outbound-traffic {
    dscp-code-point value;
    forwarding-class class-name;
    translation-table to-802.1p-from-dscp table-name;
  }
  interfaces {
    ... the interfaces subhierarchy appears after the main [edit class-of-service] hierarchy
      ...
  }
  loss-priority-maps {
    frame-relay-de (map-name | default) {
      loss-priority level code-points [ 0 1 ];
    }
  }
  restricted-queues {
    forwarding-class class-name queue queue-number;
  }
  rewrite-rules {
    (dscp | dscp-ipv6 | exp |frame-relay-de | ieee-802.1 | inet-precedence) rewrite-rule {
      forwarding-class class-name {
        loss-priority level code-point (alias | bits);
      }
      import (rewrite-rule | default);
    }
  }
  routing-instances routing-instance-name {
    classifiers {
      dscp (classifier-name | default);
      dscp-ipv6 (classifier-name | default);
      exp (classifier-name | default);
      ieee-208.1 (classifier-name | default | encapsulated | vlan-tag);
    }
  }
  scheduler-maps {
    map-name {
      forwarding-class class-name scheduler scheduler-name;
    }
  }
  schedulers {
    scheduler-name {
```



```
            buffer-size (exact | percent percentage | remainder | temporal microseconds);
            drop-profile-map loss-priority (any | high | low | medium-high | medium-low)
              protocol (any | non-tcp | tcp) drop-profile profile-name;
            excess-priority (high | low | medium-high | medium-low);
            excess-rate percent percentage;
            priority (high | low | medium-high | medium-low | strict-high);
            shaping-rate (bps | percent percentage);
            transmit-rate (bps | percent percentage | remainder) <exact | rate-limit>;
          }
        }
        traceoptions {
          file <filename> <files number> <match regular-expression> <size maximum-file-size>
            <world-readable | no-world-readable>;
          flag flag;
          no-remote-trace;
        }
        traffic-control-profiles {
          profile-name {
            delay-buffer-rate (bps | percent percentage);
            excess-rate (percent percentage | proportion value);
            guaranteed-rate (bps | percent percentage) <burst-size bytes>;
            overhead-accounting (frame-mode | cell-mode) <bytes byte-value>;
            scheduler-map map-name;
            shaping-rate (bps | percent percentage) <burst-size bytes>;
          }
        }
        translation-table {
          to-802.1p-from-dscp table-name {
            to-code-point 3-bit-pattern from-code-points [ 6-bit-patterns ];
          }
          to-dscp-from-dscp table-name {
            to-code-point 6-bit-pattern from-code-points [ 6-bit-patterns ];
          }
          to-dscp-ipv6-from-dscp-ipv6 table-name {
            to-code-point 6-bit-pattern from-code-points [ 6-bit-patterns ];
          }
          to-exp-from-exp table-name {
            to-code-point 3-bit-pattern from-code-points [ 3-bit-patterns ];
          }
          to-inet-precedence-from-inet-precedence table-name {
            to-code-point 3-bit-pattern from-code-points [ 3-bit-patterns ];
          }
        }
        tri-color;
      }

      class-of-service {
        interfaces {
          interface-name {
            excess-bandwith-share (equal | proportional value);
            input-excess-bandwith-share (equal | proportional value);
            input-scheduler-map map-name;
            input-shaping-rate bps;
            input-traffic-control-profile profile-name;
            input-traffic-control-profile-remaining profile-name;
            output-forwarding-class-map map-name;
```

```
    output-traffic-control-profile profile-name;
    output-traffic-control-profile-remaining profile-name;
    scheduler-map map-name;
    scheduler-map-chassis map-name;
    shaping-rate bps;
    unit logical-unit-number {
      adaptive-shaper adaptive-shaper-name;
      classifiers {
        dscp (classifier-name | default) {
          family [ inet mpls ];
        }
        dscp-ipv6 (classifier-name | default) {
          family [ inet mpls ];
        }
        exp (classifier-name | default);
        ieee-208.1 (classifier-name | default)  <vlan-tag (inner | outer)>;
        ieee-208.1ad (classifier-name | default);
        inet-precedence (classifier-name | default);
      }
      forwarding-class class-name;
      fragmentation-map map-name;
      input-scheduler-map map-name;
      input-shaping-rate bps;
      input-traffic-control-profile profile-name shared-instance instance-name;
      loss-priority-maps {
        (map-name | default);
      }
      output-forwarding-class-map map-name;
      output-traffic-control-profile profile-name shared-instance instance-name;
      per-session-scheduler;
      rewrite-rules {
        dscp (rule-name | default) <protocol mpls>;
        dscp-ipv6 (rule-name | default);
        exp (rule-name | default) <protocol [ mpls-any | mpls-inet-both |
          mpls-inet-both-non-vpn ]>;
        exp-push-push-push default;
        exp-swap-push-push default;
        frame-relay-de (rewrite-name | default);
        ieee-802.1 (rewrite-name | default) <vlan-tag (outer | outer-and-inner)>;
        ieee-802.1ad (rewrite-name | default) <vlan-tag (outer | outer-and-inner)>;
        inet-precedence (rewrite-name | default) <protocol mpls>;
      }
      scheduler-map map-name;
      shaping-rate bps;
      translation-table (to-dscp-from-dscp | to-dscp-ipv6-from-dscp-ipv6 |
        to-exp-from-exp | to-inet-precedence-from-inet-precedence) table-name;
    }
  }
  interface-set interface-set-name {
    excess-bandwith-share (equal | proportional value);
    input-excess-bandwith-share (equal | proportional value);
    input-traffic-control-profile profile-name;
    input-traffic-control-profile-remaining profile-name;
    internal-node;
    output-traffic-control-profile profile-name;
    output-traffic-control-profile-remaining profile-name;
```



```
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit diameter] Hierarchy Level

```
diameter {
  network-element element-name {
    forwarding {
      route dne-route-name {
        destination realm realm-name <host hostname>;
        function function-name <partition partition-name>;
        metric route-metric;
      }
    }
    function function-name;
    peer peer-name {
      priority priority-number;
    }
  }
  origin {
    host hostname;
    realm realm-name;
  }
  peer peer-name {
    address ip-address;
    connect-actively {
      port port-number;
    }
    logical-system logical-system-name <routing-instance routing-instance-name >;
    routing-instance routing-instance-name;
  }
}
```

Related Documentation

- Diameter Base Protocol Overview
- Configuring Diameter
- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

CHAPTER 5

[edit dynamic-profiles] Hierarchy Levels

[edit dynamic-profiles] Hierarchy Level

Each of the following topics lists the statements at a subhierarchy of the **[edit dynamic-profiles]** hierarchy.

Related Documentation

[edit dynamic-profiles class-of-service] Hierarchy Level

```
dynamic-profiles {
  profile-name {
    class-of-service {
      interfaces {
        interface-name {
          unit logical-unit-number {
            classifiers {
              dscp (classifier-name | default) {
                family inet;
              }
              dscp-ipv6 (classifier-name | default) {
                family inet;
              }
              ieee-802.1 (classifier-name | default) <vlan-tag (inner | outer)>;
              inet-precedence (classifier-name | default);
            }
            forwarding-class class-name;
            output-traffic-control-profile profile-name;
            rewrite-rules {
              dscp (rule-name | default) <protocol mpls>;
              dscp-ipv6 (rule-name | default);
              ieee-802.1 (rule-name | default) <vlan-tag (outer | outer-and-inner)>;
              inet-precedence (rule-name | default) <protocol mpls>;
            }
          }
        }
      }
      scheduler-maps {
        map-name {
          forwarding-class class-name scheduler scheduler-name;
        }
      }
      schedulers {
          scheduler-name {
            buffer-size (percent (percentage | $junos-cos-scheduler-bs) | remainder |
              temporal microseconds) <exact>;
            drop-profile-map loss-priority (any | high | low | medium-high | medium-low)
              protocol (any | non-tcp | tcp) drop-profile (profile-name |
              predefined-variable);
            excess-priority (high | low | $junos-cos-scheduler-excess-priority);
            excess-rate (percent (percentage | $junos-cos-scheduler-excess-rate);
            overhead-accounting shaping-mode <bytes byte-value>;
            priority (priority-level | $junos-cos-scheduler-priority);
            shaping-rate (rate | predefined-variable);
            transmit-rate (rate | percent (percentage | $junos-cos-scheduler-tx) |
              remainder) <exact | rate-limit>;
          }
        }
      }
      traceoptions {
        ... same statements as at the [edit class-of-services traceoptions] hierarchy level
          in [edit class-of-service] Hierarchy Level on page 65 ...
```

```
        }
        traffic-control-profiles profile-name {
            delay-buffer-rate (percent percentage | rate);
            excess-rate (percent (percentage | $junos-cos-excess-rate) | proportion value);
            guaranteed-rate (percent percentage | rate);
            overhead-accounting shaping-mode <bytes byte-value>;
            scheduler-map map-name;
            shaping-rate (rate | predefined-variable);
        }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit dynamic-profiles] Hierarchy Level on page 71

[edit dynamic-profiles firewall] Hierarchy Level

```
dynamic-profiles {
  profile-name {
    firewall {
      family inet {
        fast-update-filter filter-name {
          interface-specific;
          match-order [ destination-address destination-port dscp protocol source-address
            source-port ];
          term term-name {
            from {
              destination-address ip-prefix</prefix-length>;
              destination-port (afs | bgp | biff | bootpc | bootps | cmd | cvspserver | dhcp |
                domain | eklogin | ekshell | exec | finger | ftp | ftp-data | http | https | ident |
                imap | kerberos-sec | klogin | kpasswd | krb-prop | krbupdate | kshell | ldap |
                ldp | login | mobileip-agent | mobilip-mn | msdp | netbios-dgm | netbios-ns |
                netbios-ssn | nfsd | nntp | ntalk | ntp | pop3 | pptp | printer | radacct | radius |
                rip | rkinit | smtp | snmp | snmptrap | snpp | socks | ssh | sunrpc | syslog |
                tacacs | tacacs-ds | talk | telnet | tftp | timed | who | xdmcp);
              dscp (forwarding-class | forwarding-class–forwarding-class);
              match-terms match-criteria;
              protocol (ah | dstops | egp | esp | fragment | gre | hop-by-hop | icmp | icmpv6 |
                igmp | ipip | ipv6 | no-next-header | ospf | pim | routing | rsvp | sctp | tcp |
                udp | vrrp |protocol-name–protocol-name);
              source-address ip-prefix</prefix-length>;
              (source-port (... same values as for the preceding destination-port statement
                ...);
            }
            only-at-create;
            then {
              (accept | discard | routing-instance routing-instance-name
                <topology topology-name>);
              action-terms actions;
              count counter-name;
              forwarding-class class-name;
              log;
              loss-priority (high | low | medium-high | medium-low);
              policer policer-name;
              port-mirror;
            }
          }
        }
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit dynamic-profiles] Hierarchy Level on page 71

[edit dynamic-profiles interfaces] Hierarchy Level

```
dynamic-profiles {
  profile-name {
    interfaces {
      (interface-name |demux0 | interface-set interface-set-name | pp0) {
      ... statements from those in [edit dynamic-profiles] Hierarchy Level in the Junos OS
        Subscriber Access Configuration Guide, varying by the interface type ...
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit dynamic-profiles] Hierarchy Level on page 71

[edit dynamic-profiles protocols] Hierarchy Level

```
dynamic-profiles {
  profile-name {
    protocols {
      igmp {
        interface interface-name {
          ... same statements as at the [edit protocols igmp interface interface-name]
            hierarchy level in [edit protocols igmp] Hierarchy Level on page 170 ...
        }
      }
      mld {
        interface interface-name {
          ... same statements as at the [edit protocols mld interface interface-name]
            hierarchy level in [edit protocols mld] Hierarchy Level on page 185 ...
        }
      }
      router-advertisement {
        interface interface-name {
          ... same statements as at the [edit protocols router-advertisement interface
            interface-name] hierarchy level in [edit protocols router-advertisement]
            Hierarchy Level on page 218 ...
        }
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit dynamic-profiles] Hierarchy Level on page 71

[edit dynamic-profiles routing-instances] Hierarchy Level

```
dynamic-profiles {
  profile-name {
    routing-instances {
      routing-instance-name {
        access-profile profile-name;
        bridge-domains {
          ... same statements as in [edit bridge-domains] Hierarchy Level on page 56 ...
        }
        interface interface-name;
        vlan-id (id | all | none);
        vlan-tags outer <tpid.>vlan-id inner <tpid.>vlan-id;
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit dynamic-profiles] Hierarchy Level on page 71

[edit dynamic-profiles routing-options] Hierarchy Level

```
dynamic-profiles {
  profile-name {
    routing-options {
      access {
        ... same statements as at the [edit routing-options access] hierarchy level in [edit
          routing-options] Hierarchy Level on page 240 ...
      }
      access-internal {
        ... same statements as at the [edit routing-options access-internal] hierarchy level
          in [edit routing-options] Hierarchy Level on page 240 ...
      }
      multicast {
        interface interface-name <no-qos-adjust>;
        pim-to-igmp-proxy {
          upstream-interface [ interface-names ];
        }
        pim-to-mld-proxy {
          upstream-interface [ interface-names ];
        }
      }
      rib routing-table-name {
        ... same statements as at the [edit routing-options rib routing-table-name] hierarchy
          level in [edit routing-options] Hierarchy Level on page 240 ...
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit dynamic-profiles] Hierarchy Level on page 71

[edit dynamic-profiles variables] Hierarchy Level

```
dynamic-profiles {
  profile-name {
    variables {
      variable-name {
        default-value text-string;
        mandatory;
        radius {
          vendor-id id;
        }
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit dynamic-profiles] Hierarchy Level on page 71

CHAPTER 6

[edit ethernet-switching-options] Through [edit firewall] Hierarchy Levels

[edit ethernet-switching-options] Hierarchy Level

```
ethernet-switching-options {
  analyzer analyzer-name {
    ... the analyzer subhierarchy appears after the main [edit ethernet-switching-options]
      hierarchy ...
  }
  authentication-whitelist {
    mac-address {
      interface interface-name;
      vlan-assignment vlan-identifier;
    }
  }
  bpdu-block {
    disable-timeout seconds;
    interface (all | interface-name);
  }
  dot1q-tunneling {
    ether-type (0x8100 | 0x88a8 | 0x9100) ;
  }
  interfaces interface-name {
    no-mac-learning;
  }
  mac-notification {
    notification-interval seconds;
  }
  mac-table-aging-time seconds;
  port-error-disable {
    disable-timeout timeout;
  }
  redundant-trunk-group {
    group name {
      description descriptive-text;
      interface interface-name {
        primary;
      }
      preempt-cutover-timer seconds;
    }
  }
  secure-access-port {
    ... the secure-access-port subhierarchy appears after the main [edit
      ethernet-switching-options] hierarchy ...
  }
  static {
    vlan vlan-id {
      mac mac-address next-hop interface-name;
    }
  }
  storm-control {
    action-shutdown;
    interface (all | interface-name) {
      bandwidth kbps;
      no-broadcast;
      no-unknown-unicast;
```

```
        }
    }
    traceoptions {
        file filename <files number> <no-stamp> <replace> <size size> <world-readable |
            no-world-readable>;
        flag flag <disable>;
    }
    unknown-unicast-forwarding {
        vlan vlan-name {
            interface (all | interface-name);
        }
    }
    voip {
        interface (access-ports | all | interface-name) {
            forwarding-class (class-name | assured-forwarding | best-effort |
                expedited-forwarding | network-control);
            vlan vlan-name;
        }
    }
}

ethernet-switching-options {
    analyzer analyzer-name {
        input {
            egress {
                interface (all | interface-name);
            }
            ingress {
                interface (all | interface-name);
                vlan (vlan-id | vlan-name);
            }
        }
        loss-priority (high | low);
        output {
            interface {
                interface-name;
            }
            vlan {
                vlan-identifier;
            }
        }
        ratio number;
    }
}

ethernet-switching-options {
    secure-access-port {
        dhcp-snooping-file {
            location (local-pathname | url);
            timeout seconds;
            write-interval seconds;
        }
        interface interface-name {
            allowed-mac [ mac-addresses ];
            (dhcp-trusted | no-dhcp-trusted);
            fcoe-trusted;
```

```
        mac-limit number action (drop | log | none | shutdown);
        no-allowed-mac-log;
        static-ip  ip-address mac mac-address vlan vlan-id;
      }
      vlan (all | vlan-name) {
        (arp-inspection | no-arp-inspection);
        dhcp-option82 {
          disable;
          circuit-id {
            prefix hostname;
            use-interface-description;
            use-vlan-id;
          }
          remote-id {
            prefix (hostname | mac | none);
            use-interface-description;
            use-string string;
          }
          vendor-id {
            text-string;
          }
        }
        (examine-dhcp | no-examine-dhcp);
        examine-fip {
          fc-map 0x0efcdigit-pair;
        }
        (ip-source-guard| no-ip-source-guard);
        mac-move-limit number <action (drop | log | none | shutdown)>;
      }
    }
  }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit event-options] Hierarchy Level

```
event-options {
  destinations {
    destination-name {
      archive-sites {
        url <password password>;
      }
      transfer-delay seconds;
    }
  }
  event-script {
    file filename {
      checksum (md5 | sha-256 | sha1) hash;
      refresh;
      refresh-from url;
      remote-execution {
        remote-hostname {
          passphrase user-password;
          username user-login;
        }
      }
      source url;
    }
    refresh;
    refresh-from url;
    traceoptions {
      file <filename> <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag;
      no-remote-trace;
    }
  }
  generate-event event-name {
    time-interval seconds;
    time-of-day hh:mm:ss;
  }
  policy policy-name {
    ... the policy subhierarchy appears after the main [edit event-options] hierarchy ...
  }
  traceoptions {
    file <filename> <files number> <match regular-expression> <size maximum-file-size>
      <world-readable | no-world-readable>;
    flag flag;
    no-remote-trace;
  }
}

event-options {
  policy policy-name {
    attributes-match {
      event1.attribute-name equals event2.attribute-name;
      event.attribute-name matches regular-expression;
      event1.attribute-name starts-with event2.attribute-name;
```

```
        }
        events [ events ];
        then {
          event-script filename {
            arguments {
              argument-name argument-value;
            }
            destination destination-name {
              retry-count number retry-interval seconds;
              transfer-delay seconds;
            }
            output-filename filename;
            output-format (text | xml);
            user-name username;
          }
          execute-commands {
            commands {
              "command";
            }
            destination destination-name {
              retry-count number retry-interval seconds;
              transfer-delay seconds;
            }
            output-filename filename;
            output-format (text | xml);
            user-name username;
          }
          ignore;
          raise-trap;
          upload filename (filename | committed) destination destination-name {
            retry-count number retry-interval seconds;
            transfer-delay seconds;
            user-name username;
          }
        }
        within seconds {
          events [ events ];
          not events [ events ];
          trigger (after number | on number | until number);
        }
      }
    }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit fc-fabrics] Hierarchy Level

```
fc-fabrics {
  fc-fabric-name {
    description descriptive-text;
    fabric-id fc-fabric-id;
    fabric-type proxy;
    fc2{
      traceoptions {
        file filename <files number> <no-stamp> <replace> <size size> <world-readable
          | no-world-readable>;
        flag flag <disable>;
      }
    }
    interface {
      interface-name;
      vlan.vlan-interface-name;
    }
    protocols {
      fip {
        fc-map 0x0efcdigit-pair;
        fka-adv-period milliseconds;
        interface {
          interface-name {
            fka-adv-period milliseconds;
            priority priority;
          }
        priority priority;
        traceoptions {
          file filename <files number> <no-stamp> <replace> <size size> <world-readable
            | no-world-readable>;
          flag flag <disable>;
        }
      }
    }
    proxy {
      traceoptions {
        file filename <files number> <no-stamp> <replace> <size size> <world-readable
          | no-world-readable>;
        flag flag <disable>;
      }
    }
  }
}
```

Related Documentation

- Example: Setting Up Fibre Channel and FCoE VLAN Interfaces in an FCoE-FC Gateway Fabric
- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit fc-options] Hierarchy Level

```
fc-options {
  traceoptions {
    file filename <files number> <no-stamp> <replace> <size size> <world-readable |
      no-world-readable>;
    flag flag <disable>;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit firewall] Hierarchy Level

Several statements in the **[edit firewall]** hierarchy are valid at numerous locations within the hierarchy. To make the complete hierarchy easier to read, the repeated statements are listed in the following sections, which are referenced at the appropriate locations in "Complete [edit firewall] Hierarchy" on page 91.

Common Firewall Actions

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Complete [edit firewall] Hierarchy" on page 91 instead of the statements being repeated.

- **[edit firewall family (any | bridge | ccc | inet | inet6 | mpls | vpls) filter *filter-name* term *term-name* then]**
- **[edit firewall filter *filter-name* term *term-name* then]**

The common firewall actions are as follows:

```
count counter-name;
forwarding-class class-name;
loss-priority (high | low | medium-high | medium-low);
next term;
policer policer-name;
three-color-policer policer-name {
   (single-rate single-rate-policer-name | two-rate two-rate-policer-name);
}
```

Common IP Firewall Actions

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Complete [edit firewall] Hierarchy" on page 91 instead of the statements being repeated.

- **[edit firewall family inet filter *filter-name* term *term-name* then]**
- **[edit firewall family inet6 filter *filter-name* term *term-name* then]**
- **[edit firewall filter *filter-name* term *term-name* then]**

The common IP firewall actions are as follows:

```
log;
logical-system logical-system-name <routing-instance routing-instance-name>
   <topology topology-name>;
port-mirror;
port-mirror-instance instance-name;
routing-instance routing-instance-name> <topology topology-name>;
sample;
service-filter-hit;
syslog;
topology topology-name;
```

Common IPv4 Firewall Actions

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Complete [edit firewall] Hierarchy" on page 91 instead of the statements being repeated.

- **[edit firewall family inet filter *filter-name* term *term-name* then]**
- **[edit firewall filter *filter-name* term *term-name* then]**

The common IP version 4 (IPv4) firewall actions are as follows:

```
(accept | discard <accounting collector-name> | reject <administratively-prohibited |
   bad-host-tos | bad-network-tos | fragmentation-needed | host-prohibited |
   host-unknown | host-unreachable | network-prohibited | network-unknown |
   network-unreachable | port-unreachable | precedence-cutoff | precedence-violation |
   protocol-unreachable | source-host-isolated | source-route-failed | tcp-reset>);
ipsec-sa sa-name;
load-balance sa-name;
next-hop-group group-name;
prefix-action action-name;
```

Common IP Firewall Match Conditions

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Complete [edit firewall] Hierarchy" on page 91 instead of the statements being repeated.

- **[edit firewall family inet dialer-filter *filter-name* term *term-name* from]** (with the exceptions noted at this level in "Complete [edit firewall] Hierarchy" on page 91)
- **[edit firewall family inet filter *filter-name* term *term-name* from]**
- **[edit firewall family inet6 dialer-filter *filter-name* term *term-name* from]** (with the exceptions noted at this level in "Complete [edit firewall] Hierarchy" on page 91)
- **[edit firewall family inet6 filter *filter-name* term *term-name* from]**
- **[edit firewall filter *filter-name* term *term-name* from]**

The common IP firewall match conditions are as follows:

```
address {
   ip-prefix</prefix-length> <except>;
}
destination-address {
```



```
    ip-prefix</prefix-length> <except>;
  }
  destination-class [ class-names ] | destination-class-except [ class-names ]);
  (destination-port [ port-names ] | destination-port-except [ port-names ]);
  destination-prefix-list {
    list-name <except>;
  }
  (forwarding-class [ class-names ] | forwarding-class-except [ class-names ]);
  (icmp-code [ codes ] | icmp-code-except [ codes ]);
  (icmp-type [ types ] | icmp-type-except [ types ]);
  interface interface-name;
  (interface-group [ group-names ] | interface-group-except [ group-names ]);
  interface-set set-name;
  (loss-priority [ priorities ] | loss-priority-except [ priorities ]);
  (packet-length [ values ] | packet-length-except [ values ]);
  (port [ port-names ] | port-except [ port-names ]);
  prefix-list {
    list-name <except>;
  }
  service-filter-hit;
  source-address {
    ip-prefix</prefix-length> <except>;
  }
  (source-class [ class-names ] | source-class-except [ class-names ]);
  (source-port [ port-names ] | source-port-except [ port-names ]);
  source-prefix-list {
    list-name <except>;
  }
  tcp-established;
  tcp-flags flag;
  tcp-initial;
```

Common IPv4 Firewall Match Conditions

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Complete [edit firewall] Hierarchy" on page 91 instead of the statements being repeated.

- **[edit firewall family inet dialer-filter *filter-name* term *term-name* from]** (with the exceptions noted at this level in "Complete [edit firewall] Hierarchy" on page 91)
- **[edit firewall family inet filter *filter-name* term *term-name* from]**
- **[edit firewall filter *filter-name* term *term-name* from]**

The common IPv4 firewall match conditions are as follows:

```
  (ah-spi [ values ] | ah-spi-except [ values ]);
  (dscp [ code-point-values ] | dscp-except [ code-point-values ]);
  (esp-spi [ values ] | esp-spi-except [ values ]);
  first-fragment;
  fragment-flags flag;
  (fragment-offset [ offsets ] | fragment-offset-except [ offsets ]);
  (ip-options [ option-names ] | ip-options-except [ option-names ]);
  is-fragment;
  (precedence [ precedence-names ] | precedence-except [ precedence-names ]);
```

```
(protocol [ protocol-names ] | protocol-except [ protocol-names ]);
(ttl [ ttl-values ] | ttl-except [ ttl-values ]);
```

Common Layer 2 Firewall Match Conditions

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Complete [edit firewall] Hierarchy" on page 91 instead of the statements being repeated.

- **[edit firewall family bridge filter *filter-name* term *term-name* from]**
- **[edit firewall family vpls filter *filter-name* term *term-name* from]**

The common Layer 2 firewall match conditions are as follows:

```
destination-mac-address {
   mac-address <except>;
}
(destination-port [ port-names ] | destination-port-except [ port-names ]);
(dscp [ code-point-values ] | dscp-except [ code-point-values ]);
(ether-type [ protocol-types ] | ether-type-except [ protocol-types ]);
(forwarding-class [ class-names ] | forwarding-class-except [ class-names ]);
(icmp-code [ codes ] | icmp-code-except [ codes ]);
(icmp-type [ types ] | icmp-type-except [ types ]);
(interface-group [ group-names ] | interface-group-except [ group-names ]);
ip-address {
   ip-prefix</prefix-length> <except>;
}
ip-destination-address {
   ip-prefix</prefix-length> <except>;
}
(ip-precedence [ precedence-names ] | ip-precedence-except [ precedence-names ]);
(ip-protocol [ protocol-names ] | ip-protocol-except [ protocol-names ]);
ip-source-address ip-prefix</prefix-length>;
(learn-vlan-1p-priority [ priorities ] | learn-vlan-1p-priority [ priorities ]);
(learn-vlan-id [ vlan-ids ] | learn-vlan-id-except [ vlan-ids ]);
(loss-priority [ priorities ] | loss-priority-except [ priorities ]);
(port [ port-names ] | port-except [ port-names ]);
source-mac-address {
   mac-address <except>;
}
(source-port [ port-names ] | source-port-except [ port-names ]);
tcp-flags flag;
(traffic-type [ broadcast known-unicast multicast unknown-unicast ] |
   traffic-type-except [ broadcast known-unicast multicast unknown-unicast ]);
(user-vlan-1p-priority [ priorities ] | user-vlan-1p-priority [ priorities ]);
(user-vlan-id [ vlan-ids ] | user-vlan-id-except [ vlan-ids ]);
(vlan-ether-type [ protocol-types ] | vlan-ether-type-except [ protocol-types ]);
```


Complete [edit firewall] Hierarchy

```
firewall {
  family (any | bridge | ccc | inet | inet6 | mpls | vpls) {
    ... the family subhierarchies appear after the main [edit firewall] hierarchy ...
  }
  filter filter-name {
    accounting-profile [ profile-names ];
    interface-specific;
    physical-interface-policer;
    term term-name {
      filter filter-name;
      from {
        ... statements in Common IP Firewall Match Conditions on page 88 AND
          statements in Common IPv4 Firewall Match Conditions on page 89 ...
      }
      then {
        ... statements in Common Firewall Actions on page 87 AND
          statements in Common IP Firewall Actions on page 87 AND
          statements in Common IPv4 Firewall Actions on page 88 ...
      }
    }
  }
  hierarchical-policer policer-name {
    aggregate {
      if-exceeding {
        bandwidth-limit bps;
        burst-size-limit bytes;
      }
      then {
        discard;
        forwarding-class class-name;
        loss-priority (high | low | medium-high | medium-low);
      }
    }
    premium {
      if-exceeding {
        bandwidth-limit bps;
        burst-size-limit bytes;
      }
      then {
        discard;
      }
    }
  }
  interface-set interface-set-name {
    interface-name;
  }
  load-balance-group group-name {
    next-hop-group [ group-names ];
  }
  policer policer-name {
    filter-specific;
    if-exceeding {
      (bandwidth-limit bps | bandwidth-percent percentage);
      burst-size-limit bytes;
```

```
        }
        logical-bandwidth-policer;
        logical-interface-policer;
        physical-interface-policer;
        then {
            discard;
            forwarding-class class-name;
            loss-priority (high | low | medium-high | medium-low);
        }
    }
    three-color-policer policer-name {
        action {
            loss-priority high then discard;
        }
        logical-interface-policer;
        single-rate {
            (color-aware | color-blind);
            committed-burst-size bytes;
            committed-information-rate bps;
            excess-burst-size bytes;
        }
        two-rate {
            (color-aware | color-blind);
            committed-burst-size bytes;
            committed-information-rate bps;
            peak-burst-size bytes;
            peak-information-rate bps;
        }
    }
}

firewall {
    family any {
        filter filter-name {
            term term-name {
                from {
                    (forwarding-class [ class-names ] | forwarding-class-except [ class-names ]);
                    interface interface-name;
                    interface-set set-name;
                    (loss-priority [ priorities ] | loss-priority-except [ priorities ]);
                    (packet-length [ values ] | packet-length-except [ values ]);
                }
                then {
                    ... statements in Common Firewall Actions on page 87 PLUS ...
                    (accept | discard);
                }
            }
        }
    }
}

firewall {
    family bridge {
        filter filter-name {
            accounting-profile [ profile-names ];
            interface-specific;
```



```
        term term-name {
          filter filter-name;
          from {
            ... statements in Common Layer 2 Firewall Match Conditions on page 90 ...
          }
          then {
            ... statements in Common Firewall Actions on page 87 PLUS ...
            (accept | discard);
            port-mirror;
            port-mirror-instance instance-name;
          }
        }
      }
    }
}

firewall {
  family ccc {
    filter filter-name {
      accounting-profile [ profile-names ];
      interface-specific;
      term term-name {
        filter filter-name;
        from {
          (forwarding-class [ class-names ] | forwarding-class-except [ class-names ]);
          (interface-group [ group-names ] | interface-group-except [ group-names ]);
          (learn-vlan-1p-priority [ priorities ] | learn-vlan-1p-priority [ priorities ]);
          (loss-priority [ priorities ] | loss-priority-except [ priorities ]);
          (user-vlan-1p-priority [ priorities ] | user-vlan-1p-priority [ priorities ]);
        }
        then {
          ... statements in Common Firewall Actions on page 87 PLUS ...
          (accept | discard);
          port-mirror-instance instance-name;
        }
      }
    }
  }
}

firewall {
  family ethernet-switching {
    filter filter-name {
      interface-specific;
      term term-name {
        from {
          destination-address {
            ip-prefix</prefix-length>;
          }
          destination-mac-address {
            mac-address;
          }
          destination-port [ port-names ];
          destination-prefix-list {
            list-name;
          }
```

```
                dot1q-tag [ tag-values ];
                dot1q-user-priority [ priority-values ];
                dscp [ code-point-values ];
                ether-type [ protocol-names ];
                fragment-flags flag;
                icmp-code [ codes ];
                icmp-type [ types ];
                interface interface-name;
                is-fragment;
                precedence [ precedence-names ];
                protocol [ protocol-names ];
                source-address {
                    ip-prefix</prefix-length>;
                }
                source-mac-address {
                    mac-address;
                }
                source-port [ port-names ];
                source-prefix-list {
                    list-name;
                }
                tcp-established;
                tcp-flags flag;
                tcp-initial;
                vlan [ vlan-names ];
            }
            then {
                (accept | discard);
                analyzer analyzer-name;
                count counter-name;
                forwarding-class class-name;
                interface interface-name;
                log;
                loss-priority (high | low);
                policer policer-name;
                syslog;
                vlan vlan-name;
            }
        }
    }
  }
}

firewall {
  family inet {
    dialer-filter filter-name {
      accounting-profile [ profile-names ];
      term term-name {
        from {
          ... statements in Common IP Firewall Match Conditions on page 88 AND
            statements in Common IPv4 Firewall Match Conditions on page 89 EXCEPT
            FOR ...
            (ah-spi [ values ] | ah-spi-except [ values ]);   # NOT valid at this level
            (destination-class [ class-names ] |
              destination-class-except [ class-names ]);   # NOT valid at this level
            interface interface-name;   # NOT valid at this level
```



```
            (loss-priority [ priorities ] | loss-priority-except [ priorities ]);   # NOT valid at
              this level
            service-filter-hit;   # NOT valid at this level
            (source-class [ class-names ] | source-class-except [ class-names ]);   # NOT
              valid at this level
        }
        then {
          (ignore | note);
          log;
          sample;
          syslog;
        }
      }
    }
    filter filter-name {
      accounting-profile [ profile-names ];
      interface-specific;
      term term-name {
        filter filter-name;
        from {
          ... statements in Common IP Firewall Match Conditions on page 88 AND
            statements in Common IPv4 Firewall Match Conditions on page 89 ...
        }
        then {
          ... statements in Common Firewall Actions on page 87 AND
            statements in Common IP Firewall Actions on page 87 AND
            statements in Common IPv4 Firewall Actions on page 88 ...
        }
      }
    }
    prefix-action name {
      count;
      destination-prefix-length prefix-length;
      filter-specific;
      policer policer-name;
      source-prefix-length prefix-length;
      subnet-prefix-length prefix-length;
    }
    service-filter filter-name {
      term term-name {
        from {
          address {
            ip-prefix</prefix-length>;
          }
          (ah-spi [ values ] | ah-spi-except [ values ]);
          destination-address {
            ip-prefix</prefix-length>;
          }
          (destination-port [ port-names ] | destination-port-except [ port-names ]);
          destination-prefix-list {
            list-name;
          }
          (esp-spi [ values ] | esp-spi-except [ values ]);
          first-fragment;
          fragment-flags flag;
          (fragment-offset [ offsets ] | fragment-offset-except [ offsets ]);
```

```
                (interface-group [ group-names ] | interface-group-except [ group-names ]);
                (ip-options [ option-names ] | ip-options-except [ option-names ]);
                is-fragment;
                (loss-priority [ priorities ] | loss-priority-except [ priorities ]);
                (port [ port-names ] | port-except [ port-names ]);
                prefix-list {
                    list-name;
                }
                (protocol [ protocol-names ] | protocol-except [ protocol-names ]);
                source-address {
                    ip-prefix</prefix-length>;
                }
                (source-port [ port-names ] | source-port-except [ port-names ]);
                source-prefix-list {
                    list-name;
                }
                tcp-flags flag-name;
            }
            then {
                count counter-name;
                log;
                port-mirror;
                sample;
                (service | skip);
            }
        }
    }
    simple-filter filter-name {
        term term-name {
            from {
                destination-address ip-prefix</prefix-length>;
                destination-port port-name;
                forwarding-class [ class-names ];
                protocol protocol-name;
                source-address ip-prefix</prefix-length>;
                source-port port-name;
            }
            then {
                forwarding-class class-name;
                loss-priority (high | low | medium-high | medium-low);
                policer policer-name;
            }
        }
    }
  }
}

firewall {
  family inet6 {
    dialer-filter filter-name {
        accounting-profile [ profile-names ];
        term term-name {
            from {
                ... statements in Common IP Firewall Match Conditions on page 88 PLUS ...
                    (next-header [ protocol-types ] | next-header-except [ protocol-types ]);
                ... BUT NOT ...
```



```
            (destination-class [ class-names ] |
              destination-class-except [ class-names ]);   # NOT valid at this level
            (forwarding-class [ class-names ] |
              forwarding-class-except [ class-names ]);   # NOT valid at this level
            interface interface-name;   # NOT valid at this level
            (interface-group [ group-names ] | interface-group-except [ group-names ]);  #
              NOT valid at this level
            (loss-priority [ priorities ] | loss-priority-except [ priorities ]);   # NOT valid at
              this level
            service-filter-hit;   # NOT valid at this level
            (source-class [ class-names ] | source-class-except [ class-names ]);   # NOT
              valid at this level
            tcp-established;   # NOT valid at this level
            tcp-flags flag;   # NOT valid at this level
            tcp-initial;   # NOT valid at this level
        }
        then {
          (ignore | note);
          log;
          sample;
          syslog;
        }
      }
    }
    filter filter-name {
      accounting-profile [ profile-names ];
      interface-specific;
      term term-name {
        filter filter-name;
        from {
          ... statements in Common IP Firewall Match Conditions on page 88 PLUS ...
          (next-header [ protocol-types ] | next-header-except [ protocol-types ]);
          (traffic-class [ code-point-values ] | traffic-class-except [ code-point-values ]);
        }
        then {
          ... statements in Common Firewall Actions on page 87 AND
            statements in Common IP Firewall Actions on page 87 PLUS ...
          (accept | discard | reject <address-unreachable | administratively-prohibited |
            beyond-scope | fragmentation-needed | no-route | port-unreachable |
            tcp-reset>);
        }
      }
    }
    service-filter filter-name {
      term term-name {
        from {
          address {
            ip-prefix</prefix-length>;
          }
          (ah-spi [ values ] | ah-spi-except [ values ]);
          destination-address {
            ip-prefix</prefix-length>;
          }
          (destination-port [ port-names ] | destination-port-except [ port-names ]);
          destination-prefix-list {
            list-name;
```

```
                }
                (esp-spi [ values ] | esp-spi-except [ values ]);
                (interface-group [ group-names ] | interface-group-except [ group-names ]);
                (next-header [ protocol-types ] | next-header-except [ protocol-types ]);
                (port [ port-names ] | port-except [ port-names ]);
                prefix-list {
                    list-name;
                }
                source-address {
                    ip-prefix</prefix-length>;
                }
                (source-port [ port-names ] | source-port-except [ port-names ]);
                source-prefix-list {
                    list-name;
                }
                tcp-flags flag-name;
            }
            then {
                count counter-name;
                log;
                port-mirror;
                sample;
                (service | skip);
            }
        }
    }
  }
}

firewall {
  family mpls {
    dialer-filter filter-name {
      accounting-profile [ profile-names ];
      term term-name {
        from {
          (exp [ exp-bits ] | exp-except [ exp-bits ]);
        }
        then {
          (ignore | note);
          log;
          sample;
          syslog;
        }
      }
    }
    filter filter-name {
      accounting-profile [ profile-names ];
      interface-specific;
      term term-name {
        filter filter-name;
        from {
          (exp [ exp-bits ] | exp-except [ exp-bits ]);
          (forwarding-class [ class-names ] | forwarding-class-except [ class-names ]);
          interface interface-name;
          interface-set set-name;
          (loss-priority [ priorities ] | loss-priority-except [ priorities ]);
```



```
            }
            then {
              ... statements in Common Firewall Actions on page 87 PLUS ...
              (accept | discard);
              sample;
            }
          }
        }
      }
    }

    firewall {
      family vpls {
        filter filter-name {
          accounting-profile [ profile-names ];
          interface-specific;
          term term-name {
            filter filter-name;
            from {
              ... statements in Common Layer 2 Firewall Match Conditions on page 90 ...
            }
            then {
              ... statements in Common Firewall Actions on page 87 PLUS ...
              (accept | discard);
              port-mirror;
              port-mirror-instance instance-name;
            }
          }
        }
      }
    }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

CHAPTER 7

[edit forwarding-options] Hierarchy Levels

[edit forwarding-options] Hierarchy Level

Each of the following topics lists the statements at a subhierarchy of the **[edit forwarding-options]** hierarchy.

Related Documentation

Leaf Statement at the [edit forwarding-options] Hierarchy Level

```
forwarding-options {
   fast-reroute-priority (low | medium | high);
}
```

Related Documentation

[edit forwarding-options accounting] Hierarchy Level

```
forwarding-options {
  accounting group-name {
    output {
      aggregate-export-interval seconds;
      cflowd hostname {
        aggregation {
          autonomous-system;
          destination-prefix;
          protocol-port;
          source-destination-prefix {
            caida-compliant;
          }
          source-prefix;
        }
        autonomous-system-type (origin | peer);
        port port-number;
        version format;
      }
      flow-active-timeout seconds;
      flow-inactive-timeout seconds;
      interface interface-name {
        engine-id number;
        engine-type number;
        source-address address;
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit forwarding-options] Hierarchy Level on page 101

[edit forwarding-options dhcp-relay] Hierarchy Level

```
forwarding-options {
  dhcp-relay {
    active-server-group server-group-name;
    authentication {
      password password-string;
      username-include {
        circuit-type;
        delimiter delimiter-character;
        domain-name domain-name-string;
        logical-system-name;
        mac-address;
        option-60;
        option-82 <circuit-id> <remote-id>;
        routing-instance-name;
        user-prefix user-prefix-string;
      }
    }
    duplicate-clients-on-interface;
    dynamic-profile profile-name <aggregate-clients <merge | replace> |
      use-primary primary-profile-name>;
    forward-snooped-clients (all-interfaces | configured-interfaces |
      non-configured-interfaces);
    group group-name {
      ... the group subhierarchy appears after the main [edit forwarding-options dhcp-relay]
        hierarchy ...
    }
    interface-traceoptions {
      file <filename> <files number> <match regular-expression> <size size>
        <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
    }
    overrides {
      (allow-snooped-clients  | no-allow-snooped-clients);
      always-write-giaddr;
      always-write-option-82;
      client-discover-match <option60-and-option82>;
      disable-relay;
      interface-client-limit number;
      layer2-unicast-replies;
      no-arp;
      no-bind-on-request;
      proxy-mode;
      replace-ip-source-with giaddr;
      send-release-on-delete;
      trust-option-82;
    }
    relay-option-60 {
      vendor-option {
        (default-local-server-group group-name | default-relay-server-group group-name |
          drop);
        (equals | starts-with) (ascii text-string | hexadecimal hexadecimal-value) {
```

```
                (drop | local-server-group group-name | relay-server-group group-name);
              }
            }
          }
          relay-option-82 {
            circuit-id (value | ... the following prefix statement ...) {
              prefix {
                host-name;
                logical-system-name;
                routing-instance-name;
              }
              use-interface-description (device | logical);
            }
          }
          server-group {
            server-group-name {
              ip-address;
            }
          }
          traceoptions {
            file <filename> <files number> <match regular-expression> <size maximum-file-size>
              <world-readable | no-world-readable>;
            flag flag;
            no-remote-trace;
          }
        }

        dhcp-relay {
          group group-name {
            active-server-group server-group-name;
            authentication {
              ... same statements as at the [edit forwarding-options dhcp-relay authentication]
                hierarchy level ...
            }
            dynamic-profile profile-name <aggregate-clients <merge | replace> |
              use-primary primary-profile-name>;
            interface interface-name {
              exclude;
              overrides {
                ... same statements as at the [edit forwarding-options dhcp-relay overrides]
                  hierarchy level ...
              }
              trace;
              upto upto-interface-name;
            }
            relay-option-60 {
              ... same statements as at the [edit forwarding-options dhcp-relay relay-option-60]
                hierarchy level ...
            }
            relay-option-82 {
              ... same statements as at the [edit forwarding-options dhcp-relay relay-option-82]
                hierarchy level ...
            }
          }
        }
      }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit forwarding-options] Hierarchy Level on page 101

[edit forwarding-options enhanced-hash-key] Hierarchy Level

```
forwarding-options {
  enhanced-hash-key {
    family inet {
      incoming-interface-index;
      no-destination-port;
      no-source-port;
      type-of-service;
    }
    family inet6 {
      incoming-interface-index;
      no-destination-port;
      no-source-port;
      traffic-class;
    }
    family mpls {
      incoming-interface-index;
      label-1-exp;
      no-payload;
    }
    family multiservice {
      incoming-interface-index;
      no-payload;
      outer-priority;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit forwarding-options] Hierarchy Level on page 101

[edit forwarding-options family] Hierarchy Level

```
forwarding-options {
  family inet {
    filter {
      input filter-name;
      output filter-name;
    }
  }
  family inet6 {
    filter {
      input filter-name;
      output filter-name;
    }
    route-accounting;
  }
  family mpls {
    filter {
      input filter-name;
      output filter-name;
    }
  }
  family vpls {
    filter {
      input filter-name;
    }
    flood {
      input filter-name;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit forwarding-options] Hierarchy Level on page 101

[edit forwarding-options hash-key] Hierarchy Level

```
forwarding-options {
  hash-key {
    family inet {
      layer-3;
      layer-4;
      session-id;
      symmetric-hash {
        complement;
      }
    }
    family mpls {
      label-1;
      label-2;
      label-3;
      no-labels;
      no-label-1-exp;
      payload {
        ether-pseudowire;
        ip {
          layer-3-only;
          port-data {
            destination-lsb;
            destination-msb;
            source-lsb;
            source-msb;
          }
        }
      }
    }
    family multiservice {
      destination-mac;
      label-1;
      label-2;
      payload {
        ip {
          layer-3 {
            (destination-ip-only | source-ip-only);
          }
          layer-3-only;
          layer-4;
        }
      }
      source-mac;
      symmetric-hash {
        complement;
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit forwarding-options] Hierarchy Level on page 101

[edit forwarding-options helpers] Hierarchy Level

```
forwarding-options {
  helpers {
    bootp {
      client-response-ttl number;
      description text-description;
      dhcp-option82 {
        disable;
        circuit-id {
          prefix hostname;
          use-interface-description;
          use-vlan-id;
        }
        remote-id {
          prefix (hostname | mac | none);
          use-interface-description;
          use-string text-string;
        }
        vendor-id {
          text-string;
        }
      }
      interface interface-name-or-wildcard {
        broadcast;
        client-response-ttl number;
        description text-description;
        dhcp-option82 {
          ... same statements as at the [edit forwarding-options helpers bootp] hierarchy
            level ...
        }
        maximum-hop-count number;
        minimum-wait-time seconds;
        no-listen;
        server address {
          logical-system logical-system-name <routing-instance [ <default>
            routing-instance-names ]>;
          routing-instance [ <default> routing-instance-names ];
        }
      }
      maximum-hop-count number;
      minimum-wait-time seconds;
      relay-agent-option;
      server address {
        logical-system logical-system-name <routing-instance [ <default>
          routing-instance-names ]>;
        routing-instance [ <default> routing-instance-names ];
      }
      vpn;
    }
  }

  helpers {
    domain {
```

```
      description text-description;
      interface {
        interface-name {
          broadcast;
          description text-description;
          no-listen;
          server <address> <logical-system logical-system-name>
            <routing-instance (default | routing-instance-name)>;
        }
      }
      server <address> <logical-system logical-system-name>
        <routing-instance (default | routing-instance-name)>;
    }
  }

  helpers {
    port port-number {
      description text-description;
      interface {
        interface-name {
          broadcast;
          description text-description;
          no-listen;
          server <address> <logical-system logical-system-name>
            <routing-instance (default | routing-instance-name)>;
        }
      }
      server <address> <logical-system logical-system-name>
        <routing-instance (default | routing-instance-name)>;
    }
  }

  helpers {
    tftp {
      description text-description;
      interface {
        interface-name {
          broadcast;
          description text-description;
          no-listen;
          server <address> <logical-system logical-system-name>
            <routing-instance (default | routing-instance-name)>;
        }
      }
      server <address> <logical-system logical-system-name>
        <routing-instance (default | routing-instance-name)>;
      }
    }
  }

  helpers {
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      level severity;
```



```
            no-remote-trace;
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit forwarding-options] Hierarchy Level on page 101

[edit forwarding-options load-balance] Hierarchy Level

```
forwarding-options {
  load-balance {
    indexed-next-hop;
    per-flow {
      hash-seed;
    }
    per-prefix {
      hash-seed number;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit forwarding-options] Hierarchy Level on page 101

[edit forwarding-options monitoring] Hierarchy Level

```
forwarding-options {
  monitoring group-name {
    family inet {
      output {
        cflowd hostname port port-number;
        export-format cflowd-version-5;
        flow-active-timeout seconds;
        flow-export-destination cflowd-collector;
        flow-inactive-timeout seconds;
        interface interface-name {
          engine-id number;
          engine-type number;
          input-interface-index number;
          output-interface-index number;
          source-address address;
        }
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit forwarding-options] Hierarchy Level on page 101

[edit forwarding-options next-hop-group] Hierarchy Level

```
forwarding-options {
  next-hop-group group-name {
    interface interface-name {
      next-hop address;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit forwarding-options] Hierarchy Level on page 101

[edit forwarding-options packet-capture] Hierarchy Level

```
forwarding-options {
  packet-capture {
    disable;
    file filename filename <files number> <size maximum-file-size> <world-readable |
      no-world-readable>;
    maximum-capture-size number;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit forwarding-options] Hierarchy Level on page 101

[edit forwarding-options port-mirroring] Hierarchy Level

```
forwarding-options {
  port-mirroring {
    disable;
    disable-all-instances;
    family (ccc | vpls) {
      output {
        (interface interface-name | next-hop-group group-name);
        no-filter-check;
      }
    }
    family inet {
      output {
        interface interface-name {
          next-hop ipv4-address;
        }
        next-hop-group group-name;
        no-filter-check;
      }
    }
    family inet6 {
      output {
        interface interface-name {
          next-hop ipv6-address;
        }
        no-filter-check;
      }
    }
    input {
      maximum-packet-length bytes;
      rate rate;
      run-length number;
    }
    instance instance-name {
      disable;
      family family-name {
        ... same statements as at the [edit forwarding-options port-mirroring family (ccc |
          inet | inet6 | vpls)] hierarchy levels ...
      }
      input {
        ... same statements as at the [edit forwarding-options port-mirroring input] hierarchy
          level ...
      }
    }
    mirror-once;
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit forwarding-options] Hierarchy Level on page 101

[edit forwarding-options sampling] Hierarchy Level

```
forwarding-options {
  sampling {
    disable;
    family (inet | inet6 | mpls) {
      ... the family subhierarchy appears after the main [edit forwarding-options sampling]
        hierarchy ...
    }
    input {
      max-packets-per-second limit;
      maximum-packet-length bytes;
      rate number;
      run-length number;
    }
    instance instance-name {
      disable;
      family (inet | inet6 | mpls) {
        disable;
        output {
          ... same statements as at the [edit forwarding-options sampling family (inet |
            inet6 | mpls) output] hierarchy level EXCEPT FOR ...
          file filename filename <disable> <files number> <size maximum-file-size>
            <stamp | no-stamp> <world-readable | no-world-readable>;  # NOT valid at
            this level
        }
      }
      input {
        ... same statements as at the [edit forwarding-options sampling input] hierarchy
          level ...
      }
    }
    sample-once;
    traceoptions {
      file <filename> <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      no-remote-trace;
    }
  }

  sampling {
    family (inet | inet6 | mpls) {
      disable;
      output {
        aggregate-export-interval seconds;
        extension-service service-name;
        file filename filename <disable> <files number> <size maximum-file-size> <stamp |
          no-stamp> <world-readable | no-world-readable>;
        flow-active-timeout seconds;
        flow-inactive-timeout seconds;
        flow-server hostname-or-ip-address {
          aggregation {
            autonomous-system;
            destination-prefix;
```

```
                protocol-port;
                source-destination-prefix {
                    caida-compliant;
                }
                source-prefix;
            }
            autonomous-system-type (origin | peer);
            (local-dump | no-local-dump);
            port port-number;
            source-address ipv4-address;
            version (5 | 500 | 8);
            version9 {
                template {
                    template-name;
                }
            }
        }
        interface interface-name {
            engine-id number;
            engine-type number;
            source-address address;
        }
    }
}
}
}
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit forwarding-options] Hierarchy Level on page 101

CHAPTER 8

[edit groups] Through [edit policy-options] Hierarchy Levels

[edit groups] Hierarchy Level

```
groups {
  group-name {
     ... statements from any subhierarchy at the [edit] hierarchy level ...
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit interfaces] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
interfaces {
  interface-name {
    ... the "interface-name" subhierarchy appears after the main [edit interfaces] hierarchy
      level ...
  }
  interface-set interface-set-name {
    interface interface-name {
      (unit unit-number | vlan-tags-outer vlan-tag);
    }
  }
  traceoptions {
    file <filename> <files number> <match regular-expression> <size maximum-file-size>
      <world-readable | no-world-readable>;
    flag flag <disable>;
    no-remote-trace;
  }
}

interfaces {
  interface-name {
    disable;
    accounting-profile name;
    aggregated-ether-options {
      ethernet-switch-profile {
        tag-protocol-id [ hexadecimal-identifiers ];
      }
      (flow-control | flow-control);
      lacp {
        (active | passive);
        admin-key key;
        link-protection {
          disable;
          (revertive | non-revertive);
        }
        periodic (fast | slow);
        system-id mac-address;
        system-priority priority;
      }
      (link-protection | no-link-protection);
      link-speed (10m | 100m | 1g | 10g | 50g | oc192);
      (loopback | no-loopback);
      minimum-links number;
      source-address-filter {
        mac-address;
      }
      (source-filtering | no-source-filtering);
    }
    aggregated-sonet-options {
      link-speed (mixed | oc3 | oc12 | oc48 | oc192 | oc768);
```



```
    minimum-bandwidth bps;
    minimum-links number;
  }
  atm-options {
    cell-bundle-size cells;
    ilmi;
    linear-red-profiles {
      profile-name queue-depth cells high-plp-max-threshold percent
        high-plp-threshold percent low-plp-max-threshold percent
        low-plp-threshold percent;
    }
    mpls {
      pop-all-labels {
        required-depth [ levels ];
      }
    }
    pic-type (atm1 | atm2 | atm-ce);
    plp-to-clp;
    promiscuous-mode {
      vpi vpi-identifier;
    }
    scheduler-maps {
      map-name {
        forwarding-class class-name {
          epd-threshold cells plp1 cells;
          linear-red-profile profile-name;
          priority (high | low);
          transmit-weight (cells number | percent percentage);
        }
        vc-cos-mode (alternate | strict);
      }
    }
    use-null-cw;
    vpi vpi-identifier {
      maximum-vcs maximum-vcs;
      oam-liveness {
        down-count cells;
        up-count cells;
      }
      oam-period (disable | seconds);
      shaping {
        (cbr rate | rtvbr peak rate sustained rate burst length |
          vbr peak rate sustained rate burst length);
        queue-length number;
      }
    }
  }
  auto-configure {
    stacked-vlan-ranges {
      access-profile profile-name;
      authentication {
        password password-string;
        username-include {
          circuit-type;
          delimiter delimiter-character;
          domain-name domain-name-string;
```

```
            interface-name;
            mac-address;
            option-82;
            radius-realm radius-realm-string;
            user-prefix user-prefix-string;
          }
        }
        dynamic-profile profile-name {
          accept (any | dhcp-v4 | dhcp-v6 | inet | inet6 | pppoe);
          ranges (any | low-tag–high-tag),(any | low-tag–high-tag);
        }
      }
      vlan-ranges {
        access-profile profile-name;
        authentication {
          password password-string;
          username-include {
            circuit-type;
            delimiter delimiter-character;
            domain-name domain-name-string;
            interface-name;
            mac-address;
            option-82;
            radius-realm radius-realm-string;
            user-prefix user-prefix-string;
          }
        }
        dynamic-profile profile-name {
          accept (any | dhcp-v4 | dhcp-v6 | inet | inet6 | pppoe); ;
          ranges (any | low-tag)–(any | high-tag);
        }
      }
    }
    clocking (external | internal);
    container-options {
      allow-configuration-override;
      container-list [ container-interface-names ];
      container-type aps;
      member-interface-type {
        (atm | sonet) {
          member-interface-speed (mixed | oc3 | oc12 | oc48 | oc192 | oc768);
        }
      }
      (primary | standby);
      redundancy {
        hold-time down milliseconds up milliseconds;
      }
    }
    data-input (interface interface-name | system);
    dce;
    description text;
    dialer-options {
      pool pool-name priority priority;
    }
    ds0-options {
      bert-algorithm algorithm;
```



```
    bert-error-rate rate;
    bert-period seconds;
    byte-encoding (nx56 | nx64);
    fcs (16 | 32);
    idle-cycle-flag (flags | ones);
    invert-data;
    loopback payload;
    start-end-flag (filler | shared);
}
dsl-options {
    operating-mode (adsl2plus |annexm-adsl2plus | annexm-itu-dmt-bis | ansi-dmt |
        auto | etsi | itu-annexb-non-ur2 | itu-annexb-ur2 | itu-dmt | itu-dmt-bis);
}
e1-options {
    bert-algorithm algorithm;
    bert-error-rate rate;
    bert-period seconds;
    fcs (16 | 32);
    framing (g704 | g704-no-crc4 | unframed);
    idle-cycle-flag (flags | ones);
    invert-data;
    loopback (local | remote);
    start-end-flag (filler | shared);
    timeslots time-slot-range;
}
e3-options {
    atm-encapsulation (direct | plcp);
    bert-algorithm algorithm;
    bert-error-rate rate;
    bert-period seconds;
    buildout feet;
    compatibility-mode (digital-link | kentrox | larscom) <subrate value>;
    fcs (16 | 32);
    framing (g.751 | g.832);
    idle-cycle-flag (flags | ones);
    invert-data;
    loopback (local | remote);
    (payload-scrambler | no-payload-scrambler);
    start-end-flag (filler | shared);
    (unframed | no-unframed);
}
encapsulation (atm-ccc-cell-relay | atm-pvc | cisco-hdlc |
    cisco-hdlc-tcc |ether-vpls-ppp | ethernet-bridge | ethernet-ccc | ethernet-over-atm |
    ethernet-tcc | ethernet-vpls | extended-frame-relay-ccc | extended-frame-relay-tcc |
    extended-vlan-bridge | extended-vlan-ccc | extended-vlan-tcc | extended-vlan-vpls |
    flexible-ethernet-services | flexible-frame-relay | frame-relay | frame-relay-ccc |
    frame-relay-ether-type | frame-relay-ether-type-tcc | frame-relay-port-ccc |
    frame-relay-tcc | ima | multilink-frame-relay-uni-nni | ppp | ppp-ccc | ppp-tcc | satop |
    vlan-ccc | vlan-vci-ccc | vlan-vpls);
es-options {
    backup-interface es-fpc/pic/port;
}
ether-options {
    802.3ad {
        aex;
        (backup | primary);
```

```
        lacp {
            force-up;
        }
    }
    (auto-negotiation | no-auto-negotiation);
    (flow-control | no-flow-control);
    link-mode (automatic | full-duplex | half-duplex);
    speed (1g | 10m | 100m | 10m-100m | auto-negotiation);
}
fabric-options {
    member-interfaces interface-name;
}
fastether-options {
    802.3ad {
        aex;
        (backup | primary);
        lacp {
            port-priority priority;
        }
    }
    (flow-control | no-flow-control);
    ignore-l3-incompletes;
    ingress-rate-limit rate;
    (loopback | no-loopback);
    mpls {
        pop-all-labels {
            required-depth [ levels ];
        }
    }
    redundant-parent redundant-ethernet-interface-name;
    source-address-filter {
        mac-address;
    }
    (source-filtering | no-source-filtering);
}
flexible-vlan-tagging;
framing (lan-phy | sdh | sonet | wan-phy);
gigether-options {
    ... the gigether-options subhierarchy appears after the main [edit interfaces
        interface-name] hierarchy ...
}
(gratuitous-arp-reply | no-gratuitous-arp-reply);
hierarchical-scheduler <maximum-hierarchy-levels 2>;
hold-time up milliseconds down milliseconds;
ima-group-options {
    differential-delay number;
    frame-length (32 | 64 | 128 | 256);
    frame-synchronization {
        alpha number;
        beta number;
        gamma number;
    }
    minimum-links number;
    symmetry (symmetrical-config-and-operation |
        symmetrical-config-asymmetrical-operation);
    test-procedure {
```



```
        ima-test-start;
        ima-test-stop;
        interface name;
        pattern number;
        period number;
    }
    transmit-clock (common | independent);
    version (1.0 |1.1);
}
ima-link-options group-id group-id;
isdn-options {
    bchannel-allocation (ascending | descending);
    calling-number number;
    incoming-called-number number <reject>;
    spid1 spid-string;
    spid2 spid-string;
    static-tei-val value;
    switch-type (att5e | etsi | ni1 | ni2|  ntdms100 | ntt);
    t310 seconds;
    tei-option (first-call | power-up);
}
(keepalives <down-count number> <interval seconds> <up-count number> |
    no-keepalives);
layer2-policer {
    input-hierarchical-policer policer-name;
}
link-mode (full-duplex | half-duplex);
lmi {
    lmi-type (ansi | itu);
    n391dte number;
    n392dce number;
    n392dte number;
    n393dce number;
    n393dte number;
    t391dte seconds;
    t392dce seconds;
}
lsq-failure-options {
    no-termination-request;
    trigger-link-failure interface-name;
}
mac mac-address;
mlfr-uni-nni-bundle-options {
    acknowledge-retries number;
    acknowledge-timer milliseconds;
    action-red-differential-delay (disable-tx | remove-link);
    cisco-interoperability send-lip-remove-link-for-link-reject;
    drop-timeout milliseconds;
    fragment-threshold bytes;
    hello-timer milliseconds;
    link-layer-overhead percent;
    lmi-type (ansi | itu);
    minimum-links number;
    mrru bytes;
    n391 number;
    n392 number;
```

```
    n393 number;
    red-differential-delay milliseconds;
    t391 seconds;
    t392 seconds;
    yellow-differential-delay milliseconds;
}
modem-options {
    dialin (console | routable);
    init-command-string initialization-command-string;
}
mtu bytes;
multiservice-options {
    (core-dump | no-core-dump);
    (syslog | no-syslog);
}
native-vlan-id number;
no-gratuitous-arp-request;
no-partition interface-type (at | cau4 | ct3 | e1 | e3 |so | t1 | t3);
optics-options {
    alarm low–light–alarm {
        (link-down | syslog);
    }
    warning low–light–warning {
        (link-down | syslog);
    }
    wavelength nm;
}
otn-options {
    fec (efec | gfec | none);
    (laser-enable | no-laser-enable);
    (line-loopback | no-line-loopback);
    pass-thru;
    rate (fixed-stuff-bytes | no-fixed-stuff-bytes | oc192 | pass-thru);
    transmit-payload-type number;
    trigger (oc-lof | oc-lom | oc-los | oc-wavelength-lock | odu-ais | odu-bbe-th | odu-bdi |
        odu-es-th | odu-lck | odu-oci | odu-sd | odu-ses-th | odu-ttim | odu-uas-th |
        opu-ptm | otu-ais | otu-bbe-th | otu-bdi | otu-es-th | otu-fec-deg | otu-fec-exe |
        otu-iae | otu-sd | otu-ses-th | otu-ttim | otu-uas-th);
    tti;
}
partition partition-number interface-type (at | bc | cau4 | ce1 | coc1 | ct1 | ct3 | dc | ds |
    e1 | e3 | so | t1 | t3) oc-slice oc-slice-range timeslots time-slot-range;
passive-monitor-mode;
per-unit-scheduler;
pic-set set-name {
    interface interface-name;
    fpc slot-number {
        pic pic-number;
    }
}
ppp-options {
    chap {
        access-profile profile-name;
        default-chap-secret secret;
        local-name name;
        passive;
```



```
    }
    compression {
        acfc;
        pfc;
    }
    dynamic-profile profile-name;
    lcp-restart-timer milliseconds;
    loopback-clear-timer seconds;
    ncp-restart-timer milliseconds;
    no-termination-request;
    pap {
        access-profile name;
        local-name name;
        local-password password;
        passive;
    }
}
receive-bucket {
    overflow (discard | tag);
    rate percentage;
    threshold bytes;
}
redundancy-options {
    (hot-standby | warm-standby);
    primary (lsq | sp)-fpc/pic/port;
    secondary (lsq | sp)-fpc/pic/port);
}
redundant-ether-options {
    (flow-control | no-flow-control);
    lacp {
        (active | passive);
        periodic (fast | slow);
    }
    link-speed (10m | 100m | 1g);
    (loopback | no-loopback);
    redundancy-group group-name;
    source-address-filter mac-address;
    (source-filtering | no-source-filtering);
}
satop-options {
    bit-rate number;
    excessive-packet-loss-rate {
        sample-period milliseconds;
        threshold percentage;
    }
    idle-pattern pattern;
    jitter-buffer-auto-adjust;
    jitter-buffer-latency milliseconds;
    jitter-buffer-packets packets;
    payload-size number;
}
schedulers number;
serial-options {
    clock-rate rate;
    clocking-mode (dce | internal | loop);
    control-polarity (negative | positive);
```

```
    cts-polarity (negative | positive);
    dcd-polarity (negative | positive);
    dce-options {
      control-signal (assert | de-assert | normal);
      cts (ignore | normal | require);
      dcd (ignore | normal | require);
      dsr (ignore | normal | require);
      dtr (ignore | normal | require);;
      ignore-all;
      indication (ignore | normal | require);
      rts (assert | de-assert | normal);
      tm (ignore | normal | require);
    }
    dsr-polarity (negative | positive);
    dte-options {
      control-signal (assert | de-assert | normal);
      cts (ignore | normal | require);
      dcd (ignore | normal | require);
      dsr (ignore | normal | require);
      dtr (auto-synchronize <duration milliseconds> <interval milliseconds> | ignore |
        normal | require);
      ignore-all;
      indication (ignore | normal | require);
      rts (assert | de-assert | normal);
      tm (ignore | normal | require);
    }
    dtr-circuit (balanced | unbalanced);
    dtr-polarity (negative | positive);
    encoding (nrz | nrzi);
    indication-polarity (negative | positive);
    line-protocol (eia530 | v.35 | x.21);
    loopback (dce-local | dce-remote | local | remote);
    rts-polarity (negative | positive);
    tm-polarity (negative | positive);
    transmit-clock invert;
  }
  services-options {
    disable-global-timeout-override;
    ignore-errors <alg> <tcp>;
    inactivity-non-tcp-timeout seconds;
    inactivity-tcp-timeout seconds;
    inactivity-timeout seconds;
    open-timeout seconds;
    session-limit {
      maximum number;
      rate new-sessions-per-second;
    }
    session-timeout seconds;
    syslog {
      host hostname {
        facility-override facility-name;
        log-prefix prefix-value;
        services severity-level;
      }
      message-rate-limit messages-per-second;
    }
```

```
}
shared-interface;
shared-scheduler;
shared-uplink;
shdsl-options {
   annex (annex-a | annex-b | annex-f | annex-g);
   line-rate (auto | kbps);
   loopback (local | payload | remote);
   snr-margin {
      current (decibels | disable);
      snext (decibels | disable);
   }
}
sonet-options {
   aggregate asx;
   aps {
      advertise-interval milliseconds;
      annex-b;
      authentication-key password;
      (break-before-make | no-break-before-make);
      (force | request) (protect | working);
      hold-time milliseconds;
      lockout;
      neighbor address;
      paired-group group-name;
      preserve-interface;
      (protect-circuit group-name | working-circuit group-name);
      revert-time seconds;
      switching-mode (bidirectional | unidirectional);
   }
   bytes {
      c2 value;
      e1-quiet value;
      f1 value;
      f2 value;
      s1 value;
      z3 value;
      z4 value;
   }
   fcs (16 | 32);
   loopback (local | remote);
   mpls {
      pop-all-labels {
         required-depth [ levels ];
      }
   }
   path-trace trace-string;
   (payload-scrambler | no-payload-scrambler);
   rfc-2615;
   trigger {
      (ais-l | ais-p | ber-sd | ber-sf | lcpd | lof | locd | lol | lop-p | los | pll | plm-p | rfi-l |
         rfl-p | uneq-p) (hold-time down milliseconds up milliseconds | ignore);
   }
   vtmapping (itu-t | klm);
   (z0-increment | no-z0-increment);
}
```

```
speed (10m | 100m | 1g | auto | oc3 | oc12 | oc48);
stacked-vlan-tagging;
switch-options {
   switch-port port-number {
      (auto-negotiation | no-auto-negotiation);
      link-mode (full-duplex | half-duplex);
      speed (10m | 100m | 1g);
   }
}
t1-options {
   bert-algorithm algorithm;
   bert-error-rate rate;
   bert-period seconds;
   buildout value;
   byte-encoding (nx56 | nx64);
   crc-major-alarm-threshold (1e-3 | 1e-4 | 5e-4 | 1e-5 | 5e-5);
   crc-minor-alarm-threshold (1e-3 | 1e-4 | 5e-4 | 1e-5 | 5e-5 | 1e-6 | 5e-6);
   fcs (16 | 32);
   framing (esf | sf);
   idle-cycle-flag (flags | ones);
   invert-data;
   line-encoding (ami | b8zs);
   loopback (local | payload | remote);
   remote-loopback-respond;
   start-end-flag (filler | shared);
   timeslots slot-numbers;
}
t3-options {
   atm-encapsulation (direct | plcp);
   bert-algorithm algorithm;
   bert-error-rate rate;
   bert-period seconds;
   buildout feet;
   (cbit-parity | no-cbit-parity);
   compatibility-mode (adtran | digital-link | kentrox | larscom | verilink) <subrate value>;
   fcs (16 | 32);
   (feac-loop-respond | no-feac-loop-respond);
   idle-cycle-flag value;
   (long-buildout | no-long-buildout);
   (loop-timing | loop-timing);
   loopback (local | payload | remote);
   (payload-scrambler | no-payload-scrambler);
   start-end-flag (filler | shared);
}
traceoptions {
   flag flag;
}
transmit-bucket {
   overflow discard;
   rate percentage;
   threshold bytes;
}
(traps | no-traps);
unidirectional;
unit logical-unit-number {
```



```
        ... the unit subhierarchy appears after the main [edit interfaces interface-name]
            hierarchy ...
    }
    vdsl-options {
        vdsl-profile profile-name;
    }
    vlan-tagging;
    vlan-vci-tagging;
}

interface-name {
    gigether-options {
        802.3ad {
            aex;
            (backup | primary);
            lacp {
                port-priority priority;
            }
        }
        (asynchronous-notification | no-asynchronous-notification);
        (auto-negotiation <remote-fault (local-interface-online | local-interface-offline)> |
            no-auto-negotiation);
        ethernet-switch-profile {
            ... the ethernet-switch-profile subhierarchy appears after the main [edit interfaces
                interface-name gigether-options] hierarchy ...
        }
        (flow-control | no-flow-control);
        ignore-l3-incompletes;
        (loopback | no-loopback);
        mpls {
            pop-all-labels {
                required-depth [ levels ];
            }
        }
        no-auto-mdix
        redundant-parent redundant-ethernet-interface-name;
        source-address-filter {
            mac-address;
        }
        (source-filtering | no-source-filtering);
    }

    gigether-options {
        ethernet-switch-profile {
            ethernet-policer-profile {
                ... the ethernet-policer-profile subhierarchy appears after the main [edit interfaces
                    interface-name gigether-options ethernet-switch-profile] hierarchy ...
            }
            (mac-learn-enable | no-mac-learn-enable);
            tag-protocol-id [ tpids ];
        }

        ethernet-switch-profile {
            ethernet-policer-profile {
                input-priority-map {
                    ieee802.1p {
```

```
                    premium [ values ];
                }
            }
            output-priority-map {
                classifier {
                    premium {
                        forwarding-class class-name {
                            loss-priority (high | low);
                        }
                    }
                }
            }
            policer cos-policer-name {
                aggregate {
                    bandwidth-limit bps;
                    burst-size-limit bytes;
                }
                premium {
                    bandwidth-limit bps;
                    burst-size-limit bytes;
                }
            }
        }
    }
  }
}

interface-name {
  unit logical-unit-number {
    disable;
    accept-source-mac {
      mac-address mac-address {
        policer {
          input policer-name;
          output policer-name;
        }
      }
    }
    accounting-profile name;
    allow-any-vci;
    atm-l2circuit-mode (aal5 | cell);
    atm-scheduler-map (default | map-name);
    backup-options {
      interface interface-name;
    }
    bandwidth rate;
    cell-bundle-size cells;
    clear-dont-fragment-bit;
    compression {
      rtp {
        f-max-period number;
        maximum-contexts number <force>;
        port {
          minimum port-number;
          maximum port-number;
        }
```



```
        queues [ queue-numbers ];
    }
}
compression-device interface-name;
copy-tos-to-outer-ip-header;
demux-destination family;
demux-options {
    underlying-interface interface-name;
}
demux-source family;
description text;
dial-options {
    (dedicated | shared);
    ipsec-interface-id name;
    l2tp-interface-id name;
}
dialer-options {
    activation-delay seconds;
    callback;
    callback-wait-period seconds;
    deactivation-delay seconds;
    dial-string [ dial-string-numbers ];
    idle-timeout seconds;
    incoming-map {
        (accept-all | caller caller-number);
    }
    initial-route-check seconds;
    load-interval seconds;
    load-threshold percentage;
    pool pool-name;
    redial-delay seconds;
    watch-list {
        ip-prefix</prefix-length>;
    }
}
disable-mlppp-inner-ppp-pfc;
dlci dlci-identifier;
drop-timeout milliseconds;
dynamic-call-admission-control {
    activation-priority priority;
    bearer-bandwidth-limit kilobits-per-second;
}
encapsulation (atm-ccc-cell-relay | atm-ccc-vc-mux | atm-cisco-nlpid |
    atm-mlppp-llc | atm-nlpid | atm-ppp-llc | atm-ppp-vc-mux | atm-snap |
    atm-tcc-snap | atm-tcc-vc-mux | atm-vc-mux | dix | ether-over-atm-llc |
    ether-vpls-fr | ether-vpls-over-atm-llc | ethernet | ethernet-bridge | ethernet-ccc |
    ethernet-vpls | frame-relay | frame-relay-ccc | frame-relay-ether-type |
    frame-relay-ether-type-tcc | frame-relay-ppp | frame-relay-tcc |
    multilink-frame-relay-end-to-end | multilink-ppp | ppp-ccc | ppp-over-ether |
    ppp-over-ether-over-atm-llc | vlan | vlan-bridge | vlan-ccc | vlan-vci-ccc | vlan-tcc |
    vlan-vpls);
epd-threshold cells plp1 cells;
family family-name {
    ... the family subhierarchies appears after the main [edit interfaces interface-name
        unit logical-unit-number] hierarchy ...
}
```

```
filter filter-name;
fragment-threshold bytes;
inner-vlan-id-range start start-id end end-id;
input-vlan-map {
   inner-tag-protocol-id tpid;
   inner-vlan-id number;
   (pop | pop-pop | pop-swap | push | push-push | swap | swap-push | swap-swap);
   tag-protocol-id tpid;
   vlan-id number;
}
interface-shared-with psdnumerical-index;
interleave-fragments;
inverse-arp;
(keepalives <down-count number> <interval seconds> <up-count number> |
   no-keepalives);
layer2-policer {
   input-hierarchical-policer policer-name;
   input-policer policer-name;
   input-three-color policer-name;
   output-policer policer-name;
   output-three-color policer-name;
}
link-layer-overhead percent;
minimum-links number;
mrru bytes;
multicast-dlci dlci-identifier;
multicast-vci vpi-identifier.vci-identifier;
multilink-max-classes number;
multipoint;
oam-liveness {
   down-count cells;
   up-count cells;
}
oam-period (disable | seconds);
output-vlan-map {
   inner-tag-protocol-id tpid;
   inner-vlan-id number;
   (pop | pop-pop | pop-swap | push | push-push | swap | swap-push | swap-swap);
   tag-protocol-id tpid;
   vlan-id number;
}
passive-monitor-mode;
peer-interface interface-name;
peer-psd psdnumerical-index;
peer-unit unit-number;
plp-to-clp;
point-to-point;
ppp-options {
   chap {
      access-profile profile-name;
      default-chap-secretpassword;
      local-name name;
      passive;
   }
   compression <acfc> <pfc>;
   dynamic-profile profile-name;
```



```
    lcp-max-conf-req number
    lcp-restart-timer milliseconds;
    loopback-clear-timer seconds;
    ncp-max-conf-req number
    ncp-restart-timer milliseconds;
    pap {
        access-profile profile-name;
        default-pap-password password;
        local-name name;
        local-password password;
        passive;
    }
}
pppoe-options {
    access-concentrator name;
    auto-reconnect seconds;
    (client | server);
    service-name name;
    underlying-interface interface-name;
}
pppoe-underlying-options {
    access-concentrator name;
    dynamic-profile profile-name;
    duplicate-protection;
    max-sessions number;
    service-name-table table-name;
}
proxy-arp <restricted | unrestricted>;
reassemble-packets;
rpm {
    (client | server);
    twamp-server;
}
service-domain (inside | outside);
shaping {
    (cbr rate | rtvbr peak rate sustained rate burst length |
        vbr peak rate sustained rate burst length);
    queue-length number;
}
short-sequence;
transmit-weight number;
(traps | no-traps);
trunk-bandwidth rate;
trunk-id number;
tunnel {
    allow-fragmentation;
    backup-destination address;
    destination destination-address;
    do-not-fragment;
    key number;
    routing-instance {
        destination routing-instance-name;
    }
    source source-address;
    ttl number;
}
```

```
    uplink-shared-with psdn;
    vci vpi-identifier.vci-identifier;
    vci-range start start-vci end end-vci;
    vpi vpi-identifier;
    vlan-id number;
    vlan-id-list [ vlan-id vlan-id-vlan-id ];
    vlan-id-range number-number;
    vlan-tags (inner <tpid.>vlan-id | inner-list [vlan-id vlan-id–vlan-id ] |
      inner-range <tpid.>vlan-id–vlan-id) outer <tpid.>vlan-id;
  }

  unit logical-unit-number {
    family any {
      filter {
        group filter-group-number;
        input filter-name;
      }
    }

    family bridge {
      bridge-domain-type (bvlan | svlan);
      core-facing;
      filter {
        group filter-group-number;
        (input filter-name | input-list [ filter-names ]);
        (output filter-name | output-list [ filter-names ]);
      }
      (inner-vlan-id-list [ vlan-ids ] | vlan-id number | vlan-id-list [ number
        number–number ]);
      interface-mode (access | trunk);
      isid-list (all | all-service-groups);
      policer {
        input policer-name;
        output policer-name;
      }
      vlan-rewrite {
        translate old-vlan-id new-vlan-id;
      }
    }

    family ccc {
      filter {
        group filter-group-number;
        (input filter-name | input-list [ filter-names ]);
        (output filter-name | output-list [ filter-names ]);
      }
      keep-address-and-control;
      policer {
        input policer-name;
        output policer-name;
      }
      translate-discard-eligible;
      translate-fecn-and-becn;
      translate-plp-control-word-de;
      vlan-id-list [ number number–number ];
    }
```



```
family ethernet-switching {
   filter {
      input filter-name;
      output filter-name;
   }
   native-vlan-id vlan-id;
   port-mode (access | trunk);
   vlan {
      members [ all vlan-identifiers ];
   }
}

family inet {
   accounting {
      destination-class-usage;
      source-class-usage {
         (input | output | input output);
      }
   }
   address address {
      ... the address subhierarchy appears at the end of the [edit interfaces
         interface-name unit logical-unit-number family inet] hierarchy ...
   }
   demux-destination {
      destination-prefix;
   }
   demux-source {
      source-prefix;
   }
   dhcp {
      client-identifier (ascii ascii | hexadecimal hexadecimal);
      lease-time (seconds | infinite);
      retransmission-attempt number;
      retransmission-interval seconds;
      server-address ip-address;
      update-server;
      vendor-id identifier;
   }
   filter {
      dialer filter-name;
      group filter-group-number;
      (input filter-name | input-list [ filter-names ]);
      (output filter-name | output-list [ filter-names ]);
   }
   input-hierarchical-policer policer-name;
   ipsec-sa sa-name;
   location-pool-address pool-name;
   mac-validate (loose | strict);
   mtu bytes;
   multicast-only;
   negotiate-address;
   next-hop-tunnel gateway-address ipsec-vpn vpn-name;
   no-neighbor-learn;
   no-redirects;
   policer {
```

```
    arp policer-template-name;
    input policer-name;
    output policer-name;
  }
  primary;
  receive-options-packets;
  receive-ttl-exceeded;
  rpf-check {
    fail-filter filter-name;
    mode loose;
  }
  sampling {
    (input | output | input output);
  }
  service {
    input {
      post-service-filter filter-name;
      service-set service-set-name <service-filter filter-name>;
    }
    output {
      service-set service-set-name <service-filter filter-name>;
    }
  }
  simple-filter {
    input filter-name;
  }
  targeted-broadcast {
    forward-and-send-to-re;
    forward-only;
  }
  unnumbered-address interface-name <destination address>
    <destination-profile profile-name> <preferred-source-address address>;

  address address {
    arp ip-address l2-interface interface-name (mac | multicast-mac) mac-address
      <publish>;
    broadcast address;
    destination destination-address;
    destination-profile name;
    master-only;
    multipoint-destination destination-address (dlci dlci-identifier | vci vci-identifier) {
      epd-threshold cells plp1 cells;
      inverse-arp;
      oam-liveness {
        down-count cells;
        up-count cells;
      }
      oam-period (disable | seconds);
      shaping {
        (cbr rate | rtvbr peak rate sustained rate burst length |
          vbr peak rate sustained rate burst length);
        queue-length number;
      }
      transmit-weight number;
    }
    preferred;
```



```
        primary;
        vrrp-group group-number {
            (accept-data | no-accept-data);
            advertise-interval seconds;
            authentication-key key;
            authentication-type authentication;
            fast-interval milliseconds;
            (no-preempt; | ... the following preempt statement ...)
            preempt {
                hold-time seconds;
            }
            priority number;
            track {
                interface interface-name {
                    bandwidth-threshold bits-per-second priority-cost priority;
                    priority-cost priority;
                }
                priority-hold-time seconds;
                route ip-address-prefix/prefix-length routing-instance instance-name
                    priority-cost priority;
            }
            virtual-address [ addresses ];
        }
        web-authentication http;
    }
}

family inet6 {
    accounting {
        destination-class-usage;
        source-class-usage {
            (input | output | input output);
        }
    }
    address address {
        ... the address subhierarchy appears at the end of the [edit interfaces
            interface-name unit logical-unit-number family inet6] hierarchy ...
    }
    (dad-disable | no-dad-disable);
    demux-destination {
        destination-prefix;
    }
    demux-source {
        source-prefix;
    }
    filter {
        dialer filter-name;
        group filter-group-number;
        (input filter-name | input-list [ filter-names ]);
        (output filter-name | output-list [ filter-names ]);
    }
    input-hierarchical-policer policer-name;
    mtu bytes;
    no-neighbor-learn;
    policer {
        input policer-name;
```

```
        output policer-name;
    }
    rpf-check {
        fail-filter filter-name;
        mode loose;
    }
    sampling {
        (input | output | input output);
    }
    service {
        input {
            post-service-filter filter-name;
            service-set service-set-name <service-filter filter-name>;
        }
        output {
            service-set service-set-name <service-filter filter-name>;
        }
    }
    unnumbered-address interface-name preferred-source-address address;

    address ipv6-address {
        destination destination-address;
        eui-64;
        master-only;
        ndp ipv6-address <l2-interface interface-name> <(mac mac-address |
            multicast-mac multicast-mac-address) <publish>>;
        preferred;
        primary;
        vrrp-inet6-group group-number {
            (accept-data | no-accept-data);
            fast-interval milliseconds;
            inet6-advertise-interval seconds;
            (no-preempt; | ... the following preempt statement ...)
            preempt {
                hold-time seconds;
            }
            priority number;
            track {
                interface interface-name {
                    bandwidth-threshold bits-per-second priority-cost priority;
                    priority-cost priority;
                }
                priority-hold-time seconds;
                route ip-address-prefix/prefix-length routing-instance instance-name
                    priority-cost priority;
            }
            virtual-inet6-address [ addresses ];
            virtual-link-local-address ipv6-address;
            vrrp-inherit-from {
                active-group group-number;
                active-interface interface-name;
            }
        }
        web-authentication http;
    }
}
```



```
family iso {
   address iso-address;
   mtu bytes;
}

family mlfr-end-to-end {
   bundle logical-interface-name;
}

family mlfr-uni-nni {
   bundle logical-interface-name;
}

family mlppp {
   bundle logical-interface-name;
}

family mpls {
   filter {
      dialer filter-name;
      group filter-group-number;
      (input filter-name | input-list [ filter-names ]);
      (output filter-name | output-list [ filter-names ]);
   }
   input-hierarchical-policer policer-name;
   maximum-labels maximum-labels;
   mtu bytes;
   policer {
      input policer-name;
      output policer-name;
   }
}

family tcc {
   policer {
      input policer-name;
      output policer-name;
   }
   protocols [ inet iso mpls ];
   proxy inet-address address;
   remote (inet-address address | mac-address address);
}

family vpls {
   core-facing;
   filter {
      group filter-group-number;
      (input filter-name | input-list [ filter-names ]);
      (output filter-name | output-list [ filter-names ]);
   }
   policer {
      input policer-name;
      output policer-name;
   }
}
```

```
        }
      }
    }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit jsrc] Hierarchy Level

```
jsrc {
   partition partition-name {
      diameter-instance instance-name;
      destination-host hostname;
      destination-realm realm-name;
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit logical-systems] Hierarchy Level

As indicated in the following hierarchy, you can include at this hierarchy level several of the hierarchies that can be included at the **[edit]** hierarchy level. However, some statements in a subhierarchy are not valid for logical systems. To learn which statements can be included under **[edit logical-systems *logical-system-name*]** on your device, issue the **set ?** command at the hierarchy level of interest.

```
logical-systems {
  logical-system-name {
    access {
      address-assignment {
        ... same statements as in the address-assignment subhierarchy in [edit access]
          Hierarchy Level on page 45 ...
      }
    }
    access-profile profile-name;
    firewall {
      ... same statements as in several subhierarchies in [edit firewall] Hierarchy Level on
        page 87 ...
    }
    forwarding-options {
      ... same statements as in [edit forwarding-options dhcp-relay] Hierarchy Level on
        page 103 ...
    }
    interfaces {
      interface-name {
        unit logical-unit-number {
          ... some of the statements in the unit subhierarchy in [edit interfaces] Hierarchy
            Level on page 120 ...
        }
      }
    }
    policy-options {
      ... same statements as in [edit policy-options] Hierarchy Level on page 149 ...
    }
    protocols {
      ... same statements as in [edit protocols] Hierarchy Level on page 155 ...
    }
    routing-instances {
      ... most statements in [edit routing-instances] Hierarchy Level on page 229 ...
    }
    routing-options {
      ... most statements in [edit routing-options] Hierarchy Level on page 240 ...
    }
    services {
      mobile-ip {
        ... same statements as in [edit services mobile-ip] Hierarchy Level on page 328 ...
      }
    }
    system {
      services {
        dhcp-local-server {
```



```
                    ... same statements as in the services dhcp-local-server subhierarchy in [edit
                        system] Hierarchy Level on page 353 ...
                }
            }
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit multi-chassis] Hierarchy Level

```
multi-chassis {
   multi-chassis-protection ipv4-address {
      interface interface-name;
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit multicast-snooping-options] Hierarchy Level

```
multicast-snooping-options {
   flood-groups [ ip-addresses ];
   forwarding-cache {
      threshold suppress value <reuse value>;
   }
   graceful-restart <restart-duration seconds>;
   multichassis-lag-replicate-state;
   options {
      syslog {
         level severity-level;
         mark seconds;
         upto severity-level;
      }
   }
   traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
         no-world-readable>;
      flag flag <disable>;
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit poe] Hierarchy Level

```
poe {
   guard-band watts;
   interface (all | interface-name) {
      disable;
      maximum-power watts;
      priority (high | low);
      telemetries {
         disable;
         duration hours;
         interval minutes;
      }
   }
   management (class | static);
   notification-control {
      fpc fpc-number {
         disable;
      }
   }
}
```

Related Documentation

- Example: Configuring PoE Interfaces with Different Priorities on an EX Series Switch
- Configuring PoE (CLI Procedure)
- PoE and EX Series Switches Overview
- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit policy-options] Hierarchy Level

Several statements in the **[edit policy-options]** hierarchy are valid at numerous locations within the hierarchy. To make the complete hierarchy easier to read, the repeated statements are listed in the following sections, which are referenced at the appropriate locations in "Complete [edit policy-options] Hierarchy" on page 152.

Common Policy Terms

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Common Ingress Policy Match Conditions" on page 151 and "Complete [edit policy-options] Hierarchy" on page 152 instead of the statements being repeated.

- **[edit policy-options policy-statement *policy-name* from prefix-list-filter *prefix-list-name* (exact | longer | orlonger)]**
- **[edit policy-options policy-statement *policy-name* from route-filter *ip-prefix*</*prefix-length*> (exact | longer | orlonger | through *ip-prefix*</*prefix-length*> | upto /*prefix-length*)]**
- **[edit policy-options policy-statement *policy-name* from source-address-filter *ip-prefix*</*prefix-length*> (exact | longer | orlonger | through *ip-prefix*</*prefix-length*> | upto /*prefix-length*)]**
- **[edit policy-options policy-statement *policy-name* term *term-name* from prefix-list-filter *prefix-list-name* (exact | longer | orlonger)]**
- **[edit policy-options policy-statement *policy-name* term *term-name* from route-filter *ip-prefix*</*prefix-length*> (exact | longer | orlonger | through *ip-prefix*</*prefix-length*> | upto /*prefix-length*)]**
- **[edit policy-options policy-statement *policy-name* term *term-name* from source-address-filter *ip-prefix*</*prefix-length*> (exact | longer | orlonger | through *ip-prefix*</*prefix-length*> | upto /*prefix-length*)]**
- **[edit policy-options policy-statement *policy-name* then]**
- **[edit policy-options policy-statement *policy-name* term *term-name* then]**

The common policy terms are as follows:

```
(accept | reject);
as-path-expand (as-number | last-as) <count number>;
as-path-prepend as-number;
class class-name;
color (preference | add number | subtract number);
color2 (preference | add number | subtract number);
community (add | delete | set | + | – | =) community-name;
```

```
cos-next-hop-map map-name;
damping list-name;
default-action (accept | reject);
destination-class class-name;
external {
   type (1 | 2);
}
forwarding-class class-name;
install-nexthop <strict> (lsp [ lsp-names ] | lsp-regex [ regular-expressions ] |
   static-lsp [ lsp-names ] | static-lsp-regex [ regular-expressions ])
   <except (lsp [ lsp-names ] | lsp-regex [ regular-expressions | static-lsp [ lsp-names ] |
   static-lsp-regex [ regular-expressions ]])>;
load-balance per-packet;
local-preference (preference | add number | subtract number);
metric (metric-value | add number | igp <metric-offset> | minimum-igp <metric-offset> |
   subtract number | ... the following complex expression ...);
   expression {
      metric (multiplier number | offset number | multiplier number offset number);
      metric2 (multiplier number | offset number | multiplier number offset number);
   }
metric2 (metric-value | add number | subtract number);
metric3 (metric-value | add number | subtract number);
metric4 (metric-value | add number | subtract number);
next (policy | term);
next-hop (ip-address | discard | next-table routing-table-name | peer-address | reject |
   self);
origin (egp | igp | incomplete);
preference (preference | add number | subtract number);
preference2 (preference | add number | subtract number);
priority (high | low | medium);
source-class class-name;
tag (tag-number | add number | subtract number);
tag2 (tag-number | add number | subtract number);
trace;
```

Common Policy Match Conditions

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in “Complete [edit policy-options] Hierarchy” on page 152 instead of the statements being repeated.

- **[edit policy-options policy-statement *policy-name* from]**
- **[edit policy-options policy-statement *policy-name* term *term-name* from]**
- **[edit policy-options policy-statement *policy-name* term *term-name* to]**
- **[edit policy-options policy-statement *policy-name* to]**

The common policy match conditions are as follows:

```
area area-id;
as-path [ regular-expression-names ];
as-path-group [ as-path-group-names ];
color preference;
color2 preference;
community [ community-names ];
```



```
external {
   type (1 | 2);
}
family family-name;
instance instance-name;
interface [ interface-names ];
level isis-level;
local-preference value;
metric metric-value;
metric2 metric-value;
metric3 metric-value;
metric4 metric-value;
neighbor [ ip-addresses ];
next-hop [ ip-addresses ];
origin (egp | igp | incomplete);
policy [ policy-names ];
preference preference;
preference2 preference;
protocol [ protocol-names ];
rib routing-table-name;
tag [ tag-numbers ];
tag2 tag-number;
```

Common Ingress Policy Match Conditions

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Complete [edit policy-options] Hierarchy" on page 152 instead of the statements being repeated at each level.

- **[edit policy-options policy-statement *policy-name* from]**
- **[edit policy-options policy-statement *policy-name* term *term-name* from]**

The common ingress policy match conditions are as follows:

```
aggregate-contributor;
condition [ conditions ];
multicast-scope (scope-value | global | link-local | node-local | organization-local |
   site-local) <orhigher | orlower>;
next-hop-type merged;
prefix-list prefix-list-name;
prefix-list-filter prefix-list-name (exact | longer | orlonger) {
   ... statements in Common Policy Terms on page 149 ...;
}
route-filter ip-prefix</prefix-length> (exact | longer | orlonger |
   through ip-prefix</prefix-length> | upto /prefix-length) {
   ... statements in Common Policy Terms on page 149 ...;
}
route-type (external | internal);
source-address-filter ip-prefix</prefix-length> (exact | longer | orlonger |
   through ip-prefix</prefix-length> | upto /prefix-length) {
   ... statements in Common Policy Terms on page 149 ...;
}
state (active | inactive);
```

Complete [edit policy-options] Hierarchy

The statement hierarchy in this section can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
policy-options {
   as-path name regular-expression;
   as-path-group group-name {
      as-path name regular-expression;
   }
   community name {
      invert-match;
      members [ community-ids ];
   }
   condition condition-name {
      if-route-exists address table table-name;
      route-active-on (node0 | node1);
   }
   damping name {
      disable;
      half-life minutes;
      max-suppress minutes;
      reuse number;
      suppress number;
   }
   policy-statement policy-name {
      from {
         ... statements in Common Policy Match Conditions on page 150 AND
            statements in Common Ingress Policy Match Conditions on page 151 ...
      }
      term term-name {
         from {
            ... statements in Common Policy Match Conditions on page 150 AND
               statements in Common Ingress Policy Match Conditions on page 151 ...
         }
         to {
            ... statements in Common Policy Match Conditions on page 150 ...
         }
         then {
            ... statements in Common Policy Terms on page 149 ...
         }
      }
      to {
         ... statements in Common Policy Match Conditions on page 150 ...
      }
      then {
         ... statements in Common Policy Terms on page 149 ...
      }
   }
   prefix-list list-name {
      ip-prefix</prefix-length>;
      apply-path path;
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

CHAPTER 9

[edit protocols] Hierarchy Levels

[edit protocols] Hierarchy Level

Each of the following topics lists the statements at a subhierarchy of the **[edit protocols]** hierarchy.

- [edit protocols mpls] Hierarchy Level on page 186
- [edit protocols msdp] Hierarchy Level on page 191
- [edit protocols mstp] Hierarchy Level on page 193
- [edit protocols mvrp] Hierarchy Level on page 194
- [edit protocols neighbor-discovery] Hierarchy Level on page 195
- [edit protocols oam] Hierarchy Level on page 196
- [edit protocols ospf] Hierarchy Level on page 200
- [edit protocols ospf3] Hierarchy Level on page 204
- [edit protocols pgm] Hierarchy Level on page 208
- [edit protocols pim] Hierarchy Level on page 209
- [edit protocols ppp] Hierarchy Level on page 212
- [edit protocols ppp-service] Hierarchy Level on page 212
- [edit protocols pppoe] Hierarchy Level on page 213
- [edit protocols protection-group] Hierarchy Level on page 214
- [edit protocols rip] Hierarchy Level on page 215
- [edit protocols ripng] Hierarchy Level on page 217
- [edit protocols router-advertisement] Hierarchy Level on page 218
- [edit protocols router-discovery] Hierarchy Level on page 219
- [edit protocols rstp] Hierarchy Level on page 220
- [edit protocols rsvp] Hierarchy Level on page 221
- [edit protocols sap] Hierarchy Level on page 224
- [edit protocols sflow] Hierarchy Level on page 224
- [edit protocols stp] Hierarchy Level on page 225
- [edit protocols vpls] Hierarchy Level on page 226
- [edit protocols vrrp] Hierarchy Level on page 226
- [edit protocols vstp] Hierarchy Level on page 227

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit protocols ancp] Hierarchy Level

```
protocols {
  ancp {
    adjacency-timer;
    interfaces {
      interface-set interface-set-name {
        access-identifier identifier-string <neighbor ip-address>;
      }
      interface-name {
        access-identifier identifier-string <neighbor ip-address>;
      }
    }
    maximum-discovery-table-entries entry-number;
    maximum-helper-restart-time seconds;
    neighbor ip-address {
      adjacency-timer;
      ietf-mode;
      maximum-discovery-table-entries entry-number;
      pre-ietf-mode;
    }
    pre-ietf-mode;
    qos-adjust;
    traceoptions {
      file <filename> <files number> <match regular-expression > <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      level (all | error | info | notice | verbose | warning);
      no-remote-trace;
    }
  }
}
```

Related Documentation

- ANCP Topology Discovery and Traffic Monitoring Overview
- Configuring ANCP
- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols bfd] Hierarchy Level

```
protocols {
  bfd {
    no-issu-timer-negotiation;
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols bgp] Hierarchy Level

Several statements in the **[edit protocols mpls]** hierarchy are valid at numerous locations within it. To make the complete hierarchy easier to read, the repeated statements are listed in "Common BGP Family Options" on page 159 and that section is referenced at the appropriate locations in "Complete [edit protocols bgp] Hierarchy" on page 159.

Common BGP Family Options

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Complete [edit protocols bgp] Hierarchy" on page 159 instead of the statements being repeated.

- **[edit protocols bgp family inet (any | flow | labeled-unicast | multicast | unicast)]**
- **[edit protocols bgp family inet6 (any | labeled-unicast | multicast | unicast)]**
- **[edit protocols bgp family (inet-mdt | inet-mvpn | inet6-mvpn | l2vpn) signaling]**
- **[edit protocols bgp family inet-vpn (any | flow | multicast | unicast)]**
- **[edit protocols bgp family inet6-vpn (any | multicast | unicast)]**
- **[edit protocols bgp family iso-vpn unicast]**

The common BGP family options are as follows:

```
accepted-prefix-limit {
   maximum number;
   teardown <percentage> <idle-timeout (forever | minutes)>;
}
loops number;
prefix-limit {
   maximum number;
   teardown <percentage> <idle-timeout (forever | minutes)>;
}
rib-group group-name;
```

Complete [edit protocols bgp] Hierarchy

The statement hierarchy listed in this section can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
   bgp {
      disable;
      accept-remote-nexthop;
      advertise-external <conditional>;
      advertise-inactive;
      (advertise-peer-as | no-advertise-peer-as);
      authentication-algorithm (aes-128-cmac-96 | hmac-sha-1-96 | md5);
      authentication-key key;
      authentication-key-chain key-chain;
      bfd-liveness-detection {
         authentication {
            algorithm (keyed-md5 | keyed-sha-1 | meticulous-keyed-md5 |
               meticulous-keyed-sha-1 | simple-password);
```



```
        key-chain key-chain-name;
        loose-check;
    }
    detection-time {
        threshold milliseconds;
    }
    holddown-interval milliseconds;
    minimum-interval milliseconds;
    minimum-receive-interval milliseconds;
    multiplier number;
    no-adaptation;
    session-mode (automatic | multihop | single-hop);
    transmit-interval {
        minimum-interval milliseconds;
        threshold milliseconds;
    }
    version (1 | automatic);
}
cluster cluster-identifier;
damping;
description text-description;
export [ policy-names ];
family family-name {
    ... the family subhierarchies appear after the main [edit protocols bgp] hierarchy ...
}
graceful-restart {
    disable;
    restart-time seconds;
    stale-routes-time seconds;
}
group group-name {
    ... the group subhierarchy appears after the main [edit protocols bgp] hierarchy ...
}
hold-time seconds;
idle-after-switch-over (seconds | forever);
import [ policy-names ];
include-mp-next-hop;
ipsec-sa ipsec-sa;
keep (all | none);
local-address address;
local-as autonomous-system <loops number> < alias> <private>;
local-interface interface-name;
local-preference local-preference;
log-updown;
metric-out (metric | igp (delay-med-update | offset) | minimum-igp offset);
mtu-discovery;
multihop {
    no-nexthop-change;
    ttl ttl-value;
}
no-aggregator-id;
no-client-reflect;
out-delay seconds;
outbound-route-filter {
    bgp-orf-cisco-mode;
    prefix-based {
```



```
            accept {
                inet;
                inet6;
            }
        }
    }
    passive;
    path-selection {
        always-compare-med;
        as-path-ignore;
        cisco-non-deterministic;
        external-router-id;
        med-plus-igp {
            igp-multiplier number;
            med-multiplier number;
        }
    }
    peer-as autonomous-system;
    preference preference;
    remove-private;
    tcp-mss segment-size;
    traceoptions {
        file filename <files number> <size maximum-file-size> <world-readable |
            no-world-readable>;
        flag flag <flag-modifier> <disable>;
    }
    vpn-apply-export;
}

bgp {
    family inet {
        (any | multicast) {
            ... statements in Common BGP Family Options on page 159 ...
        }
        flow {
            ... statements in Common BGP Family Options on page 159 PLUS ...
            no-validate [ validation-procedure-names ];
        }
        labeled-unicast {
            ... statements in Common BGP Family Options on page 159 PLUS ...
            aggregate-label {
                community community-name;
            }
            explicit-null connected-only;
            per-group-label;
            resolve-vpn;
            rib inet.3;
            traffic-statistics {
                file filename <files number> <size maximum-file-size> <world-readable |
                    no-world-readable>;
                interval seconds;
            }
        }
        unicast {
            ... statements in Common BGP Family Options on page 159 PLUS ...
            topology name {
```

```
            community target identifier;
          }
        }
      }
    }

    bgp {
      family inet6 {
        (any | multicast) {
          ... statements in Common BGP Family Options on page 159 ...
        }
        labeled-unicast {
          ... statements in Common BGP Family Options on page 159 PLUS ...
          aggregate-label {
            community community-name:
          }
          explicit-null;
          per-group-label;
          traffic-statistics {
            file filename <files number> <size maximum-file-size> <world-readable |
              no-world-readable>;
            interval seconds;
          }
        }
        unicast {
          ... statements in Common BGP Family Options on page 159 PLUS ...
          topology name {
            community target identifier;
          }
        }
      }
    }

    bgp {
      family (inet-mdt | inet-mvpn | inet6-mvpn | l2vpn) {
        signaling {
          ... statements in Common BGP Family Options on page 159 ...
        }
      }
    }

    bgp {
      family inet-vpn {
        (any | multicast | unicast) {
          ... statements in Common BGP Family Options on page 159 PLUS ...
          aggregate-label <community community-name>;
        }
        flow {
          ... statements in Common BGP Family Options on page 159 ...
        }
      }
    }

    bgp {
      family inet6-vpn {
        (any | multicast | unicast) {
```



```
        ... statements in Common BGP Family Options on page 159 PLUS ...
        aggregate-label <community community-name>;
      }
    }
  }

  bgp {
    family iso-vpn {
      unicast {
        ... statements in Common BGP Family Options on page 159 PLUS ...
        aggregate-label <community community-name>;
      }
    }
  }

  bgp {
    family route-target {
      accepted-prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
      }
      advertise-default;
      external-paths number;
      prefix-limit {
        maximum number;
        teardown <percentage> <idle-timeout (forever | minutes)>;
      }
    }
  }

  bgp {
    group group-name {
      ... same statements as at the [edit protocols bgp] hierarchy level PLUS ...
        allow [ all ip-prefix</prefix-length> ];
        as-override;
        multipath <multiple-as>;
        neighbor address {
          ... the neighbor subhierarchy appears after the main [edit protocols bgp group
            group-name] hierarchy ...
        }
        type (external | internal);
      ... BUT NOT ...
        disable;  # NOT valid at this level
        group group-name { ... }  # NOT valid at this level
        path-selection { ... }  # NOT valid at this level
    }

    group group-name {
      neighbor address {
        ... same statements as at the [edit protocols bgp] hierarchy level PLUS ...
          as-override;
          multipath <multiple-as>;
        ... BUT NOT ...
          disable;  # NOT valid at this level
          group group-name { ... }  # NOT valid at this level
          neighbor address { ... }  # NOT valid at this level
```

```
                path-selection { ... }  # NOT valid at this level
            }
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols connections] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  connections {
    interface-switch connection-name {
      interface interface-name.unit-number;
    }
    lsp-switch connection-name {
      receive-lsp label-switched-path;
      transmit-lsp label-switched-path;
    }
    p2mp-receive-switch switch-name {
      output-interface [ interface-name.unit-number ];
      receive-p2mp-lsp lsp-name;
    }
    p2mp-transmit-switch switch-name {
      input-interface interface-name.unit-number;
      transmit-p2mp-lsp lsp-name;
    }
    remote-interface-switch connection-name {
      interface interface-name.unit-number;
      receive-lsp label-switched-path;
      transmit-lsp label-switched-path;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols dcbx] Hierarchy Level

```
protocols {
   dcbx {
      disable;
      interface (all | interface-name) {
         disable ;
         applications {
            fcoe {
               no-auto-negotiation;
            }
         }
         enhanced-transmission-selection {
            no-auto-negotiation;
         }
         priority-flow-control {
            no-auto-negotiation;
         }
      }
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit protocols dot1x] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  dot1x {
    authenticator
      authentication-profile-name profile-name;
      interface interface-name {
        disable;
        guest-vlan vlan-identifier;
        mac-radius {
          flap-on-disconnect;
          restrict;
        }
        maximum-requests number;
        quiet-period seconds;
        (reauthentication seconds | no-reauthentication);
        retries number;
        server-fail (deny | permit | use-cache | vlan vlan-identifier);
        server-reject-vlan vlan-identifier;
        server-timeout seconds;
        supplicant (multiple | single | single-secure);
        supplicant-timeout seconds;
        transmit-period seconds;
      }
      static mac-address {
        interface interface-name;
        vlan-assignment vlan-identifier;
      }
    }
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <disable>;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols dvmrp] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
   dvmrp {
      disable;
      export [ policy-names ];
      import [ policy-names ];
      interface interface-name {
         disable;
         hold-time seconds;
         metric metric;
         mode (forwarding | unicast-routing);
      }
      rib-group group-name;
      traceoptions {
         file filename <files number> <size maximum-file-size> <world-readable |
            no-world-readable>;
         flag flag <flag-modifier> <disable>;
      }
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols esis] Hierarchy Level

```
protocols {
  esis {
    disable;
    graceful-restart {
      disable;
      restart-duration seconds;
    }
    interface (interface-name | all) {
      disable;
      end-system-configuration-timer seconds;
      hold-time seconds;
    }
    preference preference;
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <flag-modifier> <disable>;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols igmp] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  igmp {
    accounting;
    interface interface-name {
      disable;
      (accounting | no-accounting);
      group-policy [ policy-names ];
      immediate-leave;
      oif-map [ map-names ];
      passive <allow-receive> <send-general-query> <send-group-query>;
      promiscuous-mode;
      ssm-map ssm-map-name;
      static {
        group multicast-group-address {
          exclude;
          group-count number;
          group-increment increment;
          source ip-address {
            source-count number;
            source-increment increment;
          }
        }
      }
      version version;
    }
    maximum-transmit-rate packets-per-second;
    query-interval seconds;
    query-last-member-interval seconds;
    query-response-interval seconds;
    robust-count number;
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <flag-modifier> <disable>;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols igmp-snooping] Hierarchy Level

```
protocols {
  igmp-snooping {
    traceoptions {
      file filename <files number> <no-stamp> <replace> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag <flag-modifier> <disable>;
    }
    vlan (all | vlan-identifier) {
      disable;
      data-forwarding {
        receiver {
          install;
          source-vlans vlan-name;
        }
        source {
          groups ip-address;
        }
      }
      immediate-leave;
      interface (all | interface-name) {
        multicast-router-interface;
        static {
          group multicast-ip-address;
        }
      }
      proxy {
        source-address ip-address;
      }
      robust-count number;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols ilmi] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  ilmi {
    traceoptions {
      file <filename> <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag;
      no-remote-trace;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols isis] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  isis {
    disable;
    clns-routing;
    context-identifier ip-address</prefix> {
      level (1 | 2) <disable>;
    }
    export [ policy-names ];
    graceful-restart {
      disable;
      helper-disable;
      restart-duration seconds;
    }
    ignore-attached-bit;
    interface interface-name {
      ... the interface subhierarchy appears after the main [edit protocols isis] hierarchy ...
    }
    label-switched-path name level level metric metric;
    level (1 | 2) {
      disable;
      authentication-key key;
      authentication-type authentication;
      external-preference preference;
      no-csnp-authentication;
      no-hello-authentication;
      no-psnp-authentication;
      preference preference;
      prefix-export-limit number;
      wide-metrics-only;
    }
    loose-authentication-check;
    lsp-lifetime seconds;
    max-areas number;
    no-adjacency-holddown;
    no-authentication-check;
    no-ipv4-routing;
    no-ipv6-routing;
    overload {
      advertise-high-metrics;
      timeout seconds;
    }
    reference-bandwidth reference-bandwidth;
    rib-group {
      inet group-name;
      inet6 group-name;
    }
    spf-options {
      delay milliseconds;
      holddown milliseconds;
```

```
      rapid-runs number;
    }
    topologies {
      ipv4-multicast;
      ipv6-multicast;
      ipv6-unicast;
    }
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <flag-modifier> <disable>;
    }
    traffic-engineering {
      disable;
      family inet {
        shortcuts {
          multicast-rpf-routes:
        }
      }
      family inet6 {
        shortcuts;
      }
    }
    ignore-lsp-metrics;
  }

  isis {
    interface interface-name {
      disable;
      bfd-liveness-detection {
        authentication {
          algorithm (keyed-md5 | keyed-sha-1 | meticulous-keyed-md5 |
            meticulous-keyed-sha-1 | simple-password);
          key-chain key-chain-name;
          loose-check;
        }
        detection-time {
          threshold milliseconds;
        }
        minimum-interval milliseconds;
        minimum-receive-interval milliseconds;
        multiplier number;
        no-adaptation;
        transmit-interval {
          minimum-interval milliseconds;
          threshold milliseconds;
        }
        version (1 | automatic);
      }
      checksum;
      csnp-interval (seconds | disable);
      hello-padding (adaptive | loose | strict);
      ldp-synchronization {
        disable;
        hold-time seconds;
      }
```



```
            level (1 | 2) {
                disable;
                hello-authentication-key key;
                hello-authentication-type authentication;
                hello-interval seconds;
                hold-time seconds;
                ipv4-multicast-metric number;
                ipv6-multicast-metric number;
                ipv6-unicast-metric number;
                metric metric;
                passive;
                priority number;
                te-metric metric;
            }
            link-protection;
            lsp-interval milliseconds;
            mesh-group (value | blocked);
            no-adjacency-down-notification;
            no-eligible-backup;
            no-ipv4-multicast;
            no-ipv6-multicast;
            no-ipv6-unicast;
            no-unicast-topology;
            node-link-protection;
            passive;
            point-to-point;
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols l2circuit] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  l2circuit {
    local-switching {
      interface interface-name {
        description text;
        end-interface {
          interface interface-name;
          protect-interface interface-name;
        }
        ignore-mtu-mismatch;
        protect-interface interface-name;
      }
    }
    neighbor address {
      interface interface-name {
        bandwidth {
          bps;
          ct0 bps;
          ct1 bps;
          ct2 bps;
          ct3 bps;
        }
        backup-neighbor address {
          community name;
          psn-tunnel-endpoint address;
          standby;
          static {
            incoming-label label;
            outgoing-label label;
          }
          virtual-circuit-id number;
        }
        community community-name;
        (control-word | no-control-word);
        description text;
        encapsulation-type type;
        ignore-encapsulation-mismatch;
        ignore-mtu-mismatch;
        mtu mtu;
        no-control-word;
        oam {
          bfd-liveness-detection {
            detection-time {
              threshold milliseconds;
            }
            holddown-interval milliseconds;
            minimum-interval milliseconds;
            minimum-receive-interval milliseconds;
            multiplier number;
```

```
                no-adaptation;
                transmit-interval {
                  minimum-interval milliseconds;
                  threshold milliseconds;
                }
                version (1 | automatic);
              }
            }
            protect-interface interface-name;
            pseudowire-status-tlv;
            psn-tunnel-endpoint address;
            revert-time seconds;
            static {
              incoming-label label;
              outgoing-label label;
            }
            switchover-delay milliseconds;
            virtual-circuit-id identifier;
          }
        }
        traceoptions {
          file filename <files number> <size maximum-file-size> <world-readable |
            no-world-readable>;
          flag flag <flag-modifier> <disable>;
        }
      }
    }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols l2iw] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  l2iw {
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <flag-modifier> <disable>;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols l2-learning] Hierarchy Level

```
protocols {
  l2-learning {
    global-mac-limit {
      limit;
      packet-action drop;
    }
    global-mac-statistics;
    global-mac-table-aging-time seconds;
    global-no-mac-learning;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols lacp] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  lacp {
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols layer2-control] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  layer2-control {
    bpdu-block {
      disable-timeout seconds;
      interface [ interface-names ];
    }
    mac-rewrite {
      interface interface-name {
        protocol {
          cdp;
          stp;
          vtp;
        }
      }
    }
    nonstop-bridging;
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <disable>;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols ldp] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  ldp {
    (deaggregate | no-deaggregate);
    egress-policy [ policy-names ];
    explicit-null;
    export [ policy-names ];
    graceful-restart {
      disable;
      helper-disable;
      maximum-neighbor-reconnect-time seconds;
      maximum-neighbor-recovery-time seconds;
      reconnect-time seconds;
      recovery-time seconds;
    }
    igp-synchronization holddown-interval seconds;
    import [ policy-names ];
    interface interface-name {
      (allow-subnet-mismatch | no-allow-subnet-mismatch;
      disable;
      hello-interval seconds;
      hold-time seconds;
      transport-address (interface | router-id);
    }
    keepalive-interval seconds;
    keepalive-timeout seconds;
    l2-smart-policy;
    log-updown {
      trap disable;
    }
    next-hop {
      merged {
        policy [ policy-names ];
      }
    }
    no-forwarding;
    oam {
      ... the oam subhierarchy appears after the main [edit protocols ldp] hierarchy ...
    }
    policing {
      fec class-address {
        ingress-traffic filter-name;
        transit-traffic filter-name;
      }
    }
    preference preference;
    session destination-address {
      authentication-algorithm algorithm;
      authentication-key key;
      authentication-key-chain key-chain;
```



```
    }
    session-protection <timeout seconds>;
    strict-targeted-hellos;
    targeted-hello {
      hello-interval seconds;
      hold-time seconds;
    }
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <flag-modifier> <disable>;
    }
    track-igp-metric;
    traffic-statistics {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      interval seconds;
      no-penultimate-hop;
    }
    transport-address (address | interface | router-id);
  }

  ldp {
    oam {
      bfd-liveness-detection {
        detection-time {
          threshold milliseconds;
        }
        ecmp;
        failure-action (remove-nexthop | remove-route);
        holddown-interval milliseconds;
        minimum-interval milliseconds;
        minimum-receive-interval milliseconds;
        multiplier number;
        no-adaptation;
        transmit-interval {
          minimum-interval milliseconds;
          threshold milliseconds;
        }
        version (1 | automatic);
      }
      fec class-address {
        bfd-liveness-detection {
          ... same statements as at the [edit protocols ldp oam bfd-liveness-detection]
            hierarchy level ...
        }
        no-bfd-liveness-detection;
        periodic-traceroute {
          ... same statements as at the [edit protocols ldp oam periodic-traceroute]
            hierarchy level PLUS ...
          disable;
        }
      }
      ingress-policy [ policy-names ];
      periodic-traceroute {
        exp cos-value;
```

```
            fanout next-hops;
            frequency minutes;
            paths number;
            retries number;
            source address;
            ttl number;
            wait seconds;
        }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols link-management] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  link-management {
    peer peer-name {
      address address;
      control-channel [ control-channel-interfaces ];
      lmp-control-channel interface-name {
        remote-address address;
      }
      lmp-protocol {
        hello-dead-interval milliseconds;
        hello-interval milliseconds;
        passive;
        retransmission-interval milliseconds;
        retry-limit number;
      }
      te-link [ te-link-names ];
    }
    te-link te-link-name {
      disable;
      interface interface-name {
        disable;
        local-address address;
        remote-address address;
        remote-id id-number;
      }
      label-switched-path lsp-name {
        disable;
        local-address address;
        remote-address address;
        remote-id id-number;
      }
      local-address address;
      remote-address address;
      remote-id id-number;
      te-metric metric;
    }
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols lldp] Hierarchy Level

```
protocols {
  lldp {
    disable;
    advertisement-interval seconds;
    hold-multiplier seconds;
    interface (all | interface-name) {
      disable;
    }
    lldp-configuration-notification-interval seconds;
    ptopo-configuration-maximum-hold-time seconds;
    ptopo-configuration-trap-interval seconds;
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <disable>;
    }
    transmit-delay seconds;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols lldp-med] Hierarchy Level

```
protocols {
  lldp-med {
    disable;
    fast-start number;
    interface (all | interface-name) {
      disable;
      location {
        civic-based {
          ca-type {
            index {
              ca-value value;
            }
          }
          country-code code;
          what value;
        }
        elin number;
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols mld] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  mld {
    accounting;
    interface interface-name {
      disable;
      (accounting | no-accounting);
      group-policy [ policy-names ];
      immediate-leave;
      oif-map [ map-names ];
      passive <allow-receive> <send-general-query> <send-group-query>;
      ssm-map ssm-map-name;
      static {
        group multicast-group-address {
          exclude;
          group-count number;
          group-increment increment;
          source source-ip-address {
            source-count number;
            source-increment number;
          }
        }
      }
      version (1 | 2);
    }
    maximum-transmit-rate packets-per-second;
    query-interval seconds;
    query-last-member-interval seconds;
    query-response-interval seconds;
    robust-count number;
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <flag-modifier> <disable>;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols mpls] Hierarchy Level

Several statements in the **[edit protocols mpls]** hierarchy are valid at numerous locations within it. To make the complete hierarchy easier to read, the repeated statements are listed in "Common MPLS Options" on page 186 and that section is referenced at the appropriate locations in "Complete [edit protocols mpls] Hierarchy" on page 187.

Common MPLS Options

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Complete [edit protocols mpls] Hierarchy" on page 187 instead of the statements being repeated.

- **[edit protocols mpls]**
- **[edit protocols mpls label-switched-path *lsp-name*]**
- **[edit protocols mpls label-switched-path *lsp-name* primary *path-name*]**
- **[edit protocols mpls label-switched-path *lsp-name* secondary *path-name*]**

The common MPLS options are as follows:

```
admin-down;
admin-group {
   exclude [ group-names ];
   include-all [ group-names ];
   include-any [ group-names ];
}
bandwidth  {
   bps;
   ct0 bps;
   ct1 bps;
   ct2 bps;
   ct3 bps;
}
class-of-service cos-value;
hop-limit number;
no-cspf;
no-decrement-ttl;
oam {
   ... the oam subhierarchy appears at the end of this section ...
}
optimize-timer seconds;
preference preference;
priority setup-priority hold-priority;
(record | no-record);
standby;

oam {
   bfd-liveness-detection {
      detection-time {
         threshold milliseconds;
      }
      failure-action (make-before-break <teardown-timeout seconds> | teardown);
```



```
        minimum-interval milliseconds;
        minimum-receive-interval milliseconds;
        multiplier number;
        no-adaptation;
        transmit-interval {
            minimum-interval milliseconds;
            threshold milliseconds;
        }
        version (1 | automatic);
    }
    lsp-ping-interval seconds;
    traceoptions {
        file <filename> <files number> <match regular-expression> <size maximum-file-size>
            <world-readable | no-world-readable>;
        flag flag;
        no-remote-trace;
    }
}
```

Complete [edit protocols mpls] Hierarchy

The statement hierarchy listed in this section can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
    mpls {
        ... statements in Common MPLS Options on page 186 PLUS ...
        disable;
        admin-groups {
            group-name group-value;
        }
        advertisement-hold-time seconds;
        auto-policing {
            class all (drop | loss-priority-high | loss-priority-low);
            class ctnumber (drop | loss-priority-high | loss-priority-low);
        }
        diffserv-te {
            bandwidth-model (extended-mam | mam | rdm);
            te-class-matrix {
                tenumber traffic-class ctnumber priority priority;
            }
        }
        expand-loose-hop;
        explicit-null;
        icmp-tunneling;
        interface (interface-name | all) {
            disable;
            admin-group [ group-names ];
        }
        ipv6-tunneling;
        label-switched-path lsp-name {
            ... the label-switched-path subhierarchy appears after the main [edit protocols mpls]
                hierarchy ...
        }
        log-updown {
            no-trap {
                mpls-lsp-traps;
```

```
        rfc3812-traps;
    }
    (syslog | no-syslog);
    trap;
    trap-path-down;
    trap-path-up;
}
no-propagate-ttl;
optimize-aggressive;
path path-name {
    (address | hostname) <loose | strict>;
}
path-mtu {
    allow-fragmentation;
    rsvp {
        mtu-signaling;
    }
}
revert-timer seconds;
rsvp-error-hold-time seconds;
smart-optimize-timer seconds;
static-label-switched-path lsp-name {
    bypass bypass-name {
        bandwidth bps;
        description text-string;
        next-hop (address | interface-name | address/interface-name);
        push out-label;
        to address;
    }
    ingress {
        bandwidth bps;
        class-of-service cos-value;
        description string;
        install {
            destination-prefix <active>;
        }
        link-protection bypass-name name;
        metric metric;
        next-hop (address | interface-name | address/interface-name);
        node-protection bypass-name name next-next-label label;
        no-install-to-address;
        policing {
            filter filter-name;
            no-auto-policing;
        }
        preference preference;
        push out-label;
        to address;
    }
    transit incoming-label {
        bandwidth bps;
        description text-string;
        link-protection bypass-name name;
        next-hop (address | interface-name | address/interface-name);
        node-protection bypass-name name next-next-label label;
        pop;
```



```
        swap out-label;
      }
    statistics {
      auto-bandwidth;
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      interval seconds;
    }
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag;
    }
    traffic-engineering (bgp | bgp-igp | bgp-igp-both-ribs | mpls-forwarding);
  }

  mpls {
    label-switched-path lsp-name {
      ... statements in Common MPLS Options on page 186 PLUS ...
      disable;
      adaptive;
      admin-groups {
        group-name group-value;
      }
      associate-backup-pe-groups;
      auto-bandwidth {
        adjust-interval seconds;
        adjust-threshold percentage;
        adjust-threshold-overflow-limit count;
        maximum-bandwidth bps;
        minimum-bandwidth bps;
        monitor-bandwidth;
      }
      description text-string;
      fast-reroute {
        bandwidth bps;
        bandwidth-percent percentage;
        (exclude [ group-names ] | no-exclude);
        hop-limit number;
        (include-all [ group-names ] | no-include-all);
        (include-any [ group-names ] | no-include-any);
      }
      from address;
      install destination-prefix</prefix-length> <active>;
      ldp-tunneling;
      (least-fill | most-fill | random);
      link-protection;
      lsp-attributes {
        encoding-type (ethernet | packet | pdh | sonet-sdh);
        gpid (ethernet | hdlc | ipv4 | pos-no-scrambling-crc-16 | pos-no-scrambling-crc-32 |
          pos-scrambling-crc-16 | pos-scrambling-crc-32 | ppp);
        signal-bandwidth type;
        switching-type (fiber | lambda | psc-1 | tdm);
      }
      metric metric;
      no-install-to-address;
```

```
            node-link-protection;
            p2mp lsp-name;
            policing {
                filter filter-name;
                no-auto-policing;
            }
            primary path-name {
                ... statements in Common MPLS Options on page 186 PLUS ...
                adaptive;
                select (manual | unconditional);
            }
            retry-limit number;
            retry-timer seconds;
            revert-timer seconds;
            secondary path-name {
                ... statements in Common MPLS Options on page 186 PLUS ...
                adaptive;
                select (manual | unconditional);
            }
            soft-preemption;
            template;
            to address;
            traceoptions {
                file filename <files number> <size maximum-file-size> <world-readable |
                    no-world-readable>;
                flag flag;
            }
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols msdp] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  msdp {
    disable;
    active-source-limit {
      maximum number;
      threshold number;
    }
    data-encapsulation (disable | enable);
    export [ policy-names ];
    group group-name {
      disable;
      export [ policy-names ];
      import [ policy-names ];
      local-address address;
      mode (mesh-group | standard);
      peer address {
        ... same statements as at the [edit protocols msdp peer address] hierarchy level ...
      }
      traceoptions {
        file filename <files number> <size maximum-file-size> <world-readable |
          no-world-readable>;
        flag flag <flag-modifier> <disable>;
      }
    }
    import [ policy-names ];
    local-address address;
    peer address {
      disable;
      active-source-limit {
        maximum number;
        threshold number;
      }
      authentication-key peer-key;
      default-peer;
      export [ policy-names ];
      import [ policy-names ];
      local-address address;
      traceoptions {
        file filename <files number> <size maximum-file-size> <world-readable |
          no-world-readable>;
        flag flag <flag-modifier> <disable>;
      }
    }
    rib-group group-name;
    source ip-prefix</prefix-length> {
      active-source-limit {
        maximum number;
        threshold number;
      }
```

```
        }
        traceoptions {
          file filename <files number> <size maximum-file-size> <world-readable |
            no-world-readable>;
          flag flag <flag-modifier> <disable>;
        }
      }
    }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols mstp] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  mstp {
    disable;
    backup-bridge-priority priority;
    bpdu-block-on-edge;
    bpdu-destination-mac-address provider-bridge-group;
    bridge-priority priority;
    configuration-name configuration-name;
    forward-delay seconds;
    hello-time seconds;
    interface interface-name {
      bpdu-timeout-action {
        alarm;
        block;
      }
      cost cost;
      edge;
      mode (point-to-point | shared);
      no-root-port;
      priority interface-priority;
    }
    max-age seconds;
    max-hops hops;
    msti identifier {
      backup-bridge-priority priority;
      bridge-priority priority;
      interface interface-name {
        cost cost;
        priority interface-priority;
      }
      vlan [ vlan-ids ];
    }
    priority-hold-time seconds;
    revision-level revision-level;
    system-id mac-address {
      ip-address ip-address</prefix-length>;
    }
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <disable>;
    }
    vpls-flush-on-topology-change;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols mvrp] Hierarchy Level

```
protocols {
   mvrp {
      disable;
      interface (all | interface-name) {
         disable;
         join-timer milliseconds;
         leave-timer milliseconds;
         leaveall-timer milliseconds;
         registration (forbidden | normal);
      }
      no-dynamic-vlan;
      traceoptions {
         file filename <files number> <no-stamp> <replace> <size maximum-file-size>
            <world-readable | no-world-readable>;
         flag flag <disable>;
      }
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols neighbor-discovery] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  neighbor-discovery {
    secure {
      cryptographic-address {
        key-length bytes;
        key-pair pathname;
      }
      security-level {
        (default | secure-messages-only);
      }
      timestamp {
        clock-drift number;
        known-peer-window seconds;
        new-peer-window seconds;
      }
      traceoptions {
        file <filename> <files number> <match regular-expression>
          <size maximum-file-size> <world-readable | no-world-readable>;
        flag flag;
        no-remote-trace;
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols oam] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  oam {
    ethernet {
      connectivity-fault-management {
      ... the connectivity-fault-management subhierarchy appears after the main [edit
        protocols oam ethernet] hierarchy ...
      evcs evc-id {
        evc-protocol (cfm maintenance-association association-name
          maintenance-domain domain-name) | (vpls routing-instance instance-name);
        multipoint-to-multipoint;
        remote-uni-count count;
      }
      link-fault-management {
      ... the link-fault-management subhierarchy appears after the main [edit protocols
        oam ethernet] hierarchy ...
      lmi {
        interface interface-name {
          evc evc-name {
            default-evc;
            vlan-list [ vlan-ids ];
          }
          evc-map-type (all-to-one-bundling | bundling | service-multiplexing);
          polling-verification-timer seconds;
          status-counter number;
          uni-id uni-id;
        }
        polling-verification-timer value;
        status-counter count;
        traceoptions {
          file <filename> <files number> <match regular-expression>
            <size maximum-file-size> <world-readable | no-world-readable>;
          flag flag;
          no-remote-trace;
        }
      }
    }

    ethernet {
      connectivity-fault-management {
        action-profile profile-name {
          default-actions {
            interface-down;
          }
          event {
            adjacency-loss;
            interface-status-tlv [ down lower-layer-down ];
            port-status-tlv blocked;
            rdi;
          }
```



```
    }
    connection-protection {
      mark-connection-protection-tlv;
    }
    linktrace {
      age (10s | 30s | 1m | 10m | 30m);
      path-database-size number;
    }
    maintenance-domain domain-name {
    ... the maintenance-domain subhierarchy appears after the main [edit protocols
      oam ethernet connectivity-fault-management] hierarchy ...
    performance-monitoring {
      delegate-server-processing;
      hardware-assisted-timestamping;
      sla-iterator-profiles {
        profile-name {
          disable;
          calculation-weight {
            delay delay-weight;
            delay-variation delay-variation-weight;
          }
          cycle-time milliseconds;
          iteration-period connections;
          measurement-type (loss | two-way-delay);
        }
      }
    }
    policer {
      all policer-name;
      continuity-check policer-name;
      other policer-name;
    }
    traceoptions {
      file <filename> <files number> <match regular-expression>
        <size maximum-file-size> <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
    }
  }

  connectivity-fault-management {
    maintenance-domain domain-name {
      bridge-domain domain-name <vlan-id [ vlan-ids ]>;
      instance routing-instance-name;
      interface interface-name;
      level number;
      maintenance-association association-name {
      ... the maintenance-association subhierarchy appears after the main [edit protocols
        oam ethernet connectivity-fault-management maintenance-domain] hierarchy
        ...
      mip-half-function (default | explicit | none);
      name-format (character-string | dns | mac+2oct | none);
      virtual-switch routing-instance-name {
        bridge-domain domain-name <vlan-id [ vlan-ids ]>;
      }
    }
```

```
        maintenance-domain domain-name {
          maintenance-association association-name {
            continuity-check {
              hold-interval minutes;
              interface-status-tlv;
              interval (100ms | 1s | 10s | 1m | 10m);
              loss-threshold number;
              port-status-tlv;
            }
            mep mep-id {
              auto-discovery;
              direction (down | up);
              interface interface-name (protect | working);
              lowest-priority-defect (all-defects | err-xcon | mac-rem-err-xcon | no-defect |
                rem-err-xcon | xcon);
              priority number;
              remote-mep mep-id {
                action-profile profile-name;
                sla-iterator-profile profile-name {
                  data-tlv-size bytes;
                  iteration-count frames;
                  priority priority-value;
                }
              }
            }
            mip-half-function (default | defer | explicit | none);
            policer {
              all policer-name;
              continuity-check policer-name;
              other policer-name;
            }
            short-name-format (2octet | character-string | icc | rfc-2685-vpn-id | vlan);
          }
        }
      }
    }

    ethernet {
      link-fault-management {
        action-profile profile-name {
          action {
            link-down;
            send-critical-event;
            syslog;
          }
          event {
            link-adjacency-loss;
            link-event-rate {
              frame-error count;
              frame-period count;
              frame-period-summary count;
              symbol-period count;
            }
            protocol-down;
          }
```



```
                }
                interface interface-name {
                    apply-action-profile profile-name;
                    event-thresholds {
                        frame-error count;
                        frame-period count;
                        frame-period-summary count;
                        symbol-period count;
                    }
                    link-discovery (active | passive);
                    negotiation-options {
                        allow-remote-loopback;
                        no-allow-link-events;
                    }
                    pdu-interval interval;
                    pdu-threshold threshold-value;
                    remote-loopback;
                }
                traceoptions {
                    file <filename> <files number> <match regular-expression>
                        <size maximum-file-size> <world-readable | no-world-readable>;
                    flag flag;
                    no-remote-trace;
                }
            }
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols ospf] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  ospf {
    disable;
    area area-id {
      ... the area subhierarchy appears after the main [edit protocols ospf] hierarchy ...
    }
    backup-spf-options {
      disable;
      downstream-paths-only;
      no-install;
    }
    database-protection {
      ignore-count number;
      ignore-time seconds;
      maximum-lsa number;
      reset-time seconds;
      warning-only;
      warning-threshold percent;
    }
    export [ policy-names ];
    external-preference preference;
    graceful-restart {
      disable;
      helper-disable;
      no-strict-lsa-checking;
      notify-duration seconds;
      restart-duration seconds;
    }
    import [ policy-names ];
    no-nssa-abr;
    no-rfc-1583;
    overload <timeout seconds>;
    preference preference;
    prefix-export-limit number;
    reference-bandwidth reference-bandwidth;
    rib-group group-name;
    spf-options {
      delay milliseconds;
      holddown milliseconds;
      rapid-runs number;
    }
    topology (default | ipv4-multicast | name) {
      backup-spf-options {
        disable;
        downstream-paths-only;
        no-install;
      }
      overload;
      prefix-export-limit number;
```



```
        spf-options {
            delay milliseconds;
            holddown milliseconds;
            rapid-runs number;
        }
        topology-id number;
    }
    traceoptions {
        file filename <files number> <size maximum-file-size> <world-readable |
            no-world-readable>;
        flag flag <flag-modifier> <disable>;
    }
    traffic-engineering {
        advertise-unnumbered-interfaces;
        credibiliity-protocol-preference;
        ignore-lsp-metrics;
        multicast-rpf-routes;
        no-topology;
        shortcuts <lsp-metric-into-summary>;
    }
}

ospf {
    area area-id {
        area-range ip-prefix</prefix-length> <exact> <override-metric metric> <restrict>;
        interface interface-name {
            ... the interface subhierarchy appears after the main [edit ospf area area-id] hierarchy
                level ...
        }
        label-switched-path name {
            disable;
            metric metric;
            topology (name | default | ipv4-multicast) {
                disable;
                metric metric;
            }
        }
        network-summary-export [ policy-names ];
        network-summary-import [ policy-names ];
        nssa {
            area-range ip-prefix</prefix-length> <exact> <override-metric metric> <restrict>;
            default-lsa {
                default-metric metric;
                metric-type type;
                type-7;
            }
            (summaries | no-summaries);
        }
        peer-interface interface-name {
            disable;
            authentication {
                md5 key-id key key-string <start-time YYYY-MM-DD.hh:mm>;
                simple-password key-string;
            }
            dead-interval seconds;
            demand-circuit;
```

```
        flood-reduction;
        hello-interval seconds;
        no-neighbor-down-notification;
        retransmit-interval seconds;
        transit-delay seconds;
      }
      stub <default-metric metric> <summaries | no-summaries>;
      virtual-link neighbor-id router-id transit-area area-id {
        disable;
        authentication {
          md5 key-id key key-string <start-time YYYY-MM-DD.hh:mm>;
          simple-password key-string;
        }
        dead-interval seconds;
        demand-circuit;
        flood-reduction;
        hello-interval seconds;
        ipsec-sa sa-name;
        no-neighbor-down-notification;
        retransmit-interval seconds;
        topology (name | default | ipv4-multicast) {
          disable;
          metric metric;
        }
        transit-delay seconds;
      }
    }

    area area-id {
      interface interface-name {
        disable;
        authentication {
          md5 key-id key key-string <start-time YYYY-MM-DD.hh:mm>;
          simple-password key-string;
        }
        bandwidth-based-metrics {
          bandwidth value metric number;
        }
        bfd-liveness-detection {
          authentication {
            algorithm (keyed-md5 | keyed-sha-1 | meticulous-keyed-md5 |
              meticulous-keyed-sha-1 | simple-password);
            key-chain key-chain-name;
            loose-check;
          }
          detection-time {
            threshold milliseconds;
          }
          full-neighbors-only;
          minimum-interval milliseconds;
          minimum-receive-interval milliseconds;
          multiplier number;
          no-adaptation;
          transmit-interval {
            minimum-interval milliseconds;
            threshold milliseconds;
```



```
                }
                version (1 | automatic);
            }
            dead-interval seconds;
            demand-circuit;
            dynamic-neighbors;
            flood-reduction;
            hello-interval seconds;
            interface-type (nbma | p2mp | p2p);
            ipsec-sa sa-name;
            ldp-synchronization {
                disable;
                hold-time seconds;
            }
            (link-protection | node-link-protection);
            metric metric;
            neighbor address <eligible>;
            no-eligible-backup;
            no-interface-state-traps;
            no-neighbor-down-notification;
            passive {
                traffic-engineering {
                    remote-node-id address;
                }
            }
            poll-interval seconds;
            priority number;
            retransmit-interval seconds;
            secondary;
            te-metric metric;
            topology (name | default | ipv4-multicast) {
                disable;
                bandwidth-based-metrics {
                    bandwidth value;
                    metric number;
                }
                metric metric;
            }
            transit-delay seconds;
        }
    }
}
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols ospf3] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  ospf3 {
    disable;
    area area-id {
      ... the area subhierarchy appears after the main [edit protocols ospf3] hierarchy ...
    }
    backup-spf-options {
      disable;
      downstream-paths-only;
      no-install;
    }
    database-protection {
      ignore-count number;
      ignore-time seconds;
      maximum-lsa number;
      reset-time seconds;
      warning-only;
      warning-threshold percent;
    }
    export [ policy-names ];
    external-preference preference;
    graceful-restart {
      disable;
      helper-disable;
      no-strict-lsa-checking;
      notify-duration seconds;
      restart-duration seconds;
    }
    import [ policy-names ];
    no-nssa-abr;
    no-rfc-1583;
    overload <timeout seconds>;
    preference preference;
    prefix-export-limit number;
    realm (ipv4-multicast | ipv4-unicast | ipv6-multicast | ipv6-unicast) {
      ... the realm subhierarchies appear after the main [edit protocols ospf3] hierarchy ...
    }
    reference-bandwidth reference-bandwidth;
    rib-group group-name;
    spf-options {
      delay milliseconds;
      holddown milliseconds;
      no-ignore-our-externals;
      rapid-runs number;
    }
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <flag-modifier> <disable>;
```



```
    }
    traffic-engineering {
      ignore-lsp-metrics;
      shortcuts <lsp-metric-into-summary>;
    }
  }

  ospf3 {
    area area-id {
      area-range ip-prefix</prefix-length> <exact> <override-metric metric> <restrict>;
      inter-area-prefix-export [ policy-names ];
      inter-area-prefix-import [ policy-names ];
      interface interface-name {
        ... the interface subhierarchy appears after the main [edit ospf3 area area-id]
          hierarchy level ...
      }
      nssa {
        area-range ip-prefix</prefix-length> <exact> <override-metric metric> <restrict>;
        default-lsa {
          default-metric metric;
          metric-type type;
          type-7;
        }
        (summaries | no-summaries);
      }
      stub <default-metric metric> <summaries | no-summaries>;
      virtual-link neighbor-id router-id transit-area area-id {
        disable;
        dead-interval seconds;
        demand-circuit;
        flood-reduction;
        hello-interval seconds;
        ipsec-sa sa-name;
        retransmit-interval seconds;
        transit-delay seconds;
      }
    }

    area area-id {
      interface interface-name {
        disable;
        bandwidth-based-metrics {
          bandwidth value metric number;
        }
        bfd-liveness-detection {
          authentication {
            algorithm (keyed-md5 | keyed-sha-1 | meticulous-keyed-md5 |
              meticulous-keyed-sha-1 | simple-password);
            key-chain key-chain-name;
            loose-check;
          }
          detection-time {
            threshold milliseconds;
          }
          full-neighbors-only;
          minimum-interval milliseconds;
```

```
            minimum-receive-interval milliseconds;
            multiplier number;
            no-adaptation;
            transmit-interval {
                minimum-interval milliseconds;
                threshold milliseconds;
            }
            version (1 | automatic);
        }
        dead-interval seconds;
        demand-circuit;
        flood-reduction;
        hello-interval seconds;
        interface-type (p2mp-over-lan | p2p);
        ipsec-sa sa-name;
        (link-protection | node-link-protection);
        metric metric;
        no-eligible-backup;
        own-router-lsa;
        passive {
            traffic-engineering {
                remote-node-id address;
            }
        }
        priority number;
        retransmit-interval seconds;
        transit-delay seconds;
    }
  }
}

ospf3 {
  realm (ipv4-multicast| ipv6-multicast) {
    ... same statements as at the [edit protocols ospf3] hierarchy level, EXCEPT FOR ...
    area area-id {
        interface interface-name {
            no-eligible-backup;    # NOT valid at this level
        }
        virtual-link { ... }    # NOT valid at this level
    }
    backup-spf-options { ... }    # NOT valid at this level
    realm realm-identifier { ... }    # NOT valid at this level
    traffic-engineering { ... }    # NOT valid at this level
  }
}

ospf3 {
  realm ipv4-unicast {
    ... same statements as at the [edit protocols ospf3] hierarchy level, PLUS ...
        area area-id {
            interface interface-name {
                ldp-synchronization {
                    disable;
                    hold-time seconds;
                }
            }
```



```
            }

        ... BUT NOT ...
            area area-id {
                virtual-link { ... }    # NOT valid at this level
            }
            realm realm-identifier { ... }    # NOT valid at this level
            traffic-engineering { ... }    # NOT valid at this level

        }
    }

    ospf3 {
        realm ipv6-unicast {
            disable;
            backup-spf-options {
                disable;
                downstream-paths-only;
                no-install;
            }
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols pgm] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  pgm {
    traceoptions {
      flag flag <flag-modifier> <disable>;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols pim] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  pim {
    disable;
    assert-timeout seconds;
    default-vpn-source {
      interface-name interface-name;
    }
    dense-groups {
      address <announce | reject>;
    }
    dr-election-on-p2p;
    export [ policy-names ];
    family (inet | inet6) {
      disable;
    }
    graceful-restart {
      disable;
      restart-duration seconds;
    }
    import [ policy-names ];
    interface interface-name {
      ... the interface subhierarchy appears after the main [edit protocols pim] hierarchy ...
    }
    join-load-balance;
    join-prune-timeout seconds;
    nonstop-routing {
      disable;
    }
    override-interval milliseconds;
    propagation-delay milliseconds;
    reset-tracking-bit;
    rib-group {
      inet group-name;
      inet6 group-name;
    }
    rp {
      ... the rp subhierarchy appears after the main [edit protocols pim] hierarchy ...
    }
    spt-threshold {
      infinity [ policy-names ];
    }
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <flag-modifier> <disable>;
      flag (route | state) <flag-modifier> <disable> <filter <match-on prefix>
        <policy [ policy-names ]>>;
    }
  }
```

```
pim {
  interface interface-name {
    accept-remote-source;
    disable;
    bfd-liveness-detection {
      authentication {
        algorithm (keyed-md5 | keyed-sha-1 | meticulous-keyed-md5 |
          meticulous-keyed-sha-1 | simple-password);
        key-chain key-chain-name;
        loose-check;
      }
      detection-time {
        threshold milliseconds;
      }
      minimum-interval milliseconds;
      minimum-receive-interval milliseconds;
      multiplier number;
      no-adaptation;
      transmit-interval {
        minimum-interval milliseconds;
        threshold milliseconds;
      }
      version (1 | automatic);
    }
    family (inet | inet6) {
      disable;
    }
    hello-interval seconds;
    mode (dense | sparse | sparse-dense);
    neighbor-policy [ policy-names ];
    override-interval milliseconds;
    priority number;
    propagation-delay milliseconds;
    reset-tracking-bit;
    version (1 | 2);
  }
}

pim {
  rp {
    auto-rp {
      (announce | discovery | mapping);
      (mapping-agent-election | no-mapping-agent-election);
    }
    bootstrap {
      family (inet | inet6) {
        export [ policy-names ];
        import [ policy-names ];
        priority number;
      }
    }
    bootstrap-export [ policy-names ];
    bootstrap-import [ policy-names ];
    bootstrap-priority number;
    dr-register-policy [ policy-names ];
```



```
        embedded-rp {
          group-ranges {
            ip-prefix</prefix-length>;
          }
          maximum-rps limit;
        }
        local {
          ... the local subhierarchy appears after the main [edit protocols pim rp] hierarchy ...
        }
        rp-register-policy [ policy-names ];
        static {
          address address {
            group-ranges {
              ip-prefix</prefix-length>;
            }
            version (1 | 2);
          }
        }
      }

      rp {
        local {
          disable;
          address address;
          family (inet | inet6) {
            disable;
            address address;
            anycast-pim {
              local-address address;
              rp-set {
                address address <forward-msdp-sa>;
              }
            }
            group-ranges {
              ip-prefix</prefix-length>;
            }
            hold-time seconds;
            priority number;
          }
          group-ranges {
            ip-prefix</prefix-length>;
          }
          hold-time seconds;
          priority number;
        }
      }
    }
  }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols ppp] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  ppp {
    monitor-session (interface-name | all);
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      level severity;
      no-remote-trace;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols ppp-service] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  ppp-service {
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      level severity;
      no-remote-trace;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols pppoe] Hierarchy Level

```
protocols {
  pppoe {
    pado-advertise;
    service-name-tables table-name {
      service service-name {
        agent-specifier {
          aci circuit-id-string ari remote-id-string {
            (delay seconds | drop | terminate);
            dynamic-profile profile-name;
            routing-instance routing-instance-name;
            static-interface interface-name;
          }
        }
        (delay seconds | drop | terminate);
        dynamic-profile profile-name;
        max-sessions number;
        routing-instance routing-instance-name;
      }
    }
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      level (all | error | info | notice | verbose | warning);
      no-remote-trace;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols protection-group] Hierarchy Level

```
protocols {
  protection-group {
    ethernet-ring ring-name {
      ... the ethernet-ring subhierarchy appears after the main [edit protocols
        protection-group] hierarchy ...
    }
    guard-interval milliseconds;
    hold-interval milliseconds;
    restore-interval minutes;
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag;
    }
  }

  protection-group {
    ethernet-ring ring-name {
      data-channel {
        vlan number;
      }
      east-interface {
        control-channel {
          interface-name;
          vlan number;
        }
        interface-none;
        ring-protection-link-end;
      }
      guard-interval milliseconds;
      hold-interval milliseconds;
      node-id mac-address;
      restore-interval minutes;
      ring-protection-link-owner;
      west-interface {
        control-channel {
          interface-name;
          vlan number;
        }
        interface-none;
        ring-protection-link-end;
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols rip] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  rip {
    authentication-key password;
    authentication-type type;
    (check-zero | no-check-zero);
    graceful-restart {
      disable;
      restart-time seconds;
    }
    group group-name {
      ... the group subhierarchy appears after the main [edit protocols rip] hierarchy ...
    }
    holddown seconds;
    import [ policy-names ];
    message-size number;
    metric-in metric;
    receive (both | none | version-1 | version-2);
    rib-group group-name;
    route-timeout seconds;
    send (broadcast | multicast | none | version-1);
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <flag-modifier> <disable>;
    }
    update-interval seconds;
  }

  rip {
    group group-name {
      bfd-liveness-detection {
        authentication {
          algorithm (keyed-md5 | keyed-sha-1 | meticulous-keyed-md5 |
            meticulous-keyed-sha-1 | simple-password);
          key-chain key-chain-name;
          loose-check;
        }
        detection-time {
          threshold milliseconds;
        }
        minimum-interval milliseconds;
        minimum-receive-interval milliseconds;
        multiplier number;
        no-adaptation;
        transmit-interval {
          minimum-interval milliseconds;
          threshold milliseconds;
        }
        version (1 | automatic);
```

```
        }
        demand-circuit;
        export [ policy-names ];
        import [ policy-names ];
        max-retrans-time seconds;
        metric-out metric;
        neighbor interface-name {
          ... the neighbor subhierarchy appears after the main [edit protocols rip group
            group-name] hierarchy level ...
        }
        preference preference;
        route-timeout seconds;
        update-interval seconds;
      }

      group group-name {
        neighbor neighbor-name {
          any-sender;
          authentication-key password;
          authentication-type type;
          bfd-liveness-detection {
            ... same statements as at the [edit protocols rip group group-name
              bfd-liveness-detection] hierarchy level ...
          }
          (check-zero | no-check-zero);
          demand-circuit;
          import [ policy-names ];
          max-retrans-time seconds;
          message-size number;
          metric-in metric;
          receive (both | none | version-1 | version-2);
          route-timeout seconds;
          send (broadcast | multicast | none | version-1);
          update-interval seconds;
        }
      }
    }
  }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols ripng] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  ripng {
    graceful-restart {
      disable;
      restart-time seconds;
    }
    group group-name {
      export [ policy-names ];
      import [ policy-names ];
      metric-out metric;
      neighbor neighbor-name {
        import [ policy-names ];
        metric-in metric;
        receive <none>;
        route-timeout seconds;
        send <none>;
        update-interval seconds;
      }
      preference number;
      route-timeout seconds;
      update-interval seconds;
    }
    holddown seconds;
    import [ policy-names ];
    metric-in metric;
    receive <none>;
    route-timeout seconds;
    send <none>;
    update-interval seconds;
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <flag-modifier> <disable>;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols router-advertisement] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  router-advertisement {
    interface interface-name {
      current-hop-limit number;
      default-lifetime seconds;
      (link-mtu | no-link-mtu);
      (managed-configuration | no-managed-configuration);
      max-advertisement-interval seconds;
      min-advertisement-interval seconds;
      (other-stateful-configuration | no-other-stateful-configuration);
      prefix prefix {
        (autonomous | no-autonomous);
        (on-link | no-on-link);
        preferred-lifetime seconds;
        valid-lifetime seconds;
      }
      reachable-time milliseconds;
      retransmit-timer milliseconds;
      virtual-router-only;
    }
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols router-discovery] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  router-discovery {
    disable;
    address address {
      (advertise | ignore);
      (broadcast | multicast);
      (ineligible | priority number);
    }
    interface interface-name {
      lifetime seconds;
      min-advertisement-interval seconds;
      max-advertisement-interval seconds;
    }
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols rstp] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  rstp {
    disable;
    backup-bridge-priority priority;
    bpdu-block-on-edge;
    bpdu-destination-mac-address provider-bridge-group;
    bridge-priority priority;
    extended-system-id id;
    force-version stp;
    forward-delay seconds;
    hello-time seconds;
    interface interface-name {
      bpdu-timeout-action {
        alarm;
        block;
      }
      cost cost;
      edge;
      mode (point-to-point | shared);
      no-root-port;
      priority interface-priority;
    }
    max-age seconds;
    priority-hold-time seconds;
    system-id mac-address {
      ip-address ip-address</prefix-length>;
    }
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <disable>;
    }
    vpls-flush-on-topology-change;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols rsvp] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  rsvp {
    disable;
    fast-reroute optimize-timer seconds;
    graceful-deletion-timeout seconds;
    graceful-restart {
      disable;
      helper-disable;
      maximum-helper-recovery-time seconds;
      maximum-helper-restart-time seconds;
    }
    interface interface-name {
      ... the interface subhierarchy appears after the main [edit protocols rsvp] hierarchy ...
    }
    keep-multiplier number;
    load-balance bandwidth;
    node-hello;
    no-interface-hello;
    no-node-id-subobject;
    peer-interface peer-interface-name {
      disable;
      (aggregate | no-aggregate);
      authentication-key key;
      hello-interval seconds;
      (reliable | no-reliable);
    }
    preemption {
      (aggressive | disabled | normal);
      soft-preemption cleanup-timer seconds;
    }
    refresh-time seconds;
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <flag-modifier> <disable>;
    }
    tunnel-services {
      devices device-names;
    }
  }

  rsvp {
    interface interface-name {
      disable;
      (aggregate | no-aggregate);
      authentication-key key;
      bandwidth bps;
      hello-interval seconds;
      link-protection {
```

```
        ... the link-protection subhierarchy appears after the main [edit protocols rsvp
            interface interface-name] hierarchy ...
    }
    (reliable | no-reliable);
    subscription {
        percentage;
        ct0 percentage;
        ct1 percentage;
        ct2 percentage;
        ct3 percentage;
    }
    update-threshold percentage;
}

interface interface-name {
    link-protection {
        disable;
        admin-group {
            exclude [ group-names ];
            include-all [ group-names ];
            include-any [ group-names ];
        }
        bandwidth {
            bps;
            ct0 bps;
            ct1 bps;
            ct2 bps;
            ct3 bps;
        }
        bypass bypass-name {
            ... the bypass subhierarchy appears after the main [edit protocols rsvp interface
                interface-name link-protection] hierarchy ...
        }
        class-of-service cos-value;
        hop-limit number;
        max-bypasses number;
        no-cspf;
        no-node-protection;
        optimize-timer seconds;
        path address <loose| strict>;
        priority setup-priority reservation-priority;
        subscription percentage;
    }

    link-protection {
        bypass bypass-name {
            admin-group {
                exclude [ group-names ];
                include-all [ group-names ];
                include-any [ group-names ];
            }
            bandwidth {
                bps;
                ct0 bps;
                ct1 bps;
                ct2 bps;
```



```
                ct3 bps;
              }
              class-of-service cos-value;
              description text;
              hop-limit number;
              no-cspf;
              path address <loose| strict>;
              priority setup-priority reservation-priority;
              to address;
            }
          }
        }
      }
    }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols sap] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  sap {
    disable;
    listen address <port port>;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols sflow] Hierarchy Level

```
protocols {
  sflow {
    disable;
    agent-id ip-address;
    collector ip-address {
      udp-port port-number;
    }
    interfaces interface-name {
      polling-interval seconds;
      sample-rate {
        egress number;
        ingress number;
      }
    }
    polling-interval seconds;
    sample-rate {
      egress number;
      ingress number;
    }
    source-ip ip-address;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols stp] Hierarchy Level

```
protocols {
  stp {
    disable;
    bpdu-block-on-edge;
    bridge-priority priority;
    forward-delay seconds;
    hello-time seconds;
    interface (all | interface-name) {
      disable;
      bpdu-timeout-action {
        block;
        log;
      }
      cost cost;
      edge;
      mode (point-to-point | shared);
      no-root-port;
      priority interface-priority;
    }
    max-age seconds;
    traceoptions {
      file filename <files number> <no-stamp> <replace> <size size> <world-readable |
        no-world-readable>;
      flag flag <disable>;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols vpls] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
   vpls {
      static-vpls {
         no-tunnel-services;
      }
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols vrrp] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
   vrrp {
      failover-delay milliseconds;
      startup-silent-period seconds;
      traceoptions {
         file <filename> <files number> <match regular-expression> <microsecond-stamp>
            <size maximum-file-size> <world-readable | no-world-readable>;
         flag flag;
         no-remote-trace;
      }
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

[edit protocols vstp] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
protocols {
  vstp {
    disable;
    bpdu-block-on-edge;
    force-version stp;
    interface interface-name {
      bpdu-timeout-action {
        alarm;
        block;
      }
      cost cost;
      edge;
      mode (point-to-point | shared);
      no-root-port;
      priority interface-priority;
    }
    priority-hold-time seconds;
    system-id mac-address {
      ip-address ip-address</prefix-length>;
    }
    vlan vlan-id {
      ... the vlan subhierarchy appears after the main [edit protocols vstp] hierarchy level ...
    }
    vpls-flush-on-topology-change;
  }

  vstp {
    vlan vlan-id {
      backup-bridge-priority priority;
      bridge-priority priority;
      forward-delay seconds;
      hello-time seconds;
      interface interface-name {
        ... same statements as at the [edit protocols vstp interface interface-name] hierarchy
          level ...
      }
      max-age seconds;
      traceoptions {
        file filename <files number> <size maximum-file-size> <world-readable |
          no-world-readable>;
        flag flag <disable>;
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit protocols] Hierarchy Level on page 155

CHAPTER 10

[edit routing-instances] Through [edit schedulers] Hierarchy Levels

[edit routing-instances] Hierarchy Level

The following statement hierarchy can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
routing-instances {
  routing-instance-name {
    access {
      address-assignment {
        ... same statements as in the address-assignment subhierarchy in [edit access]
          Hierarchy Level on page 45 ...
      }
    access-profile profile-name;
    bridge-domains bridge-domain-name {
      ... same statements as in [edit bridge-domains] Hierarchy Level on page 56 ...
    }
    description text;
    forwarding-options {
      ... same statements as in [edit forwarding-options] Hierarchy Level on page 101 EXCEPT
        FOR ...
        hash-key {...}   # NOT valid at this level
    }
    instance-type (forwarding | l2vpn | layer2-control | mpls-internet-multicast |
      no-forwarding | virtual-router | virtual-switch | vpls | vrf);
    interface interface-name;
    multicast-snooping-options {
      ... same statements as in [edit multicast-snooping-options] Hierarchy Level on page 147
        EXCEPT FOR ...
      traceoptions {...}   # NOT valid at this level
    }
    no-local-switching;
    no-vrf-advertise;
    protocols {
```

```
        ... the protocols subhierarchy appears after the main [edit routing-instances
            routing-instance-name] hierarchy ...
    }
    provider-tunnel {
        ... the provider-tunnel subhierarchy appears after the main [edit routing-instances
            routing-instance-name] hierarchy ...
    }
    route-distinguisher (as-number:number | ip-address:number);
    routing-interface interface-name;
    routing-options {
        ... the routing-options subhierarchy appears after the main [edit routing-instances
            routing-instance-name] hierarchy ...
    }
    services {
        mobile-ip {
            ... same statements as in [edit services mobile-ip] Hierarchy Level on page 328 ...
        }
    }
    switch-options {
        ... same statements as in [edit switch-options] Hierarchy Level on page 352 ...
    }
    system {
        services {
            dhcp-local-server {
                ... same statements as in the services dhcp-local-server subhierarchy in [edit
                    system] Hierarchy Level on page 353...
            }
        }
    }
    vlan-id (id | all | none);
    vlan-tags outer <tpid.>vlan-id inner <tpid.>vlan-id;
    vrf-advertise-selective {
        family {
            inet-mvpn;
            inet6-mvpn;
        }
    }
    vrf-export [ policy-names ];
    vrf-import [ policy-names ];
    (vrf-propagate-ttl | no-vrf-propagate-ttl);
    vrf-table-label;
    vrf-target {
        target:community-identiier;
        export target:community-identiier;
        import target:community-identiier;
    }
}

routing-instance-name {
    protocols {
        bgp {
            ... same statements as in [edit protocols bgp] Hierarchy Level on page 159 EXCEPT
                FOR ...
            group group-name {
                vpn-apply-export;    # NOT valid at this level
            }
```



```
    neighbor address {
        group group-name {
            vpn-apply-export;   # NOT valid at this level
        }
    }
    vpn-apply-export;   # NOT valid at this level
}
esis {
    ... same statements as in [edit protocols esis] Hierarchy Level on page 169 EXCEPT
        FOR ...
    graceful-restart {...}   # NOT valid at this level
}
igmp-snooping {
    ... the igmp-snooping subhierarchy appears after the main [edit routing-instances
        routing-instance-name protocols] hierarchy ...
}
isis {
    ... same statements as in [edit protocols isis] Hierarchy Level on page 173 EXCEPT
        FOR ...
    graceful-restart {...}   # NOT valid at this level
    interface interface-name {
        level (1 | 2) {
            te-metric metric;   # NOT valid at this level
        }
    }
    label-switched-path name level level metric metric;   # NOT valid at this level
    traffic-engineering {...}   # NOT valid at this level
}
l2vpn {
    ... the l2vpn subhierarchy appears after the main [edit routing-instances
        routing-instance-name protocols] hierarchy ...
}
ldp {
    ... same statements as in [edit protocols ldp] Hierarchy Level on page 180 EXCEPT
        FOR ...
    oam {...}   # NOT valid at this level
}
msdp {
    ... same statements as in [edit protocols msdp] Hierarchy Level on page 191 ...
}
mstp {
    ... same statements as in [edit protocols mstp] Hierarchy Level on page 193 ...
}
mvpn {
    ... the mvpn subhierarchy appears after the main [edit routing-instances
        routing-instance-name protocols] hierarchy ...
}
ospf {
    ... same statements as in [edit protocols ospf] Hierarchy Level on page 200 PLUS ...
        area area-id {
            sham-link-remote address {
                demand-circuit;
                flood-reduction;
                ipsec-sa sa-name;
                metric metric;
                topology (name | default | ipv4-multicast) {
```

```
                disable;
                metric metric;
              }
            }
          }
          domain-id (domain-id | disable);
          domain-vpn-tag number;
          route-type-community (iana | vendor);
        ... BUT NOT ...
          area area-id {
            interface interface-name {
              te-metric metric;   # NOT valid at this level
            }
            peer-interface {...}   # NOT valid at this level
          }
          traffic-engineering {...}   # NOT valid at this level
        }
        ospf3 {
        ... same statements as in [edit protocols ospf3] Hierarchy Level on page 204 PLUS
          ...
          domain-id (domain-id | disable);
          domain-vpn-tag number;
          route-type-community (iana | vendor);
        ... BUT NOT ...
          traffic-engineering {...}   # NOT valid at this level
        }
        pim {
        ... same statements as in [edit protocols pim] Hierarchy Level on page 209 PLUS ...
        mdt {
          data-mdt-reuse;
          group-range multicast-prefix;
          threshold {
            group group-address {
              source source-address {
                rate threshold-rate;
              }
            }
            tunnel-limit limit;
          }
        }
        mvpn {
          autodiscovery {
            inet-mdt;
          }
        }
        vpn-group-address address;
        }
        rip {
        ... same statements as in [edit protocols rip] Hierarchy Level on page 215 ...
        }
        ripng {
        ... same statements as in [edit protocols ripng] Hierarchy Level on page 217 ...
        }
        router-discovery {
        ... same statements as in [edit protocols router-discovery] Hierarchy Level on
          page 219 ...
```



```
    }
    rstp {
        ... same statements as in [edit protocols rstp] Hierarchy Level on page 220 ...
    }
    vpls {
        ... the vpls subhierarchy appears after the main [edit routing-instances
            routing-instance-name protocols] hierarchy ...
    }
    vstp {
        ... same statements as in [edit protocols vstp] Hierarchy Level on page 227 ...
    }
}

protocols {
    igmp-snooping {
        immediate-leave;
        interface interface-name {
            group-limit number;
            host-only-interface;
            immediate-leave;
            multicast-router-interface;
            static {
                group multicast-ip-address {
                    source multicast-ip-address;
                }
            }
        }
        proxy {
            source-address ip-address;
        }
        query-interval seconds;
        query-last-member-interval seconds;
        query-response-interval seconds;
        robust-count number;
        traceoptions {
            file filename <files number> <size maximum-file-size> <world-readable |
                no-world-readable>;
            flag flag <flag-modifier> <disable>;
        }
        vlan vlan-id {
            ... same statements as at the [edit routing-instances routing-instance-name
                protocols igmp-snooping] hierarchy level EXCEPT FOR ...
            traceoptions {...}    # NOT valid at this level
            vlan vlan-id {...}    # NOT valid at this level
        }
    }
}

protocols {
    l2vpn {
        (control-word | no-control-word);
        encapsulation-type (atm-aal5 | atm-cell | atm-cell-port-mode | atm-cell-vc-mode |
            atm-cell-vp-mode | cesop | cisco-hdlc | ethernet | ethernet-vlan | frame-relay |
            frame-relay-port-mode | interworking | ppp | satop-e1 | satop-e3 | satop-t1 |
            satop-t3);;
        ignore-encapsulation-mismatch;
```

```
        interface interface-name {
            description text-description;
            remote-site-id number;
        }
        oam {
            bfd-liveness-detection {
                detection-time {
                    threshold milliseconds;
                }
                holddown-interval milliseconds;
                minimum-interval milliseconds;
                minimum-receive-interval milliseconds;
                multiplier number;
                no-adaptation;
                transmit-interval {
                    minimum-interval milliseconds;
                    threshold milliseconds;
                }
                version (1 | automatic);
            }
            control-channel {
                (pw-label-tt1-1 | pwe3-control-word | router-alert-label);
            }
        }
        site site-name {
            interface interface-name {
                description text-description;
                remote-site-id number;
            }
            site-identifier number;
            site-preference number;
        }
        traceoptions {
            file filename <files number> <size maximum-file-size> <world-readable |
                no-world-readable>;
            flag flag <flag-modifier> <disable>;
        }
    }
}

protocols {
    mvpn {
        autodiscovery-only {
            intra-as {
                inclusive;
            }
        }
        mvpn-mode (rpt-spt | spt-only);
        receiver-site;
        route-target {
            export-target {
                target target-community;
                unicast;
            }
            import-target {
                target <target:number:number> <receiver | sender>;
```

```
            unicast <receiver | sender>;
          }
        }
        sender-site;
        traceoptions {
          file filename <files number> <size maximum-file-size> <world-readable |
            no-world-readable>;
          flag flag <flag-modifier> <disable>;
        }
        unicast-umh-election;
      }
    }

    protocols {
      vpls {
        community name;
        connectivity-type (ce | irb);
        encapsulation-type (ethernet | ethernet-vlan);
        ignore-encapsulation-mismatch;
        ignore-mtu-mismatch;
        interface interface-name {
          interface-mac-limit {
            limit;
            packet-action drop;
          }
          no-mac-learning;
          static-mac mac-address {
            vlan-id number;
          }
        }
        label-block-size size;
        interface-mac-limit {
          limit;
          packet-action drop;
        }
        mac-flush {
          any-interface;
          any-spoke;
          propagate;
        }
        mac-statistics;
        mac-table-aging-time seconds;
        mac-table-size {
          number-of-addresses;
          packet-action drop;
        }
        mesh-group group-name {
          associate-profile profile-name;
          interface interface-name;
          local-switching;
          mac-flush {
            any-interface;
            any-spoke;
            propagate;
          }
          neighbor address {
```

```
                ... same statements as at the [edit routing-instances routing-instance-name
                    protocols vpls neighbor address] hierarchy level ...
            }
            peer-as {
                all;
            }
            vpls-id name;
        }
        mtu mtu-number;
        neighbor address {
            associate-profile profile-name;
            backup-neighbor address {
                community name;
                psn-tunnel-endpoint address;
                standby;
            }
            community name;
            encapsulation-type (ethernet | ethernet-vlan);
            ignore-encapsulation-mismatch;
            psn-tunnel-endpoint address;
            switchover-delay seconds;
        }
        no-mac-learning;
        no-tunnel-services;
        revert-time seconds;
        site site-name {
            active-interface (any | primary interface-name);
            automatic-site-id {
                collision-detect-time seconds;
                new-site-wait-time seconds;
                reclaim-wait-time minimum seconds maximum seconds;
                startup-wait-time seconds;
            }
            interface interface-name {
                ... same statements as at the [edit routing-instances routing-instance-name
                    protocols vpls interface interface-name] hierarchy level ...
            }
            mesh-group group-name;
            multi-homing;
            site-identifier number;
            site-preference number;
        }
        site-range number;
        traceoptions {
            file filename <files number> <size maximum-file-size> <world-readable |
                no-world-readable>;
            flag flag <flag-modifier> <disable>;
        }
        tunnel-services {
            devices [ tunnel-interface-names ];
            primary tunnel-interface-name;
        }
        vpls-id vpls-id;
    }
  }
}
```

```
routing-instance-name {
  provider-tunnel {
    mdt {
      group-range multicast-prefix;
      threshold {
        group group-address {
          source source-address {
            rate kbps;
          }
        }
        tunnel-limit number;
      }
    }
    pim-asm {
      group-address address;
    }
    pim-ssm {
      group-address address;
    }
    rsvp-te {
      label-switched-path-template {
        (default-template | lsp-template-name);
      }
      static-lsp point-to-multipoint-lsp-name;
    }
    selective {
      group multicast-prefix</prefix-length> {
        source ip-prefix</prefix-length> {
          pim-ssm {
            group-range multicast-prefix</prefix-length>;
          }
          rsvp-te {
            label-switched-path-template {
              (default-template | lsp-template-name);
            }
            static-lsp point-to-multipoint-lsp-name;
          }
          threshold-rate kbps;
        }
        wildcard-source {
          pim-ssm {
            group-range multicast-prefix</prefix-length>;
          }
          rsvp-te {
            label-switched-path-template {
              (default-template | lsp-template-name);
            }
            static-lsp point-to-multipoint-lsp-name;
          }
          threshold-rate kbps;
        }
      }
      tunnel-limit number;
      wildcard-group-inet {
        wildcard-source {
```

```
                pim-ssm {
                  group-range multicast-prefix</prefix-length>;
                }
                rsvp-te {
                  label-switched-path-template {
                    (default-template | lsp-template-name);
                  }
                  static-lsp lsp-name;
                }
                threshold-rate kbps;
              }
            }
            wildcard-group-inet6 {
              wildcard-source {
                pim-ssm {
                  group-range multicast-prefix</prefix-length>;
                }
                rsvp-te {
                  label-switched-path-template {
                    (default-template | lsp-template-name);
                  }
                  static-lsp lsp-name;
                }
                threshold-rate kbps;
              }
            }
          }
        }
      }

      routing-instance-name {
        routing-options {
          ... same statements as in [edit routing-options] Hierarchy Level on page 240 PLUS ...
            autonomous-system autonomous-system <independent-domain> <loops number>;
            multipath {
              vpn-unequal-cost <equal-external-internal>;
            }

          ... BUT NOT ...
            confederation confederation-autonomous-system members autonomous-system;  #
              NOT valid at this level
            dynamic-tunnels tunnel-name {...}   # NOT valid at this level
            forwarding-table {
              export [ policy-names ];;   # NOT valid at this level
              (indirect-next-hop | no-indirect-next-hop);   # NOT valid at this level
            }
            med-igp-update-interval minutes;   # NOT valid at this level
            nonstop-routing;   # NOT valid at this level
            ppm {...}   # NOT valid at this level
            resolution {
              tracefilter [ filter-names ];   # NOT valid at this level
              traceoptions {...}   # NOT valid at this level
            }
            rib-groups {...}   # NOT valid at this level
            route-distinguisher-id address;   # NOT valid at this level
            route-record;   # NOT valid at this level
```



```
            source-routing {...}    # NOT valid at this level
            traceoptions {...}    # NOT valid at this level
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit routing-options] Hierarchy Level

Several statements in the **[edit routing-options** hierarchy are valid at numerous locations within the hierarchy. To make the complete hierarchy easier to read, the repeated statements are listed in "Common Routing Options" on page 240 and that section is referenced at the appropriate locations in "Complete [edit routing-options] Hierarchy" on page 241.

- Common Routing Options on page 240
- Complete [edit routing-options] Hierarchy on page 241

Common Routing Options

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Complete [edit routing-options] Hierarchy" on page 241 instead of the statements being repeated.

- **[edit routing-options aggregate defaults]**
- **[edit routing-options aggregate route *ip-prefix</prefix-length>*]**
- **[edit routing-options generate defaults]**
- **[edit routing-options generate route *ip-prefix</prefix-length>*]**
- **[edit routing-options static defaults]**
- **[edit routing-options static route *ip-prefix</prefix-length>*]**

The common routing options are as follows:

```
(active | passive);
as-path {
   aggregator as-number address;
   atomic-aggregate;
   origin (egp | igp | incomplete);
   path path-identifier;
}
color metric <type metric-type>;
color2 metric <type metric-type>;
community [ community-id no-advertise no-export no-export-subconfed ];
metric metric <type metric-type>;
metric2 metric <type metric-type>;
metric3 metric <type metric-type>;
metric4 metric <type metric-type>;
passive;
preference preference-value <type metric-type>;
preference2 preference-value <type metric-type>;
tag metric <type metric-type>;
tag2 metric <type metric-type>;
```

Complete [edit routing-options] Hierarchy

The statement hierarchy in this section can also be included at the **[edit logical-systems *logical-system-name*]** hierarchy level.

```
routing-options {
  access {
    route ip-prefix</prefix-length> {
      metric metric;
      next-hop [ addresses ];
      preference preference-value;
      qualified-next-hop address;
      tag route-tag;
    }
  }
  access-internal {
    route ip-prefix</prefix-length> {
      next-hop [ addresses ];
      qualified-next-hop address;
      tag route-tag;
    }
  }
  aggregate {
    defaults {
      ... statements in Common Routing Options on page 240 PLUS ...
      (brief | full);
      discard;
    }
    route ip-prefix</prefix-length> {
      ... statements in Common Routing Options on page 240 PLUS ...
      (brief | full);
      discard;
      policy [ policy-names ];
    }
  }
  auto-export {
    disable;
    family inet {
      disable;
      flow {
        disable;
        rib-group rib-group;
      }
      multicast {
        disable;
        rib-group rib-group;
      }
      unicast {
        disable;
        rib-group rib-group;
      }
    }
    family inet6 {
      disable;
      multicast {
        disable;
```

```
        rib-group rib-group;
      }
      unicast {
        disable;
        rib-group rib-group;
      }
    }
    family iso {
      disable;
      unicast {
        disable;
        rib-group rib-group;
      }
    }
    traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag <flag-modifier> <disable>;
    }
  }
  autonomous-system autonomous-system <asdot-notation> <loops number>;
  bgp-orf-cisco-mode;
  bmp {
    memory-limit bytes;
    station-address (ip-address | name);
    station-port-number port-number;
    statistics-timeout seconds;
  }
  confederation as-number members [ as-numbers ];
  dynamic-tunnels tunnel-name {
    destination-networks prefix;
    source-address address;
    tunnel-type tunnel-type;
  }
  fate-sharing {
    group group-name {
      cost value;
      from {
        address <to address>;
      }
    }
  }
  flow {
    route name {
      match {
        destination address;
        destination-port [ afs bgp biff bootpc bootps cmd cvspserver dhcp domain eklogin
          ekshell exec finger ftp ftp-data http https ident imap kerberos-sec klogin kpasswd
          krb-prop krbupdate kshell ldap ldp login mobileip-agent mobilip-mn msdp
          netbios-dgm netbios-ns netbios-ssn nfsd nntp ntalk ntp pop3 pptp printer radacct
          radius rip rkinit smtp snmp snmptrap snpp socks ssh sunrpc syslog tacacs
          tacacs-ds talk telnet tftp timed who xdmcp ];
        dscp [ code-points ];
        fragment [ don't-fragment first-fragment is-fragment last-fragment
          not-a-fragment ];
```



```
            icmp-code [ communication-prohibited-by-filtering destination-host-prohibited
              destination-host-unknow fragmentation-needed host-precedence-violation
              host-unreachable host-unreachable-for-tos ip-header-bad network-unreachable
              network-unreachable-for-tos port-unreachable precedence-cutoff-in-effect
              protocol-unreachable redirect-for-host redirect-for-network
              redirect-for-tos-and-host redirect-for-tos-and-net required-option-missing
              source-host-isolated source-route-failed ttl-eq-zero-during-reassembly
              ttl-eq-zero-during-transit ];
            icmp-type [ echo-reply echo-request info-reply info-request mask-reply
              mask-request parameter-problem redirect router-advertisement router-solicit
              source-quench time-exceeded timestamp timestamp-reply unreachable ];
            packet-length [ values ];
            port [ ... same values as for the preceding destination-port statement ... ];
            protocol [ ah egp esp gre icmp igmp ipip ospf pim rsvp sctp tcp udp ];
            source address;
            source-port [ ... same values as for the preceding destination-port statement ... ];
            tcp-flags [ ack fin push rst syn urgent ];
          }
          then {
            (accept | discard);
            community community-name;
            next-term;
            rate-limit value;
            routing-instance routing-instance-name;
            sample;
          }
        }
        validation {
          traceoptions {
            file filename <files number> <size maximum-file-size> <world-readable |
              no-world-readable>;
            flag flag <flag-modifier> <disable>;
          }
        }
      }
      forwarding-table {
        export [ policy-names ];
        (indirect-next-hop | no-indirect-next-hop);
        unicast-reverse-path (active-paths | feasible-paths);
      }
      generate {
        defaults {
          ... statements in Common Routing Options on page 240 PLUS ...
          (brief | full);
          discard;
        }
        route ip-prefix</prefix-length> {
          ... statements in Common Routing Options on page 240 PLUS ...
          (brief | full);
          discard;
          policy [ policy-names ];
        }
      }
      graceful-restart {
        disable;
        restart-duration seconds;
```

```
}
instance-export [ policy-names ];
instance-import [ policy-names ];
interface-routes {
   family (inet | inet6) {
      export {
         lan;
         point-to-point;
      }
      import [ policy-names ];
   }
   rib-group {
      inet group-name;
      inet6 group-name;
   }
}
l3vpn-composite-nexthop;
martians {
   ip-prefix</prefix-length> (exact | longer | orlonger |
      prefix-length-range /minimum-prefix-length–/maximum-prefix-length |
      through ip-prefix</prefix-length> | upto /prefix-length) <allow>;
}
maximum-paths path-limit <log-only | threshold value> <log-interval seconds>;
maximum-prefixes prefix-limit <log-only | threshold value> <log-interval seconds>;
med-igp-update-interval minutes;
multicast {
   ... the multicast subhierarchy appears after the main [edit routing-options] hierarchy ...
}
nonstop-routing;
options {
   mark seconds;
   syslog {
      level level;
      upto level;
   }
}
ppm {
   no-delegate-processing;
}
resolution {
   rib routing-table-name {
      import [ policy-names ];
      resolution-ribs [ routing-table-names ];
   }
   tracefilter [ filter-policy-names ];
   traceoptions {
      file filename <files number> <size maximum-file-size> <world-readable |
         no-world-readable>;
      flag flag <flag-modifier> <disable>;
   }
}
rib routing-table-name {
   access {
      ... same statements as at the [edit routing-options access] hierarchy level ...
   }
   access-internal {
```

```
            ... same statements as at the [edit routing-options access-internal] hierarchy level ...
        }
        aggregate {
            ... same statements as at the [edit routing-options aggregate] hierarchy level ...
        }
        generate {
            ... same statements as at the [edit routing-options generate] hierarchy level ...
        }
        martians {
            ip-prefix</prefix-length> (exact | longer | orlonger |
                prefix-length-range /minimum-prefix-length–/maximum-prefix-length |
                through ip-prefix</prefix-length> | upto /prefix-length) <allow>;
        }
        maximum-paths path-limit <log-only | threshold value> <log-interval seconds>;
        maximum-prefixes prefix-limit <log-only | threshold value> <log-interval seconds>;
        static {
            ... same statements as at the [edit routing-options static] hierarchy level ...
        }
    }
    rib-groups {
        group-name {
            export-rib table-name;
            import-policy [ policy-names ];
            import-rib [ table-names ];
        }
    }
    route-distinguisher-id address;
    route-record;
    router-id address;
    source-routing {
        ip;
        ipv6;
    }
    static {
        ... the static subhierarchy appears after the main [edit routing-options] hierarchy ...
    }
    topologies {
        family (inet | inet6) {
            topology topology-name;
        }
    }
    traceoptions {
        file filename <files number> <size maximum-file-size> <world-readable |
            no-world-readable>;
        flag flag <disable>;
    }
}

routing-options {
    multicast {
        asm-override-ssm;
        backup-pe-group group-name {
            backups [ addresses ];
            local-address address;
        }
        flow-map flow-map-name {
```

```
            bandwidth <bps> <adaptive>;
            forwarding-cache {
                timeout (never <non-discard-entry-only> | minutes);
            }
            policy [ policy-names ];
            redundant-sources [ addresses ];
        }
        forwarding-cache {
            threshold {
                reuse threshold-value;
                suppress threshold-value;
            }
            timeout minutes;
        }
        interface interface-name {
            maximum-bandwidth bps;
            no-qos-adjust;
            reverse-oif-mapping {
                no-qos-adjust;
            }
            subscriber-leave-timer seconds;
        }
        pim-to-igmp-proxy {
            upstream-interface [ interface-names ];
        }
        pim-to-mld-proxy {
            upstream-interface [ interface-names ];
        }
        rpf-check-policy [ policy-names ];
        scope scope-name {
            interface [ interface-names ];
            prefix ip-prefix</prefix-length>;
        }
        scope-policy [ policy-names ];
        ssm-groups [ ip-prefix</prefix-length> ];
        ssm-map ssm-map-name {
            policy [ policy-names ];
            source [ addresses ];
        }
        traceoptions {
            file filename <files number> <size maximum-file-size> <world-readable |
                no-world-readable>;
            flag flag <disable>;
        }
    }
}

routing-options {
    static {
        defaults {
            ... statements in Common Routing Options on page 240 PLUS ...
            (install | no-install);
            (readvertise | no-readvertise);
            (resolve | no-resolve);
            (retain | no-retain);
        }
```



```
rib-group group-name;
route destination-prefix {
   ... statements in Common Routing Options on page 240 PLUS ...
   backup-pe-group group-name;
   bfd-liveness-detection {
      detection-time {
         threshold milliseconds;
      }
      holddown-interval milliseconds;
      local-address ip-address;
      minimum-interval milliseconds;
      minimum-receive-interval milliseconds;
      minimum-receive-ttl milliseconds;
      multiplier number;
      neighbor address;
      no-adaptation;
      transmit-interval {
         minimum-interval milliseconds;
         threshold milliseconds;
      }
      version (1 | automatic);
   }
   (discard | next-hop [ addresses ] | next-table address | receive | reject);
   (install | no-install);
   lsp-next-hop {
      metric metric;
      preference preference;
   }
   p2mp-lsp-next-hop lsp-name {
      metric metric;
      preference preference;
   }
   (readvertise | no-readvertise);
   (resolve | no-resolve);
   (retain | no-retain);
   static-lsp-next-hop lsp-name {
      metric metric;
      preference preference-value;
   }
}
}
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit schedulers] Hierarchy Level

```
schedulers {
  scheduler scheduler-name {
    daily (all-day | exclude | start-time time stop-time time);
    friday (all-day | exclude | start-time time stop-time time);
    monday (all-day | exclude | start-time time stop-time time);
    saturday (all-day | exclude | start-time time stop-time time);
    start-date date-time stop-date date-time;
    sunday (all-day | exclude | start-time time stop-time time);
    thursday (all-day | exclude | start-time time stop-time time);
    tuesday (all-day | exclude | start-time time stop-time time);
    wednesday (all-day | exclude | start-time time stop-time time);
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

CHAPTER 11

[edit security] Hierarchy Levels

[edit security] Hierarchy Level

Each of the following topics lists the statements at a subhierarchy of the **[edit security]** hierarchy.

- [edit security traceoptions] Hierarchy Level on page 287
- [edit security utm] Hierarchy Level on page 288
- [edit security zones] Hierarchy Level on page 294

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit security alg] Hierarchy Level

```
security {
  alg {
    dns {
      disable;
      traceoptions flag all <extensive>;
    }
    ftp {
      disable;
      traceoptions flag all <extensive>;
    }
    h323 {
      disable;
      application-screen {
        message-flood {
          gatekeeper threshold messages-per-second;
        }
        unknown-message {
          permit-nat-applied;
          permit-routed;
        }
      }
      dscp-rewrite {
        code-point 6-bit-code-point;
      }
      endpoint-registration-timeout seconds;
      media-source-port-any;
      traceoptions {
        flag flag <flag-modifier>;
      }
    }
    ike-esp-nat {
      enable;
      esp-gate-timeout seconds;
      esp-session-timeout seconds;
      state-timeout seconds;
      traceoptions flag all <extensive>;
    }
    mgcp {
      disable;
      application-screen {
        connection-flood threshold requests-per-second;
        message-flood threshold messages-per-second;
        unknown-message {
          permit-nat-applied;
          permit-routed;
        }
      }
      dscp-rewrite {
        code-point 6-bit-code-point;
      }
      inactive-media-timeout seconds;
      maximum-call-duration minutes;
```

```
    traceoptions {
        flag flag <extensive>;
    }
    transaction-timeout seconds;
}
msrpc {
    disable;
    traceoptions flag all <extensive>;
}
pptp {
    disable;
    traceoptions flag all <extensive>;
}
real {
    disable;
    traceoptions flag all <extensive>;
}
rsh {
    disable;
    traceoptions flag all <extensive>;
}
rtsp {
    disable;
    traceoptions flag all <extensive>;
}
sccp {
    disable;
    application-screen {
        call-flood threshold calls-per-second;
        unknown-message {
            permit-nat-applied;
            permit-routed;
        }
    }
    dscp-rewrite {
        code-point 6-bit-code-point;
    }
    inactive-media-timeout seconds;
    traceoptions {
        flag flag <extensive>;
    }
}
sip {
    disable;
    application-screen {
        protect {
            deny {
                all;
                destination-ip {
                    address;
                }
                timeout seconds;
            }
        }
        unknown-message {
            permit-nat-applied;
```

```
            permit-routed;
          }
        }
        c-timeout minutes;
        disable-call-id-hiding;
        dscp-rewrite {
          code-point 6-bit-code-point;
        }
        inactive-media-timeout seconds;
        maximum-call-duration minutes;
        retain-hold-resource;
        t1-interval milliseconds;
        t4-interval seconds;
        traceoptions {
          flag flag <flag-modifier>;
        }
      }
      sql {
        disable;
        traceoptions flag all <extensive>;
      }
      sunrpc {
        disable;
        traceoptions flag all <extensive>;
      }
      talk {
        disable;
        traceoptions flag all <extensive>;
      }
      tftp {
        disable;
        traceoptions flag all <extensive>;
      }
    }
  }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security analysis] Hierarchy Level

```
security {
  analysis {
    no-report;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security application-tracking] Hierarchy Level

```
security {
  application-tracking {
    (first-update | first-update-interval minutes);
    session-update-interval minutes;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security authentication-key-chains] Hierarchy Level

```
security {
  authentication-key-chains {
    key-chain key-chain-name {
      description text-description;
      key key-id {
        secret secret-data;
        start-time YYYY-MM-DD.hh:mm;
      }
      tolerance seconds;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security certificates] Hierarchy Level

```
security {
  certificates {
    cache-size bytes;
    cache-timeout-negative seconds;
    certification-authority ca-profile-name {
      ca-name certificate-authority-name;
      crl filename;
      encoding (binary | pem);
      enrollment-url url;
      file certificate-filename;
      ldap-url url-name;
    }
    enrollment-retry number;
    local certificate-name {
      certificate-key-string;
      load-key-file URL-or-path;
    }
    maximum-certificates number;
    path-length bytes;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security datapath-debug] Hierarchy Level

```
security {
  datapath-debug {
    packet-filter filter-name {
      action-profile default;
      destination-port (port-name–port-name | afs | bgp | biff | bootpc | bootps | cmd |
        cvspserver | dhcp | domain | eklogin | ekshell | exec | finger | ftp | ftp-data | http |
        https | ident | imap | kerberos-sec | klogin | kpasswd | krb-prop | krbupdate | kshell |
        ldap | ldp | login | mobileip-agent | mobilip-mn | msdp | netbios-dgm | netbios-ns |
        netbios-ssn | nfsd | nntp | ntalk | ntp | pop3 | pptp | printer | radacct | radius | rip |
        rkinit | smtp | snmp | snmptrap | snpp | socks | ssh | sunrpc | syslog | tacacs |
        tacacs-ds | talk | telnet | tftp | timed | who | xdmcp);
      destination-prefix ipv4-address;
      protocol (ah | egp | esp | gre | icmp | igmp | ipip | ospf | pim | rsvp | sctp | tcp | udp);
      source-port (... same values as for the preceding destination-port statement ...);
      source-prefix ipv4-address;
    }
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      no-remote-trace;
      rate-limit rate;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security firewall-authentication] Hierarchy Level

```
security {
  firewall-authentication {
    traceoptions {
      flag flag <flag-modifier>;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security flow] Hierarchy Level

```
security {
  flow {
    aging {
      early-ageout seconds;
      high-watermark percentage;
      low-watermark percentage;
    }
    allow-dns-reply;
    route-change-timeout seconds;
    syn-flood-protection-mode (syn-cookie | syn-proxy);
    tcp-mss {
      all-tcp {
        mss number;
      }
      gre-in {
        mss number;
      }
      gre-out {
        mss number;
      }
      ipsec-vpn {
        mss number;
      }
    }
    tcp-session {
      no-sequence-check;
      no-syn-check;
      no-syn-check-in-tunnel;
      rst-invalidate-session;
      rst-sequence-check;
      tcp-initial-timeout seconds;
    }
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
      packet-filter filter-name {
        destination-port port-identifier;
        destination-prefix address;
        interface interface-name;
        protocol protocol-identifier;
        source-port port-identifier;
        source-prefix address;
      }
      rate-limit messages-per-second;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security forwarding-options] Hierarchy Level

```
security {
  forwarding-options {
    family {
      inet6 {
        mode (drop | flow-based | packet-based);
      }
      iso {
        mode packet-based;
      }
      mpls {
        mode packet-based;
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security forwarding-process] Hierarchy Level

```
security {
  forwarding-process {
    application-services {
      maximize-alg-sessions;
      maximize-cp-sessions;
      maximize-idp-sessions {
        inline-tap;
        weight {
          (equal | firewall | idp);
        }
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security gprs] Hierarchy Level

```
security {
  gprs {
    gtp {
      enable;
      profile profile-name {
        apn pattern-string {
          mcc-mnc number {
            action (drop | pass | selection <ms | net | vrf>);
          }
        }
        drop {
          aa-create-pdp (0 | 1 | all);
          aa-delete-pdp (0 | 1 | all);
          create-pdp (0 | 1 | all);
          data-record (0 | 1 | all);
          delete-pdp (0 | 1 | all);
          echo (0 | 1 | all);
          error-indication (0 | 1 | all);
          failure-report (0 | 1 | all);
          fwd-relocation (0 | 1 | all);
          fwd-srns-context (0 | 1 | all);
          g-pdu (0 | 1 | all);
          identification (0 | 1 | all);
          node-alive (0 | 1 | all);
          note-ms-present (0 | 1 | all);
          pdu-notification (0 | 1 | all);
          ran-info (0 | 1 | all);
          redirection (0 | 1 | all);
          relocation-cancel (0 | 1 | all);
          send-route (0 | 1 | all);
          sgsn-context (0 | 1 | all);
          supported-extension (0 | 1 | all);
          update-pdp (0 | 1 | all);
          ver-not-supported (0 | 1 | all);
        }
        log {
          forwarded (basic | detail);
          prohibited (basic | detail);
          rate-limited {
            (basic | detail);
            frequency-number number;
          }
          state-invalid (basic | detail);
        }
        max-message-length number;
        min-message-length number;
        rate-limit messages-per-second;
        remove-r6;
        seq-number-validated;
        timeout hours;
      }
      traceoptions
```

```
            file <filename> <files number> <match regular-expression>
              <size maximum-file-size> <world-readable | no-world-readable>;
            flag flag;
            no-remote-trace;
          }
        }
        sctp {
          log configuration;
          log decoding-error;
          log dropped-packet;
          log exceeding-rate-limt;
          profile profile-name {
            association-timeout minutes;
            drop {
              m3ua-service isup;
              m3ua-service sccp;
              m3ua-service tup;
              payload-protocol (all | asap | bicc | ddp-segment | ddp-stream | dua | enrp |
                h248 | h323 | iua | m2pa | m2ua | m3ua | qipc | reserved | simco | sua | tali |
                v5ua);
            }
            handshake-timeout seconds;
            limit {
              rate {
                address ip-address {
                  sccp number;
                  ssp number;
                  sst number;
                }
                sccp number;
                ssp number;
                sst number;
              }
            }
          }
          traceoptions
            file <filename> <files number> <match regular-expression>
              <size maximum-file-size> <world-readable | no-world-readable>;
            flag flag;
            no-remote-trace;
          }
        }
      }
    }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security group-vpn] Hierarchy Level

```
security {
  group-vpn {
    co-location;
    member {
      ike {
        gateway gateway-name {
          address [ ip-addresses-or-hostnames ];
          ike-policy policy-name;
          local-address ip-address;
          local-identity (distinguished-name | hostname hostname | inet ipv4-address |
            user-at-hostname e-mail-address);
        }
        policy name {
          certificate {
            local-certificate identifier;
            peer-certificate-type (pkcs7 | x509-signature);
            trusted-ca (ca-index | use-all);
          }
          description description-string;
          mode (aggressive | main);
          pre-shared-key (ascii-text text | hexadecimal hexadecimal-number);
          proposal-set (basic | compatible | standard);
          proposals [ proposal-names ];
        }
        proposal proposal-name {
          authentication-algorithm (md5 | sha-256 | sha1);
          authentication-method (pre-shared-keys | rsa-signatures);
          description description-string;
          dh-group (group1 | group2 | group5);
          encryption-algorithm (3des-cbc | aes-128-cbc | aes-192-cbc | aes-256-cbc |
            des-cbc);
          lifetime-seconds seconds;
        }
      }
      ipsec {
        vpn vpn-name {
          group id-number;
          group-vpn-external-interface interface-name;
          heartbeat-threshold number;
          ike-gateway gateway-name;
        }
      }
    }
    server {
      group group-name {
        activation-time-delay seconds;
        anti-replay-time-window seconds;
        description description-string;
        group-id number;
        ike-gateway gateway-name;
        ipsec-sa security-association-name {
          match-policy policy-name {
```

```
            destination ip-address</prefix-length>;
            destination-port port-number;
            protocol protocol-number;
            source ip-address</prefix-length>;
            source-port port-number;
          }
          proposal name;
            match-policy policy-name {
              destination ip-address</prefix-length>;
              destination-port port-number;
              protocol protocol-number;
              source ip-address</prefix-length>;
              source-port port-number;
            }
          }
        }
        no-anti-replay;
        server-address ip-address;
        server-member-communication {
          certificate certificate-id;
          communication-type (multicast | unicast);
          encryption-algorithm (3des-cbc | aes-128-cbc | aes-192-cbc | aes-256-cbc |
            des-cbc);
          heartbeat seconds;
          lifetime-seconds seconds;
          multicast-group group-address;
          multicast-outgoing-interface interface-name;
          number-of-retransmission number;
          retransmission-period seconds;
          sig-hash-algorithm (md5 | sha1);
        }
      }
      ike {
        gateway gateway-name {
          address (ip-address | hostname);
          dynamic {
            distinguished-name {
              container text-string;
              wildcard text-string;
            }
            hostname hostname;
            inet ipv4-address;
            user-at-hostname e-mail-address;
          }
          ike-policy name;
          local-identity {
            distinguished-name;
            hostname hostname;
            inet ipv4-address;
            user-at-hostname e-mail-address;
          }
        }
        policy name {
          certificate {
            local-certificate identifier;
            peer-certificate-type (pkcs7 | x509-signature);
```



```
                trusted-ca (ca-index | use-all);
              }
              description description-string;
              mode (aggressive | main);
              pre-shared-key (ascii-text text | hexadecimal hexadecimal-number);
              proposal-set (basic | compatible | standard);
              proposals [ proposal-names ];
            }
            proposal name {
              authentication-algorithm (md5 | sha-256 | sha1);
              authentication-method (pre-shared-keys | rsa-signatures);
              description text;
              dh-group (group1 | group2 | group5);
              encryption-algorithm (3des-cbc | aes-128-cbc | aes-192-cbc | aes-256-cbc |
                des-cbc);
            }
          }
          ipsec {
            proposal name {
              authentication-algorithm (hmac-md5-96 | hmac-sha1-96);
              description description-string;
              encryption-algorithm (3des-cbc | aes-128-cbc | aes-192-cbc | aes-256-cbc |
                des-cbc);
              lifetime-seconds seconds;
            }
          }
          traceoptions
            file <filename> <files number> <match regular-expression>
              <size maximum-file-size> <world-readable | no-world-readable>;
            flag flag;
            no-remote-trace;
          }
        }
      }
    }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security idp] Hierarchy Level

```
security {
  idp {
    active-policy policy-name;
    application-ddos application-name {
      connection-rate-threshold number;
      context context-name {
        exclude-context-values [ regular-expressions ];
        hit-rate-threshold number;
        max-context-values number;
        time-binding-count number;
        time-binding-period seconds;
        value-hit-rate-threshold seconds;
      }
      service (service-name | dns | http);
    }
    custom-attack {
      ... the custom-attack subhierarchy appears after the main [edit security idp] hierarchy
        ...
    }
    custom-attack-group group-name {
      group-members [ group-and-attack-names ];
    }
    dynamic-attack-group group-name {
      filters {
        category {
          values [ values ];
        }
        direction {
          values [ any client-to-server exclude-any exclude-client-to-server
            exclude-server-to-client server-to-client ];
        }
        false-positives {
          values [ frequently occasionally rarely unknown ];
        }
        performance {
          values [ fast normal slow unknown ];
        }
        products {
          values [ values ];
        }
        recommended;
        service {
          values [ values ];
        }
        severity {
          values [ critical info major minor warning ];
        }
        type {
          values [ anomaly signature ];
        }
      }
    }
```

```
    idp-policy policy-name {
        ... the idp-policy subhierarchy appears after the main [edit security idp] hierarchy ...
    }
    security-package {
        automatic {
            download-timeout minutes;
            enable;
            interval hours;
            start-time MM-DD.hh:mm;
        }
        install {
            ignore-version-check;
        }
        url url;
    }
    sensor-configuration {
        ... the sensor-configuration subhierarchy appears after the main [edit security idp]
            hierarchy ...
    }
    traceoptions {
        file <filename> <files number> <match regular-expression> <size maximum-file-size>
            <world-readable | no-world-readable>;
        }
        flag all;
        level severity;
        no-remote-trace;
    }
}

idp {
    custom-attack attack-name {
        attack-type {
            ... the attack-type subhierarchy appears after the main [edit security idp
                custom-attack attack-name] hierarchy level ...
        }
        recommended-action (close | close-client | close-server | drop | drop-packet | ignore |
            none);
        severity (critical | info | major | minor | warning);
        time-binding {
            count count-value;
            scope (destination | peer | source);
        }
    }

    custom-attack attack-name {
        attack-type {
            anomaly {
                direction (any | client-to-server | server-to-client);
                service service-name;
                shellcode (all | intel | no-shellcode | sparc);
                test test-condition;
            }
            chain {
                expression boolean-expression;
                member member-name {
                    attack-type {
```

```
            anomaly {
                ... same statements as at the [edit security idp custom-attack attack-name
                    attack-type anomaly] hierarchy level ...
            }
            signature {
                ... same statements as at the [edit security idp custom-attack attack-name
                    attack-type signature] hierarchy level EXCEPT FOR ...
                protocol-binding {...}    # NOT valid at this level
            }
        }
    }
    order;
    protocol-binding {
        application application-name;
        icmp;
        ip {
            protocol-number transport-layer-protocol-number;
        }
        nested-application application-name;
        rpc {
            program-number rpc-program-number;
        }
        tcp {
            minimum-port port-number maximum-port port-number;
        }
        udp {
            minimum-port port-number maximum-port port-number;
        }
    }
    reset;
    scope (session | transaction);
}
signature {
    context context-name;
    direction (any | client-to-server | server-to-client);
    negate;
    pattern signature-pattern;
    protocol {
        ... the protocol subhierarchy appears after the main [edit security idp
            custom-attack attack-name attack-type signature] hierarchy level ...
    }
    protocol-binding {
        ... same statements as at the [edit security idp custom-attack attack-name
            attack-type chain protocol-binding] hierarchy level ...
    }
    regexp regular-expression;
    shell-code (all | intel | no-shellcode | sparc);
}

signature {
    protocol {
        icmp {
            code {
                match (equal | greater-than | less-than | not-equal);
                value code-value;
            }
```



```
    data-length {
      match (equal | greater-than | less-than | not-equal);
      value data-length;
    }
    identification {
      match (equal | greater-than | less-than | not-equal);
      value identification-value;
    }
    sequence-number {
      match (equal | greater-than | less-than | not-equal);
      value sequence-number;
    }
    type {
      match (equal | greater-than | less-than | not-equal);
      value type-value;
    }
  }
  ip {
    destination {
      match (equal | greater-than | less-than | not-equal);
      value hostname;
    }
    identification {
      match (equal | greater-than | less-than | not-equal);
      value identification-value;
    }
    ip-flags (df | no-df) (mf | no-mf) (rb | no-rb);
    protocol {
      match (equal | greater-than | less-than | not-equal);
      value transport-layer-protocol-id;
    }
    source {
      match (equal | greater-than | less-than | not-equal);
      value hostname;
    }
    tos {
      match (equal | greater-than | less-than | not-equal);
      value type-of-service-in-decimal;
    }
    total-length {
      match (equal | greater-than | less-than | not-equal);
      value length-of-ip-datagram;
    }
    ttl {
      match (equal | greater-than | less-than | not-equal);
      value time-to-live;
    }
  }
  tcp {
    ack-number {
      match (equal | greater-than | less-than | not-equal);
      value acknowledgment-number;
    }
    data-length {
      match (equal | greater-than | less-than | not-equal);
      value tcp-data-length;
```

```
        }
        destination-port {
            match (equal | greater-than | less-than | not-equal);
            value port-number;
        }
        header-length {
            match (equal | greater-than | less-than | not-equal);
            value header-length;
        }
        mss {
            match (equal | greater-than | less-than | not-equal);
            value maximum-segment-size;
        }
        option {
            match (equal | greater-than | less-than | not-equal);
            value tcp-option;
        }
        sequence-number {
            match (equal | greater-than | less-than | not-equal);
            value sequence-number;
        }
        source-port {
            match (equal | greater-than | less-than | not-equal);
            value port-number;
        }
        tcp-flags (ack | no-ack) (fin | no-fin) (psh | no-psh) (r1 | no-r1) (r2 | no-r2)
            (rst | no-rst) (syn | no-syn) (urg | no-urg);
        }
        urgent-pointer {
            match (equal | greater-than | less-than | not-equal);
            value urgent-pointer;
        }
        window-scale {
            match (equal | greater-than | less-than | not-equal);
            value window-scale-factor;
        }
        window-size {
            match (equal | greater-than | less-than | not-equal);
            value window-size;
        }
    }
    udp {
        data-length {
            match (equal | greater-than | less-than | not-equal);
            value udp-data-length;
        }
        destination-port {
            match (equal | greater-than | less-than | not-equal);
            value port-number;
        }
        source-port {
            match (equal | greater-than | less-than | not-equal);
            value port-number;
        }
    }
}
```

```
        }
      }
    }
  }

  idp {
    idp-policy policy-name {
      rulebase-ddos {
        rule rule-name {
          description text;
          match {
            application (application-name | any | default);
            application-ddos {
            (application-name | adp);
            destination-address [ any names ];
            destination-except [ names ];
            from-zone (zone-name | any);
            source-address [ names ];
            source-except [ names ];
            to-zone zone-name;
          }
          then {
            action {
              (close-server | drop-connection | drop-packet | no-action);
            }
            ip-action {
              (ip-block | ip-close | ip-connection-rate-limit connections-per-second |
                ip-notify);
              log;
              timeout seconds;
            }
            notification {
              log-attacks {
                alert;
              }
            }
          }
        }
      }
      rulebase-exempt {
        rule rule-name {
          description text;
          match {
            attacks {
              custom-attack-groups [ group-names ];
              custom-attacks [ attack-names ];
              dynamic-attack-groups [ group-names ];
              predefined-attack-groups [ group-names ];
              predefined-attacks [ attack-names ];
            }
            destination-address [ any names ];
            destination-except [ names ];
            from-zone zone-name;
            source-address [ any names ];
            source-except [ names ];
            to-zone zone-name;
```

```
            }
          }
        }
        rulebase-ips {
          rule rule-name {
            description text;
            match {
              application application-name;
              attacks {
                custom-attack-groups [ group-names ];
                custom-attacks [ attack-names ];
                dynamic-attack-groups [ group-names ];
                predefined-attack-groups [ group-names ];
                predefined-attacks [ attack-names ];
              }
              destination-address [ any addresses ];
              destination-except [ addresses ];
              from-zone zone-name;
              source-address [ any addresses ];
              source-except [ addresses ];
              to-zone zone-name;
            }
            terminal;
            then {
              action {
                (close-client | close-client-and-server | close-server | drop-connection |
                  drop-packet | ignore-connection | mark-diffserv value | no-action |
                  recommended);
              }
              ip-action {
                (ip-block | ip-close | ip-connection-rate-limit connections-per-second |
                  ip-notify);
                log;
                target (destination-address | service | source-address | source-zone |
                  zone-service);
                timeout seconds;
              }
              notification {
                log-attacks {
                  alert;
                }
                packet-log {
                  pre-attack packets;
                  post-attack packets;
                  post-attack-timeout seconds;
                }
              }
              severity (critical | info | major | minor | warning);
            }
          }
        }
      }
    }

    idp {
      sensor-configuration {
```

```
application-identification {
   disable;
   (application-system-cache | no-application-system-cache);
   application-system-cache-timeout value;
   max-packet-memory value;
   max-sessions value;
   max-tcp-session-packet-memory value;
   max-udp-session-packet-memory value;
}
application-ddos {
   statistics {
      interval minutes {
   }
}
detector {
   protocol-name protocol-name {
      tunable-name tunable-name {
         tunable-value value;
      }
   }
}
flow {
   (allow-icmp-without-flow | no-allow-icmp-without-flow);
   fifo-max-size value;
   hash-table-size bytes;
   (log-errors | no-log-errors);
   max-timers-poll-ticks value;
   reject-timeout value;
   (reset-on-policy | no-reset-on-policy);
   udp-anticipated-timeout value;
}
global {
   (enable-all-qmodules | no-enable-all-qmodules);
   (enable-packet-pool | no-enable-packet-pool);
   gtp {
      (decapsulation | no-decapsulation);
   }
   memory-limit-percent percentage;
   (policy-lookup-cache | no-policy-lookup-cache);
}
ips {
   (detect-shellcode | no-detect-shellcode);
   fifo-max-size value;
   (ignore-regular-expression | no-ignore-regular-expression);
   log-supercede-min minimum-value;
   (process-ignore-s2c | no-process-ignore-s2c);
   (process-override | no-process-override);
   process-port port-number;
}
log {
   cache-size size;
   suppression {
      disable;
      (include-destination-address | no-include-destination-address);
      max-logs-operate value;
      max-time-report value;
```

```
            start-log value;
          }
        }
        packet-log {
          host {
            ip-address;
            port port-number;
          }
          max-sessions percentage;
          session-npkt value;
          source-address ip-address;
          total-memory percentage;
        }
        re-assembler {
          (ignore-memory-overflow | no-ignore-memory-overflow);
          (ignore-reassembly-memory-overflow | no-ignore-reassembly-memory-overflow);
          ignore-reassembly-overflow;
          max-flow-mem value;
          max-packet-mem value;
        }
        ssl-inspection {
          sessions number;
        }
      }
    }
  }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security ike] Hierarchy Level

```
security {
  ike {
    gateway gateway-name {
      address [ addresses-or-hostnames ];
      dead-peer-detection {
        always-send;
        interval seconds;
        threshold number;
      }
      dynamic {
        connections-limit number;
        distinguished-name {
          container container-name;
          wildcard wildcard;
        }
        hostname hostname;
        ike-user-type (group-ike-id | shared-ike-id);
        inet ipv4-address;
        user-at-hostname "email-address";
      }
      external-interface interface-name;
      ike-policy policy-name;
      local-identity (distinguished-name | hostname hostname | inet ipv4-address |
        user-at-hostname "email-address");
      nat-keepalive seconds;
      no-nat-traversal;
      xauth access-profile profile-name;
    }
    policy (address | policy-name) {
      certificate {
        local-certificate certificate-identifier;
        peer-certificate-type (pkcs7 | x509-signature);
        trusted-ca (ca-index | use-all);
      }
      description text-description;
      encoding (binary | pem);
      identity identity-name;
      local-certificate certificate-filename;
      local-key-pair private-public-key-file;
      mode (aggressive | main);
      pre-shared-key (ascii-text key | hexadecimal key);
      proposal-set (basic | compatible | standard);
      proposals [ proposal-names ];
    }
    proposal ike-proposal-name {
      authentication-algorithm (md5 | sha1 | sha-256);
      authentication-method (dsa-signatures | pre-shared-keys | rsa-signatures);
      description text-description;
      dh-group (group1 | group2 | group5);
      encryption-algorithm (3des-cbc | aes-128-cbc | aes-192-cbc | aes-256-cbc | des-cbc);
      lifetime-seconds seconds;
    }
```

```
        respond-bad-spi number;
        traceoptions {
            file <filename> <files number> <match regular-expression> <size maximum-file-size>
                <world-readable | no-world-readable>;
            flag flag;
            no-remote-trace;
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security ipsec] Hierarchy Level

```
security {
  ipsec {
    internal {
      security-association sa-name {
        manual {
          ... same statements as at the [edit security ipsec security-association sa-name
            manual] hierarchy level ...
        }
      }
    }
    policy ipsec-policy-name {
      description text-description;
      perfect-forward-secrecy {
        keys (group1 | group2 | group5);
      }
      proposal-set (basic | compatible | standard);
      proposals [ proposal-names ];
    }
    proposal ipsec-proposal-name {
      authentication-algorithm (hmac-md5-96 | hmac-sha1-96);
      description text-description;
      encryption-algorithm (3des-cbc | aes-128-cbc | aes-192-cbc | aes-256-cbc | des-cbc);
      lifetime-seconds seconds;
      protocol (ah | bundle | esp);
    }
    security-association sa-name {
      description text-description;
      dynamic {
        ipsec-policy policy-name;
        replay-window-size (32 | 64);
      }
      manual {
        direction (bidirectional | inbound | outbound) {
          authentication {
            algorithm (hmac-md5-96 | hmac-sha1-96);
            key (ascii-text key | hexadecimal key);
          }
          auxiliary-spi spi-index;
          encryption {
            algorithm (3des-cbc | aes-128-cbc | aes-192-cbc | aes-256-cbc | des-cbc);
            key (ascii-text key | hexadecimal key);
          }
          protocol (ah | bundle | esp);
          spi spi-index;
        }
      }
      mode (transport | tunnel);
    }
    traceoptions {
      flag flag;
    }
    vpn vpn-name {
```

```
            bind-interface interface-name;
            df-bit (clear | copy | set);
            establish-tunnels (immediately | on-traffic);
            ike {
              gateway gateway-name;
              idle-time seconds;
              install-interval seconds;
              ipsec-policy policy-name;
              no-anti-replay;
              proxy-identity {
                local ip-prefix</prefix-length>;
                remote ip-prefix</prefix-length>;
                service service-name;
              }
            }
            manual {
              authentication {
                algorithm (hmac-md5-96 | hmac-sha1-96);
                key (ascii-text key | hexadecimal key);
              }
              encryption {
                encryption-algorithm (3des-cbc | aes-128-cbc | aes-192-cbc | aes-256-cbc |
                  des-cbc);
                key (ascii-text key | hexadecimal key);
              }
              external-interface interface-name;
              gateway address;
              protocol (ah | esp);
              spi spi-index;
            }
            vpn-monitor {
              destination-ip address;
              optimized;
              source-interface interface-name;
            }
            vpn-monitor-options {
              interval seconds;
              threshold failures;
            }
          }
        }
      }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security log] Hierarchy Level

```
security {
   log {
      disable;
      format (sd-syslog | syslog);
      source-address address;
      stream stream-name {
         host {
            address;
            port port-number;
         }
         severity severity;
      }
      traceoptions {
         file <filename> <files number> <match regular-expression> <size maximum-file-size>
            <world-readable | no-world-readable>;
         flag flag;
         no-remote-trace;
      }
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security nat] Hierarchy Level

```
security {
  nat {
    destination {
      ... the destination subhierarchy appears after the main [edit security nat] hierarchy ...
    }
    proxy-arp {
      interface interface-name {
        address ip-address</prefix-length> <to higher-ip-address</prefix-length>>;
      }
    }
    source {
      ... the source subhierarchy appears after the main [edit security nat] hierarchy ...
    }
    static {
      rule-set rule-set-name {
        from (interface [ interface-names ] | routing-instance [ routing-instance-names ] |
          zone [ zone-names ]);
        rule rule-name {
          match {
            destination-address ip-address</prefix-length>;
          }
          then {
            static-nat prefix ip-address</prefix-length>
              <routing-instance routing-instance-name>;
          }
        }
      }
    }
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag <syslog>;
      no-remote-trace;
    }
  }

  nat {
    destination {
      pool pool-name {
        address ip-address</prefix-length> (port port-number |
          to higher-ip-address</prefix-length>);
        routing-instance routing-instance-name;
      }
      rule-set rule-set-name {
        from (interface [ interface-names ] | routing-instance [ routing-instance-names ] |
          zone [ zone-names ]);
        rule rule-name {
          match {
            destination-address ip-address</prefix-length>;
            destination-port port-number;
            source-address [ source-addresses ];
          }
```

```
                then {
                  destination-nat (off | pool pool-name);
                }
              }
            }
          }
        }

        nat {
          source {
            address-persistent;
            interface {
              port-overloading off;
            }
            pool pool-name {
              address ip-address</prefix-length> <to higher-ip-address</prefix-length>>;
              host-address-base ip-address</prefix-length>;
              overflow-pool (interface | pool-name);
              port (no-translation | range lower-port-number to higher-port-number);
              routing-instance routing-instance-name;
            }
            pool-utilization-alarm {
              clear-threshold threshold-value;
              raise-threshold threshold-value;
            }
            port-randomization disable;
            rule-set rule-set-name {
              from (interface [ interface-names ] | routing-instance [ routing-instance-names ] |
                zone [ zone-names ]);
              rule rule-name {
                match {
                  destination-address ip-address</prefix-length>;
                  destination-port port-number;
                  source-address [ source-addresses ];
                }
                then {
                  source-nat {
                    (... the following interface statement ... | off | pool pool-name);
                    interface {
                      persistent-nat {
                        inactivity-timeout seconds;
                        max-session-number number;
                        permit (any-remote-host | target-host | target-host-port);
                      }
                    }
                  }
                }
              }
              to (interface [ interface-names ] | routing-instance [ routing-instance-names ] |
                zone [ zone-names ]);
            }
          }
        }
      }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security pki] Hierarchy Level

```
security {
  pki {
    auto-re-enrollment {
      certificate-id certificate-id {
        ca-profile-name profile-name;
        challenge-password password;
        re-enroll-trigger-time-percentage percentage;
        re-generate-keypair;
        validity-period days;
      }
    }
    ca-profile ca-profile-name {
      administrator {
        email-address email-address;
      }
      ca-identity ca-identifier;
      enrollment {
        retry attempts;
        retry-interval seconds;
        url url;
      }
      revocation-check {
        disable;
        crl {
          disable on-download-failure;
          refresh-interval hours;
          url url {
            password password;
          }
        }
      }
    }
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security policies] Hierarchy Level

```
security {
  policies {
    default-policy {
      (deny-al | permit-all);
    }
    from-zone zone-name to-zone zone-name {
      ... the from-zone subhierarchy appears after the main [edit security policies] hierarchy
        ...
    }
    policy-rematch;
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
    }
  }

  policies {
    from-zone zone-name to-zone zone-name {
      policy policy-name {
        match {
          application [ application-names-or-sets ];
          destination-address [ addresses <any> ];
          source-address [ addresses <any> ];
        }
        scheduler-name scheduler-name;
        then {
          count {
            alarm per-second-threshold bytes per-minute-threshold kilobytes;
          }
          (deny | permit {... configuration shown just following ...} | reject);
          permit {
            application-services {
              idp;
              redirect-wx;
              reverse-redirect-wx;
              utm-policy;
            }
            destination-address {
              drop-translated;
              drop-untranslated;
            }
            destination-nat nat-name;
            firewall-authentication {
              pass-through {
                access-profile profile-name;
                client-match user-or-group-name;
                web-redirect;
              }
              web-authentication (
                client-match user-or-group-name;
```

```
                }
            }
            source-nat {
                (interface | pool pool-name | pool-set pool-set-name);
            }
            tunnel {
                ipsec-vpn vpn-name;
                pair-policy policy-name;
            }
        }
        log {
            session-close;
            session-init;
        }
    }
}
}
}
}
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security resource-manager] Hierarchy Level

```
security {
  resource-manager {
    traceoptions {
      flag flag <flag-modifier>;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security screen] Hierarchy Level

```
security {
  screen {
    ids-option screen-name {
      alarm-without-drop;
      icmp {
        flood <threshold packets-per-second>;
        fragment;
        ip-sweep <threshold packets-per-microsecond>;
        large;
        ping-death;
      }
      ip {
        bad-options;
        block-frag;
        loose-source-route-option;
        record-route-option;
        security-option;
        source-route-option;
        spoofing;
        stream-option;
        strict-source-route-option;
        tear-drop;
        timestamp-option;
        unknown-protocol;
      }
      limit-session {
        destination-ip-based number-of-sessions;
        source-ip-based number-of-sessions;
      }
      tcp {
        fin-no-ack;
        land;
        port-scan <threshold packets-per-microsecond>;
        syn-ack-ack-proxy <threshold number-of-connections>;
        syn-fin;
        syn-flood {
          alarm-threshold requests-per-second;
          attack-threshold requests-per-second;
          destination-threshold packets-per-second;
          source-threshold packets-per-second;
          timeout seconds;
        }
        syn-frag;
        tcp-no-flag;
        tcp-sweep <threshold value>;
        winnuke;
      }
      udp {
        flood <threshold packets-per-second>;
        udp-sweep <threshold value>;
      }
    }
```

```
        traceoptions {
            file <filename> <files number> <match regular-expression> <size maximum-file-size>
                <world-readable | no-world-readable>;
            flag flag;
            no-remote-trace;
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security ssh-known-hosts] Hierarchy Level

```
security {
  ssh-known-hosts {
    fetch-from-server (hostname | address);
    host (hostname | address) {
      dsa-key key;
      rsa-key key:
      rsa1-key key;
    }
    load-key-file filename;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security traceoptions] Hierarchy Level

```
security {
  traceoptions {
    file <filename> <files number> <match regular-expression> <size maximum-file-size>
      <world-readable | no-world-readable>;
    flag flag;
    no-remote-trace;
    rate-limit rate;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security utm] Hierarchy Level

```
security {
  utm {
    application-proxy {
      traceoptions {
        flag flag;
      }
    }
    custom-objects {
      custom-url-category {
        category-list-name {
          value [ values ];
        }
      }
      filename-extension {
        extension-list-name {
          value [ values ];
        }
      }
      mime-pattern {
        mime-list-name {
          value [ values ];
        }
      }
      protocol-command {
        command-list-name {
          value [ values ];
        }
      }
      url-pattern {
        url-list-name {
          value [ values ];
        }
      }
    }
    feature-profile {
      ... the feature-profile subhierarchy appears after the main [edit security utm] hierarchy
        level ...
    }
    ipc {
      traceoptions {
        flag flag;
      }
    }
    traceoptions {
      flag flag;
    }
    utm-policy policy-name {
      anti-spam {
        smtp-profile profile-name;
      }
      anti-virus {
        ftp {
```



```
            download-profile profile-name;
            upload-profile profile-name;
          }
          http-profile profile-name;
          imap-profile profile-name;
          pop3-profile profile-name;
          smtp-profile profile-name;
        }
        content-filtering {
          ftp {
            download-profile profile-name;
            upload-profile profile-name;
          }
          http-profile profile-name;
          imap-profile profile-name;
          pop3-profile profile-name;
          smtp-profile profile-name;
        }
        traffic-options {
          sessions-per-client {
            limit number;
            over-limit (block | log-and-permit);
          }
        }
        web-filtering {
          http-profile profile-name;
        }
      }
    }

    utm {
      feature-profile {
        anti-spam {
          address-blacklist list-name;
          address-whitelist list-name;
          symantec-sbl {
            profile profile-name {
              custom-tag-string text-string;
              (sbl-default-server | no-sbl-default-server);
              spam-action (block | tag-header | tag-subject);
            }
          }
          traceoptions {
            flag flag;
          }
        }
        anti-virus {
          ... the anti-virus subhierarchy appears after the main [edit security utm
            feature-profile] hierarchy level ...
        }
        content-filtering {
          profile profile-name {
            block-command command-list;
            block-content-type {
              activex;
              exe;
```

```
            http-cookie;
            java-applet;
            zip;
        }
        block-extension extension-list;
        block-mime {
            exception exception-string;
            list list-name;
        }
        notification-options {
            custom-message message;
            (notify-mail-sender | no-notify-mail-sender);
            type (message | protocol-only);
        }
    permit-command command-list;
    traceoptions {
        flag flag;
    }
}
web-filtering {
    surf-control-integrated {
        ... the surf-control-integrated subhierarchy appears after the main [edit security
            utm feature-profile web-filtering] hierarchy level ...
    }
    traceoptions {
        flag flag;
    }
    type (surf-control-integrated | websense-redirect);
    url-blacklist list-name;
    url-whitelist list-name;
    websense-redirect {
        ... the websense-redirect subhierarchy appears after the main [edit security utm
            feature-profile web-filtering] hierarchy level ...
    }
}

web-filtering {
    surf-control-integrated {
        cache {
            size size;
            timeout timeout;
        }
        profile profile-name {
            category category-name {
                action (block | log-and-permit | permit);
            }
            custom-block-message message-text;
            default (block | log-and-permit | permit);
            fallback-settings {
                default (block | log-and-permit);
                server-connectivity (block | log-and-permit);
                timeout (block | log-and-permit);
                too-many-requests (block | log-and-permit);
            }
            timeout timeout;
        }
```



```
            server {
                host address-or-hostname;
                port port-number;
            }
        }
    }

    web-filtering {
        websense-redirect {
            profile profile-name {
                account account-name;
                custom-block-message message-text;
                fallback-settings {
                    default (block | log-and-permit);
                    server-connectivity (block | log-and-permit);
                    timeout (block | log-and-permit);
                    too-many-requests (block | log-and-permit);
                }
                server {
                    host address-or-hostname;
                    port port-number;
                }
                sockets number;
                timeout timeout;
            }
        }
    }
}

feature-profile {
    anti-virus {
        juniper-express-engine {
            ... the juniper-express-engine subhierarchy appears after the main [edit security
                utm feature-profile anti-virus] hierarchy level ...
        }
        kaspersky-lab-engine {
            ... the kaspersky-lab-engine subhierarchy appears after the main [edit security
                utm feature-profile anti-virus] hierarchy level ...
        }
        mime-whitelist {
            exception exception-string;
            list list-name;
        }
        traceoptions {
            flag flag;
        }
        type (juniper-express-engine | kaspersky-lab-engine);
        url-whitelist list-name;
    }

    anti-virus {
        juniper-express-engine {
            pattern-update {
                email-notify {
                    admin-email email-address;
                    custom-message message;
```

```
            custom-message-subject message-subject;
          }
          interval interval;
          no-autoupdate;
          url url;
        }
        profile profile-name {
          fallback-options {
            content-size (block | log-and-permit);
            default (block | log-and-permit);
            engine-not-ready (block | log-and-permit);
            out-of-resources (block | log-and-permit);
            timeout (block | log-and-permit);
            too-many-requests (block | log-and-permit);
          }
          notification-options {
            fallback-block {
              custom-message message;
              custom-message-subject message-subject;
              (notify-mail-sender | no-notify-mail-sender);
              type (message | protocol-only);
            }
            fallback-non-block {
              custom-message message;
              custom-message-subject message-subject;
              (notify-mail-recipient | no-notify-mail-recipient);
            }
            virus-detection {
              custom-message message;
              custom-message-subject message-subject;
              (notify-mail-sender | no-notify-mail-sender);
              type (message | protocol-only);
            }
          }
          scan-options {
            content-size-limit limit;
            (intelligent-prescreening | no-intelligent-prescreening);
            timeout timeout;
          }
          trickling timeout timeout;
        }
      }
    }

    anti-virus {
      kaspersky-lab-engine {
        pattern-update {
          email-notify {
            admin-email email-address;
            custom-message message;
            custom-message-subject message-subject;
          }
          interval interval;
          no-autoupdate;
          url url;
        }
```



```
                profile profile-name {
                  fallback-options {
                    content-size (block | log-and-permit);
                    corrupt-file (block | log-and-permit);
                    decompress-layer (block | log-and-permit);
                    default (block | log-and-permit);
                    engine-not-ready (block | log-and-permit);
                    out-of-resources (block | log-and-permit);
                    password-file (block | log-and-permit);
                    timeout (block | log-and-permit);
                    too-many-requests (block | log-and-permit);
                  }
                  notification-options {
                    fallback-block {
                      custom-message message;
                      custom-message-subject message-subject;
                      (notify-mail-sender | no-notify-mail-sender);
                      type (message | protocol-only);
                    }
                    fallback-non-block {
                      custom-message message;
                      custom-message-subject message-subject;
                      (notify-mail-recipient | no-notify-mail-recipient);
                    }
                    virus-detection {
                      custom-message message;
                      custom-message-subject message-subject;
                      (notify-mail-sender | no-notify-mail-sender);
                      type (message | protocol-only);
                    }
                  }
                  scan-options {
                    content-size-limit limit;
                    decompress-layer-limit limit;
                    (intelligent-prescreening | no-intelligent-prescreening);
                    scan-extension file-extension;
                    scan-mode (all | by-extension);
                    timeout timeout;
                  }
                  trickling timeout timeout;
                }
              }
            }
          }
        }
      }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

[edit security zones] Hierarchy Level

```
security {
  zones {
    functional-zone management {
      host-inbound-traffic {
        protocols {
          protocol-name <except>;
        }
        system-services {
          service-name <except>;
        }
      }
      interfaces {
        interface-name {
          host-inbound-traffic {
            protocols {
              protocol-name <except>;
            }
            system-services {
              service-name <except>;
            }
          }
        }
      }
      screen screen-name;
    }
    security-zone zone-name {
      address-book {
        address address-name (ip-prefix</prefix-length> | dns-name dns-address-name);
        address-set set-name {
          address address-name;
        }
      }
      host-inbound-traffic {
        protocols {
          protocol-name <except>;
        }
        system-services {
          service-name <except>;
        }
      }
      interfaces {
        interface-name {
          host-inbound-traffic {
            protocols {
              protocol-name <except>;
            }
            system-services {
              service-name <except>;
            }
          }
        }
      }
```

```
            screen object-name;
            tcp-rst;
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit security] Hierarchy Level on page 249

CHAPTER 12

[edit services] Hierarchy Levels

[edit services] Hierarchy Level

Each of the following topics lists the statements at a subhierarchy of the **[edit services]** hierarchy.

- [edit services service-set] Hierarchy Level on page 342
- [edit services softwire] Hierarchy Level on page 344
- [edit services stateful-firewall] Hierarchy Level on page 345
- [edit services unified-access-control] Hierarchy Level on page 346

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit services aacl] Hierarchy Level

```
services {
  aacl {
    rule rule-name {
      match-direction (input | input-output | output);
      term term-name {
        from {
          application-group-any;
          application-groups [ application-group-names ];
          applications [ application-names ];
          destination-address address <any-unicast>;
          destination-address-range low minimum-value high maximum-value;
          destination-prefix-list list-name;
          source-address address <any-unicast>;
          source-address-range low minimum-value high maximum-value;
          source-prefix-list list-name;
        }
        then {
          (accept | discard);
          count (application | application-group | application-group-any | none);
          forwarding-class class-name;
          police policer-name;
        }
      }
    }
    rule-set rule-set-name {
      rule rule-name;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services adaptive-services-pics] Hierarchy Level

```
services {
  adaptive-services-pics {
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services application-identification] Hierarchy Level

```
services {
  application-identification {
    application application-name {
      disable;
      idle-timeout seconds;
      index number;
      port-mapping {
        disable;
        port-range {
          tcp [ ports port-ranges ];
          udp [ ports port-ranges ];
        }
      }
      session-timeout seconds;
      signature {
        disable;
        client-to-server {
          dfa-pattern text-string;
          regex regular-expression;
        }
        min-data bytes;
        order priority;
        port-range {
          tcp [ ports port-ranges ];
          udp [ ports port-ranges ];
        }
        server-to-client {
          dfa-pattern text-string;
          regex regular-expression;
        }
      }
      type type;
      type-of-service service-type;
    }
    application-group group-name {
      disable;
      application-groups {
        application-group-name;
      }
      applications {
        application-name;
      }
      index number;
    }
    application-system-cache-timeout seconds;
    download {
      automatic {
        interval hours;
        start-time MM-DD.hh:mm;
      }
      url url;
    }
```

```
max-checked-bytes bytes;
max-checked-packets number;
max-sessions number;
min-checked-bytes bytes;
nested-application name {
   index number;
   protocol http ;
   signature name {
      chain-order ;
      maximum-transactions number;
      member name {
         context (http-header-content-type | http-header-host | http-url-parsed |
            http-url-parsed-param-parsed);
         direction (any | client-to-server | server-to-client);
         pattern dfa-pattern;
      }
      order number;
   }
   type application-name;
}
nested-application-settings {
   no-application-system-cache;
   no-nested-application;
}
no-application-identification;
no-application-system-cache;
no-clear-application-system-cache;
no-protocol-based;
no-signature-based;
profile profile-name {
   rule-set rule-set-name;
}
rule rule-name {
   address address-name {
      destination {
         ip address</prefix-length>;
         port-range {
            tcp [ ports port-ranges ];
            udp [ ports port-ranges ];
         }
      }
      order number;
      source {
         ip address</prefix-length>;
         port-range {
            tcp [ ports port-ranges ];
            udp [ ports port-ranges ];
         }
      }
   }
   application-name application-name;
}
rule-set rule-set-name {
   rule application-rule-name;
}
traceoptions {
```

```
            file <filename> <files number> <match regular-expression> <size size>
              <world-readable | no-world-readable>;
            flag flag;
            no-remote-trace;
          }
        }
      }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services border-signaling-gateway] Hierarchy Level

```
services {
  border-signaling-gateway {
    gateway gateway-name {
      admission-control profile-name {
        dialogs {
          committed-attempts-rate dialogs-per-second;
          committed-burst-size number;
          maximum-concurrent number;
        }
        transactions {
          committed-attempts-rate transactions-per-second;
          committed-burst-size number;
          maximum-concurrent number;
        }
      }
      embedded-spdf {
        service-class service-class-name {
          term term-name {
            from {
              media-type (any | audio | video);
            }
            then {
              committed-burst-size bytes;
              committed-information-rate bps;
              dscp (alias | do-not-change | dscp-value);
              reject;
            }
          }
        }
      }
      name-resolution-cache {
        accelerations {
          initiate-alternative-queries;
          initiate-next-queries;
          no-refresh-before-ttl-expiry;
        }
        blacklist-period seconds;
        maximum-records-in-cache number;
        maximum-time-in-cache (unlimited | seconds);
      }
      service-interface interface-name;
      service-point service-point-name {
        default-media-realm realm-id;
        service-interface interface-name.unit-number;
        service-point-type service-point-type;
        service-policies {
          new-call-usage-input-policies [ policy-names policy-set-names ];
          new-call-usage-output-policies [ policy-names policy-set-names ];
          new-transaction-input-policies [ policy-names policy-set-names ];
          new-transaction-output-policies [ policy-names policy-set-names ];
        }
        transport-details <ip-address ip-address> <port port-number> <tcp> <udp>;
```

```
    }
    sip {
      ... the sip subhierarchy appears after the main [edit services
          border-signaling-gateway gateway gateway-name] hierarchy level ...
    }
    traceoptions {
      flag {
        datastore {
          data trace-level;
          db trace-level;
          handle trace-level;
          minimum trace-level;
        }
        framework {
          action trace-level;
          event trace-level;
          executor trace-level;
          freezer trace-level;
          minimum trace-level;
          memory-pool trace-level;
        }
        minimum trace-level;
        sbc-utils {
          common trace-level;
          configuration trace-level;
          device-monitor trace-level;
          ipc trace-level;
          memory-management trace-level;
          message trace-level;
          minimum trace-level;
          user-interface trace-level;
        }
        session-trace trace-level;
        signaling {
          b2b trace-level;
          b2b-wrapper trace-level;
          minimum trace-level;
          policy trace-level;
          sip-stack-wrapper trace-level;
          topology-hiding trace-level;
          ua trace-level;
        }
        sip-stack {
          dev-logging;
          event-tracing;
          ips-tracing;
          pd-log-detail (full | summary);
          pd-log-level (audit | exception | problem);
          per-tracing;
          verbose-logging;
        }
      }
    }
}

gateway gateway-name {
```



```
sip {
   local-tag-prefix prefix;
   local-uri-prefix prefix;
   message-manipulation-rules {
      manipulation-rule rule-name {
         actions {
            request-uri {
               field-value {
                  modify-regular-expression regular-expression with field-value;
               }
            }
            sip-header header-field-name {
               field-value {
                  add field-value;
                  add-missing field-value;
                  add-overwrite field-value;
                  modify-regular-expression regular-expression with field-value;
                  reject-regular-expression regular-expression;
                  remove-all;
                  remove-regular-expression regular-expression;
               }
            }
         }
      }
   }
   new-call-usage-policy policy-name {
      term term-name {
         from {
            contact {
               regular-expression [ regular-expressions ];
            }
            method {
               method-invite;
            }
            request-uri {
               regular-expression [ regular-expressions ];
            }
            source-address [ ip-addresses ];
         }
         then {
            accept;
            media-policy {
               data-inactivity-detection {
                  inactivity-duration seconds;
               }
               media-release;
               no-anchoring;
               service-class service-class-name;
            }
            reject;
            trace;
         }
      }
   }
   new-call-usage-policy-set policy-set-name {
      policy-name [ policy-names ];
```

```
}
new-transaction-policy policy-name {
   term term-name {
      from {
         contact <registration-state (registered | not-registered)>
            <regular-expression [ regular-expressions ]> <uri-hiding (hidden-uri |
            not-hidden-uri)>;
         method {
            method-invite;
            method-message;
            method-options;
            method-publish;
            method-refer;
            method-register;
            method-subscribe;
         }
         request-uri [ uri-fields ];
         source-address [ ip-addresses ];
      }
      then {
         accept;
         admission-control admission-control-profile;
         message-manipulation {
            forward-manipulation {
               manipulation-rule-name;
            }
            reverse-manipulation {
               manipulation-rule-name;
            }
         }
         on-3xx-response {
            recursion-limit number;
         }
         reject;
         route {
            egress-service-point service-point-name;
            next-hop (request-uri | address ipv4-address <port port-number>
               <transport-protocol (tcp | udp)>);
            server-cluster cluster-name;
         }
         signaling-realm signaling-realm;
         trace;
      }
   }
}
new-transaction-policy-set policy-set-name {
   policy-name [ policy-names ];
}
routing-destinations {
   availability-check-profiles {
      profile-name {
         keepalive-interval {
            available-server seconds;
            unavailable-server seconds;
         }
         keepalive-method sip-options;
```



```
                keepalive-strategy (do-not-send <blackout-period seconds> |
                  send-always <failures-before-unavailable number>
                  <successes-before-available number> |
                  send-when-unavailable <successes-before-available number>);
                transaction-timeout seconds;
              }
            }
            clusters {
              cluster-name {
                server server-name {
                  priority priority-level;
                  weight weight-level;
                }
              }
            }
            default-availability-check-profile profile-name;
            servers {
              server-name {
                address ip4-address <port port-number> <transport (tcp | udp)>;
                admission-control profile-name;
                availability-check-profile profile-name;
                service-point service-point-name;
              }
            }
          }
          signaling-realms signaling-realm;
          timers {
            inactive-call seconds;
            timer-c seconds;
          }
        }
      }
    }
  }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services captive-portal] Hierarchy Level

```
services {
  captive-portal {
    authentication-profile-name authentication-profile-name;
    custom-options {
      banner-message string;
      footer-bgcolor color;
      footer-message string;
      form-header-bgcolor color;
      form-header-message string;
      form-reset-label label-name;
      form-submit-label label-name;
      header-bgcolor color;
      header-logo filename;
      header-message string;
      post-authentication-url url;
    }
    interface (all | interface-name) {
      quiet-period seconds;
      retries number-of-retries;
      server-timeout seconds;
      session-expiry seconds;
      supplicant (multiple | single | single-secure);
    }
    secure-authentication (http | https);
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services convergence-services] Hierarchy Level

```
services {
  convergence-services {
    class-of-restriction class-name {
      policy policy-name {
        call-type {
          (call-type | any-call | inter-branch-call | international-call | local-call |
            long-distance-call);
        }
        permission (allow | deny);
      }
    }
    dial-plan plan-name {
      route-pattern digits {
        call-type {
          (call-type | emergency-call | inter-branch-call | international-call |
            intra-branch-call | local-call | long-distance-call | trunk-call);
        }
        trunk-group group-name {
          digit-transform transform-name;
          preference number;
        }
      }
      route-policy policy-name {
        term term-name {
          from {
            trunk-group group-name;
          }
          then {
            route {
              next-hop {
                (peer-call-server server-name | trunk-group group-name);
              }
            }
          }
        }
      }
    }
    digit-manipulation {
      digit-transform transform-name {
        regular-expression regular-expression;
      }
    }
    features {
      ... the features subhierarchy appears after the main [edit services
        convergence-services] hierarchy ...
    }
    media-gateway gateway-name {
      dial-plan plan-name;
      peer-call-server server-name;
      protocol {
        sip {
          port port-number;
```

```
            transport (tcp | tls | udp);
        }
    }
    service-point {
        zone zone-name;
    }
}
media-policy policy-name {
    term term-name {
        from {
            peer-address {
                fqdn domain-name;
                ip-address ip-address</prefix-length>;
            }
        }
        then {
            dscp code-point;
        }
    }
}
peer-call-server server-name {
    address {
        fqdn domain-name;
        ipv4-address ipv4-address;
    }
    auth-id authentication-id;
    auth-password authentication-password;
    codec [ G711-A G711-MU G729AB ];
    description description-string;
    dtmf-method (inband | rfc-2833);
    protocol {
        sip {
            port port-number;
            transport (tcp | tls | udp);
        }
    }
    pstn-access-number number;
    registrar-address {
        fqdn domain-name;
        ipv4-address ipv4-address;
    }
    sip-registration {
        disable;
    }
    source-interface interface-name;
}
preferences {
    sip {
        registration-expiry-timeout seconds;
        session-timers {
            minimum-expiry-interval seconds;
            session-expiry-interval seconds;
        }
    }
}
station station-name {
```



```
    auth-id authentication-id;
    auth-password authentication-password;
    class-of-restriction class-name;
    direct-inward-dialing number;
    direct-inward-line {
      trunk-group group-name;
    }
    extension extension-number;
    station-type {
      analog {
        tdm-interface interface-name;
        template-template-name;
        time-slot timeslot-number;
      }
    }
    sip {
      template template-name;
    }
  }
  station-group group-name {
    description description-string;
    station [ station-names ];
  }
  station-template {
    analog-template template-name {
      caller-id-transmit {
        disable;
      }
      class-of-restriction class-name;
      comfort-noise-generation {
        disable;
      }
      disconnect-supervision {
        power-denial {
          disable;
          denial-timeout milliseconds;
        }
      }
      voice-activity-detection {
        disable;
      }
    }
    sip-template template-name {
      caller-id-transmit {
        disable;
      }
      class-of-restriction class-name;
      codec [ G711-A G711-MU G729AB ];
      dtmf-method (inband | rfc-2833);
      extension-inherit {
        from-extension start-range;
        to-extension end-range;
      }
    }
  }
  survivable-call-service service-name {
```

```
        dial-plan plan-name;
        heartbeat-normal-interval seconds;
        heartbeat-survivable-interval milliseconds;
        monitor-timeout seconds;
        peer-call-server server-name;
        protocol {
            sip {
                port port-number;
                transport (tcp | tls | udp);
            }
        }
        registration-expiry-timeout seconds;
        response-threshold {
            minimum percentage;
        }
        service-point {
            zone zone-name;
        }
        sip-method (info | options | register);
        sip-timeout seconds;
    }
    trunk trunk-name {
        ... the trunk subhierarchy appears after the main [edit services convergence-services]
            hierarchy ...
    }
    trunk-group group-name {
        description description-string;
        trunk [ trunk-names ];
    }
}

convergence-services {
    features {
        accounting {
            profile profile-name {
                description description-string;
                ftp {
                    ... the ftp subhierarchy appears at the end of the [edit services
                        convergence-services features accounting profile profile-name] hierarchy ...
                }
                operational-state (any | normal | survivable);
                report-unanswered-call;
                use-compact-cdr;

                ftp {
                    format {
                        comma-separated-value {
                            batch-size number;
                            purge-time-interval seconds;
                        }
                    }
                    gateway gateway-name {
                        address {
                            fqdn domain-name;
                            ipv4-addr ipv4-address;
                        }
```



```
                auth-id identifier;
                auth-password password;
                description description-string;
              }
            }
          }
        }
        auto-attendant {
          live-attendant {
            extension extension-number;
            hours {
              end-time hh:mm;
              start-time hh:mm;
            }
          }
        }
        call-park {
          extension logical-extension-number;
          number-of-slots number;
        }
        guest {
          auto-register {
            disable;
          }
          class-of-restriction class-name;
        }
        hunt-group group-name {
          extension logical-extension-number;
          ring-timeout seconds;
          station-group group-name;
        }
        music-on-hold {
          directory pathname;
          format (all | ulaw);
          order (alphabetical | random);
        }
        pickup-group group-name {
          station-group group-name;
        }
        ring-group group-name {
          extension logical-extension-number;
          station-group group-name;
        }
        voice-mail {
          extension extension-number;
          remote-access-number number;
        }
      }
    }
    convergence-services {
      trunk trunk-name {
        direct-inward-dialing [ numbers ];
        trunk-type {
          fxo {
            answer-supervision {
              battery-reversal {
```

```
                disable;
              }
            }
            disconnect-supervision {
              battery-reversal {
                disable;
              }
            }
            tdm-interface interface-name;
          }
          fxs {
            disconnect-supervision {
              power-denial {
                denial-timeout milliseconds;
                disable;
              }
            }
            tdm-interface interface-name;
          }
          sip {
            peer-proxy-server {
              address {
                fqdn domain-name;
                ipv4-address ipv4-address;
              }
              auth-id authentication-id;
              auth-password authentication-password;
              codec [ G711-A G711-MU G729AB ];
              description description-string;
              dtmf-method (inband | rfc-2833);
              max-concurrent-calls number;
              port port-number;
              registrar-address {
                fqdn domain-name;
                ipv4-address ipv4-address;
              }
              sip-registration {
                disable;
              }
              transport (tcp | tls | udp);
            }
          }
          t1
            cas-group {
              signaling (em-wink-start | fxo-loop-start | fxs-loop-start);
              time-slots timeslots;
            }
          }
        }
      }
    }
  }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services cos] Hierarchy Level

```
services {
  cos {
    application-profile profile-name {
      ftp {
        data {
          dscp (alias | bits);
          forwarding-class class-name;
        }
      }
      sip {
        video {
          dscp (alias | bits);
          forwarding-class class-name;
        }
        voice {
          dscp (alias | bits);
          forwarding-class class-name;
        }
      }
    }
    rule rule-name {
      match-direction (input | output | input-output);
      term term-name {
        from {
          application-sets set-name;
          applications [ application-names ];
          destination-address address <except>;
          destination-address-range low minimum-value high maximum-value <except>;
          destination-prefix-list list-name <except>;
          source-address (address | any-unicast) <except>;
          source-address-range low minimum-value high maximum-value <except>;
          source-prefix-list list-name <except>;
        }
        then {
          application-profile profile-name;
          dscp (alias | bits);
          forwarding-class class-name;
          syslog;
          (reflexive | reverse) {
            application-profile profile-name;
            dscp (alias | bits);
            forwarding-class class-name;
            syslog;
          }
        }
      }
    }
    rule-set rule-set-name {
      rule rule-name;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services dynamic-flow-capture] Hierarchy Level

```
services {
  dynamic-flow-capture {
    capture-group client-name {
      content-destination identifier {
        address address;
        hard-limit bandwidth;
        hard-limit-target bandwidth;
        soft-limit bandwidth;
        soft-limit-clear bandwidth;
        ttl hops;
      }
      control-source identifier {
        allowed-destinations [ destinations ];
        minimum-priority value;
        no-syslog;
        notification-targets address port port-number;
        service-port port-number;
        shared-key value;
        source-addresses [ addresses ];
      }
      duplicates-dropped-periodicity seconds;
      input-packet-rate-threshold rate;
      interfaces interface-name;
      max-duplicates number;
      pic-memory-threshold percentage percentage;
    }
    g-duplicates-dropped-periodicity seconds;
    g-max-duplicates number;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services flow-collector] Hierarchy Level

```
services {
  flow-collector {
    analyzer-address address;
    analyzer-id name;
    destinations {
      ftp:url {
        password "password";
      }
    }
    file-specification {
      variant variant-number {
        data-format format;
        name-format "format";
        transfer {
          record-level number;
          timeout seconds;
        }
      }
    }
    interface-map {
      collector interface-name;
      file-specification variant-number;
      interface-name {
        file-specification variant-number;
        collector interface-name;
      }
    }
    retry number;
    retry-delay seconds;
    transfer-log-archive {
      archive-sites {
        ftp:url <password "password">;
      }
      filename-prefix prefix;
      maximum-age minutes;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services flow-monitoring] Hierarchy Level

```
services {
  flow-monitoring {
    version9 {
      template template-name {
        flow-active-timeout seconds;
        flow-inactive-timeout seconds;
        ipv4-template {
          nexthop-options {
            mpls {
              label-position [ positions ];
            }
          }
        }
        ipv6-template;
        mpls-template {
          label-position [ positions ];
        }
        mpls-ipv4-template {
          label-position [ positions ];
        }
        option-refresh-rate {
          packets packets;
          seconds seconds;
        }
        peer-as-billing-template;
        template-refresh-rate {
          packets packets;
          seconds seconds;
        }
        peer-as-billing-template;
        option-refresh-rate packets;
        template-refresh-rate packets;
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services flow-tap] Hierarchy Level

```
services {
   flow-tap {
      (interface sp-fpc/pic/port | tunnel-interface vt-fpc/pic/port);
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services ids] Hierarchy Level

```
services {
  ids {
    rule rule-name {
      match-direction (input | output | input-output);
      term term-name {
        from {
          application-sets set-name;
          applications [ application-names ];
          destination-address (address | any-unicast) <except>;
          destination-address-range low minimum-value high maximum-value <except>;
          destination-prefix-list list-name <except>;
          source-address (address | any-unicast) <except>;
          source-address-range low minimum-value high maximum-value <except>;
          source-prefix-list list-name <except>;
        }
        then {
          aggregation {
            destination-prefix prefix-value;
            destination-prefix-ipv6 prefix-value;
            source-prefix prefix-value;
            source-prefix-ipv6 prefix-value;
          }
        }
        (force-entry | ignore entry);
        logging {
          syslog;
          threshold rate;
        }
        session-limit {
          by-destination {
            hold-time seconds;
            maximum number;
            packets number;
            rate number;
          }
          by-pair {
            maximum number;
            packets number;
            rate number;
          }
          by-source {
            hold-time seconds;
            maximum number;
            packets number;
            rate number;
          }
        }
        syn-cookie {
          mss value;
          threshold rate;
        }
      }
```

```
        }
        rule-set rule-set-name {
            rule rule-name;
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services ipsec-vpn] Hierarchy Level

```
services {
  ipsec-vpn {
    clear-ike-sas-on-pic-restart;
    clear-ipsec-sas-on-pic-restart;
    establish-tunnels (immediately | on-traffic);
    ike {
      policy policy-name {
        description description;
        local-certificate identifier;
        local-id (fqdn domain-name | ipv4_addr ipv4-address | ipv6-addr ipv6-address |
          key-id identifier);
        mode (aggressive | main);
        pre-shared-key (ascii-text key | hexadecimal key);
        proposals [ proposal-names ];
        remote-id {
          (any-remote-id | one or more of the following four statements);
          fqdn [ domain-names ];
          ipv4_addr [ ipv4-addresses ];
          ipv6-addr [ ipv6-addresses ];
          key-id [ identifiers ];
        }
      }
      proposal proposal-name {
        authentication-algorithm (md5 | sha1 | sha256);
        authentication-method (dsa-signatures | pre-shared-keys | rsa-signatures);
        description description;
        dh-group (group1 | group2 | group5 | group14);
        encryption-algorithm algorithm;
        lifetime-seconds seconds;
      }
    }
    ipsec {
      policy policy-name {
        description description;
        perfect-forward-secrecy {
          keys (group1 | group2);
        }
        proposals [ proposal-names ];
      }
      proposal proposal-name {
        authentication-algorithm (hmac-md5-96 | hmac-sha1-96);
        description description;
        encryption-algorithm algorithm;
        lifetime-seconds seconds;
        protocol (ah | esp | bundle);
      }
    }
    no-ipsec-tunnel-in-traceroute;
    rule rule-name {
      match-direction (input | output);
      term term-name {
        from {
```

```
                destination-address address;
                ipsec-inside-interface interface-name;
                source-address address;
            }
            then {
                anti-replay-window-size bits;
                backup-remote-gateway address;
                clear-dont-fragment-bit;
                dynamic {
                    ike-policy policy-name;
                    ipsec-policy policy-name;
                }
                initiate-dead-peer-detection;
                manual {
                    ... the manual subhierarchy appears after the main [edit services ipsec-vpn ipsec
                        rule rule-name term term-name then] hierarchy level ...
                }
                no-anti-replay;
                remote-gateway address;
                syslog;
                tunnel-mtu bytes;
            }

            then {
                manual {
                    direction (inbound | outbound | bidirectional) {
                        authentication {
                            algorithm (hmac-md5-96 | hmac-sha1-96);
                            key (ascii-text key | hexadecimal key);
                            }
                        }
                        auxiliary-spi spi-value;
                        encryption {
                            algorithm algorithm;
                            key (ascii-text key | hexadecimal key);
                        }
                        protocol (ah | bundle | esp);
                        spi spi-value;
                    }
                }
            }
        }
    }
    rule-set rule-set-name {
        rule rule-name;
    }
    traceoptions {
        file <filename> <files number> <match regular-expression> <size maximum-file-size>
            <world-readable | no-world-readable>;
        flag flag;
        level level;
        no-remote-trace;
    }
  }
}
```


Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services l2tp] Hierarchy Level

```
services {
  l2tp {
    disable-calling-number-avp;
    fail-over-within-preference;
    tunnel-group group-name {
      hello-interval seconds;
      hide-avps;
      l2tp-access-profile profile-name;
      local-gateway address address;
      maximum-send-window packets;
      ppp-access-profile profile-name;
      receive-window packets;
      retransmit-interval seconds;
      service-interface interface-name;
      syslog {
        host hostname {
          facility-override facility-name;
          log-prefix prefix-value;
          services severity-level;
        }
      }
      tunnel-timeout seconds;
    }
    traceoptions {
      debug-level level;
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      filter {
        protocol name;
        user-name username;
      }
      flag flag;
      interfaces interface-name {
        debug-level severity;
        flag flag;
      }
      level (all | error | info | notice | verbose | warning);
      no-remote-trace;
    }
    weighted-load-balancing;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services logging] Hierarchy Level

```
services {
   logging {
      traceoptions {
         file <filename> <files number> <match regular-expression> <size maximum-file-size>
            <world-readable | no-world-readable>;
         flag flag;
         no-remote-trace;
      }
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services mobile-ip] Hierarchy Level

```
services {
  mobile-ip {
    access-type {
      (generic | wimax);
    }
    authenticate {
      order (aaa | local);
    }
    dynamic-home-assignment {
      home-agent {
        nai (name@domain | @domain) {
          home-agent ip-address;
        }
      }
    }
    home-agent {
      enable-service interface-name;
      virtual-network {
        home-agent-address ip-address {
          registration-lifetime seconds;
          revocation-required;
          timestamp-tolerance seconds;
        }
      }
    }
    peer {
      (ip-address address | nai user@domain) {
        spi hexadecimal-value {
          algorithm (hmac-md5 | md5);
          entity-type (host | mobility-agent);
          key (hex | ascii) string;
          replay-method (none | timestamp seconds);
        }
      }
    }
    traceoptions {
      file <filename> <files number> <match regular-expression > <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      level (all | error | info | notice | verbose | warning);
      no-remote-trace;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services nat] Hierarchy Level

```
services {
  nat {
    ipv6-multicast-interfaces (all | interface-name) {
      disable;
    }
    pool nat-pool-name {
      address ip-prefix</prefix-length>;
      address-range low minimum-value high maximum-value;
      mapping-timeout seconds;
      pgcp {
        hint [ hint-strings ];
        ports-per-session ports;
        remotely-controlled:
        transport [ rtp-avp tcp udp ];
      }
      port (automatic <auto> | range low minimum-value high maximum-value)
        <random-allocation>;
    }
    rule rule-name {
      match-direction (input | output);
      term term-name {
        from {
          application-sets set-name;
          applications [ application-names ];
          destination-address (address | any-unicast) <except>;
          destination-address-range low minimum-value high maximum-value <except>;
          destination-prefix-list list-name <except>;
          source-address (address | any-unicast) <except>;
          source-address-range low minimum-value high maximum-value <except>;
          source-prefix-list list-name <except>;
        }
        nat-type (full-cone | symmetric);
        then {
          no-translation;
          syslog;
          translated {
            address-pooling paired;
            destination-pool nat-pool-name;
            destination-prefix destination-prefix;
            dns-alg-pool dns-alg-pool;
            dns-alg-prefix dns-alg-prefix;
            filtering-type endpoint-independent;
            mapping-type endpoint-independent;
            overload-pool overload-pool-name;
            overload-prefix overload-prefix;
            source-pool nat-pool-name;
            source-prefix source-prefix;
            translation-type {
              destination (dynamic | static);
              source static;
            }
            use-dns-map-for-destination-translation;
```

```
                }
              }
            }
          }
          rule-set rule-set-name {
            rule rule-name;
          }
        }
      }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services pgcp] Hierarchy Level

```
services {
  pgcp {
    gateway gateway-name {
      ... the gateway subhierarchy appears after the main [edit services pgcp] hierarchy ...
    }
    notification-rate-limit rate;
    rule rule-name {
      gateway gateway-name;
      nat-pool [ pool-names ];
    }
    rule-set rule-set-name {
      rule rule-name;
    }
    session-mirroring {
      delivery-function function-name {
        destination-address destination-address;
        destination-port destination-port;
        memory-management {
          operational-mode (fast | location-tracking | type-tracking);
        }
        network-operator-id network-operator-id;
        source-address source-address;
        source-port source-port;
      }
      disable-session-mirroring;
    }
    traceoptions {
      file <filename> <files number> <match regular-expression> <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag {
        bgf-core {
          common trace-level;
          default trace-level;
          firewall trace-level;
          gate-logic trace-level;
          pic-broker trace-level;
          policy trace-level;
          statistics trace-level;
        }
        default trace-level;
        h248-stack {
          control-association trace-level;
          default trace-level;
          media-gateway trace-level;
          messages;
        }
        sbc-utils {
          common trace-level;
          configuration trace-level;
          default trace-level;
          device-monitor trace-level;
          ipc trace-level;
```

```
            memory-management trace-level;
            messaging trace-level;
            user-interface trace-level;
          }
        }
        no-remote-trace;
      }
      virtual-interface interface-number {
        nat-pool [ pool-names ];
        routing-instance instance-name {
          service-interface name.number;
        }
        service-state (in-service | out-of-service-forced | out-of-service-graceful);
      }
    }

    pgcp {
      gateway gateway-name {
        cleanup-timeout seconds;
        data-inactivity-detection {
          inactivity-delay seconds;
          inactivity-duration seconds;
          latch-deadlock-delay seconds;
          no-rtcp-check;
          report-service-change {
            service-change-type (forced-906 | forced-910);
          }
          send-notification-on-delay;
          stop-detection-on-drop;
        }
        fast-update-filters {
          maximum-terms number-of-terms;
          maximum-fuf-percentage percentage;
        }
        gateway-address gateway-address;
        gateway-controller gateway-controller-name {
          controller-address ip-address;
          controller-port port-number;
          interim-ah-scheme {
            algorithm algorithm;
          }
          (local-controller | remote-controller);
        }
        gateway-port gateway-port;
        graceful-restart {
          catchup-replication-delay number;
          maximum-synchronization-mismatches number;
          no-synchronization;
        }
        h248-options {
          ... the h248-options subhierarchy appears after the main [edit services pgcp gateway
            gateway-name] hierarchy ...
        }
        h248-properties {
          ... the h248-properties subhierarchy appears after the main [edit services pgcp
            gateway gateway-name] hierarchy ...
```



```
    }
    h248-timers {
      initial-average-ack-delay milliseconds;
      maximum-net-propagation-delay milliseconds;
      maximum-waiting-delay milliseconds;
      tmax-retransmission-delay milliseconds;
    }
    ipsec-transport-security-association security-association-name;
    max-concurrent-calls number;
    monitor {
      media {
        rtcp;
        rtp;
      }
    }
    overload-control {
      queue-limit-percentage percentage;
      reject-all-commands-threshold percentage;
      reject-new-calls-threshold percentage;
    }
    platform {
      (device interface-name | routing-engine);
    }
    routing-instance routing-instance-name;
    service-state (in-service | out-of-service-forced | out-of-service-graceful);
    session-mirroring {
      delivery-function [ function-names ];
      disable-session-mirroring;
    }
  }

  gateway gateway-name {
    h248-options {
      accept-emergency-calls-while-graceful;
      audit-observed-events-returns;
      encoding {
        no-dscp-bit-mirroring;
        use-lower-case;
      }
      h248-profile {
        profile-name profile-name;
        profile-version version-number;
      }
      implicit-tcp-latch;
      implicit-tcp-source-filter;
      service-change {
        context-indications {
          state-loss (forced-910 | forced-915 | none);
        }
        control-association-indications {
          disconnect {
            controller-failure (failover-909 | restart-902);
            reconnect (disconnected-900 | restart-902);
          }
          down {
            administrative (forced-905 | forced-908 | none);
```

```
                failure (forced-904 | forced-908 | none);
                graceful (graceful-905 | none);
            }
            up {
                cancel-graceful (none | restart-918);
                failover-cold (failover-920 | restart-901);
                failover-warm (failover-919 | restart-902);
            }
        }
        use-wildcard-response;
        virtual-interface-indications {
            virtual-interface-down {
                administrative (forced-905 | forced-906 | none);
                graceful (graceful-905 | none);
            }
            virtual-interface-up {
                cancel-graceful (none | restart-918);
                warm (none | restart-900);
            }
        }
    }
  }
}

gateway gateway-name {
  h248-properties {
    application-data-inactivity-detection {
        ip-flow-stop-detection (immediate-notify | regulated-notify);
    }
    base-root {
        mg-originated-pending-limit {
            default milliseconds;
            maximum milliseconds;
            minimum milliseconds;
        }
        mg-provisional-response-timer-value {
            default milliseconds;
            maximum milliseconds;
            minimum milliseconds;
        }
        mgc-originated-pending-limit {
            default number-of-messages;
            maximum number-of-messages;
            minimum number-of-messages;
        }
        mgc-provisional-response-timer-value {
            default number-of-messages;
            maximum number-of-messages;
            minimum number-of-messages;
        }
        normal-mg-execution-time {
            default milliseconds;
            maximum milliseconds;
            minimum milliseconds;
        }
        normal-mgc-execution-time {
```



```
        default milliseconds;
        maximum milliseconds;
        minimum milliseconds;
      }
    }
    diffserv {
      dscp {
        default (dscp-value | alias | do-not-change);
        ignore-signaled-value;
      }
    }
    event-timestamp-notification {
      request-timestamp (autonomous | requested | suppressed);
    }
    hanging-termination-detection {
      timerx seconds;
    }
    inactivity-timer {
      inactivity-timeout {
        detect;
        maximum-inactivity-time {
          default 10-millisecond-multiple;
          maximum 10-millisecond-multiple;
          minimum 10-millisecond-multiple;
        }
      }
    }
    notification-behavior {
      notification-regulation {
        default (once | percentage);
      }
    }
    segmentation {
      mg-maximum-pdu-size {
        default bytes;
        maximum bytes;
        minimum bytes;
      }
      mg-segmentation-timer {
        default milliseconds;
        maximum milliseconds;
        minimum milliseconds;
      }
      mgc-maximum-pdu-size {
        default bytes;
        maximum bytes;
        minimum bytes;
      }
      mgc-segmentation-timer {
        default milliseconds;
        maximum milliseconds;
        minimum milliseconds;
      }
    }
    traffic-management {
      max-burst-size {
```

```
                    default bytes-per-second;
                    maximum bytes-per-second;
                    minimum bytes-per-second;
                    rtcp {
                        (fixed-value bytes | percentage percentage);
                    }
                }
                peak-data-rate {
                    default bytes-per-second;
                    maximum bytes-per-second;
                    minimum bytes-per-second;
                    rtcp {
                        (fixed-value bytes | percentage percentage);
                    }
                }
                sustained-data-rate {
                    default bytes-per-second;
                    maximum bytes-per-second;
                    minimum bytes-per-second;
                    rtcp {
                        (fixed-value bytes | percentage percentage);
                    }
                }
            }
        }
    }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services ptsp] Hierarchy Level

```
services {
  ptsp {
    forward-rule forward-rule-name {
      term precedence {
        from {
          application-groups [ application-group-names ];
          applications [ application-names ];
          local-address address <except>;
          local-address-range low low-value high high-value <except >;
          local-prefix-list prefix-list-name <except >;
        }
        then {
          forwarding-instance forwarding-instance;
          unit-number unit-number;
        }
      }
    }
    rule rule-name {
      count-type (application | rule);
      demux (destination-address | source-address);
      forward-rule forward-rule-name;
      match-direction (input | input-output | output);
      term precedence {
        from {
          application-group-any;
          application-groups [ application-group-names ];
          applications [ application-names ];
          local-port-range low low-value high high-value;
          local-ports [ port-numbers ];
          protocol protocol-number;
          remote-address address <except>;
          remote-address-range low low-value high high-value <except>;
          remote-port-range low low-value high high-value;
          remote-ports [ port-numbers ];
          remote-prefix-list prefix-list-name <except>;
        }
        then {
          (accept | discard);
          count (application | application-group | application-group-any | none | rule);
          forwarding-class forwarding-class;
          police policer-name;
        }
      }
    }
    rule-set rule-set-name {
      rule rule-name;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services radius-flow-tap] Hierarchy Level

```
services {
  radius-flow-tap {
    forwarding-class class-name;
    interfaces interface-name;
    source-ipv4-address ipv4-address;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services rpm] Hierarchy Level

```
services {
  rpm {
    bgp {
      data-fill data;
      data-size size;
      destination-port port;
      history-size size;
      logical-system logical-system-name <routing-instances routing-instance-name>;
      moving-average-size number-of-samples;
      probe-count count;
      probe-interval seconds;
      probe-type type;
      routing-instances {
        routing-instance-name;
      }
      test-interval seconds;
    }
    probe owner {
      test test-name {
        data-fill data;
        data-size size;
        destination-interface interface-name;
        destination-port port;
        dscp-code-point dscp-bits;
        hardware-timestamp;
        history-size size;
        moving-average-size number;
        one-way-hardware-timestamp;
        probe-count count;
        probe-interval seconds;
        probe-type type;
        routing-instance instance-name;
        source-address address;
        target (address address | url url);
        test-interval interval;
        thresholds {
          egress-time microseconds;
          ingress-time microseconds;
          jitter-egress microseconds;
          jitter-ingress microseconds;
          jitter-rtt microseconds;
          rtt microseconds;
          std-dev-egress microseconds;
          std-dev-ingress microseconds;
          std-dev-rtt microseconds;
          successive-loss count;
          total-loss count;
        }
        traps [ trap-names ];
      }
    }
    probe-limit number;
```

```
        probe-server {
          icmp {
            destination-interface interface-name;
          }
          tcp {
            destination-interface interface-name;
            port port-number;
          }
          udp {
            destination-interface interface-name;
            port port-number;
          }
        }
        twamp {
          server {
            authentication-key-chain identifier {
              key-id identifier {
                secret password-string;
              }
            }
            authentication-mode
              authenticated <control-only>;
              encrypted <control-only>;
              none;
            }
            client-list list-name {
              address address;
            }
            max-connection-duration hours;
            maximum-connections count;
            maximum-connections-per-client count;
            maximum-sessions count;
            maximum-sessions-per-connection count;
            port number;
            server-inactivity-timeoutminutes;
          }
        }
      }
    }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services service-interface-pools] Hierarchy Level

```
services {
   service-interface-pools {
      pool pool-name {
         interface interface-name.unit-number;
      }
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services service-set] Hierarchy Level

```
services {
  service-set service-set-name {
    allow-multicast;
    (cos-rules rule-name | cos-rule-sets rule-set-name);
    extension-service service-name {
      provider-specific-rules;
    }
    (ids-rules rule-names | ids-rule-sets rule-set-name);
    interface-service {
      service-interface interface-name;
    }
    ipsec-vpn-options {
      anti-replay-window-size bits;
      clear-dont-fragment-bit;
      ike-access-profile profile-name;
      local-gateway address;
      no-anti-replay;
      passive-mode-tunneling;
      trusted-ca [ ca-profile-names ];
      tunnel-mtu bytes;
    }
    (ipsec-vpn-rules rule-names | ipsec-vpn-rule-sets rule-set-name);
    max-flows number;
    (nat-rules rule-names | nat-rule-sets rule-set-name);
    next-hop-service {
      inside-service-interface name.number;
      outside-service-interface name.number;
      service-interface-pool name;
    }
    (pgcp-rules rule-names | pgcp-rule-sets rule-set-name);
    (ptsp-rules rule-names | ptsp-rule-sets rule-set-name);
    service-order {
      forward-flow [ service-names ];
      reverse-flow [ service-names ];
    }
    service-set-options {
      bypass-traffic-on-exceeding-flow-limits;
      bypass-traffic-on-pic-failure;
    }
    (softwire-rules rule-name | softwire-rule-sets rule-set-name);
    (stateful-firewall-rules rule-names | stateful-firewall-rule-sets rule-set-name);
    syslog {
      host hostname {
        facility-override facility-name;
        log-prefix prefix-value;
        services severity-level;
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services softwire] Hierarchy Level

```
services {
  softwire {
    ipv6-multicast-interfaces (all | interface-name);
    rule rule-name {
      match-direction (input | output);
      term term-name {
        then {
          (ds-lite ds-lite-concentrator-name | v6rd v6rd-concentrator-name);
        }
      }
    }
    rule-set rule-set-name {
      rule rule-name;
    }
    softwire-concentrator {
      ds-lite ds-lite-softwire-concentrator {
        auto-update-mtu;
        flow-limit flows;
        mtu-v6 bytes;
        softwire-address address;
      }
      v6rd v6rd-softwire-concentrator {
        ipv4-prefix ipv4-prefix;
        mtu-v4 bytes;
        softwire-address ipv4-address;
        v6rd-prefix ipv6-prefix;
      }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services stateful-firewall] Hierarchy Level

```
services {
  stateful-firewall {
    rule rule-name {
      match-direction (input | output | input-output);
      term term-name {
        from {
          application-sets set-name;
          applications [ application-names ];
          destination-address (address | any-unicast) <except>;
          destination-address-range low minimum-value high maximum-value <except>;
          destination-prefix-list list-name <except>;
          source-address (address | any-unicast) <except>;
          source-address-range low minimum-value high maximum-value <except>;
          source-prefix-list list-name <except>;
        }
        then {
          (accept | discard | reject);
          allow-ip-options [ range-of-values any loose-source-route route-record
            router-alert security stream-id strict-source-route timestamp ];
          syslog;
        }
      }
    }
    rule-set rule-set-name {
      rule rule-name;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

[edit services unified-access-control] Hierarchy Level

```
services {
  unified-access-control {
    captive-portal policy-name {
      redirect-traffic (all | unauthenticated);
      redirect-url url;
    }
    infranet-controller hostname {
      address ip-address;
      ca-profile [ ca-profiles ];
      interface interface-name;
      password password;
      port port-number;
      server-certificate-subject subject;
    }
    interval seconds;
    test-only-mode;
    timeout seconds;
    timeout-action (close | no-change | open);
    traceoptions {
      flag flag;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit services] Hierarchy Level on page 297

CHAPTER 13

[edit snmp] Through [edit vlans] Hierarchy Levels

[edit snmp] Hierarchy Level

```
snmp {
  client-list list-name {
    address {
      restrict;
    }
  }
  community community-name {
    authorization (read-only | read-write);
    client-list-name list-name;
    clients {
      address <restrict>;
    }
    logical-system logical-system-name {
      routing-instance instance-name;
    }
    routing-instance instance-name {
      client-list-name list-name;
      clients {
        address <restrict>;
      }
    }
    view view-name;
  }
  contact contact-information;
  description description;
  engine-id {
    (local engine-id | use-default-ip-address | use-mac-address);
  }
  filter-duplicates;
```

```
health-monitor {
   falling-threshold percentage;
   interval seconds;
   rising-threshold percentage;
}
interface [ interface-names ];
location location;
logical-system-trap-filter;
name system-name;
nonvolatile {
   commit-delay seconds;
}
rmon {
   alarm index {
      description description;
      falling-event-index index;
      falling-threshold integer;
      falling-threshold-interval seconds;
      interval seconds;
      request-type (get-next-request | get-request | walk-request);
      rising-event-index index;
      rising-threshold integer;
      sample-type (absolute-value | delta-value);
      startup-alarm (falling-alarm | rising-alarm | rising-or-falling alarm);
      syslog-subtag text-string;
      variable oid-variable;
   }
   event index {
      community community-name;
      description description;
      type (log | log-and-trap | none | snmptrap);
   }
   history index {
      bucket-size number;
      interface interface-name;
      interval seconds;
      owner owner-name;
   }
}
routing-instance-access {
   access-list {
      routing-instance-name <restrict>;
   }
}
traceoptions {
   file <files number> <match regular-expression> <size maximum-file-size>
      <world-readable | no-world-readable>;
   flag flag;
   no-remote-trace;
}
trap-group group-name {
   categories {
      authentication;
      chassis;
      chassis-cluster;
      configuration;
```



```
            link;
            otn-alarms {
                alarm-name;
            }
            remote-operations;
            rmon-alarm;
            routing;
            services;
            sonet-alarms {
                alarm-name;
            }
            startup;
            vrrp-events;
        }
        destination-port port-number;
        logical-system logical-system-name {
            routing-instance instance-name;
        }
        routing-instance instance-name;
        targets {
            address;
        }
        version (all | v1 | v2);
    }
    trap-options {
        agent-address outgoing-interface;
        enterprise-oid;
        logical-system logical-system-name {
            routing-instance instance-name;
        }
        routing-instance instance-name {
            source-address (address | lo0);
        }
        source-address address;
    }
    v3 {
        ... the v3 subhierarchy appears after the main [edit snmp] hierarchy level ...
    }
    view view-name {
        oid object-identifier <exclude | include>;
    }
}

snmp {
    v3 {
        notify name {
            tag tag-name;
            type (inform | trap);
        }
        notify-filter profile-name {
            oid oid <exclude | include>;
        }
        snmp-community community-index {
            community-name community-name;
            context context-name;
            security-name security-name;
```

```
    tag tag-name;
  }
  target-address target-address-name {
    address address;
    address-mask address-mask;
    logical-system logical-system-name {
      routing-instance routing-instance-name;
    }
    port port-number;
    retry-count number;
    routing-instance routing-instance-name;
    tag-list tag-list;
    target-parameters parameter-name;
    timeout seconds;
  }
  target-parameters parameter-name {
    notify-filter profile-name;
    parameters {
      message-processing-model (v1 | v2c | v3);
      security-level (authentication | none | privacy);
      security-model (usm | v1 | v2c);
      security-name security-name;
    }
  }
  usm {
    local-engine {
      user username {
        authentication-md5 {
          authentication-password password;
        }
        authentication-none;
        authentication-sha {
          authentication-password password;
        }
        privacy-3des {
          privacy-password password;
        }
        privacy-aes128 {
          privacy-password password;
        }
        privacy-des {
          privacy-password password;
        }
        privacy-none;
      }
    }
    remote-engine engine-id {
      user username {
        authentication-md5 {
          authentication-password password;
        }
        authentication-none;
        authentication-sha {
          authentication-password password;
        }
        privacy-3des {
```



```
                privacy-password password;
              }
              privacy-aes128 {
                privacy-password password;
              }
              privacy-des {
                privacy-password password;
              }
              privacy-none;
            }
          }
        }
        vacm {
          access {
            group group-name {
              context-prefix prefix {
                security-model (any | usm | v1 | v2c) {
                  security-level (authentication | none | privacy) {
                    context-match (exact | prefix);
                    notify-view view-name;
                    read-view view-name;
                    write-view view-name;
                  }
                }
              }
              default-context-prefix prefix {
                security-model (any | usm | v1 | v2c) {
                  security-level (authentication | none | privacy) {
                    context-match (exact | prefix);
                    notify-view view-name;
                    read-view view-name;
                    write-view view-name;
                  }
                }
              }
            }
          }
          security-to-group {
            security-model (usm | v1 | v2c) {
              security-name security-name {
                group group-name;
              }
            }
          }
        }
      }
    }
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- Understanding the Integrated Local Management Interface

[edit switch-options] Hierarchy Level

```
switch-options {
   interface interface-name {
      interface-mac-limit {
         number-of-addresses;
         packet-action drop;
      }
      no-mac-learning;
   }
   interface-mac-limit {
      number-of-addresses;
      packet-action drop;
   }
   mac-statistics;
   mac-table-size {
      number-of-addresses;
      packet-action drop;
   }
   no-mac-learning;
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit system] Hierarchy Level

```
system {
  accounting {
    destination {
      radius {
        server {
          server-address {
            accounting-port port-number;
            port port-number;
            retry number;
            secret password;
            source-address address;
            timeout seconds;
          }
        }
      }
      tacplus {
        server {
          server-address {
            port port-number;
            secret password;
            single-connection;
            timeout seconds;
          }
        }
      }
    }
    events  [ change-log interactive-commands login ];
  }
  archival {
    configuration {
      archive-sites {
        ftp://<username>:<password>@<host>:<port>/<url-path>;
        scp://<username>:<password>@<host>:<port>/<url-path>;
      }
      transfer-interval interval;
      transfer-on-commit;
    }
  }
  arp {
    aging-timer minutes;
    gratuitous-arp-delay;
    gratuitous-arp-on-ifup;
    interfaces {
      logical-interface-name {
        aging-timer minutes;
      }
    }
    passive-learning;
    purging;
  }
  authentication-order [ authentication-methods ];
  auto-configuration {
```

```
    traceoptions {
      file <filename> <files number> <match regular-expression <size size>
        <world-readable | no-world-readable>;
      flag flag;
      level level;
      no-remote-trace;
    }
  }
  autoinstallation {
    configuration-servers {
      server-url <password password>;
    }
    interfaces {
      interface-name {
        bootp;
        rarp;
      }
    }
  }
  backup-router address <destination [ destination-addresses ]>;
  commit synchronize;
  (compress-configuration-files | no-compress-configuration-files);
  default-address-selection;
  diag-port-authentication (encrypted-password "password" | plain-text-password);
  domain-name domain-name;
  domain-search [ domain-list ];
  encrypt-configuration-files;
  extensions {
    ... the extensions subhierarchy appears after the main [edit system] hierarchy ...
  }
  host-name hostname;
  inet6-backup-router ipv6-address <destination address>;
  internet-options {
    (gre-path-mtu-discovery | no-gre-path-mtu-discovery);
    icmpv4-rate-limit bucket-size number packet-rate rate;
    icmpv6-rate-limit bucket-size number packet-rate rate;
    (ipip-path-mtu-discovery | no-ipip-path-mtu-discovery);
    (ipv6-path-mtu-discovery | noipv6-path-mtu-discovery);
    ipv6-path-mtu-discovery-timeout;
    no-tcp-rfc1323;
    no-tcp-rfc1323-paws;
    (path-mtu-discovery | no-path-mtu-discovery);
    source-port upper-limit port-number;
    (source-quench | no-source-quench);
    tcp-drop-synfin-set;
  }
  location {
    altitude feet;
    building name;
    country-code code;
    floor number;
    hcoord horizontal-coordinate;
    lata service-area;
    latitude degrees;
    longitude degrees;
    npa-nxx number;
```

```
    postal-code postal-code;
    rack number;
    vcoord vertical-coordinate;
  }
  login {
    announcement "text";
    class class-name {
      access-end "hh<:mm:<ss>>";
      access-start "hh<:mm:<ss>>";
      allow-commands "regular-expression";
      allow-configuration "regular-expression";
      allowed-days [ sunday monday tuesday wednesday thursday friday saturday ];
      deny-commands "regular-expression";
      deny-configuration "regular-expression";
      idle-timeout minutes;
      logical-system logical-system-name;
      login-alarms;
      login-script script-name;
      login-tip;
      permissions [ permissions ];
    }
    message "text";
    password {
      change-type (character-sets | set-transitions);
      format (des | md5 | sha1);
      maximum-length number;
      minimum-changes number;
      minimum-length number;
    }
    retry-options {
      backoff-factor number;
      backoff-threshold number;
      minimum-time number;
      tries-before-disconnect number;
    }
    user username {
      authentication {
        (encrypted-password "password" | plain-text-password);
        load-key-file filename;
        ssh-dsa "public-key" <from hostname>;
        ssh-rsa "public-key" <from hostname>;
      }
      class class-name;
      full-name "complete-name";
      uid uid-value;
    }
  }
  max-configurations-on-flash number;
  mirror-flash-on-disk;
  name-server {
    address;
  }
  no-multicast-echo;
  no-ping-record-route;
  no-ping-time-stamp;
  no-redirects;
```

```
ntp {
   authentication-key key-number type md5 value password;
   boot-server address;
   broadcast <address> <key key-number> <ttl value> <version value>;
   broadcast-client;
   multicast-client <address>;
   peer address <key key-number> <prefer> <version value>;
   server address <key key-number> <prefer> <version value>;
   source-address source-address;
   trusted-key [ key-numbers ];
}
packet-triggered-subscribers-partition {
   partition-name;
}
pic-console-authentication {
   (encrypted-password "encrypted-password" | plain-text-password);
}
ports {
   auxiliary {
      disable;
      insecure;
      type (ansi | small-xterm | vt100 | xterm);
   }
   console {
      disable;
      insecure;
      log-out-on-disconnect;
      type (ansi | small-xterm | vt100 | xterm);
   }
}
processes {
   process-name (enable | disable) failover (alternate-media | other-routing-engine);
   timeout seconds;
}
radius-options {
   attributes {
      nas-ip-address address;
   }
   password-protocol mschap-v2;
}
radius-server {
   server-address {
      accounting-port port-number;
      port port-number;
      retry number;
      secret password;
      source-address source-address;
      timeout seconds;
   }
}
root-authentication {
   (encrypted-password "password" | plain-text-password);
   load-key-file filename;
   ssh-dsa "public-key" <from hostname>;
   ssh-rsa "public-key" <from hostname>;
}
```

```
(saved-core-context | no-saved-core-context);
saved-core-files number;
scripts {
   commit {
      allow-transients;
      direct-access;
      file filename.xsl {
         checksum (md5 | sha-256 | sha1) hash;
         optional;
         refresh;
         refresh-from url;
         source url;
      }
      refresh;
      refresh-from url;
      traceoptions {
         file <filename> <files number> <size maximum-file-size> <world-readable |
            no-world-readable>;
         flag flag;
         no-remote-trace;
      }
   }
   op {
      file filename.xsl {
         arguments {
            argument-name {
               description descriptive-text;
            }
         }
         checksum (md5 | sha-256 | sha1) hash;
         command filename-alias;
         description descriptive-text;
         refresh;
         refresh-from url;
         source url;
      }
      refresh;
      refresh-from url;
      traceoptions {
         file <filename> <files number> <size maximum-file-size> <world-readable |
            no-world-readable>;
         flag flag;
         no-remote-trace;
      }
   }
}
services {
   ... the services subhierarchy appears after the main [edit system] hierarchy ...
}
static-host-mapping {
   hostname {
      alias [ aliases ];
      inet [ addresses ];
      inet6 [ addresses ];
      sysid system-identifier;
   }
```

```
    }
    syslog {
      archive <files number> <size size> <world-readable | no-world-readable>;
      console {
        facility severity;
      }
      file filename {
        facility severity;
        archive <archive-sites {ftp-url <password password>}> <files number> <size size>
          <start-time "YYYY-MM-DD.hh:mm"> <transfer-interval minutes> <world-readable |
          no-world-readable>;
        explicit-priority;
        match "regular-expression";
        structured-data;
      }
      host (hostname | other-routing-engine | scc-master) {
        facility severity;
        explicit-priority;
        facility-override facility;
        log-prefix string;
        match "regular-expression";
      }
      source-address source-address;
      time-format (year | millisecond | year millisecond);
      user (username | *) {
        facility severity;
        match "regular-expression";
      }
    }
    tacplus-options {
      (exclude-cmd-attribute | no-cmd-attribute-value);
      service-name service-name;
    }
    tacplus-server {
      server-address {
        port port-number;
        secret password;
        single-connection;
        source-address source-address;
        timeout seconds;
      }
    }
    time-zone (GMT | GMT+hour-offset | GMT-hour-offset | zone-name);
    tracing destination-override syslog host address;
    use-imported-time-zones;
  }

    system {
      extensions {
      providers {
        provider-id {
          license-type license deployment-scope [ deployments ];
        }
      }
      resource-limits {
        package package-name {
```



```
            resources {
              cpu {
                priority number;
                time seconds;
              }
              file {
                core-size bytes;
                open number;
                size bytes;
              }
              memory {
                data-size bytes;
                locked-in bytes;
                resident-set-size bytes;
                socket-buffers bytes;
                stack-size bytes;
              }
            }
          }
          process process-ui-name {
            resources {
              cpu {
                priority number;
                time seconds;
              }
              file {
                core-size bytes;
                open number;
                size bytes;
              }
              memory {
                data-size bytes;
                locked-in bytes;
                resident-set-size bytes;
                socket-buffers bytes;
                stack-size bytes;
              }
            }
          }
        }
      }
    }

    system {
      services {
        database-replication {
          traceoptions {
            file <filename> <files number> <match regular-expression>
              <size maximum-file-size> <world-readable | no-world-readable>;
            flag flag;
            no-remote-trace;
          }
        }
        dhcp {
          ... the dhcp subhierarchy appears after the main [edit system services] hierarchy ...
        }
```

```
dhcp-local-server {
   ... the dhcp-local-server subhierarchy appears after the main [edit system services]
      hierarchy ...
}
dns {
   dnssec {
      disable;
      dlv {
         domain domain-name trusted-anchor trusted-anchor;
      }
      secure-domains {
         domain-name;
      }
      trusted-keys {
         key text-string;
         load-key-file pathname;
      }
   }
   forwarders {
      ip-address;
   }
   max-cache-ttl seconds;
   max-ncache-ttl seconds;
   traceoptions {
      category category-name;
      debug-level number;
      file <filename> <files number> <size maximum-file-size> <world-readable |
         no-world-readable>;
      no-remote-trace;
   }
}
dns-proxy {
   cache {
      hostname inet address;
   }
   interface {
      interface-name;
   }
   server-select list-identifier {
      domain-name domain-name;
      name-server {
         address;
      }
   }
   traceoptions {
      file filename <files number> <match regular-expression> <size maximum-file-size>
         <world-readable | no-world-readable>;
      flag flag;
   }
}
dynamic-dns {
   client hostname {
      agent agent-name;
      interface interface-name;
      password password;
      server (ddo | dyndns);
```



```
        username server-username;
    }
}
finger {
    connection-limit limit;
    rate-limit limit;
}
flow-tap-dtcp {
    ssh {
        connection-limit limit;
        rate-limit limit;
    }
}
ftp {
    connection-limit limit;
    rate-limit limit;
}
local-policy-decision-function {
    statistics {
        aacl-statistics-profile profile-name {
            aacl-fields {
                address;
                all-fields;
                application;
                application-group;
                input-bytes;
                input-interface;
                input-packets;
                mask;
                output-bytes;
                output-packets;
                subscriber-name;
                timestamp;
                vrf-name;
            }
            file filename;
            record-mode (interim-active-only | interim-full);
            report-interval minutes;
        }
        file filename {
            archive-sites {
                url;
            }
            files number;
            size bytes;
            transfer-interval minutes;
        }
        record-type (data | interim);
    }
    traceoptions {
        file <filename> <files number> <match regular-expression>
            <size maximum-file-size> <world-readable | no-world-readable>;
        flag flag;
        no-remote-trace;
    }
}
```

```
netconf {
   ssh {
      connection-limit limit;
      rate-limit limit;
   }
}
outbound-ssh {
   client client-id {
      address {
         port port-number;
         retry number;
         timeout seconds;
      }
      device-id device-id;
      keep-alive {
         retry number;
         timeout seconds;
      }
      reconnect-strategy (in-order | sticky);
      secret secret;
      services netconf;
   }
   traceoptions {
      file <filename> <files number> <match regular-expression>
         <size maximum-file-size> <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
   }
}
packet-triggered-subscribers {
   partition partition-name {
      destination-host hostname;
      destination-realm realm;
      diameter-instance instance-name;
   }
   traceoptions {
      file <filename> <files number> <match regular-expression>
         <size maximum-file-size> <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
   }
}
service-deployment {
   local-certificate certificate-name;
   servers {
      server-address {
         port port-number;
         security-options {
            (ssl3 | tls);
         }
         user username;
      }
   }
   source-address source-address;
   traceoptions {
      flag flag;
```



```
    }
  }
  ssh {
    connection-limit limit;
    protocol-version [ v1 v2 ];
    rate-limit limit;
    root-login (allow | deny | deny-password);
  }
  static-subscribers {
    access-profile profile-name;
    authentication {
      password password-string;
      username-include {
        domain-name domain-name;
        interface;
        logical-system-name;
        routing-instance-name;
        user-prefix user-prefix-string;
      }
    }
    dynamic-profile profile-name {
      access-profile (merge | replace);
    }
    group group-name {
      access-profile profile-name;
      authentication {
        password password-string;
        username-include {
          domain-name domain-name;
          interface;
          logical-system-name;
          routing-instance-name;
          user-prefix user-prefix-string;
        }
      }
      dynamic-profile profile-name {
        aggregate-clients (merge | replace);
      }
      interface interface-name <exclude> <upto upto-interface-name>;
    }
    traceoptions {
      file filename <files number> <match regular-expression > <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      level (all | error | info | notice | verbose | warning);
      no-remote-trace;
    }
  }
  subscriber-management {
    maintain-subscriber {
      interface-delete;
    }
    traceoptions {
      file <filename> <files number> <match regular-expression > <size
        maximum-file-size> <world-readable | no-world-readable>;
      flag flag;
```

```
        no-remote-trace;
      }
    }
    telnet {
      connection-limit limit;
      rate-limit limit;
    }
    web-management {
      control {
        max-threads number;
      }
      http {
        interface [ interface-names ];
        port port-number;
      }
      https {
        interface [ interface-names ];
        (local-certificate certificate-name | pki-local-certificate certificate-name |
          system-generated-certificate);
        port port-number;
      }
      session {
        idle-timeout minutes;
        session-limit number;
      }
    }
    xnm-clear-text {
      connection-limit limit;
      rate-limit limit;
    }
    xnm-ssl {
      connection-limit limit;
      local-certificate certificate-name;
      rate-limit limit;
    }
  }

  services {
    dhcp {
      boot-file filename;
      boot-server (address | hostname);
      default-lease-time (seconds | infinite);
      domain-name domain-name;
      domain-search {
        domain-suffix;
      }
      maximum-lease-time (seconds | infinite);
      name-server {
        address;
      }
      next-server address;
      option option-index (array type-name [ type-values ] | byte 8-bit-value | flag (false |
        off | on | true) | integer signed-32-bit-value | ip-address address |
        short signed-16-bit-value | string text-string | unsigned-integer 32-bit-value |
        unsigned-short 16-bit-value);
      pool ip-prefix/prefix-length {
```



```
        ... the pool subhierarchy appears after the main [edit system services dhcp] hierarchy
            ...
    }
    propagate-settings interface-name;
    router {
        address;
    }
    server-identifier identifier;
    static-binding {
        ... the static-binding subhierarchy appears after the main [edit system services dhcp]
            hierarchy ...
    }
    traceoptions {
        file <filename> <files number> <match regular-expression>
            <size maximum-file-size> <world-readable | no-world-readable>;
        flag flag;
        level severity;
        no-remote-trace;
    }
    wins-server {
        address;
    }
}

dhcp {
    pool ip-prefix/prefix-length {
        address-range low address high address;
        boot-file filename;
        boot-server (address | hostname);
        default-lease-time (seconds | infinite);
        domain-name domain-name;
        domain-search {
            domain-suffix;
        }
        exclude-address {
            ipv4-address;
        }
        maximum-lease-time (seconds | infinite);
        name-server {
            address;
        }
        next-server address;
        option option-index (array type-name  type-values ] | byte 8-bit-value | flag (false |
            off | on | true) | integer signed-32-bit-value | ip-address address |
            short signed-16-bit-value | string text-string | unsigned-integer 32-bit-value |
            unsigned-short 16-bit-value);
        propagate-settings interface-name;
        router {
            address;
        }
        server-identifier identifier;
        wins-server {
            address;
        }
    }
}
```

```
    dhcp {
      static-binding mac-address {
        boot-file filename;
        boot-server (address | hostname);
        client-identifier (ascii ascii-text | hexadecimal hexadecimal-value);
        domain-name domain-name;
        domain-search {
          domain-suffix;
        }
        fixed-address {
          ipv4-address;
        }
        host-name hostname;
        name-server {
          address;
        }
        next-server address;
        option option-index (array type-name  type-values ] | byte 8-bit-value | flag (false |
          off | on | true) | integer signed-32-bit-value | ip-address address |
          short signed-16-bit-value | string text-string | unsigned-integer 32-bit-value |
          unsigned-short 16-bit-value);
        router {
          address;
        }
        server-identifier identifier;
        wins-server {
          address;
        }
      }
    }
  }

  services {
    dhcp-local-server {
      authentication {
        password password;
        username-include {
          circuit-type;
          delimiter delimiter-character;
          domain-name domain-name;
          logical-system-name;
          mac-address;
          option-60;
          option-82 <circuit-id> <remote-id>;
          routing-instance-name;
          user-prefix user-prefix;
        }
      }
      dhcpv6 {
        ... the dhcpv6 subhierarchy appears after the main [edit system services
          dhcp-local-server] hierarchy ...
      }
      duplicate-clients-on-interface;
      dynamic-profile (profile-name | junos-default-profile) <aggregate-clients <merge |
        replace> | use-primary primary-profile-name>;
```



```
forward-snooped-clients (all-interfaces | configured-interfaces |
   non-configured-interfaces);
group group-name {
   authentication {
      ... same statements as at the [edit system services dhcp-local-server
         authentication] hierarchy level ...
   }
   dynamic-profile (profile-name | junos-default-profile) <aggregate-clients <merge |
      replace> | use-primary primary-profile-name>;
   interface interface-name {
      exclude;
      overrides {
         ... same statements as at the [edit system services dhcp-local-server overrides]
            hierarchy level ...
      }
      trace;
      upto upto-interface-name;
   }
   overrides {
      ... same statements as at the [edit system services dhcp-local-server overrides]
         hierarchy level ...
   }
   reconfigure {
      ... same statements as at the [edit system services dhcp-local-server reconfigure]
         hierarchy level ...
   }
}
interface-traceoptions {
   file <filename> <files number> <match regular-expression> <size size>
      <world-readable | no-world-readable>;
   flag flag;
   no-remote-trace;
}
overrides {
   client-discover-match <option60-and-option82>;
   interface-client-limit number;
   no-arp;
}
pool-match-order {
   external-authority;
   ip-address-first;
   option-82;
}
reconfigure {
   attempts attempt-count;
   clear-on-abort;
   strict;
   timeout timeout-value;
   token token-value;
   trigger {
      radius-disconnect;
   }
}
traceoptions {
   file <filename> <files number> <match regular-expression>
      <size maximum-file-size> <world-readable | no-world-readable>;
```

```
        flag flag;
        no-remote-trace;
      }
    }

    dhcp-local-server {
      dhcpv6 {
        authentication {
          password password-string;
          username-include {
            circuit-type;
            client-id;
            delimiter delimiter-character;
            domain-name domain-name-string;
            logical-system-name;
            relay-agent-interface-id;
            relay-agent-remote-id;
            relay-agent-subscriber-id;
            routing-instance-name;
            user-prefix user-prefix-string;
          }
        }
        dynamic-profile (profile-name | junos-default-profile) <aggregate-clients <merge |
          replace> | use-primary primary-profile-name>;
        group group-name {
          authentication {
            ... same statements as at the [edit system services dhcp-local-server dhcpv6
              authentication] hierarchy level ...
          }
          dynamic-profile (profile-name | junos-default-profile)
            <aggregate-clients <merge | replace> | use-primary primary-profile-name>;
          interface interface-name {
            exclude;
            overrides {
              interface-client-limit number;
            }
            trace;
            upto interface-name;
          }
        }
        overrides {
          interface-client-limit number;
        }
        reconfigure {
          attempts attempt-count;
          clear-on-abort;
          strict;
          timeout timeout-value;
          token token-value;
          trigger {
            radius-disconnect;
          }
        }
      }
    }
  }
```



```
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit virtual-chassis] Hierarchy Level

```
virtual-chassis {
   auto-sw-update {
      package-name filename;
   }
   fast-failover {
      ge;
      vcp {
         disable;
      }
      xe;
   }
   id id;
   mac-persistence-timer {
      minutes;
   }
   member member-id {
      mastership-priority number;
      no-management-vlan;
      role (line-card | routing-engine);
      serial-number number;
   }
   no-split-detection;
   preprovisioned;
   traceoptions {
      file filename <files number> <no-stamp> <replace> <size maximum-file-size>
         <world-readable | no-world-readable>;
      flag flag <disable>;
   }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit vlans] Hierarchy Level

```
vlans {
  vlan-name {
    description text-description;
    dot1q-tunneling {
      customer-vlans [ native vlan-ids vlan-id-ranges ];
      layer2-protocol-tunneling {
        (802.1x | 802.3ah | all | cdp | e-lmi | gvrp | lacp | lldp | mmrp | mvrp | stp | vstp | vtp)
          {
          drop-threshold number;
          shutdown-threshold number;
        }
      }
    }
    filter {
      input filter-name;
      output filter-name;
    }
    interface {
      interface-name {
        (egress | ingress);
        mapping {
          native {
            (push | swap);
          }
          policy;
          rule-name {
            (push | swap);
          }
        }
      }
    }
    l3-interface vlan.logical-interface-number;
    mac-limit number;
    mac-table-aging-time seconds;
    no-local-switching;
    no-mac-learning;
    primary-vlan vlan-id;
    vlan-id vlan-tag;
    vlan-range lower-vlan-id–higher-vlan-id;
  }
  traceoptions {
    flag flag <disable>;
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

CHAPTER 14

[edit wlan] Hierarchy Levels

[edit wlan] Hierarchy Level

Each of the following topics lists the statements at a subhierarchy of the **[edit wlan]** hierarchy.

- [edit wlan access-point] Hierarchy Level on page 374
- [edit wlan cluster] Hierarchy Level on page 379

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6

[edit wlan access-point] Hierarchy Level

Several statements in the **[edit wlan access-point]** hierarchy are valid at numerous locations within it. To make the complete hierarchy easier to read, the repeated statements are listed in "Common WLAN Access Point Queue Options" on page 374 and "Common WLAN Station Queue Options" on page 374. Those sections are referenced at the appropriate locations in "Complete [edit wlan access-point] Hierarchy" on page 375.

Common WLAN Access Point Queue Options

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Complete [edit wlan access-point] Hierarchy" on page 375 instead of the statements being repeated.

- **[edit wlan access-point *name* radio (1 | 2) quality-of-service access-point-queues background-queue]**
- **[edit wlan access-point *name* radio (1 | 2) quality-of-service access-point-queues best-effort-queue]**
- **[edit wlan access-point *name* radio (1 | 2) quality-of-service access-point-queues video-queue]**
- **[edit wlan access-point *name* radio (1 | 2) quality-of-service access-point-queues voice-queue]**

The common WLAN access point queue options are as follows:

```
arbitration-inter-frame-space slots;
maximum-burst microseconds;
maximum-contention-window {
   (1 | 3 | 7 | 15 | 31 | 63 | 127 | 255 | 511 | 1023);
}
minimum-contention-window {
   (1 | 3 | 7 | 15 | 31 | 63 | 127 | 255 | 511 | 1023);
}
```

Common WLAN Station Queue Options

This section lists statements that are valid at the following hierarchy levels, and is referenced at those levels in "Complete [edit wlan access-point] Hierarchy" on page 375 instead of the statements being repeated.

- **[edit wlan access-point *name* radio (1 | 2) quality-of-service station-queues background-queue]**
- **[edit wlan access-point *name* radio (1 | 2) quality-of-service station-queues best-effort-queue]**
- **[edit wlan access-point *name* radio (1 | 2) quality-of-service station-queues video-queue]**
- **[edit wlan access-point *name* radio (1 | 2) quality-of-service station-queues voice-queue]**

The common WLAN station queue options are as follows:

```
arbitration-inter-frame-space slots;
```



```
maximum-contention-window {
   (1 | 3 | 7 | 15 | 31 | 63 | 127 | 255 | 511 | 1023);
}
minimum-contention-window {
   (1 | 3 | 7 | 15 | 31 | 63 | 127 | 255 | 511 | 1023);
}
transmit-opportunity-limit ms;
```

Complete [edit wlan access-point] Hierarchy

```
wlan {
  access-point name {
    access-point-options {
      country {
        country-code;
      }
      station-mac-filter {
        (allow-list | deny-list) {
          mac-address [ addresses ];
        }
      }
    }
    cluster {
      cluster-name;
    }
    description description;
    external {
      dot1x-supplicant {
        password password;
        username username;
      }
      system {
        console {
          baud-rate (9600 | 19200 | 38400 | 57600 | 115200);
        }
        ntp-server name;
        ports {
          ethernet {
            management-vlan vlan-id;
            name-server [ ip-addresses ];
            static {
              address ip-prefix</prefix-length>;
              default-gateway ip-address;
            }
            untagged-vlan vlan-id;
          }
        }
      }
    }
    location location;
    mac-address mac-address;
    radio (1 | 2) {
      quality-of-service {
        access-point-queues {
          background-queue {
            ... statements in Common WLAN Access Point Queue Options on page 374 ...
          }
```

```
        best-effort-queue {
            ... statements in Common WLAN Access Point Queue Options on page 374 ...
        }
        video-queue {
            ... statements in Common WLAN Access Point Queue Options on page 374 ...
        }
        voice-queue {
            ... statements in Common WLAN Access Point Queue Options on page 374 ...
        }
    }
    no-acknowledgement;
    no-auto-power-save;
    no-wifi-multimedia;
    station-queues {
        background-queue {
            ... statements in Common WLAN Station Queue Options on page 374 ...
        }
        best-effort-queue {
            ... statements in Common WLAN Station Queue Options on page 374 ...
        }
        video-queue {
            ... statements in Common WLAN Station Queue Options on page 374 ...
        }
        voice-queue {
            ... statements in Common WLAN Station Queue Options on page 374 ...
        }
    }
}
radio-options {
    beacon-interval ms;
    broadcast-multicast-rate-limit {
        rate-limit packets-per-second;
        rate-limit-bursts packets-per-second;
    }
    channel {
        bandwidth (20 | 40);
        number (auto | channel-number);
        primary (lower | upper);
    }
    dfs-off;
    disable-dot11d;
    dtim-period beacons;
    fixed-multicast-rate (auto | 1 | 2 | 5.5 | 6 | 9 | 11 | 12 | 18 | 24 | 36 | 48 | 54);
    fragmentation-threshold size;
    maximum-stations number;
    mode (2.4GHz | 5GHz | a | an | bg | bgn);
    no-short-guard-interval;
    protection (auto | off);
    radio-off;
    rts-threshold size;
    space-time-block-coding;
    transmit-power percent;
    transmit-rate-sets {
        supported-basic-rates rate;
        supported-rates rate;
    }
```



```
}
virtual-access-point id {
   description description;
   http-redirect {
      redirect-url url;
   }
   no-broadcast-ssid;
   security {
      ... the security subhierarchy appears after the main [edit wlan access-point name
         radio (1 | 2) virtual-access-point id] hierarchy level ...
   }
   ssid ssid;
   vlan vlan-id;
}

virtual-access-point id {
   security {
      dot1x {
         broadcast-key-refresh-rate minutes;
         radius-key key;
         radius-server ip-address;
         session-key-refresh-rate minutes;
      }
      mac-authentication-type (disabled | local | radius);
      none;
      static-wep {
         authentication-type (both | open | shared);
         key-length (64bits | 128bits);
         key-type (ascii | hex);
         transfer-key-index id;
         wep-key-1 key;
         wep-key-2 key;
         wep-key-3 key;
         wep-key-4 key;
      }
      wpa-enterprise {
         cipher-suites {
            (both | ccmp | tkip);
         }
         pre-authenticate;
         radius {
            broadcast-key-refresh-rate minutes;
            radius-key key;
            radius-server ip-address;
            session-key-refresh-rate minutes;
         }
         wpa-version {
            (both | v1 | v2);
         }
      }
      wpa-personal {
         broadcast-key-refresh-rate minutes;
         cipher-suites {
            (both | ccmp | tkip);
         }
         key key;
```

```
                wpa-version {
                    (both | v1 | v2);
                }
            }
        }
    }
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit wlan] Hierarchy Level on page 373

[edit wlan cluster] Hierarchy Level

```
wlan {
  cluster cluster-name {
    access-point-options {
      country {
        country-code;
      }
      station-mac-filter {
        (allow-list | deny-list) {
          mac-address [ addresses ];
        }
      }
    }
    channel-management;
    name cluster-name;
    radio (1 | 2) {
      ... same statements as at the [edit wlan access-point name radio (1 | 2)] hierarchy
        level in [edit wlan access-point] Hierarchy Level on page 374 ...
    }
    system {
      ntp-server hostname;
    }
  }
}
```

Related Documentation

- Notational Conventions Used in Junos OS Configuration Hierarchies on page 6
- [edit wlan] Hierarchy Level on page 373

PART 4

Index

Index