Junos® OS

CLI User Guide

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Junos® OS CLI User Guide

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Table of Contents

About the Documentation xvii
Documentation and Release Notes xvii
Using the Examples in This Manual xvii
Merging a Full Example xviii
Merging a Snippet xviii
Documentation Conventions xix
Documentation Feedback xxi
Requesting Technical Support xxi
Self-Help Online Tools and Resources xxii
Opening a Case with JTAC xxii

Chapter 1 **Overview 23**

CLI Overview 23
Introducing the Junos OS Command-Line Interface 23
Key Features of the CLI 24
Understanding the Junos OS CLI Modes, Commands, and Statement Hierarchies 25
Junos OS CLI Command Modes 25
CLI Command Hierarchy 26
Configuration Statement Hierarchy 26
Moving Among Hierarchy Levels 27
Other Tools to Configure and Monitor Devices Running Junos OS 28
Configuring Junos OS in a FIPS Environment 28

Chapter 2 **Getting Started 31**

Getting Started: A Quick Tour of the CLI 31
Getting Started with the Junos OS Command-Line Interface 31
Switching Between Junos OS CLI Operational and Configuration Modes . . . 33
Using Keyboard Sequences to Move Around and Edit the Junos OS CLI 35
Configuring a User Account on a Device Running Junos OS 37
Using the CLI Editor in Configuration Mode 39
Checking the Status of a Device Running Junos OS 41
Rolling Back Junos OS Configuration Changes 43
Configuring a Routing Protocol 44
Shortcut 45
Longer Configuration 45
Making Changes to a Routing Protocol Configuration 48
Online Help in the CLI 51
Getting Online Help from the Junos OS Command-Line Interface 51
Getting Help About Commands 51
Getting Help About a String in a Statement or Command 52

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Getting Help About Configuration Statements 53
Getting Help About System Log Messages 53
Junos OS CLI Online Help Features 54
Help for Omitted Statements 54
Using CLI Command Completion 54
Using Command Completion in Configuration Mode 55
Displaying Tips About CLI Commands 55
CLI Explorer Overview 56
CLI Environment Settings 56
Controlling the Junos OS CLI Environment 57
Setting the Terminal Type 57
Setting the CLI Prompt 58
Setting the CLI Directory 58
Setting the CLI Timestamp 58
Setting the Idle Timeout 58
Setting the CLI to Prompt After a Software Upgrade 58
Setting Command Completion 58
Displaying CLI Settings 59
Setting the Junos OS CLI Screen Length and Width 59
Setting the Screen Length 59
Setting the Screen Width 59
Example: Controlling the CLI Environment 60
Example: Enabling Configuration Breadcrumbs 66

Chapter 3 Using Configuration Statements to Configure a Device 69

CLI Configuration Mode Overview 69
Understanding Junos OS CLI Configuration Mode 69
Configuration Mode Commands 71
Configuration Statements and Identifiers 72
Configuration Statement Hierarchy 74
Entering and Exiting the Junos OS CLI Configuration Mode 76
Issuing Relative Junos OS Configuration Mode Commands 78
Examples: Using Command Completion in Configuration Mode 79
Notational Conventions Used in Junos OS Configuration Hierarchies 81
Configure Command Overview 82
Forms of the configure Command 82
Using the configure Command 84
Using the configure exclusive Command 84
Updating the configure private Configuration 86
Modifying the Configuration for a Device 87
Displaying Users Currently Editing the Junos OS Configuration 87
Modifying the Junos OS Configuration 88
Adding Junos OS Configuration Statements and Identifiers 89
Deleting a Statement from a Junos OS Configuration 90
Example: Deleting a Statement from the Junos OS Configuration 91
Copying a Junos OS Statement in the Configuration 92
Example: Copying a Statement in the Junos Configuration 93
Examples: Re-Using Configuration 95
Inserting a New Identifier in a Junos OS Configuration 100

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Example: Inserting a New Identifier in a Junos Configuration 101
Renaming an Identifier in a Junos OS Configuration 104
Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration 105
Example: Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration 105
Using Global Replace in the Junos OS Configuration 107
Common Regular Expressions to Use with the replace Command 108
Example: Using Global Replace in a Junos OS Configuration—Using the \n Back Reference 109
Example: Using Global Replace in a Junos OS Configuration—Replacing an Interface Name 111
Example: Using Global Replace in a Junos OS Configuration—Using the upto Option 113
Using Regular Expressions to Delete Related Items from a Junos OS Configuration 114
Adding Comments in a Junos OS Configuration 116
Adding Comments in the CLI 116
Adding Comments in a File 117
Example: Including Comments in a Junos OS Configuration by Using the CLI 118
Using Configuration Groups to Quickly Configure Devices 120
Understanding Junos OS Configuration Groups 121
Configuration Groups Overview 121
Inheritance Model 122
Configuring Configuration Groups 122
Creating a Junos OS Configuration Group 122
Applying a Junos OS Configuration Group 124
Example: Creating and Applying Junos OS Configuration Groups 125
Example: Creating and Applying Configuration Groups on a TX Matrix Router 126
Disabling Inheritance of a Junos OS Configuration Group 127
Using the junos-defaults Configuration Group 129
Using Wildcards with Configuration Groups 130
Improving Commit Time When Using Configuration Groups 133
Example: Configuring Sets of Statements with Configuration Groups 133
Example: Configuring Interfaces Using Configuration Groups 134
Example: Configuring a Consistent IP Address for the Management Interface Using Configuration Groups 137
Example: Configuring Peer Entities Using Configuration Groups 138
Example: Establishing Regional Configurations Using Configuration Groups 140
Example: Configuring Wildcard Configuration Group Names 141
Example: Referencing the Preset Statement From the Junos OS defaults Group 142
Example: Viewing Default Statements That Have Been Applied to the Configuration 143
Setting Up Routing Engine Configuration Groups 144

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Using Conditions to Apply Configuration Groups . . . 146
Example: Configuring Conditions for Applying Configuration Groups . . . 146
Viewing the Configuration . . . 149
Displaying the Current Junos OS Configuration . . . 149
Example: Displaying the Current Junos OS Configuration . . . 150
Displaying Additional Information About the Junos OS Configuration . . . 151
Displaying set Commands from the Junos OS Configuration . . . 154
Example: Displaying set Commands from the Configuration . . . 154
Example: Displaying Required set Commands at the Current Hierarchy Level . . . 155
Example: Displaying set Commands with the match Option . . . 155
Verifying the Junos OS Configuration . . . 156
Committing a Configuration . . . 157
Junos OS Commit Model for Configurations . . . 157
Committing a Junos OS Configuration and Exiting Configuration Mode . . . 158
Committing a Junos OS Configuration . . . 158
Commit Operation When Multiple Users Configure the Software . . . 161
Commit Preparation and Activation Overview . . . 162
Committing Junos OS Configurations in Two Steps: Preparation and Activation . . . 163
Activating a Junos OS Configuration but Requiring Confirmation . . . 165
Scheduling a Junos OS Commit Operation . . . 166
Monitoring the Junos OS Commit Process . . . 167
Adding a Comment to Describe the Committed Configuration . . . 168
Junos OS Batch Commits Overview . . . 169
Aggregation and Error Handling . . . 169
Example: Configuring Batch Commit Server Properties . . . 170
Backing Up the Committed Configuration on the Alternate Boot Drive . . . 178

Chapter 4 Managing Configurations . . . 181

Configuration Files Overview . . . 181
Understanding Configuration Files . . . 181
Configuration File Terms . . . 182
Understanding How the Junos OS Configuration Is Stored . . . 182
Managing Configurations . . . 183
Understanding the show | compare | display xml Command Output . . . 184
Adding a Statement (create Operation) . . . 185
Deleting a Statement (delete Operation) . . . 185
Changing a Statement (delete and create Operations) . . . 186
Changing Metadata (inactive Attribute and Operation) . . . 187
Adding an Annotation (comment Tag and create Operation) . . . 188
Changing an Annotation (comment Tag, and delete and create Operations) . . . 189
Adding a Statement Inside a Container (create Operation, and insert and key Attributes) . . . 189

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Changing the Order Inside a Container (merge Operation, and insert and key Attributes) . . . 190
Returning to the Most Recently Committed Junos OS Configuration . . . 191
Returning to a Previously Committed Junos OS Configuration . . . 191
Returning to a Configuration Prior to the One Most Recently Committed . . . 191
Displaying Previous Configurations . . . 192
Comparing Configuration Changes with a Prior Version . . . 193
Saving a Configuration to a File . . . 194
Compressing the Current Configuration File . . . 195
Freeing Up System Storage Space . . . 197
Understanding Automatic Refreshing of Scripts on EX Series Switches . . . 198
Cleaning Up Files with the CLI . . . 198
Autoinstallation of Configuration Files . . . 200
Understanding Autoinstallation of Configuration Files . . . 200
Typical Uses for Autoinstallation . . . 200
Autoinstallation Configuration Files and IP Addresses . . . 201
Typical Autoinstallation Process on a New Switch . . . 201
Configuring Autoinstallation of Configuration Files (CLI Procedure) . . . 203
Loading Configuration Files . . . 205
Loading a Configuration from a File or the Terminal . . . 206
Understanding Character Encoding on Devices Running Junos OS . . . 208
Additional Details About Specifying Junos OS Statements and Identifiers . . . 210
Specifying Statements . . . 210
Performing CLI Type Checking . . . 212
Examples: Loading a Configuration from a File . . . 213
Uploading a Configuration File . . . 215
Backing Up Configurations to an Archive Site . . . 217
Configuring the Transfer of the Currently Active Configuration to an Archive Site . . . 217
Configuring the Periodic Transfer of the Active Configuration to an Archive Site . . . 218
Configuring the Transfer of the Currently Active Configuration When a Configuration Is Committed . . . 218
Configuring Archive Sites for the Transfer of Active Configuration Files . . . 218
Factory Default Configuration . . . 219
Reverting to the Default Factory Configuration . . . 219
Reverting to the Default Factory Configuration for the EX Series Switch . . . 220
Reverting to the Factory-Default Configuration by Using the LCD Panel . . . 221
Reverting to the Factory-Default Configuration by Using the request system zeroize Command . . . 222
Reverting to the Factory-Default Configuration by Using the load factory-default Command . . . 222
Reverting to the Factory-Default Configuration by Using the Factory Reset/Mode button on EX2300 and EX3400 Switches . . . 223

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Rescue Configuration 224
Creating and Returning to a Rescue Configuration 224
Reverting to the Rescue Configuration 225
Reverting to the Rescue Configuration for the EX Series Switch 226
Setting or Deleting the Rescue Configuration 226
Encrypting and Decrypting Configuration Files 227
Encrypting Configuration Files 227
Decrypting Configuration Files 229
Modifying the Encryption Key 229
Example: Protecting the Junos OS Configuration from Modification or Deletion 230
Synchronizing Configurations Across Routing Engines 238
Synchronizing Routing Engines 238
Configuring Multiple Routing Engines to Synchronize Committed Configurations Automatically 242

Chapter 5 Using Operational Commands to Monitor a Device 245

CLI Operational Mode Overview 245
Overview of Junos OS CLI Operational Mode Commands 245
CLI Command Categories 245
Commonly Used Operational Mode Commands 247
Junos OS Operational Mode Commands That Combine Other Commands 248
Understanding the brief, detail, extensive, and terse Options of Junos OS Operational Commands 249
Interface Naming Conventions Used in the Junos OS Operational Commands 250
Physical Part of an Interface Name 250
Logical Part of an Interface Name 250
Channel Identifier Part of an Interface Name 250
Using Wildcard Characters in Interface Names 251
Using Operational Commands to Monitor a Device 252
Examples: Using the Junos OS CLI Command Completion 252
Controlling the Scope of an Operational Mode Command 253
Operational Mode Commands on a TX Matrix Router or TX Matrix Plus Router 254
Examples of Routing Matrix Command Options 254
Monitoring Who Uses the Junos OS CLI 256
Viewing Files and Directories on a Device Running Junos OS 257
Directories on the Router or Switch 257
Listing Files and Directories 258
Specifying Filenames and URLs 260
Displaying Junos OS Information 261
Managing Programs and Processes Using Junos OS Operational Mode Commands 263
Showing Software Processes 263
Restarting the Junos OS Process 265
Stopping Junos OS 266

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Rebooting Junos OS . . . 267
Using the Junos OS CLI Comment Character # for Operational Mode Commands . . . 268
Example: Using Comments in Junos OS Operational Mode Commands . . . 268
Displaying the Junos OS CLI Command and Word History . . . 269
Filtering Operational Command Output . . . 270
Using the Pipe (|) Symbol to Filter Junos OS Command Output . . . 270
Using Regular Expressions with the Pipe (|) Symbol to Filter Junos OS Command Output . . . 271
Pipe (|) Filter Functions in the Junos OS Command-Line Interface . . . 272
Comparing Configurations and Displaying the Differences in Text . . . 272
Comparing Configurations and Displaying the Differences in XML . . . 274
Counting the Number of Lines of Output . . . 275
Displaying Output in XML Tag Format . . . 275
Displaying Static Configuration Data . . . 275
Displaying Ephemeral Configuration Data . . . 276
Displaying Output in JSON Format . . . 276
Displaying the Configuration with YANG Translation Scripts Applied . . . 277
Displaying the RPC Tags for a Command . . . 279
Ignoring Output That Does Not Match a Regular Expression . . . 279
Displaying Output from the First Match of a Regular Expression . . . 279
Retaining Output After the Last Screen . . . 280
Displaying Output Beginning with the Last Entries . . . 280
Displaying Output That Matches a Regular Expression . . . 281
Preventing Output from Being Paginated . . . 281
Sending Command Output to Other Users . . . 281
Resolving IP Addresses . . . 282
Saving Output to a File . . . 282
Appending Output to a File . . . 282
Displaying Output on Screen and Writing to a File . . . 283
Trimming Output by Specifying the Starting Column . . . 283
Refreshing the Output of a Command . . . 283
Filtering Operational Mode Command Output in a QFabric System . . . 284

Chapter 6 Junos OS Configuration Statements and Commands . . . 287

activate . . . 289
annotate . . . 290
apply-groups . . . 291
apply-groups-except . . . 291
archival . . . 292
archive-sites (Configuration File) . . . 293
autoinstallation . . . 295
clear system commit prepared . . . 296
commit . . . 297
commit activate . . . 302
commit prepare . . . 303
commit-interval (Batch Commits) . . . 304
configuration . . . 305
configuration-breadcrumbs . . . 306

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configuration-servers . . . 307
copy . . . 308
days-to-keep-error-logs (Batch Commits) . . . 308
deactivate . . . 309
delete . . . 310
edit . . . 311
exit . . . 312
export-format . . . 313
groups . . . 315
help . . . 317
insert . . . 318
load . . . 319
maximum-aggregate-pool (Batch Commits) . . . 321
maximum-entries (Batch Commits) . . . 322
no-hidden-commands . . . 322
protect . . . 323
quit . . . 324
rename . . . 325
replace . . . 326
rollback . . . 327
run . . . 328
save . . . 329
server (Batch Commits) . . . 331
set . . . 333
show . . . 334
show configuration . . . 335
show | display inheritance . . . 338
show | display omit . . . 339
show | display set . . . 340
show | display set relative . . . 341
show groups junos-defaults . . . 342
status . . . 343
synchronize . . . 345
top . . . 347
traceoptions (Batch Commits) . . . 348
transfer-interval (Configuration) . . . 349
transfer-on-commit . . . 350
unprotect . . . 351
up . . . 352
update . . . 353
when . . . 354
wildcard delete . . . 356

Chapter 7 Junos OS CLI Environment Commands . . . 357

set cli complete-on-space . . . 358
set cli directory . . . 359
set cli idle-timeout . . . 360
set cli prompt . . . 361
set cli restart-on-upgrade . . . 362

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set cli screen-length . . . 363
set cli screen-width . . . 364
set cli terminal . . . 365
set cli timestamp . . . 366
set date . . . 367
show cli . . . 368
show cli . . . 370
show cli authorization . . . 371
show cli directory . . . 373
show cli history . . . 374

Chapter 8 Junos OS CLI Operational Mode Commands . . . 375

clear log . . . 377
clear system commit . . . 379
configure . . . 380
file . . . 382
file archive . . . 383
file checksum md5 . . . 385
file checksum sha1 . . . 386
file checksum sha-256 . . . 387
file compare . . . 388
file delete . . . 392
file list . . . 394
file rename . . . 396
file show . . . 398
help . . . 400
| (pipe) . . . 401
request . . . 405
request system commit server pause . . . 407
request system commit server queue cleanup . . . 408
request system commit server start . . . 410
request system configuration rescue delete . . . 411
request system configuration rescue save . . . 412
restart . . . 413
set . . . 424
show system commit . . . 425
show system commit server queue . . . 428
show system commit server status . . . 432
show system configuration archival . . . 433
show system configuration rescue . . . 434
show system rollback . . . 436
test configuration . . . 438

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List of Figures

Chapter 1 Overview 23

Figure 1: Monitoring and Configuring Routers 24
Figure 2: Committing a Configuration 26
Figure 3: Configuration Statement Hierarchy Example 27

Chapter 3 Using Configuration Statements to Configure a Device 69

Figure 4: Configuration Mode Hierarchy of Statements 75
Figure 5: Replacement by Object 113
Figure 6: Confirm a Configuration 166

Chapter 4 Managing Configurations 181

Figure 7: Overriding the Current Configuration 213
Figure 8: Using the replace Option 213
Figure 9: Using the merge Option 214
Figure 10: Using a Patch File 214
Figure 11: Using the set Option 215
Figure 12: EX Series Switch LCD Panel 221

Chapter 5 Using Operational Commands to Monitor a Device 245

Figure 13: Commands That Combine Other Commands 248
Figure 14: Command Output Options 249
Figure 15: Restarting a Process 266

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List of Tables

About the Documentation xvii

Table 1: Notice Icons xix
Table 2: Text and Syntax Conventions xx

Chapter 1 Overview 23

Table 3: CLI Configuration Mode Navigation Commands 27

Chapter 2 Getting Started 31

Table 4: CLI Keyboard Sequences 35

Chapter 3 Using Configuration Statements to Configure a Device 69

Table 5: Summary of Configuration Mode Commands 71
Table 6: Configuration Mode Top-Level Statements 73
Table 7: Forms of the configure Command 83
Table 8: Common Regular Expressions to Use with the replace Command 108
Table 9: Replacement Examples 109

Chapter 4 Managing Configurations 181

Table 10: Configuration File Terms 182
Table 11: CLI Configuration Input Types 212
Table 12: Options for the load Command 216
Table 13: request system set-encryption-key Commands 227

Chapter 5 Using Operational Commands to Monitor a Device 245

Table 14: Commonly Used Operational Mode Commands 247
Table 15: Wildcard Characters for Specifying Interface Names 251
Table 16: Directories on the Router 257
Table 17: show system process extensive Command Output Fields 265
Table 18: Common Regular Expression Operators in Operational Mode Commands 271

Chapter 7 Junos OS CLI Environment Commands 357

Table 19: show cli Output Fields 368

Chapter 8 Junos OS CLI Operational Mode Commands 375

Table 20: show system commit Output Fields 426

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About the Documentation

- Documentation and Release Notes on page xvii
- Using the Examples in This Manual on page xvii
- Documentation Conventions on page xix
- Documentation Feedback on page xxi
- Requesting Technical Support on page xxi

Documentation and Release Notes

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

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Using the Examples in This Manual

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

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

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Merging a Full Example

To merge a full example, follow these steps:

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

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

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

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

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

Merging a Snippet

To merge a snippet, follow these steps:

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

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

   ```
   commit {
     file ex-script-snippet.xsl; }
   ```


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2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

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

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

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

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

Documentation Conventions

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

Table 1: Notice Icons

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

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

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Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the **configure** command: user@host> **configure**
`Fixed-width text like this`	Represents output that appears on the terminal screen.	`user@host>` **show chassis alarms** `No alarms currently active`
Italic text like this	• Introduces or emphasizes important new terms. • Identifies guide names. • Identifies RFC and Internet draft titles.	• A policy *term* is a named structure that defines match conditions and actions. • *Junos OS CLI User Guide* • RFC 1997, *BGP Communities Attribute*
Italic text like this	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# **set system domain-name** *domain-name*
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	• To configure a stub area, include the **stub** statement at the **[edit protocols ospf area area-id]** hierarchy level. • The console port is labeled **CONSOLE**.
< > (angle brackets)	Encloses optional keywords or variables.	**stub <default-metric** *metric***>;**
| (pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	**broadcast | multicast** **(*string1* | *string2* | *string3*)**
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	**rsvp { # Required for dynamic MPLS only**
[ ] (square brackets)	Encloses a variable for which you can substitute one or more values.	**community name members [** ***community-ids*** **]**

Indention and braces ({ })	Identifies a level in the configuration hierarchy.	[edit]
		routing-options {
		  static {
		  route default {
		  nexthop *address*;
		  retain;
		  }
		  }
		}

; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.	

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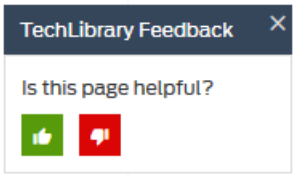
Table 2: Text and Syntax Conventions (continued)

Convention	Description	Examples
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	• In the Logical Interfaces box, select **All Interfaces**. • To cancel the configuration, click **Cancel**.
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select **Protocols>Ospf**.

Documentation Feedback

We encourage you to provide feedback so that we can improve our documentation. You can use either of the following methods:

- Online feedback system—Click TechLibrary Feedback, on the lower right of any page on the Juniper Networks TechLibrary site, and do one of the following:



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- E-mail—Send your comments to **techpubs-comments@juniper.net**. Include the document or topic name, URL or page number, and software version (if applicable).

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- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at https://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf.
- Product warranties—For product warranty information, visit https://www.juniper.net/support/warranty/.

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- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

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

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

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

Opening a Case with JTAC

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

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

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

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CHAPTER 1

Overview

- CLI Overview on page 23

CLI Overview

The Junos command-line interface (CLI) is the software interface used to access your device. From here you configure the device, monitor its operations, and adjust the configuration as needed. For more information, see the following topics:

- Introducing the Junos OS Command-Line Interface on page 23
- Understanding the Junos OS CLI Modes, Commands, and Statement Hierarchies on page 25
- Other Tools to Configure and Monitor Devices Running Junos OS on page 28
- Configuring Junos OS in a FIPS Environment on page 28

Introducing the Junos OS Command-Line Interface

The Junos® operating system (Junos OS) command-line interface (CLI) is the software interface you use to access a device running Junos OS—whether from the console or through a network connection.

The Junos OS CLI is a Juniper Networks-specific command shell that runs on top of a FreeBSD UNIX-based operating system kernel. By leveraging industry-standard tools and utilities, the CLI provides a powerful set of commands that you can use to monitor and configure devices running Junos OS (see Figure 1 on page 24).

The Junos OS CLI has two modes:

- Operational mode—This mode displays the current status of the device. In operational mode, you enter commands to monitor and troubleshoot the Junos OS, devices, and network connectivity.
- Configuration mode—This mode enables you to configure the device. A configuration is stored as a hierarchy of configuration statements. In this mode, you enter statements to configure all properties of the device, including interfaces, general routing information, routing protocols, user access, and several system and hardware properties.

  When you enter configuration mode, you are actually viewing and changing a file called the *candidate configuration*. The candidate configuration file enables you to make

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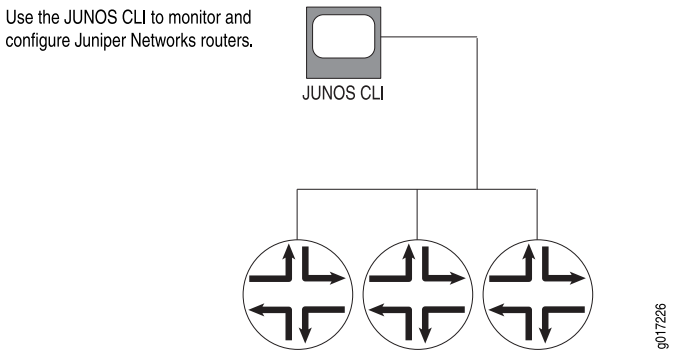
configuration changes without causing operational changes to the current operating configuration, called the *active configuration*. The router or switch does not implement the changes you added to the candidate configuration file until you commit them, which activates the configuration on the device. Candidate configurations enable you to alter your configuration without causing potential damage to your current network operations.

Figure 1: Monitoring and Configuring Routers



Key Features of the CLI

The Junos OS CLI commands and statements follow a hierarchal organization and have a regular syntax. The Junos OS CLI provides the following features to simplify CLI use:

- Consistent command names—Commands that provide the same type of function have the same name, regardless of the portion of the software on which they are operating. For example, all **show** commands display software information and statistics, and all **clear** commands erase various types of system information.
- Lists and short descriptions of available commands—Information about available commands is provided at each level of the CLI command hierarchy. If you type a question mark (**?**) at any level, you see a list of the available commands along with a short description of each command. This means that if you already are familiar with the Junos OS or with other routing software, you can use many of the CLI commands without referring to the documentation.
- Command completion—Command completion for command names (keywords) and for command options is available at each level of the hierarchy. To complete a command or option that you have partially typed, press the Tab key or the Spacebar. If the partially typed letters begin a string that uniquely identifies a command, the complete command name appears. Otherwise, a beep indicates that you have entered an ambiguous command, and the possible completions are displayed. Completion also applies to other strings, such as filenames, interface names, usernames, and configuration statements.

  If you have typed the mandatory arguments for executing a command in the operational or configuration mode the CLI displays **<[Enter]>** as one of the choices when you type a question mark (**?**). This indicates that you have entered the mandatory arguments and can execute the command at that level without specifying any further options. Likewise, the CLI also displays **<[Enter]>** when you have reached a specific hierarchy

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level in the configuration mode and do not have to enter any more mandatory arguments or statements.

- Industry-standard technology—With FreeBSD UNIX as the kernel, a variety of UNIX utilities are available on the Junos OS CLI. For example, you can:
  - Use regular expression matching to locate and replace values and identifiers in a configuration, filter command output, or examine log file entries.
  - Use Emacs-based key sequences to move around on a command line and scroll through the recently executed commands and command output.
  - Store and archive Junos OS device files on a UNIX-based file system.
    - Use standard UNIX conventions to specify filenames and paths.
    - Exit from the CLI environment and create a UNIX C shell or Bourne shell to navigate the file system, manage router processes, and so on.

See Also
- Getting Started with the Junos OS Command-Line Interface on page 31

Understanding the Junos OS CLI Modes, Commands, and Statement Hierarchies

The Junos OS command-line interface (CLI) commands and statements are organized under two command modes and various hierarchies. The following sections provide you an overview of the Junos OS CLI command modes and commands and statements hierarchies:

- Junos OS CLI Command Modes on page 25
- CLI Command Hierarchy on page 26
- Configuration Statement Hierarchy on page 26
- Moving Among Hierarchy Levels on page 27

Junos OS CLI Command Modes

The Junos OS CLI has two modes:

- Operational mode—This mode displays the current status of the device. In operational mode, you enter commands to monitor and troubleshoot the Junos OS, devices, and network connectivity. To enter the operational mode, type the **CLI** command. The character ">" identifies operational mode. For example, user@router>
- Configuration mode—A configuration for a device running on Junos OS is stored as a hierarchy of statements. In configuration mode, you enter these statements to define all properties of the Junos OS, including interfaces, general routing information, routing protocols, user access, and several system and hardware properties. You enter the configuration mode by issuing the **configure** command from the operational mode. The character "#" identifies configuration mode. For example, user@router#

When you enter configuration mode, you are actually viewing and changing a file called the *candidate configuration*. The candidate configuration file enables you to make configuration changes without causing operational changes to the current operating

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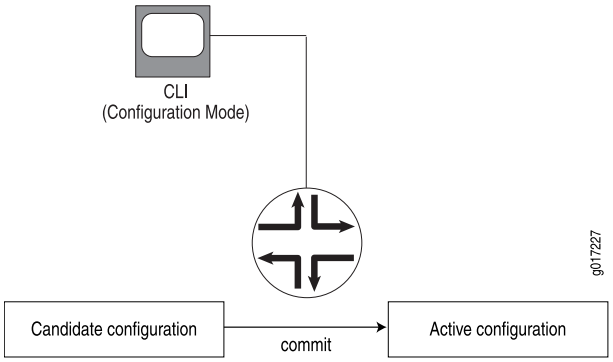
configuration, called the *active configuration*. The router or switch does not implement the changes you added to the candidate configuration file until you commit them, which activates the configuration on the router or switch (see Figure 2 on page 26). Candidate configurations enable you to alter your configuration without causing potential damage to your current network operations.

Figure 2: Committing a Configuration



CLI Command Hierarchy

CLI commands are organized in a hierarchy. Commands that perform a similar function are grouped together under the same level of the hierarchy. For example, all commands that display information about the system and the system software are grouped under the **show system** command, and all commands that display information about the routing table are grouped under the **show route** command.

To execute a command, you enter the full command name, starting at the top level of the hierarchy. For example, to display a brief view of the routes in the routing table, use the command **show route brief**.

Configuration Statement Hierarchy

The configuration statement hierarchy has two types of statements: *container statements*, which are statements that contain other statements, and *leaf statements*, which do not contain other statements. All of the container and leaf statements together form the *configuration hierarchy*.

Figure 3 on page 27 illustrates a part of the hierarchy tree. The **protocols** statement is a top-level statement at the trunk of the configuration tree. The **ospf**, **area**, and **interface** statements are all subordinate container statements of a higher statement (they are branches of the hierarchy tree), and the **hello-interval** statement is a leaf on the tree.

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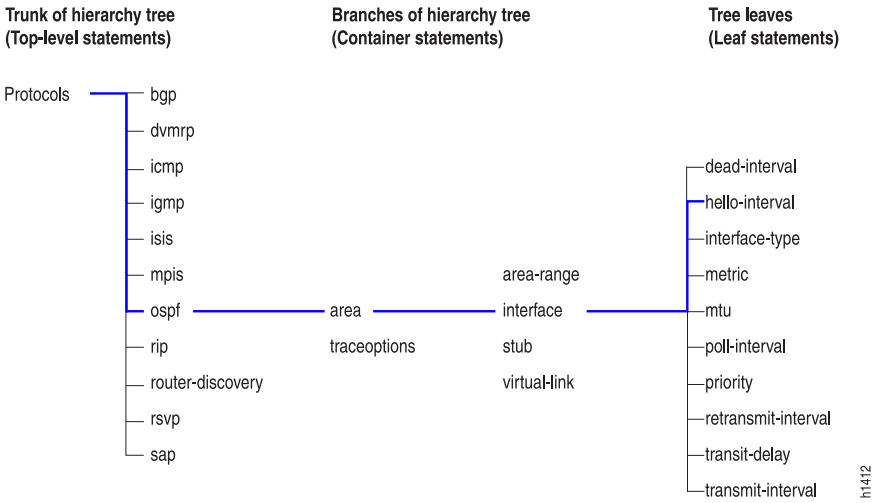
Figure 3: Configuration Statement Hierarchy Example



Moving Among Hierarchy Levels

You can use the CLI commands in Table 3 on page 27 to navigate the levels of the configuration statement hierarchy.

Table 3: CLI Configuration Mode Navigation Commands

Command	Description
edit ***hierarchy-level***	Moves to an existing configuration statement hierarchy or creates a hierarchy and moves to that level.
exit	Moves up the hierarchy to the previous level where you were working. This command is, in effect, the opposite of the **edit** command. Alternatively, you can use the **quit** command. The **exit** and **quit** commands are interchangeable.
up	Moves up the hierarchy one level at a time.
top	Moves directly to the top level of the hierarchy.

See Also

- Getting Started with the Junos OS Command-Line Interface on page 31

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Other Tools to Configure and Monitor Devices Running Junos OS

Apart from the command-line interface, Junos OS also supports the following applications, scripts, and utilities that enable you to configure and monitor devices running Junos OS:

- J-Web graphical user interface (GUI)—Allows you to monitor, configure, troubleshoot, and manage the router on a client by means of a Web browser with Hypertext Transfer Protocol (HTTP) or HTTP over Secure Sockets Layer (HTTPS) enabled. For more information, see the *J-Web Interface User Guide*.
- Junos XML management protocol—Application programmers can use the Junos XML management protocol to monitor and configure Juniper Networks routers. Juniper Networks provides a Perl module with the API to help you more quickly and easily develop custom Perl scripts for configuring and monitoring routers. For more information, see the *Junos XML Management Protocol Developer Guide*.
- NETCONF Application Programming Interface (API)—Application programmers can also use the NETCONF XML management protocol to monitor and configure Juniper Networks routers. For more information, see the *NETCONF XML Management Protocol Developer Guide*.
- Junos OS commit scripts and self-diagnosis features—You can define scripts to enforce custom configuration rules, use commit script macros to provide simplified aliases for frequently used configuration statements, and configure diagnostic event policies and actions associated with each policy. For more information, see the *Automation Scripting Feature Guide*.
- Management Information Bases (MIBs)—You can use enterprise-specific and standard MIBS to retrieve information about the hardware and software components on a Juniper Networks router. For more information about MIBs, see the *Network Management and Monitoring Guide*.

See Also
- Getting Started with the Junos OS Command-Line Interface on page 31

Configuring Junos OS in a FIPS Environment

Junos-FIPS enables you to configure a network of Juniper Networks routers in a Federal Information Processing Standards (FIPS) 140-2 environment.

The Junos-FIPS software environment requires the installation of FIPS software by a crypto officer. In Junos-FIPS, some Junos OS commands and statements have restrictions and some additional configuration statements are available. For more information, see the following resources:

- *Common Criteria and FIPS Certifications*—Provides links to guidelines for configuring devices running Junos OS so that the secure environment is in compliance with the requirements of public sector certifications such as Common Criteria (CC) and FIPS certification.

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- Compliance Advisor—A Web application that provides regulatory compliance information about Common Criteria, FIPS, Homologation, ROHS2, and USGv6 for Juniper Networks products.

See Also

- *IPsec Requirements for Junos-FIPS*
- *Configuring IPsec for Enabling Internal Communications Between Routing Engines for Junos OS in FIPS Mode*

Related Documentation

- Day One: Exploring the Junos CLI

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CHAPTER 2

Getting Started

- Getting Started: A Quick Tour of the CLI on page 31
- Online Help in the CLI on page 51
- CLI Environment Settings on page 56

Getting Started: A Quick Tour of the CLI

To get started with the Junos OS CLI after installing Junos OS on the device, perform configuration changes, switch between operational mode and configuration mode, create a user account, execute some of the basic commands, see the following topics:

- Getting Started with the Junos OS Command-Line Interface on page 31
- Switching Between Junos OS CLI Operational and Configuration Modes on page 33
- Using Keyboard Sequences to Move Around and Edit the Junos OS CLI on page 35
- Configuring a User Account on a Device Running Junos OS on page 37
- Using the CLI Editor in Configuration Mode on page 39
- Checking the Status of a Device Running Junos OS on page 41
- Rolling Back Junos OS Configuration Changes on page 43
- Configuring a Routing Protocol on page 44

Getting Started with the Junos OS Command-Line Interface

As an introduction to the Junos OS command-line interface (CLI), this topic provides instructions for simple steps you take after installing Junos OS on the device. It shows you how to start the CLI, view the command hierarchy, and make small configuration changes. The related topics listed at the end of this topic provide you more detailed information about using the CLI.

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NOTE:

- The instructions and examples in this topic are based on sample M Series and T Series routers. You can use them as a guideline for entering commands on your devices running Junos OS.
- Before you begin, make sure your device hardware is set up and Junos OS is installed. You must have a direct console connection to the device or network access using SSH or Telnet. If your device is not set up, follow the installation instructions provided with the device before proceeding.

To log in to a router and start the CLI:

1. Log in as **root**.

   The root login account has superuser privileges, with access to all commands and statements.

2. Start the CLI:

```
root# cli
root@>
```

   The > command prompt shows you are in operational mode. Later, when you enter configuration mode, the prompt will change to #.

NOTE: If you are using the root account for the first time on the device, remember that the device ships with no password required for root, but the first time you commit a configuration with Junos OS Release 7.6 or later, you must set a root password. Root access is not allowed over a telnet session. To enable root access over an SSH connection, you must configure the **system services ssh root-login allow** statement.

The CLI includes several ways to get help about commands. This section shows some examples of how to get help:

1. Type **?** to show the top-level commands available in operational mode.

```
root@> ?
Possible completions:
    clear           Clear information in the system
    configure       Manipulate software configuration information
    diagnose        Invoke diagnose script
    file            Perform file operations
    help            Provide help information
    monitor         Show real-time debugging information
    mtrace          Trace multicast path from source to receiver
    ping            Ping remote target
    quit            Exit the management session
```


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```
    request         Make system-level requests
    restart         Restart software process
    set             Set CLI properties, date/time, craft interface message
    show            Show system information
    ssh             Start secure shell on another host
    start           Start shell
    telnet          Telnet to another host
    test            Perform diagnostic debugging
    traceroute      Trace route to remote host
```

2. Type **file ?** to show all possible completions for the **file** command.

```
root@> file ?

Possible completions:
    <[Enter]>            Execute this command
    archive              Archives files from the system
    checksum             Calculate file checksum
    compare              Compare files
    copy                 Copy files (local or remote)
    delete               Delete files from the system
    list                 List file information
    rename               Rename files
    show                 Show file contents
    source-address       Local address to use in originating the connection
    |                    Pipe through a command
```

3. Type **file archive ?** to show all possible completions for the **file archive** command.

```
root@> file archive ?
Possible completions:
    compress             Compresses the archived file using GNU gzip (.tgz)
   destination         Name of created archive (URL, local, remote, or floppy)
    source               Path of directory to archive
```

See Also

- Getting Online Help from the Junos OS Command-Line Interface on page 51
- Examples: Using the Junos OS CLI Command Completion on page 252

Switching Between Junos OS CLI Operational and Configuration Modes

When you monitor and configure a device running Junos OS, you may need to switch between operational mode and configuration mode. When you change to configuration mode, the command prompt also changes. The operational mode prompt is a right angle bracket (**>**) and the configuration mode prompt is a pound sign (**#**).

To switch between operational mode and configuration mode:

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1. When you log in to the router and type the **cli** command, you are automatically in operational mode:

```
---  JUNOS 9.2B1.8 built 2008-05-09 23:41:29 UTC
% cli
user@host>
```

2. To enter configuration mode, type the **configure** command or the **edit** command from the CLI operation mode. For example:

```
user@host> configure
Entering configuration mode

[edit]
user@host#
```

   The CLI prompt changes from **user@host>** to **user@host#** and a banner appears to indicate the hierarchy level.

3. You can return to operational mode in one of the following ways:

   - To commit the configuration and exit:

```
[edit]
user@host# commit and-quit
commit complete
Exiting configuration mode
user@host>
```

   - To exit without committing:

```
[edit]
user@host# exit
Exiting configuration mode
user@host>
```

   When you exit configuration mode, the CLI prompt changes from **user@host#** to **user@host>** and the banner no longer appears. You can enter or exit configuration mode as many times as you wish without committing your changes.

4. To display the output of an operational mode command, such as **show**, while in configuration mode, issue the **run** configuration mode command and then specify the operational mode command:

```
[edit]
user@host# run operational-mode-command
```

   For example, to display the currently set priority value of the Virtual Router Redundancy Protocol (VRRP) primary router while you are modifying the VRRP configuration for a backup router:

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```
[edit interfaces xe-4/2/0 unit 0 family inet vrrp-group 27]
user@host# show
virtual-address [ 192.168.1.15 ];
[edit interfaces xe-4/2/0 unit 0 family inet vrrp-group 27]
user@host# run show vrrp detail
Physical interface: xe-5/2/0, Unit: 0, Address: 192.168.29.10/24
Interface state: up, Group: 10, State: backup
Priority: 190, Advertisement interval: 3, Authentication type: simple
Preempt: yes, VIP count: 1, VIP: 192.168.29.55
Dead timer: 8.326, Master priority: 201, Master router: 192.168.29.254
[edit interfaces xe-4/2/0 unit 0 family inet vrrp-group 27]
user@host# set priority ...
```

See Also

- Understanding the Junos OS CLI Modes, Commands, and Statement Hierarchies on page 25
- Getting Online Help from the Junos OS Command-Line Interface on page 51

Using Keyboard Sequences to Move Around and Edit the Junos OS CLI

You can use keyboard sequences in the Junos OS command-line interface (CLI) to move around and edit the command line. You can also use keyboard sequences to scroll through a list of recently executed commands. Table 4 on page 35 lists some of the CLI keyboard sequences. They are the same as those used in Emacs.

Table 4: CLI Keyboard Sequences

Category	Action	Keyboard Sequence
Move the Cursor	Move the cursor back one character.	Ctrl+b
	Move the cursor back one word.	Esc+b or Alt+b
	Move the cursor forward one character.	Ctrl+f
	Move the cursor forward one word.	Esc+f or Alt+f
	Move the cursor to the beginning of the command line.	Ctrl+a
	Move the cursor to the end of the command line.	Ctrl+e

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Table 4: CLI Keyboard Sequences (continued)

Category	Action	Keyboard Sequence
Delete Characters	Delete the character before the cursor.	Ctrl+h, Delete, or Backspace
	Delete the character at the cursor.	Ctrl+d
	Delete all characters from the cursor to the end of the command line.	Ctrl+k
	Delete all characters on the command line.	Ctrl+u or Ctrl+x
	Delete the word before the cursor.	Ctrl+w, Esc+Backspace, or Alt+Backspace
	Delete the word after the cursor.	Esc+d or Alt+d
Insert Recently Deleted Text	Insert the most recently deleted text at the cursor.	Ctrl+y
Redraw the Screen	Redraw the current line.	Ctrl+l
Display Previous Command Lines	Scroll backward through the list of recently executed commands.	Ctrl+p
	Scroll forward through the list of recently executed commands.	Ctrl+n
	Search the CLI history in reverse order for lines matching the search string.	Ctrl+r
	Search the CLI history by typing some text at the prompt, followed by the keyboard sequence. The CLI attempts to expand the text into the most recent word in the history for which the text is a prefix.	Esc+/
Display Previous Command Words	Scroll backward through the list of recently entered words in a command line.	Esc+. or Alt+.
Repeat Keyboard Sequences	Specify the number of times to execute a keyboard sequence. *number* can be from 1 through 9 and *sequence* is the keyboard sequence that you want to execute.	Esc+*number sequence* or Alt+*number sequence*

See Also

- Using Wildcard Characters in Interface Names on page 251

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- Using Global Replace in the Junos OS Configuration on page 107

Configuring a User Account on a Device Running Junos OS

This topic describes how to log on to a device running Junos OS using a root account and configure a new user account. You can configure an account for your own use or create a test account.

To configure a new user account on the device:

1. Log in as root and enter configuration mode:

```
root@host> configure
[edit]
root@host#
```

   The prompt in brackets (**[edit]**), also known as a *banner*, shows that you are in configuration edit mode at the top of the hierarchy.

2. Change to the **[edit system login]** section of the configuration:

```
[edit]
root@host# edit system login
[edit system login]
root@host#
```

   The prompt in brackets changes to **[edit system login]** to show that you are at a new level in the hierarchy.

3. Now add a new user account:

```
[edit system login]
root@host# edit user nchen
```

   This example adds an account **nchen** (for Nathan Chen).

   NOTE: In Junos OS Release 12.2 and later, user account names can contain a period (.) in the name. For example, you can have a user account named nathan.chen. However, the username cannot begin or end with a period.

4. Configure a full name for the account. If the name includes spaces, enclose the entire name in quotation marks (" "):

```
[edit system login user nchen]
root@host# set full-name "Nathan Chen"
```

5. Configure an account class. The account class sets the user access privileges for the account:

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```
[edit system login user nchen]
root@host# set class super-user
```

6. Configure an authentication method and password for the account:

```
[edit system login user nchen
root@host# set authentication plain-text-password
New password:
Retype new password:
```

When the new password prompt appears, enter a clear-text password that the system can encrypt, and then confirm the new password.

7. Commit the configuration:

```
[edit system login user nchen]
root@host# commit
commit complete
```

Configuration changes are not activated until you commit the configuration. If the commit is successful, a **commit complete** message appears.

8. Return to the top level of the configuration, and then exit:

```
[edit system login user nchen]
root@host# top
[edit]
root@host# exit
Exiting configuration mode
```

9. Log out of the device:

```
root@host> exit
% logout Connection closed.
```

10. To test your changes, log back in with the user account and password you just configured:

```
login: nchen
Password: password
--- Junos 8.3-R1.1 built 2005-12-15 22:42:19 UTC
nchen@host>
```

When you log in, you should see the new username at the command prompt.

You have successfully used the CLI to view the device status and perform a simple configuration change. See the related topics listed in this section for more information about the Junos OS CLI features.

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NOTE: For complete information about the commands to issue to configure your device, including examples, see the Junos OS configuration guides.

See Also

- Getting Online Help from the Junos OS Command-Line Interface on page 51
- Displaying the Junos OS CLI Command and Word History on page 269

Using the CLI Editor in Configuration Mode

This topic describes some of the basic commands that you must use to enter configuration mode in the command-line interface (CLI) editor, navigate through the configuration hierarchy, get help, and commit or revert the changes that you make during the configuration session.

Task	Command/Statement	Example
Edit Your Configuration		
Enter configuration mode. When you first log in to the device, the device is in operational mode. You must explicitly enter configuration mode. When you do, the CLI prompt changes from **user@host>** to **user@host#** and the hierarchy level appears in square brackets.	**configure**	user@host> **configure** [edit] user@host#
Create a statement hierarchy. You can use the **edit** command to simultaneously create a hierarchy and move to that new level in the hierarchy. You cannot use the **edit** command to change the value of identifiers.	**edit** *hierarchy-level value*	[edit] user@host# **edit security zones security-zone myzone** [edit security zones security-zone myzone] user@host#
Create a statement hierarchy and set identifier values. The **set** command is similar to **edit** except that your current level in the hierarchy does not change.	**set** *hierarchy-level value*	[edit] user@host# **set security zones security-zone myzone** [edit] user@host#
Navigate the Hierarchy		
Navigate down to an existing hierarchy level.	**edit** *hierarchy-level*	[edit] user@host# **edit security zones** [edit security zones] user@host#

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Task	Command/Statement	Example
Navigate up one level in the hierarchy.	up	[edit security zones] user@host# **up** [edit security] user@host#
Navigate to the top of the hierarchy.	top	[edit security zones] user@host# **top** [edit] user@host#
Commit or Revert Changes		
Commit your configuration.	commit	[edit] user@host# **commit** commit complete
Roll back changes from the current session. Use the **rollback** command to revert all changes from the current configuration session. When you run the **rollback** command before exiting your session or committing changes, the software loads the most recently committed configuration onto the device. You must enter the **rollback** statement at the **edit** level in the hierarchy.	rollback	[edit] user@host# **rollback** load complete
Exit Configuration Mode		
Commit the configuration and exit configuration mode.	commit and-quit	[edit] user@host# **commit and-quit** user@host>
Exit configuration mode without committing your configuration. You must navigate to the top of the hierarchy using the **up** or **top** commands before you can exit configuration mode.	exit	[edit] user@host# **exit** The configuration has been changed but not committed Exit with uncommitted changes? [yes,no] (yes)
Get Help		
Display a list of valid options for the current hierarchy level.	?	[edit] user@host# **edit security zones ?** Possible completions: <[Enter]> Execute this command > functional-zone Functional zone > security-zone Security zones | Pipe through a command [edit]

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See Also

- Understanding Junos OS CLI Configuration Mode on page 69
- Entering and Exiting the Junos OS CLI Configuration Mode on page 76
- Displaying the Current Junos OS Configuration on page 149

Checking the Status of a Device Running Junos OS

You can use **show** commands to check the status of the device and monitor the activities on the device.

To help you become familiar with **show** commands:

- Type **show ?** to display the list of **show** commands you can use to monitor the router:

```
root@> show ?
Possible completions:
  accounting           Show accounting profiles and records
  aps                  Show Automatic Protection Switching information
  arp                  Show system Address Resolution Protocol table entries
  as-path              Show table of known autonomous system paths
  bfd                  Show Bidirectional Forwarding Detection information
  bgp                  Show Border Gateway Protocol information
  chassis              Show chassis information
  class-of-service     Show class-of-service (CoS) information
  cli                  Show command-line interface settings
  configuration        Show current configuration
  connections          Show circuit cross-connect connections
  dvmrp                Show Distance Vector Multicast Routing Protocol
info
  dynamic-tunnels      Show dynamic tunnel information information
  esis                 Show end system-to-intermediate system information
  firewall             Show firewall information
  helper               Show port-forwarding helper information
  host                 Show hostname information from domain name server
  igmp                 Show Internet Group Management Protocol information
  ike                  Show Internet Key Exchange information
  ilmi                 Show interim local management interface information
  interfaces           Show interface information
  ipsec                Show IP Security information
  ipv6                 Show IP version 6 information
  isis                 Show Intermediate System-to-Intermediate System info
  l2circuit            Show Layer 2 circuit information
  l2vpn                Show Layer 2 VPN information
  lacp                 Show Link Aggregation Control Protocol information
  ldp                  Show Label Distribution Protocol information
  link-management      Show link management information
  llc2                 Show LLC2 protocol related information
  log                  Show contents of log file
  mld                  Show multicast listener discovery information
  mpls                 Show Multiprotocol Label Switching information
  msdp                 Show Multicast Source Discovery Protocol information
  multicast            Show multicast information
  ntp                  Show Network Time Protocol information
  ospf                 Show Open Shortest Path First information
  ospf3                Show Open Shortest Path First version 3 information
  passive-monitoring   Show information about passive monitoring
  pfe                  Show Packet Forwarding Engine information
```

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```
pgm                  Show Pragmatic Generalized Multicast information
pim                  Show Protocol Independent Multicast information
policer              Show interface policer counters and information
policy               Show policy information
ppp                  Show PPP process information
rip                  Show Routing Information Protocol information
ripng                Show Routing Information Protocol for IPv6 info
route                Show routing table information
rsvp                 Show Resource Reservation Protocol information
sap                  Show Session Announcement Protocol information
security             Show security information
services             Show services information
snmp                 Show Simple Network Management Protocol information
system               Show system information
task                 Show routing protocol per-task information
ted                  Show Traffic Engineering Database information
version              Show software process revision levels
vpls                 Show VPLS information
vrrp                 Show Virtual Router Redundancy Protocol information
```

- Use the **show chassis routing-engine** command to view the Routing Engine status:

```
root@> show chassis routing-engine
```

```
Routing Engine status:
  Slot 0:
    Current state                  Master
    Election priority              Master (default)
    Temperature                 31 degrees C / 87 degrees F
    CPU temperature             32 degrees C / 89 degrees F
    DRAM                       768 MB
    Memory utilization          84 percent
    CPU utilization:
      User                       0 percent
      Background                 0 percent
      Kernel                     1 percent
      Interrupt                  0 percent
      Idle                      99 percent
    Model                          RE-2.0
    Serial ID                      b10000078c10d701
    Start time                     2005-12-28 13:52:00 PST
    Uptime                       12 days, 3 hours, 44 minutes, 19 seconds
    Load averages:                 1 minute   5 minute  15 minute
                                       0.02       0.01       0.00
```

- Use the **show system storage** command to view available storage on the device:

```
root@> show system storage
```

```
Filesystem        Size       Used     Avail  Capacity   Mounted on
/dev/ad0s1a       865M       127M      669M       16%  /
devfs             1.0K       1.0K        0B      100%  /dev
devfs             1.0K       1.0K        0B      100%  /dev/
/dev/md0          30M        30M         0B      100%  /packages/mnt/jbase
/dev/md1          158M       158M        0B      100%
/packages/mnt/jkernel-9.3B1.5
/dev/md2          16M        16M         0B      100%
/packages/mnt/jpfe-M7i-9.3B1.5
```


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```
/dev/md3           3.8M       3.8M         0B      100%
/packages/mnt/jdocs-9.3B1.5
/dev/md4           44M        44M          0B      100%
/packages/mnt/jroute-9.3B1.5
/dev/md5           12M        12M          0B      100%
/packages/mnt/jcrypto-9.3B1.5
/dev/md6           25M        25M          0B      100%
/packages/mnt/jpfe-common-9.3B1.5
/dev/md7           1.5G       196K       1.4G        0%  /tmp
/dev/md8           1.5G       910K       1.4G        0%  /mfs
/dev/ad0s1e        96M        38K         88M        0%  /config
procfs             4.0K       4.0K         0B      100%  /proc
/dev/ad1s1f        17G        2.6G        13G        17%  /var
```

See Also

- Displaying the Junos OS CLI Command and Word History on page 269
- Managing Programs and Processes Using Junos OS Operational Mode Commands on page 263
- Viewing Files and Directories on a Device Running Junos OS on page 257

Rolling Back Junos OS Configuration Changes

This topic shows how to use the **rollback** command to return to the most recently committed Junos OS configuration. The **rollback** command is useful if you make configuration changes and then decide not to keep the changes.

The following procedure shows how to configure an SNMP health monitor on a device running Junos OS and then return to the most recently committed configuration that does not include the health monitor. When configured, the SNMP health monitor provides the network management system (NMS) with predefined monitoring for file system usage, CPU usage, and memory usage on the device.

1. Enter configuration mode:

   ```
   user@host> configure
   entering configuration mode
   [edit]
   user@host#
   ```

2. Show the current configuration (if any) for SNMP:

   ```
   [edit]
   user@host# show snmp
   ```

   No **snmp** statements appear because SNMP has not been configured on the device.

3. Configure the health monitor:

   ```
   [edit]
   user@host# set snmp health-monitor
   ```

4. Show the new configuration:

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```
[edit]
user@host# show snmp
health-monitor;
```

The **health-monitor** statement indicates that SNMP health monitoring is configured on the device.

5. Enter the **rollback** configuration mode command to return to the most recently committed configuration:

```
[edit]
user@host# rollback
load complete
```

6. Show the configuration again to make sure your change is no longer present:

```
[edit]
user@host# show snmp
```

No **snmp** configuration statements appear. The health monitor is no longer configured.

7. Enter the **commit** command to activate the configuration to which you rolled back:

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

8. Exit configuration mode:

```
[edit]
user@host# exit
Exiting configuration mode
```

You can also use the **rollback** command to return to earlier configurations.

See Also

- Returning to the Most Recently Committed Junos OS Configuration on page 191

Configuring a Routing Protocol

This topic provides a sample configuration that describes how to configure an OSPF backbone area that has two SONET interfaces.

The final configuration looks like this:

```
[edit]
protocols {
   ospf {
      area 0.0.0.0 {
         interface so-0/0/0 {
            hello-interval 5;
            dead-interval 20;
         }
         interface so-0/0/1 {
```


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```
        hello-interval 5;
        dead-interval 20;
      }
    }
  }
}
```

This topic contains the following examples of configuring a routing protocol:

- Shortcut on page 45
- Longer Configuration on page 45
- Making Changes to a Routing Protocol Configuration on page 48

Shortcut

You can create a shortcut for this entire configuration with the following two commands:

```
[edit]
user@host# set protocols ospf area 0.0.0.0 interface so-0/0/0 hello-interval 5
  dead-interval 20
[edit]
user@host# set protocols ospf area 0.0.0.0 interface so-0/0/1 hello-interval 5
  dead-interval 20
```

Longer Configuration

This section provides a longer example of creating the previous OSPF configuration. In the process, it illustrates how to use the different features of the CLI.

1. Enter configuration mode by issuing the **configure** top-level command:

   ```
   user@host> configure
   entering configuration mode
   [edit]
   user@host#
   ```

   Notice that the prompt has changed to a pound sign (**#**) to indicate configuration mode.

2. To create the above configuration, you start by editing the **protocols ospf** statements:

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

3. Now add the OSPF area:

   ```
   [edit protocols ospf]
   user@host# edit area 0.0.0.0
   [edit protocols ospf area 0.0.0.0]
   ```

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```
user@host#
```

4. Add the first interface:

```
[edit protocols ospf area 0.0.0.0]
user@host# edit interface so0
[edit protocols ospf area 0.0.0.0 interface so-0/0/0]
user@host#
```

You now have four nested statements.

5. Set the hello and dead intervals.

```
[edit protocols ospf area 0.0.0.0 interface so-0/0/0]
user@host#set ?
user@host# set hello-interval 5
user@host# set dead-interval 20
user@host#
```

6. You can see what is configured at the current level with the **show** command:

```
[edit protocols ospf area 0.0.0.0 interface so-0/0/0]
user@host# show
hello-interval 5;
dead-interval 20;
[edit protocols ospf area 0.0.0.0 interface so-0/0/0]
user@host#
```

7. You are finished at this level, so back up a level and take a look at what you have so far:

```
[edit protocols ospf area 0.0.0.0 interface so-0/0/0]
user@host# up
[edit protocols ospf area 0.0.0.0]
user@host# show
interface so-0/0/0 {
   hello-interval 5;
   dead-interval 20;
}
[edit protocols ospf area 0.0.0.0]
user@host#
```

The **interface** statement appears because you have moved to the **area** statement.

8. Add the second interface:

```
[edit protocols ospf area 0.0.0.0]
user@host# edit interface so-0/0/1
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# set hello-interval 5
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
```


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```
user@host# set dead-interval 20
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# up
[edit protocols ospf area 0.0.0.0]
user@host# show
interface so-0/0/0 {
  hello-interval 5;
  dead-interval 20;
}
interface so-0/0/1 {
  hello-interval 5;
  dead-interval 20;
}
[edit protocols ospf area 0.0.0.0]
user@host#
```

9. Back up to the top level and see what you have:

```
[edit protocols ospf area 0.0.0.0]
user@host# top
[edit]
user@host# show
protocols {
  ospf {
    area 0.0.0.0 {
      interface so-0/0/0 {
        hello-interval 5;
        dead-interval 20;
      }
      interface so-0/0/1 {
        hello-interval 5;
        dead-interval 20;
      }
    }
  }
}
[edit]
user@host#
```

This configuration now contains the statements you want.

10. Before committing the configuration (and thereby activating it), verify that the configuration is correct:

```
[edit]
user@host# commit check
configuration check succeeds
[edit]
user@host#
```

11. Commit the configuration to activate it on the router:

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```
[edit]
user@host# commit
commit complete
[edit]
user@host#
```

Making Changes to a Routing Protocol Configuration

Suppose you decide to use different dead and hello intervals on interface **so-0/0/1**. You can make changes to the configuration.

1. Go directly to the appropriate hierarchy level by typing the full hierarchy path to the statement you want to edit:

```
[edit]
user@host# edit protocols ospf area 0.0.0.0 interface so-0/0/1
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# show
hello-interval 5;
dead-interval 20;
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# set hello-interval 7
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# set dead-interval 28
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# top
[edit]
user@host# show
protocols {
   ospf {
      area 0.0.0.0 {
         interface so-0/0/0 {
            hello-interval 5;
            dead-interval 20;
         }
         interface so-0/0/1 {
            hello-interval 7;
            dead-interval 28;
         }
      }
   }
}
[edit]
user@host#
```

2. If you decide not to run OSPF on the first interface, delete the statement:

```
[edit]
user@host# edit protocols ospf area 0.0.0.0
[edit protocols ospf area 0.0.0.0]
user@host# delete interface so-0/0/0
[edit protocols ospf area 0.0.0.0]
```


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```
user@host# top
[edit]
user@host# show
protocols {
   ospf {
      area 0.0.0.0 {
         interface so-0/0/1 {
            hello-interval 7;
            dead-interval 28;
         }
      }
   }
}
[edit]
user@host#
```

Everything inside the statement you deleted was deleted with it. You can also eliminate the entire OSPF configuration by simply entering **delete protocols ospf** while at the top level.

3. If you decide to use the default values for the hello and dead intervals on your remaining interface but you want OSPF to run on that interface, delete the hello and dead interval timers:

```
[edit]
user@host# edit protocols ospf area 0.0.0.0 interface so-0/0/1
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# delete hello-interval
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# delete dead-interval
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# top
[edit]
user@host# show
protocols {
   ospf {
      area 0.0.0.0 {
         interface so-0/0/1;
      }
   }
}
[edit]
user@host#
```

You can set multiple statements at the same time as long as they are all part of the same hierarchy (the path of statements from the top inward, as well as one or more statements at the bottom of the hierarchy). This feature can reduce considerably the number of commands you must enter.

4. To go back to the original hello and dead interval timers on interface **so-0/0/1**, enter:

```
[edit]
```

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```
user@host# edit protocols ospf area 0.0.0.0 interface so-0/0/1
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# set hello-interval 5 dead-interval 20
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# exit
[edit]
user@host# show
protocols {
   ospf {
      area 0.0.0.0 {
         interface so-0/0/1 {
            hello-interval 5;
            dead-interval 20;
         }
      }
   }
}
[edit]
user@host#
```

5. You also can recreate the other interface, as you had it before, with only a single entry:

```
[edit]
user@host# set protocols ospf area 0.0.0.0 interface so-0/0/1 hello-interval 5
   dead-interval 20
[edit]
user@host# show
protocols {
   ospf {
      area 0.0.0.0 {
         interface so-0/0/0 {
            hello-interval 5;
            dead-interval 20;
         }
         interface so-0/0/1 {
            hello-interval 5;
            dead-interval 20;
         }
      }
   }
}
[edit]
user@host#
```

See Also

- Displaying the Junos OS CLI Command and Word History on page 269
- Interface Naming Conventions Used in the Junos OS Operational Commands on page 250

Related Documentation

- Day One: Exploring the Junos CLI

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Online Help in the CLI

The Junos OS CLI includes comprehensive system of online help. The online help system includes several options for getting help any time. For more information, see the following topics:

- Getting Online Help from the Junos OS Command-Line Interface on page 51
- Junos OS CLI Online Help Features on page 54
- CLI Explorer Overview on page 56

Getting Online Help from the Junos OS Command-Line Interface

The Junos OS command-line interface (CLI) has a context-sensitive online help feature that enables you to access information about commands and statements from the Junos OS CLI. This topic contains the following sections:

- Getting Help About Commands on page 51
- Getting Help About a String in a Statement or Command on page 52
- Getting Help About Configuration Statements on page 53
- Getting Help About System Log Messages on page 53

Getting Help About Commands

Information about commands is provided at each level of the CLI command hierarchy. You can type a question mark to get help about commands:

- If you type the question mark at the command-line prompt, the CLI lists the available commands and options. For example, to view a list of top-level operational mode commands, type a question mark (?) at the command-line prompt.

```
user@host> ?
Possible completions:
clear       Clear information in the system
configure   Manipulate software configuration information
file        Perform file operations
help        Provide help information
mtrace      Trace mtrace packets from source to receiver.
monitor     Real-time debugging
ping        Ping a remote target
quit        Exit the management session
request     Make system-level requests
restart     Restart a software process
set         Set CLI properties, date, time, craft display text
show        Show information about the system
ssh         Open a secure shell to another host
start       Start a software process
telnet      Telnet to another host
test        Diagnostic debugging commands
traceroute  Trace the route to a remote host
user@host>
```

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- If you type the question mark after entering the complete name of a command or command option, the CLI lists the available commands and options and then redisplays the command names and options that you typed.

```
user@host> clear ?
Possible completions:
arp        Clear address-resolution information
bgp          Clear BGP information
chassis      Clear chassis information
firewall     Clear firewall counters
igmp         Clear IGMP information
interfaces   Clear interface information
ilmi         Clear ILMI statistics information
isis         Clear IS-IS information
ldp          Clear LDP information
log          Clear contents of a log file
mpls         Clear MPLS information
msdp         Clear MSDP information
multicast    Clear Multicast information
ospf         Clear OSPF information
pim          Clear PIM information
rip          Clear RIP information
route        Clear routing table information
rsvp         Clear RSVP information
snmp         Clear SNMP information
system       Clear system status
vrrp         Clear VRRP statistics information
user@host> clear
```

- If you type the question mark in the middle of a command name, the CLI lists possible command completions that match the letters you have entered so far. It then redisplays the letters that you typed. For example, to list all operational mode commands that start with the letter *c*, type the following:

```
user@host> c?
Possible completions:
clear      Clear information in the system
configure  Manipulate software configuration information
user@host> c
```

- For introductory information on using the question mark or the help command, you can also type **help** and press Enter:

```
user@host> help
```

Getting Help About a String in a Statement or Command

You can use the **help** command to display help about a text string contained in a statement or command name:

```
help apropos string
```


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string is a text string about which you want to get help. This string is used to match statement or command names as well as to match the help strings that are displayed for the statements or commands.

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.

For statements or commands which need input data type as STRING, the supported characters set are as follows:

- Any printable ASCII characters
- For characters with space, it should be enclosed in double-quotes
- To have double-quote as the input, it should be escaped with '\'

NOTE: **No escape characters are supported in a string other than to escape from double quotes.**

Range of supported characters for attributes is 0 through 65499 characters.

Range of supported characters for string type identifiers is 1 through 255 characters.

In configuration mode, this command displays statement names and help text that match the string specified. In operational mode, this command displays command names and help text that match the string specified.

Getting Help About Configuration Statements

You can display help based on text contained in a statement name using the **help topic** and **help reference** commands:

```
help topic word
help reference statement-name
```

The **help topic** command displays usage guidelines for the statement based on information that appears in the Junos OS configuration guides. The **help reference** command displays summary information about the statement based on the summary descriptions that appear in the Junos OS configuration guides.

Getting Help About System Log Messages

You can display help based on a system log tag using the **help syslog** command:

```
help syslog syslog-tag
```

The **help syslog** command displays the contents of a system log message.

See Also

- Getting Started with the Junos OS Command-Line Interface on page 31

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Junos OS CLI Online Help Features

The Junos OS CLI online help provides the following features for ease of use and error prevention:

- Help for Omitted Statements on page 54
- Using CLI Command Completion on page 54
- Using Command Completion in Configuration Mode on page 55
- Displaying Tips About CLI Commands on page 55

Help for Omitted Statements

If you have omitted a required statement at a particular hierarchy level, when you attempt to move from that hierarchy level or when you issue the **show** command in configuration mode, a message indicates which statement is missing. For example:

```
[edit protocols pim interface so-0/0/0]
user@host# top
Warning: missing mandatory statement: 'mode'
[edit]
user@host# show
protocols {
   pim {
      interface so-0/0/0 {
         priority 4;
         version 2;
         # Warning: missing mandatory statement(s): 'mode'
      }
   }
}
```

Using CLI Command Completion

The Junos OS CLI provides you a command completion option that enables Junos OS to recognize commands and options based on the initial few letters you typed. That is, you do not always have to remember or type the full command or option name for the CLI to recognize it.

- To display all possible command or option completions, type the partial command followed immediately by a question mark.
- To complete a command or option that you have partially typed, press Tab or the Spacebar. If the partially typed letters begin a string that uniquely identifies a command, the complete command name appears. Otherwise, a prompt indicates that you have entered an ambiguous command, and the possible completions are displayed.

Command completion also applies to other strings, such as filenames, interface names, and usernames. To display all possible values, type a partial string followed immediately by a question mark. To complete a string, press Tab.

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Using Command Completion in Configuration Mode

The CLI command completion functions also apply to the commands in configuration mode and to configuration statements. Specifically, to display all possible commands or statements, type the partial string followed immediately by a question mark. To complete a command or statement that you have partially typed, press Tab or the Spacebar.

Command completion also applies to identifiers, with one slight difference. To display all possible identifiers, type a partial string followed immediately by a question mark. To complete an identifier, you must press Tab. This scheme allows you to enter identifiers with similar names; then press the Spacebar when you are done typing the identifier name.

Displaying Tips About CLI Commands

To get tips about CLI commands, issue the **help tip cli** command. Each time you enter the command, a new tip appears. For example:

```
user@host> help tip cli
Junos tip:
Use 'request system software validate' to validate the incoming software
against the current configuration without impacting the running system.
user@host> help tip cli
Junos tip:
Use 'commit and-quit' to exit configuration mode after the commit has
succeeded. If the commit fails, you are left in configuration mode.
```

You can also enter **help tip cli *number*** to associate a tip with a number. This enables you to recall the tip at a later time. For example:

```
user@host> help tip cli 10
JUNOS tip:
Use '#' in the beginning of a line in command scripts to cause the
rest of the line to be ignored.

user@host> help tip cli
JUNOS tip:
Use the 'apply-groups' statement at any level of the configuration
hierarchy to inherit configuration statements from a configuration group.

user@host>
```

See Also

- Examples: Using the Junos OS CLI Command Completion on page 252

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CLI Explorer Overview

CLI Explorer is a Web application that helps you to explore Junos OS configuration statements and commands. It lists all the configuration statements and commands supported in the Junos OS across different platforms on several products.

To view the available configuration statements and commands, you can use any of the following filtering options:

- Filter by product family—To find the CLI reference information by product family, you can either select “All products” or select any of the specific product.

  For example: ACX Series, EX Series.

- Filter by number or letter—To find the CLI reference information by number or letter, you can either select “All” or filter by numbers “3” or “8” or any of the letters (“A”, “B”, “C”...).

  For example, if you select the letter “A”, commands such as **aaa**, **aaa clients (TDF)**, **aaa-access-profile (L2TP LNS)** appear.

- Filter by the normal search option—To use this option to filter the commands and statements, you enter your search criteria.

  For example, if you enter the number “3”, all the commands and statements containing the number “3” appear in the search results.

When you click on the link in the search results, you are directed to a page describing the command or statement that is referenced in a feature guide.

To explore the Junos OS configuration statements and commands, see the CLI Explorer.

See Also

- Understanding the Junos OS CLI Modes, Commands, and Statement Hierarchies on page 25

Related Documentation

- Day One: Exploring the Junos CLI

CLI Environment Settings

In operational mode, you can control the Junos OS command-line interface (CLI) environment and change the default CLI environment according to your specific requirements. For more information, see the following topics:

- Controlling the Junos OS CLI Environment on page 57
- Setting the Junos OS CLI Screen Length and Width on page 59
- Example: Controlling the CLI Environment on page 60
- Example: Enabling Configuration Breadcrumbs on page 66

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Controlling the Junos OS CLI Environment

In operational mode, you can control the Junos OS command-line interface (CLI) environment. For example, you can specify the number of lines that are displayed on the screen or your terminal type. The following output lists the options that you can use to control the CLI environment:

```
user@host>set cli ?
Possible completions:
  complete-on-space    Set whether typing space completes current word
  directory            Set working directory
  idle-timeout         Set maximum idle time before login session ends
  logical-system       Set default logical system
  prompt               Set CLI command prompt string
  restart-on-upgrade   Set whether CLI prompts to restart after software upgrade

  screen-length        Set number of lines on screen
  screen-width         Set number of characters on a line
  terminal             Set terminal type
  timestamp            Timestamp CLI output
```

NOTE: When you use SSH to log in to the router or log in from the console when its terminal type is already configured , your terminal type, screen length, and screen width are already set.

This chapter discusses the following topics:

- Setting the Terminal Type on page 57
- Setting the CLI Prompt on page 58
- Setting the CLI Directory on page 58
- Setting the CLI Timestamp on page 58
- Setting the Idle Timeout on page 58
- Setting the CLI to Prompt After a Software Upgrade on page 58
- Setting Command Completion on page 58
- Displaying CLI Settings on page 59

Setting the Terminal Type

To set the terminal type, use the **set cli terminal** command:

```
user@host> set cli terminal terminal-type
```

The terminal type can be one of the following: **ansi**, **vt100**, **small-xterm**, or **xterm**.

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Setting the CLI Prompt

The default CLI prompt is **user@host>**. To change this prompt, use the **set cli prompt** command. If the prompt string contains spaces, enclose the string in quotation marks (" ").

```
user@host> set cli prompt string
```

Setting the CLI Directory

To the set the current working directory, use the **set cli directory** command:

```
user@host> set cli directory directory
```

directory is the pathname of working directory.

Setting the CLI Timestamp

By default, CLI output does not include a timestamp. To include a timestamp in CLI output, use the **set cli timestamp** command:

```
user@host> set cli timestamp [format time-date-format | disable]
```

If you do not specify a timestamp format, the default format is ***Mmm dd hh:mm:ss*** (for example, Feb 08 17:20:49). Enclose the format in single quotation marks (‘).

Setting the Idle Timeout

By default, an individual CLI session never times out after extended times, unless the **idle-timeout** statement has been included in the user’s login class configuration. To set the maximum time an individual session can be idle before the user is logged off the router, use the **set cli idle-timeout** command:

```
user@host> set cli idle-timeout timeout
```

timeout can be **0** through **100,000** minutes. Setting ***timeout*** to **0** disables the timeout.

Setting the CLI to Prompt After a Software Upgrade

By default, the CLI prompts you to restart after a software upgrade. To disable the prompt for an individual session, use the **set cli restart-on-upgrade off** command:

```
user@host>set cli restart-on-upgrade off
```

To reenable the prompt, use the **set cli restart-on-upgrade on** command:

```
user@host> set cli restart-on-upgrade on
```

Setting Command Completion

By default, you can press Tab or the Spacebar to have the CLI complete a command.

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To have the CLI allow only a tab to complete a command, use the **set cli complete-on-space off** command:

```
user@host> set cli complete-on-space off
Disabling complete-on-space
user@host>
```

To reenable the use of both spaces and tabs for command completion, use the **set cli complete-on-space on** command:

```
user@host> set cli complete-on-space on
Enabling complete-on-space
user@host>
```

Displaying CLI Settings

To display the current CLI settings, use the **show cli** command:

```
user@host> show cli
CLI screen length set to 24
CLI screen width set to 80
CLI complete-on-space set to on
```

NOTE: In Junos OS Release 13.3 and later, the value of **screen width** is 0 or in the range of 40 through 1024.

Setting the Junos OS CLI Screen Length and Width

You can set the Junos OS command-line interface (CLI) screen length and width according to your specific requirements. This topic contains the following sections:

- Setting the Screen Length on page 59
- Setting the Screen Width on page 59

Setting the Screen Length

The default CLI screen length is 24 lines. To change the length, use the **set cli screen-length** command:

```
user@host> set cli screen-length length
```

Setting the screen length to 0 lines disables the display of output one screen at a time. Disabling this UNIX **more**-type interface can be useful when you are issuing CLI commands from scripts.

Setting the Screen Width

The value of CLI screen width is **0** or in the range of **40** through **1024**. The default CLI screen width is 80 characters. To change the width, use the **set cli screen-width** command:

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```
user@host> set cli screen-width width
```

NOTE: In Junos OS Release 13.2 and earlier, the value of *width* is in the range of 0 through 1024.

Example: Controlling the CLI Environment

The following example shows you how to change the default CLI environment.

Changing the CLI environment is all about customizing the CLI window to fit your personal preferences. Use the settings discussed in this topic to make the CLI window look and behave according to what you find most convenient and efficient.

- Requirements on page 60
- Overview on page 60
- Configuration on page 61

Requirements

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

Before starting this example, check what the default settings are. Use the **show cli** operational mode command.

```
user@host> show cli
CLI complete-on-space set to on
CLI idle-timeout disabled
CLI restart-on-upgrade set to on
CLI screen length set to 66
CLI screen width set to 80
CLI terminal is 'xterm'
```

Is the prompt set to your *username*@*routername*? If not, exit the CLI and enter the operational mode again.

Is the CLI screen length set to 66 and the CLI screen width set to 80? If so, you can start the example. Otherwise, make these changes to the CLI settings:

```
user@host> set cli screen-length 66
Screen length set to 66 lines long
user@host> set cli screen-width 80
Screen width set to 80 columns wide
```

Overview

To see a list of CLI environmental settings that you can change, use the **set cli ?** command.

```
user@host> set cli ?
```


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```
Possible completions:
  complete-on-space  Set whether typing space completes current word
  directory          Set working directory
  idle-timeout       Set maximum idle time before login session ends
  logical-system     Set default logical system
  prompt             Set CLI command prompt string
  restart-on-upgrade Set whether CLI prompts to restart after software upgrade
  screen-length      Set number of lines on screen
  screen-width       Set number of characters on a line
  terminal           Set terminal type
  timestamp          Timestamp CLI output
```

This example focuses on three of these commands: **set cli screen-length**, **set cli screen-width**, and **set cli prompt**.

Configuration

This configuration example has the following sections:

- Configuring the CLI Prompt on page 61
- Configuring CLI Width on page 62
- Configuring CLI Length on page 63
- Return to the Default CLI Prompt on page 65

CLI Quick Configuration

To quickly configure this example, copy the following commands and paste them in a text file, remove any line breaks, change the values used to match your network configuration, and then copy and paste the commands into the CLI at the operational command prompt.

```
set cli prompt "router1-san-jose> "
set cli screen-width 110
set cli screen-length 45
```

NOTE: In Junos OS Release 13.3 and later, the value of **screen width** is 0 or in the range of 40 through 1024.

Configuring the CLI Prompt

Step-by-Step Procedure

The default CLI prompt is your *username*@*hostname*. But you can have any prompt you find useful.

To configure a different CLI prompt:

- Use the following operational mode command where *string* is the exact text you want to see at the command line.

  ```
  set cli prompt "string"
  ```

  For example, if “*string*” is “router1-san-jose> “, the command is as follows:

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```
set cli prompt "router1-san-jose> "
router1-san-jose>
```

Configuring CLI Width

Step-by-Step Procedure

How do you know what width works best for you? This example discusses how CLI width can affect what you see.

To configure a new default CLI width:

1. See what the current defaults are for the CLI environment.

```
router1-san-jose> show cli
CLI complete-on-space set to on
CLI idle-timeout disabled
CLI restart-on-upgrade set to on
CLI screen length set to 66
CLI screen width set to 80
CLI terminal is 'xterm'
router1-san-jose>
```

NOTE: In Junos OS Release 13.3 and later, the value of *width* is 0 or in the range of 40 through 1024.

2. Look at the following output for the operational command **show class-of-service forwarding-class**.

   The output from this command is wider than some and so illustrates a common problem with viewing output. If, for example, you have a relatively narrow window, command output might show up in overrun lines.

```
router1-san-jose> show class-of-service forwarding-class
Forwarding class     ID    Queue  Restricted queue  Fabric
priority  Policing priority   SPU priority
  premium-rate        0     0          0             low
               normal             low
  medium-rate         1     1          1             low
               normal             low
  low-rate            2     2          2             low
               normal             low
  NC                  3     3          3             low
               normal             low
  tunnel-rate         4     4          0             low
               normal             low
```

   The lines look to be intermingled and it is hard to read across to find the information you might be seeking.

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3. Change the window width to 110 columns.

   Notice how the output of this command is much easier to read in the wider format:

```
router1-san-jose> set cli screen-width 110
```

```
router1-san-jose> show class-of-service forwarding-class
Forwarding class      ID    Queue  Restricted queue  Fabric priority  Policing priority   SPU priority
  premium-rate         0     0          0             low               normal            low
  medium-rate          1     1          1             low               normal            low
  low-rate             2     2          2             low               normal            low
  NC                   3     3          3             low               normal            low
  tunnel-rate          4     4          0             low               normal            low
```

Configuring CLI Length

Step-by-Step Procedure

You can configure the length of the CLI screen in a similar fashion as you did the width.

To configure a new default CLI length:

1. See what the current defaults are for the CLI environment.

```
router1-san-jose> show cli
CLI complete-on-space set to on
CLI idle-timeout disabled
CLI restart-on-upgrade set to on
CLI screen length set to 66
CLI screen width set to 80
CLI terminal is 'xterm'
router1-san-jose>
```

2. Look at the following output for the operational command **show version**.

```
Makefile                                sync-dpm-sb.manifest
build                                   sync-equilibrium-sb.manifest
etc                                     sync-equilibrium2-sb.manifest
include                                 sync-hellopics-sb.manifest
jexample                                sync-ipprobe-mt-sb.manifest
jnx-cc-routeservice-sb.manifest         sync-ipprobe-sb.manifest
jnx-example-sb.manifest                 sync-ipsnooper-sb.manifest
jnx-flow-sb.manifest                    sync-monitube-sb.manifest
jnx-gateway-sb.manifest                 sync-monitube2-plugin-sb.manifest
jnx-ifinfo-sb.manifest                  sync-packetproc-sb.manifest
jnx-mspexampled-sb.manifest             sync-passthru-sb.manifest
jnx-msprsm-sb.manifest                  sync-policy-manager-sb.manifest
jnx-routeservice-sb.manifest            sync-reassembler-sb.manifest
lib                                     sync-route-manager-sb.manifest
JnprFirewall-Proto.html Makefile.depend.octeon  dfw_filter.proto
JnprFirewall.html       Makefile.depend.powerpc dfw_ifattach.proto
Makefile                Makefile.depend.xlr     dfw_policer.proto
Makefile.depend.arm     dfw.jsdl                dfw_stats.proto
Makefile.depend.host    dfw_bulk.proto
Makefile.depend.i386    dfw_common.proto
```

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```
Trying 192.168.184.75...
Connected to spot-fxp0.englab.juniper.net.
Escape character is '^]'.
Unauthorized use is prohibited.

router1-san-jose> show version
Hostname: spot
Model: mx240
Junos: 14.2-20140710_ib_14_2_psd.1
JUNOS Base OS boot [14.2-20140710_ib_14_2_psd.1]
JUNOS Base OS Software Suite [14.2-20140710_ib_14_2_psd.1]
JUNOS Kernel Software Suite [14.2-20140710_ib_14_2_psd.1]
JUNOS Crypto Software Suite [14.2-20140710_ib_14_2_psd.1]
JUNOS Packet Forwarding Engine Support (M/T/EX Common)
[14.2-20140710_ib_14_2_psd.1]
JUNOS Packet Forwarding Engine Support (MX Common)
[14.2-20140710_ib_14_2_psd.1]
JUNOS Online Documentation [14.2-20140710_ib_14_2_psd.1]
JUNOS Services AACL Container package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services Application Level Gateways [14.2-20140710_ib_14_2_psd.1]
JUNOS AppId Services [14.2-20140710_ib_14_2_psd.1]
JUNOS Border Gateway Function package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services Captive Portal and Content Delivery Container package
[14.2-20140710_ib_14_2_psd.1]
JUNOS Services HTTP Content Management package [14.2-20140710_ib_14_2_psd.1]
JUNOS IDP Services [14.2-20140710_ib_14_2_psd.1]
JUNOS Services Jflow Container package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services LL-PDF Container package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services MobileNext Software package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services Mobile Subscriber Service Container package
[14.2-20140710_ib_14_2_psd.1]
JUNOS Services NAT [14.2-20140710_ib_14_2_psd.1]
JUNOS Services PTSP Container package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services RPM [14.2-20140710_ib_14_2_psd.1]
JUNOS Services Stateful Firewall [14.2-20140710_ib_14_2_psd.1]
JUNOS Voice Services Container package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services Crypto [14.2-20140710_ib_14_2_psd.1]
JUNOS Services SSL [14.2-20140710_ib_14_2_psd.1]
JUNOS Services IPSec [14.2-20140710_ib_14_2_psd.1]
JUNOS platform Software Suite [14.2-20140710_ib_14_2_psd.1]
JUNOS Routing Software Suite [14.2-20140710_ib_14_2_psd.1]
JUNOS Runtime Software Suite [14.2-20140710_ib_14_2_psd.1]
JUNOS Web Management [14.2-20140710_ib_14_2_psd.1]
JUNOS py-base-i386 [14.2-20140710_ib_14_2_psd.1]

router1-san-jose>
```

The current length is 66 lines, which is close to the length of a typical monitor. But even though the output is fairly long, it hardly needs all that space to be clearly seen in its entirety. In fact, it is harder to pick out just where the output starts in a screen this long.

3. Change the window width to 45 lines.

```
router1-san-jose> set cli screen-length 45
```

4. Now look at the output again.

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```
router1-san-jose> show version
Hostname: spot
Model: mx240
Junos: 14.2-20140710_ib_14_2_psd.1
JUNOS Base OS boot [14.2-20140710_ib_14_2_psd.1]
JUNOS Base OS Software Suite [14.2-20140710_ib_14_2_psd.1]
JUNOS Kernel Software Suite [14.2-20140710_ib_14_2_psd.1]
JUNOS Crypto Software Suite [14.2-20140710_ib_14_2_psd.1]
JUNOS Packet Forwarding Engine Support (M/T/EX Common)
[14.2-20140710_ib_14_2_psd.1]
JUNOS Packet Forwarding Engine Support (MX Common)
[14.2-20140710_ib_14_2_psd.1]
JUNOS Online Documentation [14.2-20140710_ib_14_2_psd.1]
JUNOS Services AACL Container package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services Application Level Gateways [14.2-20140710_ib_14_2_psd.1]
JUNOS AppId Services [14.2-20140710_ib_14_2_psd.1]
JUNOS Border Gateway Function package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services Captive Portal and Content Delivery Container package
[14.2-20140710_ib_14_2_psd.1]
JUNOS Services HTTP Content Management package [14.2-20140710_ib_14_2_psd.1]
JUNOS IDP Services [14.2-20140710_ib_14_2_psd.1]
JUNOS Services Jflow Container package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services LL-PDF Container package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services MobileNext Software package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services Mobile Subscriber Service Container package
[14.2-20140710_ib_14_2_psd.1]
JUNOS Services NAT [14.2-20140710_ib_14_2_psd.1]
JUNOS Services PTSP Container package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services RPM [14.2-20140710_ib_14_2_psd.1]
JUNOS Services Stateful Firewall [14.2-20140710_ib_14_2_psd.1]
JUNOS Voice Services Container package [14.2-20140710_ib_14_2_psd.1]
JUNOS Services Crypto [14.2-20140710_ib_14_2_psd.1]
JUNOS Services SSL [14.2-20140710_ib_14_2_psd.1]
JUNOS Services IPSec [14.2-20140710_ib_14_2_psd.1]
JUNOS platform Software Suite [14.2-20140710_ib_14_2_psd.1]
JUNOS Routing Software Suite [14.2-20140710_ib_14_2_psd.1]
JUNOS Runtime Software Suite [14.2-20140710_ib_14_2_psd.1]
JUNOS Web Management [14.2-20140710_ib_14_2_psd.1]
JUNOS py-base-i386 [14.2-20140710_ib_14_2_psd.1]

router1-san-jose>
```

With a shorter sscreen, you can easily see where the current output begins and ends.

Return to the Default CLI Prompt

Step-by-Step Procedure

To go back to the default prompt:

1. Exit the CLI.

```
router1-san-jose> exit
%
```

2. Enter the CLI operational mode again.

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```
% cli
user@host>
```

Example: Enabling Configuration Breadcrumbs

The output of **show configuration** operational mode command and **show** configuration mode commands can be configured to display configuration breadcrumbs that indicate the exact location in the hierarchy of the output being viewed.

Before enabling the configuration breadcrumbs feature, check the output of the **show configuration** command.

```
user@host> show configuration
```

```
...
                }
            }
        }
    }
  }
  fe-4/1/2 {
      description "FA4/1/2: mxxj1-mr6 (64.12.137.160/27) (T=bblan, bbmail,
bbowmtc)";
      unit 0 {
          family inet {
              filter {
                  output 151mj;
              }
              address 64.12.137.187/27 {
                  vrrp-group 1 {
                      virtual-address 64.12.137.189;
---(more 18%)--------------------------------------------------------
```

In the output, there is no clear indication about the section of the configuration being viewed.

To enable the configuration breadcrumbs feature:

1. Define a class at the **[edit system login]** hierarchy level.

   ```
   [edit system login]
   user@host# set class breadclass idle-timeout 10
   ```

2. Add a user to the defined login class to enable the breadcrumbs output view when this user enters the **show configuration** operational mode command.

   ```
   [edit system login user user1]
   user@host# set class breadclass
   ```


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3. Configure the **configuration-breadcrumbs** statement at the **[edit system login class *<class name>*]** hierarchy level.

```
[edit system login class breadclass]
user@host# set configuration-breadcrumbs
```

4. Confirm the configuration.

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

On enabling configuration breadcrumbs in the CLI, User1 (the user added to the login class) can verify the feature in the output by entering the **show configuration** command.

```
user1@host> show configuration

...
                }
              }
            }
        }
    }
    fe-4/1/2 {
        description "FA4/1/2: mxxj1-mr6 (64.12.137.160/27) (T=bblan, bbmail,
bbowmtc)";
        unit 0 {
            family inet {
                filter {
                    output 151mj;
                }
                address 64.12.137.187/27 {
                    vrrp-group 1 {
                        virtual-address 64.12.137.189;
---(more 18%)---[groups main interfaces fe-4/1/2 unit 0 family inet address
64.12.137.187/27 vrrp-group 1]---
```

The new output indicates the exact location of the configuration hierarchy being viewed. User1 is currently viewing the interface configuration of a group.

NOTE: If you are enabling configuration breadcrumbs for your own user account, you should log out and log in again to see the changes.

See Also

- *class*
- configuration-breadcrumbs on page 306

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Release History Table

Release	Description
13.3	In Junos OS Release 13.3 and later, the value of **screen width** is **0** or in the range of **40** through **1024**.
13.2	In Junos OS Release 13.2 and earlier, the value of ***width*** is in the range of **0** through **1024**.

Related Documentation

- Day One: Exploring the Junos CLI

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CHAPTER 3

Using Configuration Statements to Configure a Device

- CLI Configuration Mode Overview on page 69
- Configure Command Overview on page 82
- Modifying the Configuration for a Device on page 87
- Using Configuration Groups to Quickly Configure Devices on page 120
- Viewing the Configuration on page 149
- Verifying the Junos OS Configuration on page 156
- Committing a Configuration on page 157

CLI Configuration Mode Overview

The configuration mode of the CLI enables you to configure a device. The configuration statements allow you to configure all properties of the device. For more information about the configuration mode, see the following topics:

- Understanding Junos OS CLI Configuration Mode on page 69
- Entering and Exiting the Junos OS CLI Configuration Mode on page 76
- Issuing Relative Junos OS Configuration Mode Commands on page 78
- Examples: Using Command Completion in Configuration Mode on page 79
- Notational Conventions Used in Junos OS Configuration Hierarchies on page 81

Understanding Junos OS CLI Configuration Mode

You can configure all properties of Junos OS, including interfaces, general routing information, routing protocols, and user access, as well as several system hardware properties.

As described in "Understanding the Junos OS CLI Modes, Commands, and Statement Hierarchies" on page 25, a router configuration is stored as a hierarchy of statements. In configuration mode, you create the specific hierarchy of configuration statements that you want to use. When you have finished entering the configuration statements, you commit them, which activates the configuration on the router.

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You can create the hierarchy interactively or you can create an ASCII text file that is loaded onto the router or switch and then committed.

This topic covers:

- Configuration Mode Commands on page 71
- Configuration Statements and Identifiers on page 72
- Configuration Statement Hierarchy on page 74

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Configuration Mode Commands

Table 5 on page 71 summarizes each CLI configuration mode command. The commands are organized alphabetically.

Table 5: Summary of Configuration Mode Commands

Command	Description
activate	Remove the **inactive:** tag from a statement, effectively reading the statement or identifier to the configuration. Statements or identifiers that have been activated take effect when you next issue the **commit** command.
annotate	Add comments to a configuration. You can add comments only at the current hierarchy level.
commit	Commit the set of changes to the database and cause the changes to take operational effect.
copy	Make a copy of an existing statement in the configuration.
deactivate	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.
delete	Delete a statement or identifier. All subordinate statements and identifiers contained within the specified statement path are deleted with it.
edit	Move inside the specified statement hierarchy. If the statement does not exist, it is created.
exit	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.
extension	Manage configurations that are contributed by SDK application packages. Either display or delete user-defined configuration contributed by the named SDK application package. A configuration defined in any native Junos OS package is never deleted by the extension command.
help	Display help about available configuration statements.
insert	Insert an identifier into an existing hierarchy.
load	Load a configuration from an ASCII configuration file or from terminal input. Your current location in the configuration hierarchy is ignored when the load operation occurs.

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Table 5: Summary of Configuration Mode Commands (continued)

Command	Description
quit	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.
rename	Rename an existing configuration statement or identifier.
replace	Replace identifiers or values in a configuration.
rollback	Return to a previously committed configuration. The software saves the last 10 committed configurations, including the rollback number, date, time, and name of the user who issued the **commit configuration** command.
run	Run a top-level CLI command without exiting from configuration mode.
save	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.
set	Create a statement hierarchy and set identifier values. This is similar to **edit** except that your current level in the hierarchy does not change.
show	Display the current configuration.
status	Display the users currently editing the configuration.
top	Return to the top level of configuration command mode, which is indicated by the **[edit]** banner.
up	Move up one level in the statement hierarchy.
update	Update a private database.
wildcard	Delete a statement or identifier. All subordinate statements and identifiers contained within the specified statement path are deleted with it. You can use regular expressions to specify a pattern. Based on this pattern, you search for items that contain these patterns and delete them.

Configuration Statements and Identifiers

You can configure router or switch properties by including the corresponding statements in the configuration. Typically, a statement consists of a keyword, which is fixed text, and, optionally, an identifier. An identifier is an identifying name that you can define, such as

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the name of an interface or a username, which enables you and the CLI to differentiate among a collection of statements.

Table 6 on page 73 describes top-level CLI configuration mode statements.

NOTE: The QFX3500 switch does not support the IS-IS, OSPF, BGP, LDP, MPLS, and RSVP protocols.

Table 6: Configuration Mode Top-Level Statements

Statement	Description
access	Configure the Challenge Handshake Authentication Protocol (CHAP). For information about the statements in this hierarchy, see the *Junos OS Administration Library*.
accounting-options	Configure accounting statistics data collection for interfaces and firewall filters. For information about the statements in this hierarchy, see the *Network Management and Monitoring Guide*.
chassis	Configure properties of the router chassis, including conditions that activate alarms and SONET/SDH framing and concatenation properties. For information about the statements in this hierarchy, see the *Junos OS Administration Library*.
class-of-service	Configure class-of-service parameters. For information about the statements in this hierarchy, see the Junos OS Class of Service Feature Guide for Routing Devices.
firewall	Define filters that select packets based on their contents. For information about the statements in this hierarchy, see the *Routing Policies, Firewall Filters, and Traffic Policers Feature Guide*.
forwarding-options	Define forwarding options, including traffic sampling options. For information about the statements in this hierarchy, see the *Junos OS Network Interfaces Library for Routing Devices*.
groups	Configure configuration groups. For information about statements in this hierarchy, see the *Junos OS Administration Library*.
interfaces	Configure interface information, such as encapsulation, interfaces, virtual channel identifiers (VCIs), and data-link connection identifiers (DLCIs). For information about the statements in this hierarchy, see the *Junos OS Network Interfaces Library for Routing Devices*.
policy-options	Define routing policies, which allow you to filter and set properties in incoming and outgoing routes. For information about the statements in this hierarchy, see the *Routing Policies, Firewall Filters, and Traffic Policers Feature Guide*.

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Table 6: Configuration Mode Top-Level Statements (continued)

Statement	Description
protocols	Configure routing protocols, including BGP, IS-IS, LDP, MPLS, OSPF, RIP, and RSVP. For information about the statements in this hierarchy, see the chapters that discuss how to configure the individual routing protocols in the *Junos OS Routing Protocols Library* and the MPLS Applications Feature Guide for Routing Devices.
routing-instances	Configure multiple routing instances. For information about the statements in this hierarchy, see the *Junos OS Routing Protocols Library*.
routing-options	Configure protocol-independent routing options, such as static routes, autonomous system numbers, confederation members, and global tracing (debugging) operations to log. For information about the statements in this hierarchy, see the *Junos OS Routing Protocols Library*.
security	Configure IP Security (IPsec) services. For information about the statements in this hierarchy see the *Junos OS Administration Library*.
snmp	Configure SNMP community strings, interfaces, traps, and notifications. For information about the statements in this hierarchy, see the *Network Management and Monitoring Guide*.
system	Configure systemwide properties, including the hostname, domain name, Domain Name System (DNS) server, user logins and permissions, mappings between hostnames and addresses, and software processes. For information about the statements in this hierarchy, see the *Junos OS Administration Library*.

For specific information on configuration statements, see the Junos OS configuration guides.

Configuration Statement Hierarchy

The Junos OS configuration consists of a hierarchy of *statements*. There are two types of statements: *container statements*, which are statements that contain other statements, and *leaf statements*, which do not contain other statements (see Figure 4 on page 75). All of the container and leaf statements together form the *configuration hierarchy*.

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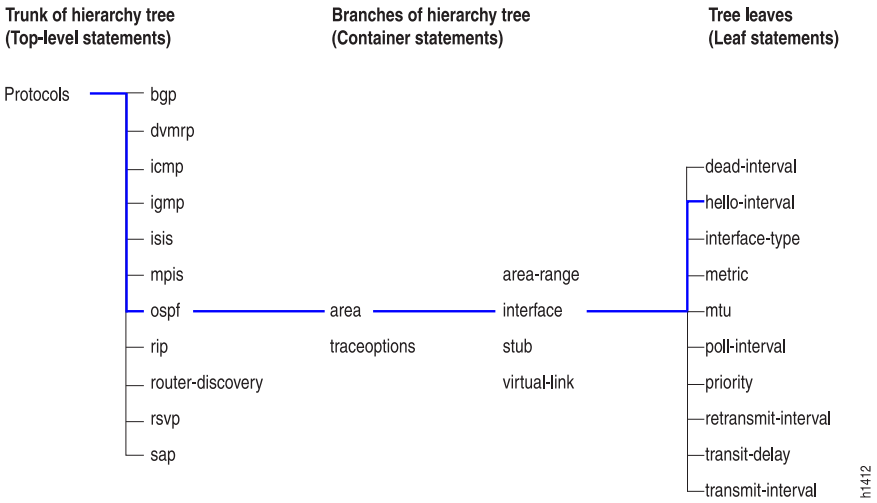
Figure 4: Configuration Mode Hierarchy of Statements



Each statement at the top level of the configuration hierarchy resides at the trunk (or root level) of a hierarchy tree. The top-level statements are container statements, containing other statements that form the tree branches. The leaf statements are the leaves of the hierarchy tree. An individual hierarchy of statements, which starts at the trunk of the hierarchy tree, is called a *statement path*. Figure 4 on page 75 illustrates the hierarchy tree, showing a statement path for the portion of the protocol configuration hierarchy that configures the hello interval on an interface in an OSPF area.

The **protocols** statement is a top-level statement at the trunk of the configuration tree. The **ospf**, **area**, and **interface** statements are all subordinate container statements of a higher statement (they are branches of the hierarchy tree); and the **hello-interval** statement is a leaf on the tree which in this case contains a data value: the length of the hello interval, in seconds.

The CLI represents the statement path shown in Figure 4 on page 75 as **[edit protocols ospf area *area-number* interface *interface-name*]** and displays the configuration as follows:

```
protocols {
  ospf {
    area 0.0.0.0 {
      interface so-0/0/0 {
        hello-interval 5;
      }
      interface so-0/0/1 {
        hello-interval 5;
      }
    }
  }
}
```

The CLI indents each level in the hierarchy to indicate each statement's relative position in the hierarchy and generally sets off each level with braces, using an open brace at the

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beginning of each hierarchy level and a closing brace at the end. If the statement at a hierarchy level is empty, the braces are not printed.

Each leaf statement ends with a semicolon. If the hierarchy does not extend as far as a leaf statement, the last statement in the hierarchy ends with a semicolon.

The configuration hierarchy can also contain "oneliners" at the last level in the hierarchy. Oneliners remove one level of braces in the syntax and display the container statement, its identifiers, the child or leaf statement and its attributes all on one line. For example, in the following sample configuration hierarchy, the line **level 1 metric *10*** is a oneliner because the **level** container statement with identifier ***1***, its child statement **metric**, and its corresponding attribute ***10*** all appear on a single line in the hierarchy:

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

Likewise, in the following example, **dynamic-profile *dynamic-profile-name* aggregate-clients;** is a oneliner because the **dynamic-profile** statement, its identifier ***dynamic-profile-name***, and leaf statement **aggregate-clients** all appear on one line when you run the **show** command in the configuration mode:

```
[edit forwarding-options]
user@host# show
dhcp-relay {
  dynamic-profile dynamic-profile-name aggregate-clients;
}
```

Entering and Exiting the Junos OS CLI Configuration Mode

You configure Junos OS by entering configuration mode and creating a hierarchy of configuration mode statements.

- To enter configuration mode, use the **configure** command.

  When you enter configuration mode, the following configuration mode commands are available:

```
user@host>configure
```

```
entering 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
```


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```
  deactivate          Add the inactive tag to a statement
  delete              Delete a data element
  edit                Edit a sub-element
  exit                Exit from this level
  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
  wildcard            Wildcard operations
[edit]
user@host>
```

Users must have configure permission to view and use the **configure** command. When in configuration mode, a user can view and modify only those statements for which they have access privileges set. For more information, see the *Junos OS Administration Library*.

- If you enter configuration mode and another user is also in configuration mode, a message shows the user's name and what part of the configuration the user is viewing or editing:

```
user@host> configure
Entering configuration mode
Users currently editing the configuration:
  root terminal d0 (pid 4137) on since 2008-04-09 23:03:07 PDT, idle 7w6d 08:22

  [edit]
The configuration has been changed but not committed

[edit]
user@host#
```

Up to 32 users can be in configuration mode simultaneously, and they all can make changes to the configuration at the same time.

- To exit configuration mode, use the **exit configuration-mode** configuration mode command from any level, or use the **exit** command from the top level. For example:

```
[edit protocols ospf area 0.0.0.0 interface so-0/0/0]
user@host# exit configuration-mode
exiting configuration mode
user@host>
```

```
[edit]
user@host# exit
```

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```
exiting configuration mode
user@host>
```

If you try to exit from configuration mode using the **exit** command and the configuration contains changes that have not been committed, you see a message and prompt:

```
[edit]
user@host# exit
The configuration has been changed but not committed
Exit with uncommitted changes? [yes,no] (yes) <Enter>
Exiting configuration mode
user@host>
```

- To exit with uncommitted changes without having to respond to a prompt, use the **exit configuration-mode** command. This command is useful when you are using scripts to perform remote configuration.

```
[edit]
user@host# exit configuration-mode
The configuration has been changed but not committed
Exiting configuration mode
user@host>
```

See Also

- Modifying the Junos OS Configuration on page 88
- Commit Operation When Multiple Users Configure the Software on page 161
- Managing Programs and Processes Using Junos OS Operational Mode Commands on page 263
- Displaying set Commands from the Junos OS Configuration on page 154
- Using the configure exclusive Command on page 84
- Updating the configure private Configuration on page 86
- Switching Between Junos OS CLI Operational and Configuration Modes on page 33

Issuing Relative Junos OS Configuration Mode Commands

The **top** or **up** command followed by another configuration command, including **edit**, **insert**, **delete**, **deactivate**, **annotate**, or **show** enables you to quickly move to the top of the hierarchy or to a level above the area you are configuring.

To issue configuration mode commands from the top of the hierarchy, use the **top** command; then specify a configuration command. For example:

```
[edit interfaces fxp0 unit 0 family inet]
user@host# top edit system login
[edit system login]
user@host#
```


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To issue configuration mode commands from a location higher up in the hierarchy, use the **up** configuration mode command; specify the number of levels you want to move up the hierarchy and then specify a configuration command. For example:

```
[edit protocols bgp]
user@host# up 2 activate system
```

See Also

- Displaying the Current Junos OS Configuration on page 149

Examples: Using Command Completion in Configuration Mode

List the configuration mode commands:

```
[edit]
user@host# ?
  <[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
  wildcard             Wildcard operations
[edit]user@host#
```

List all the statements available at a particular hierarchy level:

```
[edit]
user@host# edit ?
Possible completions:
> accounting-options  Accounting data configuration
> chassis             Chassis configuration
> class-of-service    Class-of-service configuration
> firewall            Define a firewall configuration
> forwarding-options  Configure options to control packet sampling
> groups              Configuration groups
> interfaces          Interface configuration
```

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```
> policy-options      Routing policy option configuration
> protocols           Routing protocol configuration
> routing-instances   Routing instance configuration
> routing-options     Protocol-independent routing option configuration
> snmp                Simple Network Management Protocol
> system              System parameters
```

```
user@host# edit protocols ?
Possible completions:
<[Enter]>          Execute this command
> bgp              BGP options
> connections      Circuit cross-connect configuration
> dvmrp            DVMRP options
> igmp             IGMP options
> isis             IS-IS options
> ldp              LDP options
> mpls             Multiprotocol Label Switching options
> msdp             MSDP options
> ospf             OSPF configuration
> pim              PIM options
> rip              RIP options
> router-discovery ICMP router discovery options
> rsvp             RSVP options
> sapSession       Advertisement Protocol options
> vrrp             VRRP options
|                  Pipe through a command
```

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

List all commands that start with a particular letter or string:

```
user@host# edit routing-options a?
Possible completions:
> aggregate          Coalesced routes
> autonomous-system   Autonomous system number
```

```
[edit]
user@host# edit routing-options a
```

List all configured Asynchronous Transfer Mode (ATM) interfaces:

```
[edit]
user@host# edit interfaces at?
<interface_name>     Interface name
  at-0/2/0             Interface name
  at-0/2/1             Interface name
[edit]
user@host# edit interfaces at
```

Display a list of all configured policy statements:

```
[edit]
user@host# show policy-options policy-statement ?
```


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```
<policy_name>        Name to identify a policy filter
user@host# show policy-options policy-statement
  <policy_name>        Name to identify a policy filter
  lo0only-v4           Name to identify a policy filter
  lo0only-v6           Name to identify a policy filter
  lo2bgp               Name to identify a policy filter
```

See Also

- Examples: Using the Junos OS CLI Command Completion on page 252
- Displaying the Junos OS CLI Command and Word History on page 269

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.

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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.

See Also
- *Configuration Features in the Junos OS*
- *Configuration Mode Commands in the Junos OS*

Related Documentation
- Day One: Exploring the Junos CLI

Configure Command Overview

Configure command is used to enter the CLI configuration mode. It can also be used to gather other information, such as other users currently in configuration mode. For more information, see the following topics:

- Forms of the configure Command on page 82
- Using the configure Command on page 84
- Using the configure exclusive Command on page 84
- Updating the configure private Configuration on page 86

Forms of the configure Command

The Junos OS supports three forms of the **configure** command: **configure**, **configure private**, and **configure exclusive**. These forms control how users edit and commit configurations and can be useful when multiple users configure the software. See Table 7 on page 83.

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Table 7: Forms of the configure Command

Command	Edit Access	Commit Access
configure	• No one can lock the configuration. All users can make configuration changes. When you enter configuration mode, the CLI displays the following information: ◦ A list of other users editing the configuration. ◦ Hierarchy levels the users are viewing or editing. ◦ Whether the configuration has been changed, but not committed. ◦ When multiple users enter conflicting configurations, the most recent change to be entered takes precedence.	• No one can lock the configuration. All users can commit all changes to the configuration. • If you and another user make changes and the other user commits changes, your changes are committed as well.
configure exclusive	• One user locks the configuration and makes changes without interference from other users. • Other users can enter and exit configuration mode, but they cannot commit the configuration. • If you enter configuration mode while another user has locked the configuration (with the **configure exclusive** command), the CLI displays the user and the hierarchy level the user is viewing or editing. • If you enter configuration mode while another user has locked the configuration, you can forcibly log out that user with the **request system logout** operational mode command. For details, see the CLI Explorer.	
configure private	• Multiple users can edit the configuration at the same time. • Each user has a private candidate configuration to edit independently of other users. • When multiple users enter conflicting configurations, the first commit operation takes precedence over subsequent commit operations.	• When you commit the configuration, the router verifies that the operational (running) configuration has not been modified by another user before accepting your private candidate configuration as the new operational configuration. • If the configuration has been modified by another user, you can merge the modifications into your private candidate configuration and attempt to commit again.

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See Also

- Committing a Junos OS Configuration on page 158
- Displaying Users Currently Editing the Junos OS Configuration on page 87
- Displaying set Commands from the Junos OS Configuration on page 154

Using the configure Command

You can use the **configure** command to not only enter the CLI configuration mode but also to gather other information, such as other users currently in configuration mode.

Up to 32 users can be in configuration mode simultaneously, and they all can make changes to the configuration at the same time. When you commit changes to the configuration, you may be committing a combination of changes you and other users have made. For this reason, you will want to keep track on who if anyone is in configuration mode with you.

To see other users currently logged onto the same device in configuration mode:

- Use the **configure** command to enter the CLI configuration mode.

  If there are other users, the message displayed indicates who the users are and what portion of the configuration the each person is viewing or editing.

```
user@host> configure
Entering configuration mode
Current configuration users:
root terminal p3 (pid 1088) on since 1999-05-13 01:03:27 EDT
[edit interfaces so-3/0/0 unit 0 family inet]
The configuration has been changed but not committed
[edit]
user@host#
```

Notice also that If, when you enter configuration mode, the configuration contains changes that have not been committed, another message is displayed:

```
user@host> configure
Entering configuration mode
The configuration has been changed but not committed
[edit]
user@host#
```

This tells you that another user has already made changes to the configuration.

Using the configure exclusive Command

If you enter configuration mode with the **configure exclusive** command, you lock the candidate *global* configuration (also known as the *shared configuration* or *shared configuration database*) for as long as you remain in configuration mode, allowing you to make changes without interference from other users. Other users can enter and exit configuration mode, but they cannot commit the configuration.

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If another user has locked the configuration, and you need to forcibly log the person out, enter the operational mode command **request system logout pid** *pid_number*.

If you enter configuration mode and another user is also in configuration mode and has locked the configuration, a message identifies the user and the portion of the configuration that the user is viewing or editing:

```
user@host> configure
Entering configuration mode
Users currently editing the configuration:
root terminal p3 (pid 1088) on since 2000-10-30 19:47:58 EDT, idle 00:00:44
exclusive [edit interfaces so-3/0/0 unit 0 family inet]
```

In configure exclusive mode, any uncommitted changes are discarded when you exit:

```
user@host> configure exclusive
warning: uncommitted changes will be discarded on exit
Entering configuration mode
[edit]
user@host# set system host-name cool
[edit]
user@host# quit
The configuration has been changed but not committed
warning: Auto rollback on exiting 'configure exclusive'
Discard uncommitted changes? [yes,no] (yes)
warning: discarding uncommitted changes
load complete
Exiting configuration mode
```

When you use the **yes** option to exit configure exclusive mode, Junos OS discards your uncommitted changes and rolls backs your configuration. The **no** option allows you to continue editing or to commit your changes in configure exclusive mode.

When a user exits from configure exclusive mode while another user is in configure private mode, Junos OS will roll back any uncommitted changes.

If you enter the configuration mode with the **configure exclusive** command, and issue **commit confirmed**, but do not confirm the commit, auto rollback happens. Once auto rollback happens, the management daemon (MGD) removes the exclusive lock from your session and as a result, the error message “access has been revoked” is displayed. This is because the session is no more an exclusive session.

```
user@host> configure exclusive
warning: uncommitted changes will be discarded on exit
Entering configuration mode
[edit]
user@host# commit confirmed 1
commit confirmed will be automatically rolled back in 1 minutes unless confirmed
commit
# commit confirmed will be rolled back in 1 minute
Commit was not confirmed; automatic rollback complete.
[edit]
user@host# commit
```

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```
error: access has been revoked.
user@host# commit check
error: access has been revoked.
```

If the you initiate a configure exclusive session, issue **commit confirmed** and confirm the commit, the exclusive lock is retained in your session

```
user@host> configure exclusive
warning: uncommitted changes will be discarded on exit
Entering configuration mode
[edit]
user@host# commit confirmed 1
commit confirmed will be automatically rolled back in 1 minutes unless confirmed
commit complete
# commit confirmed will be rolled back in 1 minute
[edit]
user@host# commit
commit complete
[edit]
user@host# commit
commit complete
```

See Also

- Adding Junos OS Configuration Statements and Identifiers on page 89

Updating the configure private Configuration

When you are in configure private mode, you must work with a copy of the most recently committed shared configuration. If the global configuration changes, you can issue the **update** command to update your private candidate configuration. When you do this, your private candidate configuration contains a copy of the most recently committed configuration with your private changes merged in. For example:

```
[edit]
user@host# update
[edit]
user@host#
```

NOTE: Merge conflicts can occur when you issue the update command.

You can also issue the **rollback** command to discard your private candidate configuration changes and obtain the most recently committed configuration:

```
[edit]
user@host# rollback
[edit]
user@host#
```


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Related Documentation

- Day One: Exploring the Junos CLI

Modifying the Configuration for a Device

Junos CLI enables you to modify an existing Junos OS configuration. For more information about modifying the existing configuration, for example adding a statement, deleting a statement, copying a statement, inserting a new identifier, see the following topics.

- Displaying Users Currently Editing the Junos OS Configuration on page 87
- Modifying the Junos OS Configuration on page 88
- Adding Junos OS Configuration Statements and Identifiers on page 89
- Deleting a Statement from a Junos OS Configuration on page 90
- Example: Deleting a Statement from the Junos OS Configuration on page 91
- Copying a Junos OS Statement in the Configuration on page 92
- Example: Copying a Statement in the Junos Configuration on page 93
- Examples: Re-Using Configuration on page 95
- Inserting a New Identifier in a Junos OS Configuration on page 100
- Example: Inserting a New Identifier in a Junos Configuration on page 101
- Renaming an Identifier in a Junos OS Configuration on page 104
- Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration on page 105
- Example: Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration on page 105
- Using Global Replace in the Junos OS Configuration on page 107
- Common Regular Expressions to Use with the replace Command on page 108
- Example: Using Global Replace in a Junos OS Configuration—Using the \n Back Reference on page 109
- Example: Using Global Replace in a Junos OS Configuration—Replacing an Interface Name on page 111
- Example: Using Global Replace in a Junos OS Configuration—Using the upto Option on page 113
- Using Regular Expressions to Delete Related Items from a Junos OS Configuration on page 114
- Adding Comments in a Junos OS Configuration on page 116
- Example: Including Comments in a Junos OS Configuration by Using the CLI on page 118

Displaying Users Currently Editing the Junos OS Configuration

To display the users currently editing the configuration, use the **status** configuration mode command:

```
user@host# status
```

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```
Users currently editing the configuration:
rchen terminal p0 (pid 55691) on since 2006-03-01 13:17:25 PST
[edit interfaces]
```

The system displays who is editing the configuration (**rchen**), where the user is logged in (**terminal p0**), the date and time the user logged in (**2006-03-01 13:17:25 PST**), and what level of the hierarchy the user is editing (**[edit interfaces]**).

If you issue the **status** configuration mode command and a user has scheduled a candidate configuration to become active for a future time, the system displays who scheduled the commit (**root**), where the user is logged in (**terminal d0**), the date and time the user logged in (**2002-10-31 14:55:15 PST**), and that a commit is pending **(commit at).**

```
[edit]
user@host# status
Users currently editing the configuration:
root terminal d0 (pid 767) on since 2002-10-31 14:55:15 PST, idle 00:03:09
commit at
```

For information about how to schedule a commit, see "Scheduling a Junos OS Commit Operation" on page 166.

If you issue the **status** configuration mode command and a user is editing the configuration in configure exclusive mode, the system displays who is editing the configuration (**root**), where the user is logged in (**terminal d0**), the date and time the user logged in (**2002-11-01 13:05:11 PST**), and that a user is editing the configuration in configure exclusive mode (**exclusive [edit]**).

```
[edit]
user@host# status
Users currently editing the configuration:
root terminal d0 (pid 2088) on since 2002-11-01 13:05:11 PST
exclusive [edit]
```

See Also

- Forms of the configure Command on page 82
- Using the configure Command on page 84

Modifying the Junos OS Configuration

To configure a device running Junos OS or to modify an existing Junos OS configuration, you add statements to the configuration. For each statement hierarchy, you create the hierarchy starting with a statement at the top level and continuing with statements that move progressively lower in the hierarchy.

To modify the hierarchy, you use two configuration mode commands:

- **edit**—Moves to a particular hierarchy level. If that hierarchy level does not exist, the **edit** command creates it. The **edit** command has the following syntax:

  ```
  edit <statement-path>
  ```


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- **set**—Creates a configuration statement and sets identifier values. After you issue a **set** command, you remain at the same level in the hierarchy. The **set** command has the following syntax:

  ```
  set <statement-path> statement <identifier>
  ```

  statement-path is the hierarchy to the configuration statement and the statement itself. If you have already moved to the statement's hierarchy level, you can omit the statement path. ***statement*** is the configuration statement itself. ***identifier*** is a string that identifies an instance of a statement.

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

See Also

- Displaying the Current Junos OS Configuration on page 149
- Using the configure exclusive Command on page 84
- Updating the configure private Configuration on page 86
- Issuing Relative Junos OS Configuration Mode Commands on page 78

Adding Junos OS Configuration Statements and Identifiers

All properties of a device running Junos OS are configured by including *statements* in the configuration. A statement consists of a keyword, which is fixed text, and, optionally, an *identifier*. An identifier is an identifying name which you define, such as the name of an interface or a username, and which allows you and the CLI to discriminate among a collection of statements.

For example, the following list shows the statements available at the top level of configuration mode:

```
user@host# set?
Possible completions:
> accounting-options   Accounting data configuration
+ apply-groups         Groups from which to inherit configuration data
> chassis              Chassis configuration
> class-of-service     Class-of-service configuration
> firewall             Define a firewall configuration
> forwarding-options   Configure options to control packet sampling
> groups               Configuration groups
> interfaces           Interface configuration
> policy-options       Routing policy option configuration
> protocols            Routing protocol configuration
> routing-instances    Routing instance configuration
> routing-options      Protocol-independent routing option configuration
> snmp                 Simple Network Management Protocol
> system               System parameters
```

An angle bracket (>) before the statement name indicates that it is a container statement and that you can define other statements at levels below it. If there is no angle bracket

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(>) before the statement name, the statement is a leaf statement; you cannot define other statements at hierarchy levels below it.

A plus sign (+) before the statement name indicates that it can contain a set of values. To specify a set, include the values in brackets. For example:

```
[edit]
user@host# set policy-options community my-as1-transit members [65535:10 65535:11]
```

In some statements, you can include an identifier. For some identifiers, such as interface names, you must specify the identifier in a precise format. For example, the interface name so-0/0/0 refers to a SONET/SDH interface that is on the Flexible PIC Concentrator (FPC) in slot 0, in the first PIC location, and in the first port on the Physical Interface Card (PIC). For other identifiers, such as interface descriptive text and policy and firewall term names, you can specify any name, including special characters, spaces, and tabs.

You must enclose in quotation marks (double quotes) identifiers and any strings that include a space or tab character or any of the following characters:

```
( ) [ ] { } ! @ # $ % ^ & | ' = ?
```

If you do not type an option for a statement that requires one, a message indicates the type of information required. In this example, you need to type an area number to complete the command:

```
[edit]
user@host# set protocols ospf area<Enter>
                                 ^
syntax error, expecting <identifier>
```

See Also

- Using the configure exclusive Command on page 84
- Additional Details About Specifying Junos OS Statements and Identifiers on page 210
- Displaying the Current Junos OS Configuration on page 149

Deleting a Statement from a Junos OS Configuration

To delete a statement or identifier from a Junos OS configuration, use the **delete** configuration mode command. Deleting a statement or an identifier effectively "unconfigures" the functionality associated with that statement or identifier, returning that functionality to its default condition.

```
user@host# delete <statement-path> <identifier>
```

When you delete a statement, the statement and all its subordinate statements and identifiers are removed from the configuration.

For statements that can have more than one identifier, when you delete one identifier, only that identifier is deleted. The other identifiers in the statement remain.

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To delete the entire hierarchy starting at the current hierarchy level, do not specify a statement or an identifier in the **delete** command. When you omit the statement or identifier, you are prompted to confirm the deletion:

```
[edit]
user@host# delete
Delete everything under this level? [yes, no] (no)
Possible completions:
no    Don't delete everything under this level
yes   Delete everything under this level
Delete everything under this level? [yes, no] (no)
```

NOTE: You cannot delete multiple statements or identifiers within a hierarchy using a single **delete** command. You must delete each statement or identifier individually using multiple **delete** commands. For example, consider the following configuration at the **[edit system]** hierarchy level:

```
system {
   host-name host-211;
   domain-name domain-122;
   backup-router 192.168.71.254;
   arp;
   authentication-order [ radius password tacplus ];
}
```

To delete the **domain-name**, **host-name**, and **backup-router** from the configuration, you cannot issue a single **delete** command:

```
user@host> delete system hostname host-211 domain-name domain-122 backup-router
192.168.71.254
```

You can only delete each statement individually:

```
user@host delete system host-name host-211
user@host delete system domain-name domain-122
user@host delete system backup-router 192.168.71.254
```

Example: Deleting a Statement from the Junos OS Configuration

The following example shows how to delete the **ospf** statement, effectively unconfiguring OSPF on the router:

```
[edit]
user@host# set protocols ospf area 0.0.0.0 interface so-0/0/0 hello-interval 5
[edit]
user@host# show
protocols {
   ospf {
      area 0.0.0.0 {
         interface so-0/0/0 {
```

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```
            hello-interval 5;
        }
      }
    }
}
[edit]
user@host# delete protocols ospf
[edit]
user@host# show
[edit]
user@host#
```

Delete all statements from the current level down:

```
[edit]
user@host# edit protocols ospf area 0.0.0.0
[edit protocols ospf area 0.0.0.0]
user@host# set interface so-0/0/0 hello-interval 5
[edit protocols ospf area 0.0.0.0]
user@host# delete
Delete everything under this level? [yes, no] (no) yes
[edit protocols ospf area 0.0.0.0]
user@host# show
[edit]
user@host#
```

Unconfigure a particular property:

```
[edit]
user@host# set interfaces so-3/0/0 speed 100mb
[edit]
user@host# show
interfaces {
    so-3/0/0 {
        speed 100mb;
    }
}
[edit]
user@host# delete interfaces so-3/0/0 speed
[edit]
user@host# show
interfaces {
    so-3/0/0;
}
```

Copying a Junos OS Statement in the Configuration

When you have many similar statements in a Junos configuration, you can add one statement and then make copies of that statement. Copying a statement duplicates that statement and the entire hierarchy of statements configured under that statement. Copying statements is useful when you are configuring many physical or logical interfaces of the same type.

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To make a copy of an existing statement in the configuration, use the configuration mode **copy** command:

```
user@host# copy existing-statement to new-statement
```

Immediately after you have copied a portion of the configuration, the configuration might not be valid. You must check the validity of the new configuration, and if necessary, modify either the copied portion or the original portion for the configuration to be valid.

Example: Copying a Statement in the Junos Configuration

This example shows how you can create one virtual connection (VC) on an interface by copying an existing VC.

- Requirements on page 93
- Overview on page 94
- Configuration on page 94

Requirements

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

Before you begin this example, configure the following initial configuration.

```
[edit interfaces]
user@host# show
at-1/0/0 {
   description "PAIX to MAE West"
   encapsulation atm-pvc;
   unit 61 {
      point-to-point;
      vci 0.61;
      family inet {
         address 10.0.1.1/24;
      }
   }
}
```

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

```
set interfaces at-1/0/0 description "PAIX to MAE West"
set interfaces at-1/0/0 encapsulation atm-pvc
set interfaces at-1/0/0 unit 61 point-to-point
set interfaces at-1/0/0 unit 61 vci 0.61
set interfaces at-1/0/0 unit 61 family inet address 10.0.1.1/24
```

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Overview

Copying statements is useful when you are configuring many physical or logical interfaces of the same type. You can add one statement and then make copies of that statement. Copying a statement duplicates that statement and the entire hierarchy of statements configured under that statement. In the case of this example, we are adding a virtual connection that is very similar to a virtual connection already configured.

Configuration

CLI Quick Configuration

Start at the **[edit interfaces at-1/0/0]** hierarchy level.

```
copy unit 61 to unit 62
set unit 62 vci 0.62
edit unit 62
replace pattern 10.0.1.1 with 10.0.2.1
```

Configuring by Copying

Step-by-Step Procedure

To configure by copying a configuration:

1. Go to the **[edit interfaces at-1/0/0]** hierarchy level and copy unit 61.

   ```
   [edit interfaces at-1/0/0]
   user@host# copy unit 61 to unit 62
   ```

2. Take a look at the new configuration and see what you need to change to make the configuration valid..

   ```
   user@host# show interfaces at-1/0/0
   description "PAIX to MAE West"
   encapsulation atm-pvc;
   unit 61 {
      point-to-point;
      vci 0.61;
      family inet {
         address 10.0.1.1/24;
      }
   }
   unit 62 {
      point-to-point;
      vci 0.61;
      family inet {
         address 10.0.1.1/24;
      }
   }
   ```

3. Change the configuration to make it valid.

   In this example you want to reconfigure the virtual circuit identifier (VCI) and virtual path identifier (VPI).

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```
[edit interfaces at-1/0/0]
user@host# set unit 62 vci 0.62
```

You also want to replace the IP address of the new interface with its own IP address.

```
[edit interfaces at-1/0/0]
user@host# edit unit 62
user@host# replace pattern 10.0.1.1 with 10.0.2.1
```

Results

```
[edit]
show interfaces
at-1/0/0 {
   description "PAIX to MAE West"
   encapsulation atm-pvc;
   unit 61 {
      point-to-point;
      vci 0.61;
      family inet {
         address 10.0.1.1/24;
      }
   }
   unit 62 {
      point-to-point;
      vci 0.62;
      family inet {
         address 10.0.2.1/24;
      }
   }
}
```

Examples: Re-Using Configuration

If you need to make changes to the configuration of a device, you can always remove the original configuration settings using the **delete** command and add your new configuration settings using the **set** command. There are, however, other ways of modifying a configuration that are more efficient and easier to use.

This example shows how to use the following configuration mode commands to update an existing configuration:

- **rename**—Rename an existing configuration setting, such as an interface name. This can be useful when you are adding new interfaces to a device.
- **copy**—Copy a configuration setting and the entire hierarchy of statements configured under that setting. Copying configuration statements is useful when you are configuring many physical or logical interfaces of the same type.

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- **replace**—Make global changes to text patterns in the configuration. For example, if you consistently misspell a word common to the description statement for all of the interfaces on your device, you can fix this mistake with a single command.

- Requirements on page 96
- Overview on page 96
- Configuration on page 96

Requirements

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

Overview

In the course of the first example in this topic, you will make the following configuration changes:

- Create a new interface with a description that contains a typing error.
- Copy the configuration from the interface that you created to create a new interface.
- Rename one of the interfaces that you created.
- Fix the typing error in the description for the interfaces that you created.

In the second, shorter example, you will experiment with some of the same commands under slightly different circumstances.

Configuration

CLI Quick Configuration

This example does not use commands that are suitable for this section.

Using the Copy, Rename, and Replace Commands to Modify a Loopback Interface Configuration

Step-by-Step Procedure

CAUTION: If your configuration uses any of the loopback interface unit numbers used in this example, you must substitute different loopback interface unit numbers that you are not using in your device's configuration in the following steps to avoid adversely impacting the operational status of your device.

To create and modify a configuration of a loopback interface using the **copy**, **rename**, and **replace** commands:

1. Create a new loopback interface unit number and include a description.

   The mistakes in the spelling of *loopback* in the description are intentional.

   ```
   [edit]
   ```


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```
user@host# set interfaces lo0 unit 100 description "this is a lopbck interface"
```

2. Display the configuration for the loopback interface you have just added.

```
[edit]
user@host# show interfaces lo0 unit 100
description "this is a lopbck interface";
```

3. Duplicate the loopback interface you have just created, warts and all, from unit 100 to unit 101.

```
[edit]
user@host# copy interfaces lo0 unit 100 to unit 101
```

4. Display the configurations for loopback interfaces lo0 unit 100 and lo0 unit 101.

```
[edit]
user@host# show interfaces lo0 unit 100
description "this is a lopbck interface";
[edit]
user@host# show interfaces lo0 unit 101
description "this is a lopbck interface";
```

The **copy** command duplicates an interface including any child statements such as **description**.

5. Rename the loopback interface lo0 unit 100 to loopback interface lo0 unit 102.

```
[edit]
user@host# rename interfaces lo0 unit 100 to unit 102
```

6. Display the configuration for loopback interface lo0 unit 100.

```
[edit]
user@host# show interfaces lo0 unit 100
[edit]
user@host#
```

You should not see any results from this command. The loopback interface lo0 unit 100 is now gone. The **rename** command replaces the configuration statement indicated with the new configuration.

7. Fix the misspelling of the word *loopback* in the descriptions for loopback interfaces lo0 unit 101 and lo0 unit 102.

```
[edit]
user@host# replace pattern lopbck with loopback
```

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8. Display the configuration for loopback interfaces lo0 unit 101 and lo0 102 to verify that the word *loopback* is spelled correctly now.

```
[edit]
user@host# show interfaces lo0 unit 101
description "this is a loopback interface";
[edit]
user@host# show interfaces lo0 unit 102
description "this is a loopback interface";
```

The **replace** command replaces all instances of the pattern specified in the command, unless limited in some way. The next example in this topic shows one way to limit the effect of the **replace** command.

9. From configuration mode, use the **rollback** command to put the device's configuration back to the state it was in before you executed the previous steps.

```
[edit]
user@host# rollback
```

Results From configuration mode, use the **show interfaces lo0 unit 101** and **show interfaces lo0 unit 102** commands to ensure that the device's configuration is back to the state it was in before you executed the steps in this example.

```
[edit]
user@host: show interfaces lo0 unit 101
[edit]
user@host#
```

You should not see any results from this command.

```
[edit]
user@host# show interfaces lo0 unit 102
[edit]
user@host#
```

You should not see any results from this command.

Compare the Copy Command at the Top-Level Configuration Hierarchy Level

Step-by-Step Procedure The previous example shows the **copy**, **rename**, and **replace** commands at the **[edit interfaces *interface-name* unit *logical-interface-number*]** hierarchy level. This example shows how some of these commands work at the top level of the CLI configuration mode hierarchy.

The following example requires you to navigate to various levels in the configuration hierarchy. For information about navigating the CLI, see "Using the CLI Editor in Configuration Mode" on page 39 in the *CLI User Guide*.

1. Create an Ethernet interface.

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```
[edit]
user@host# set interfaces et-2/0/0 unit 0 family inet address 192.0.2.2
```

2. Copy the interface you just created to another interface.

```
[edit]
user@host# copy interfaces et-2/0/0 to et-2/1/0
```

Compare this **copy** command to the one in Step 3 in the first example, where the **copy** command takes the keyword **unit** before the value to be copied. Notice thatthe keyword **interfaces** is not repeated after the preposition **to** and before the value to be copied. This happens in some top-level statements with the **copy** command.

TIP: Similarly, in the rename command, you do not repeat the keyword part of the statement before the new identifier in some top-level statements.

3. Show your configuration so far.

```
[edit]
user@host# show interfaces
et-2/0/0 {
   unit 0 {
      family inet {
         address 192.0.2.2/32;
      }
   }
}
et-2/1/0 {
   unit 0 {
      family inet {
         address 192.0.2.2/32;
      }
   }
}
```

4. Replace the address for et-2/1/0 with another IP address.

```
[edit interfaces et-2/1/0 unit 0 family inet]
user@host# replace pattern 192.0.2.2 with 192.0.2.40
```

Notice that if you want to change only a specific occurrence of a pattern instead of all of them (as you did in Step 7 in the first example), you need to drill down to that specific hierarchy level before using the **replace** command.

5. Show your interfaces again.

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```
[edit]
user@host# show interfaces
et-2/0/0 {
   unit 0 {
      family inet {
         address 192.0.2.2/32;
      }
   }
}
et-2/1/0 {
   unit 0 {
      family inet {
         address 192.0.2.40/32;
      }
   }
}
```

6. From configuration mode, use the **rollback** command to put the device's configuration back to the state it was in before you executed the previous steps.

```
[edit]
user@host# rollback
```

Results From configuration mode, use the **show interfaces et-2/0/0** and **show interfaces et-2/1/0** commands to ensure that the device's configuration is back to the state it was in before you executed the steps in this example.

```
[edit]
user@hostshow interfaces et-2/0/0
[edit]
user@host#
```

You should not see any results from this command.

```
[edit]
user@R1# show interfaces et-2/1/0
[edit]
user@host#
```

You should not see any results from this command.

Inserting a New Identifier in a Junos OS Configuration

When configuring a device running Junos OS, you can enter most statements and identifiers in any order. Regardless of the order in which you enter the configuration statements, the CLI always displays the configuration in a strict order. However, there are a few cases where the ordering of the statements matters because the configuration statements create a sequence that is analyzed in order.

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For example, in a routing policy or firewall filter, you define terms that are analyzed sequentially. Also, when you create a named path in dynamic MPLS, you define an ordered list of the transit routers in the path, starting with the first transit router and ending with the last one.

To modify a portion of the configuration in which the statement order matters, use the **insert** configuration mode command:

```
user@host# insert <statement-path> identifier1 (before | after) identifier2
```

If you do not use the **insert** command, but instead simply configure the identifier, it is placed at the end of the list of similar identifiers.

Example: Inserting a New Identifier in a Junos Configuration

This example shows the use of the **insert** command.

Whereas a term added using the **set** command is placed at the end of the existing list of terms, you use the **insert** command to add a term in the order you specify. Specifying the order of statement is important in the cases in which the order of the statements matters because the configuration statements create a sequence that is analyzed in order.

As this example shows, you must create the term (or it must already exist), before you can place it using the **insert** command. The reference point for placing the term must also exist, for example, to place the term T1 before the term T2, both T1 and T2 must already exist, and be populated (Junos automatically removes empty terms).

- Requirements on page 101
- Overview on page 102
- Configuration on page 102

Requirements

Before you can insert a term, you must configure an initial policy. To quickly configure the initial policy for this example, copy the following commands, paste them into a text file, remove any line breaks and change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit policy-options]** hierarchy level, and then enter **commit** from configuration mode.

```
set policy-statement statics term term1 from route-filter 192.168.0.0/16 orlonger
set policy-statement statics term term1 from route-filter 224.0.0.0/3 orlonger
set policy-statement statics term term1 then reject
set policy-statement statics term term2 from protocol direct
set policy-statement statics term term2 then reject
set policy-statement statics term term3 from protocol static
set policy-statement statics term term3 then reject
set policy-statement statics term term4 then accept
```

Now check that you have the hierarchy correctly configured.

```
[edit policy-options]
```

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```
user@host# show
policy-statement statics {
   term term1 {
      from {
         route-filter 192.168.0.0/16 orlonger;
         route-filter 224.0.0.0/3 orlonger;
      }
      then reject;
   }
   term term2 {
      from protocol direct;
      then reject;
   }
   term term3 {
      from protocol static;
      then reject;
   }
   term term4 {
      then accept;
   }
}
```

Overview

When configuring a device running Junos OS, you can enter most statements and identifiers in any order. However, there are a few cases, such as in routing policies or firewall filters, in which the order of the statements matters because the configuration statements create a sequence that is analyzed in order.

To modify a portion of the configuration in which the statement order matters, you must use the **insert** configuration mode command. If you use the **set** command instead, the added statement or identifier will be in the wrong place sequentially. The only other way to get the terms of the command in the correct order is to dismantle the configuration and start over.

Configuration

CLI Quick Configuration

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

```
[edit]
user@host# rename policy-options policy-statement statics term term4 to term term6
[edit]
user@host# set policy-options policy-statement statics term term4 from protocol local
[edit]
user@host# set policy-options policy-statement statics term term4 then reject
[edit]
user@host# set policy-options policy-statement statics term term5 from protocol
   aggregate
[edit]
user@host# set policy-options policy-statement statics term term5 then reject
```


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```
[edit]
user@host# insert policy-options policy-statement statics term term4 after term term3
[edit]
user@host# insert policy-options policy-statement statics term term5 after term term4
```

Configuring to Insert Terms

Step-by-Step Procedure

[Warning: element unresolved in stylesheets: <_nopagebreak> (in <procedure>). This is probably a new element that is not yet supported in the stylesheets.]
[Warning: element unresolved in stylesheets: <step> (in <_nopagebreak>). This is probably a new element that is not yet supported in the stylesheets.]

Rename original term4 to term6.

```
[edit]
user@host# rename policy-options policy-statement statics term term4 to term term6
```

This step preserves the original last term, now renamed term6, as the last term.

1. Determine in what order the terms in your configuration need to go—the original terms and the new terms you plan to add.

   In the original configuration, the policy is named **statics** and there are four terms. Each of the first three terms matches on a different match criteria and the resulting matches are rejected. The last term accepts all the rest of the traffic.

   In this example, you need to add two terms that weed out additional types of traffic. Both of these terms need to go before the last term in the original configuration.

2. Create a new term4.

   ```
   [edit]
   user@host# set policy-options policy-statement statics term term4 from protocol
     local
   user@host# set policy-options policy-statement statics term term4 then reject
   ```

   A new term is added that matches traffic from local system addresses and rejects it.

3. Create new term5.

   ```
   [edit]
   user@host# set policy-options policy-statement statics term term5 from protocol
     aggregate
   user@host# set policy-options policy-statement statics term term5 then reject
   ```

   A new term is added that matches traffic from aggregate routes and rejects it.

4. Insert term4 after term3.

   ```
   [edit]
   ```

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```
user@host# insert policy-options policy-statement statics term term4 after term
   term3
```

5. Insert term5 after term4.

```
[edit]
user@host# insert policy-options policy-statement statics term term5 after term
   term4
```

Results

```
[edit]
user@host# show policy-options policy-statement statics
term term1 {
   from {
      route-filter 192.168.0.0/16 orlonger;
      route-filter 224.0.0.0/3 orlonger;
   }
   then reject;
}
term term2 {
   from protocol direct;
   then reject;
}
term term3 {
   from protocol static;
   then accept;
}
term term4 {
   from protocol local;
   then reject;
}
term term5 {
   from protocol aggregate;
   then reject;
}
term term6 {
   then accept;
}
```

Renaming an Identifier in a Junos OS Configuration

When modifying a Junos configuration, you can rename an identifier that is already in the configuration. You can do this either by deleting the identifier (using the **delete** command) and then adding the renamed identifier (using the **set** and **edit** commands), or you can rename the identifier using the **rename** configuration mode command:

```
user@host# rename <statement-path> identifier1 to identifier2
```


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Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration

In a Junos configuration, you can deactivate statements and identifiers so that they do not take effect when you issue the **commit** command. Any deactivated statements and identifiers are marked with the **inactive** tag. They remain in the configuration, but are not activated when you issue a **commit** command.

To deactivate a statement or identifier, use the **deactivate** configuration mode command:

```
user@host# deactivate( statement | identifier )
```

To reactivate a statement or identifier, use the **activate** configuration mode command:

```
user@host# activate ( statement | identifier )
```

In both commands, the ***statement*** and ***identifier*** you specify must be at the current hierarchy level. When you deactivate a statement, that specific statement is completely ignored and is not applied at all when you issue a **commit** command.

To disable a statement, use the **disable** configuration mode command:

In some portions of the configuration hierarchy, you can include a **disable** statement to disable functionality. One example is disabling an interface by including the **disable** statement at the **[edit interface *interface-name*]** hierarchy level. When you disable a functionality, it is activated when you issue a **commit** command but is treated as though it is down or administratively disabled.

Example: Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration

This example shows a common use case in which the **deactivate** and **activate** configuration mode commands are used. It involves dual Routing Engines, master and backup, that have graceful Routing Engine switchover (GRES) configured. The software on both Routing Engines needs to be upgraded. This can easily be accomplished by deactivating GRES, updating the Routing Engines, and then reactivating GRES.

NOTE: You can also perform a similar upgrade using the same setup except that nonstop active routing (NSR) is configured instead of GRES. You would need to deactivate NSR and then upgrade the Routing Engines before reactivating NSR.

- Requirements on page 105
- Overview on page 106
- Configuration on page 106

Requirements

This example requires the use of a router with dual Routing Engines that can be upgraded.

Before you begin this example, make sure that your have GRES configured.

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Overview

In this example, there are two Routing Engines. GRES is configured, and the Routing Engines need to be upgraded. To accomplish the upgrading, you need to deactivate the GRES feature, upgrade each of the Routing Engines, and then activate GRES again.

Configuration

Configuring the Deactivation and Reactivation of GRES

Step-by-Step Procedure

To deactivate and reactivate GRES for Routing Engine upgrade:

1. Show that GRES is enabled for the router.

```
[edit]
```

```
user@host# show chassis
```

```
redundancy {
    graceful-switchover;
}
fpc 2 {
    pic 0 {
        tunnel-services {
            bandwidth 1g;
        }
    }
}
```

2. Deactivate GRES.

```
[edit]
user@host# deactivate chassis redundancy graceful-switchover
user@host# commit
```

3. Show that GRES is deactivated.

```
[edit]
```

```
user@host# show chassis
```

```
redundancy {
    inactive: graceful-switchover;
}
fpc 2 {
    pic 0 {
        tunnel-services {
            bandwidth 1g;
        }
    }
}
```

4. Upgrade the Routing Engines one by one.

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For instructions on upgrading Junos OS on dual Routing Engines, see tasks 2 and 3 in *Installing the Software Package on a Router with Redundant Routing Engines*.

5. Reactivate GRES.

```
[edit]
user@host# activate chassis redundancy graceful-switchover
user@host# commit
```

Results Verify that GRES feature is activated again.

```
[edit]
```

```
user@host# show chassis
redundancy {
    graceful-switchover;
}
fpc 2 {
    pic 0 {
        tunnel-services {
            bandwidth 1g;
        }
    }
}
```

Using Global Replace in the Junos OS Configuration

You can make global changes to variables and identifiers in the Junos OS configuration by using the **replace** configuration mode command. This command replaces a pattern in a configuration with another pattern. For example, you can use this command to find and replace all occurrences of an interface name when a PIC is moved to another slot in the router.

```
user@host# replace pattern pattern1 with pattern2 <upto n>
```

pattern ***pattern1*** is a text string or regular expression that defines the identifiers and values you want to replace in the configuration.

pattern2 is a 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.

The **upto** ***n*** option specifies the 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

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first. Multiple occurrences of a pattern within a given object are considered a single replacement. For example, if a configuration contains a **010101** text string, the command **replace pattern 01 with pattern 02 upto 2** replaces **010101** with **020202** (instead of **020201**). Replacement of **010101** with **020202** is considered a single replacement (***n*** = **1**), not three separate replacements (***n*** =**3**).

If you do not specify an **upto** option, all identifiers and values in the configuration that match ***pattern1*** are replaced.

The **replace** command is available in configuration mode at any hierarchy level. All matches are case-sensitive.

Common Regular Expressions to Use with the replace Command

Table 8: Common Regular Expressions to Use with the replace Command

Operator	Function
|	Indicates that a match can be one of the two terms on either side of the pipe.
^	Used at the beginning of an expression, denotes where a match should begin.
$	Used at the end of an expression, denotes that a term must be matched exactly up to the point of the **$** character.
[ ]	Specifies a range of letters or digits to match. To separate the start and end of a range, use a hyphen (-).
( )	Specifies a group of terms to match. Stored as numbered variables. Use for back references as **\1 \2 .... \9**.
*****	0 or more terms.
+	One or more terms.
.	Any character except for a space (" ").
****	A backslash escapes special characters to suppress their special meaning. For example, \. matches **.** (period symbol).
n	Back reference. Matches the *n*th group.
&	Back reference. Matches the entire match.

Table 9 on page 109 lists some replacement examples.

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Table 9: Replacement Examples

Command	Result
replace pattern myrouter with router1	Match: **myrouter** Result: **router1**
replace pattern "192\.168\.(.*)/24" with "10.2.\1/28"	Match: **192.168.3.4/24** Result: **10.2.3.4/28**
replace pattern "1.\1" with "abc&def"	Match: **1.1** Result: **abc1.1def**
replace pattern 1.1 with " abc\&def"	Match: **1#1** Result: **abc&def**

Example: Using Global Replace in a Junos OS Configuration—Using the \n Back Reference

This example shows how you can use a backreference to replace a pattern.

- Requirements on page 109
- Overview on page 110
- Configuration on page 110

Requirements

No special configuration beyond device initiation is required before configuring this example.

Before you begin, configure the following:

```
[edit]
user@host# show interfaces
xe-0/0/0 {
   unit 0;
}
fe-3/0/1 {
   vlan-tagging;
   unit 0 {
      description "inet6 configuration. IP: 2000::c0a8::1bf5";
      vlan-id 100;
      family inet {
         address 17.10.1.1/24;
      }
      family inet6 {
         address 2000::c0a8:1bf5/3;
      }
   }
}
```

To quickly configure this initial configuration, copy the following commands and paste them in a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level:

```
set interfaces xe-0/0/0 unit 0
set interfaces fe-3/0/1 vlan-tagging
set interfaces fe-3/0/1 unit 0 description "inet6 configuration IP: 2000::c0a8::1bf5"
set interfaces fe-3/0/1 unit 0 vlan-id 100
set interfaces fe-3/0/1 unit 0 family inet address 17.10.1.1/24
set interfaces fe-3/0/1 unit 0 family inet6 address 2000::c0a8:1bf5/3
```

Overview

One of the most useful features of regular expressions is the backreference. Backreferences provide a convenient way to identify a repeated character or substring within a string. Once you find the pattern, you can repeat it without writing it again. You refer to the previously captured pattern with just **\#** (where **#** is a numeral that indicates the number of times you want the pattern matched).

You can use backreferences to recall, or find, data and replace it with something else. In this way you can reformat large sets of data with a single replace command, thus saving you the time it would take to look for and replace the pattern manually.

Configuration

Configuring a Replacement Using a Backreference in the Command

Step-by-Step Procedure

To replace a pattern in a Junos OS configuration using a backreference:

- Use the **replace** command.

  ```
  [edit]
  user@host# replace pattern pattern1 with pattern2
  ```

  In this case, we want to replace ":1bf5" with "1bf5".

  ```
  [edit]
  user@host# replace pattern "(.*):1bf5" with "\11bf5"
  ```

  Notice the backreference (\1), which indicates the pattern should be searched for and replaced only once.

Results

Here is the resulting configuration:

```
[edit]
user@host# show interfaces
xe-0/0/0 {
   unit 0;
```


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```
}
fe-3/0/1 {
  vlan-tagging;
  unit 0 {
    description "inet6 configuration. IP: 2000::c0a8:1bf5";
    vlan-id 100;
    family inet {
      address 17.10.1.1/24;
    }
    family inet6 {
      address 2000::c0a8:1bf5/3;
    }
  }
}
```

In this example, the pattern 2000::c0a8::1bf5 is replaced with 2000::c0a8:1bf5 once.

Example: Using Global Replace in a Junos OS Configuration—Replacing an Interface Name

This example shows how to replace an interface name globally in a configuration by using the **replace** command.

Using the **replace** command can be a faster and better way to change a configuration. For example, a PIC might be moved to another slot in a router, which changes the interface name. With one command you can update the whole configuration. Or you might want to quickly extend the configuration with other similar configurations, for example, similar interfaces. By using a combination of the **copy** and **replace** commands, you can add to a configuration and then replace certain aspects of the newly copied configurations. The **replace** command works with regular expressions. Regular expressions are quick, flexible, and ubiquitous. You can fashion just about any pattern you might need to search for, and most programming languages support regular expressions.

- Requirements on page 111
- Overview on page 112
- Configuration on page 112

Requirements

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

Before you begin, configure the following hierarchy on the router. To quickly configure this hierarchy, see "CLI Quick Configuration" on page 112 .

```
user@host# show interfaces
so-0/0/0 {
  dce;
}
user@host# show protocols
ospf {
  area 0.0.0.0 {
```

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```
    interface so-0/0/0.0 {
      hello-interval 5;
    }
  }
}
```

Overview

This example shows how to replace an interface name globally in a configuration by using the **replace** command. It is a simple example.

The previous configuration is the starting point for this configuration update. In the course of this example, you change the name of the initial interface throughout the configuration with one command.

Configuration

CLI Quick Configuration

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

```
set interfaces so-0/0/0 dce
set protocols ospf area 0.0.0.0 interface so-0/0/0.0 hello-interval 5
```

Configuring an Interface Name Change

Step-by-Step Procedure

To change an interface name:

1. Make sure that you are at the top of the configuration mode hierarchy.

   ```
   user@host# top
   ```

2. Replace so-0/0/0 with so-1/1/0 using the **replace** command, which uses the **pattern** keyword.

   ```
   user@host# replace pattern so-0/0/0 with so-1/1/0
   ```

Results

After making the required changes, verify the configuration by using the **show interfaces** and **show protocols** configuration mode commands.

```
[edit]
user@host# show interfaces
so-1/1/0 {
  dce;
```


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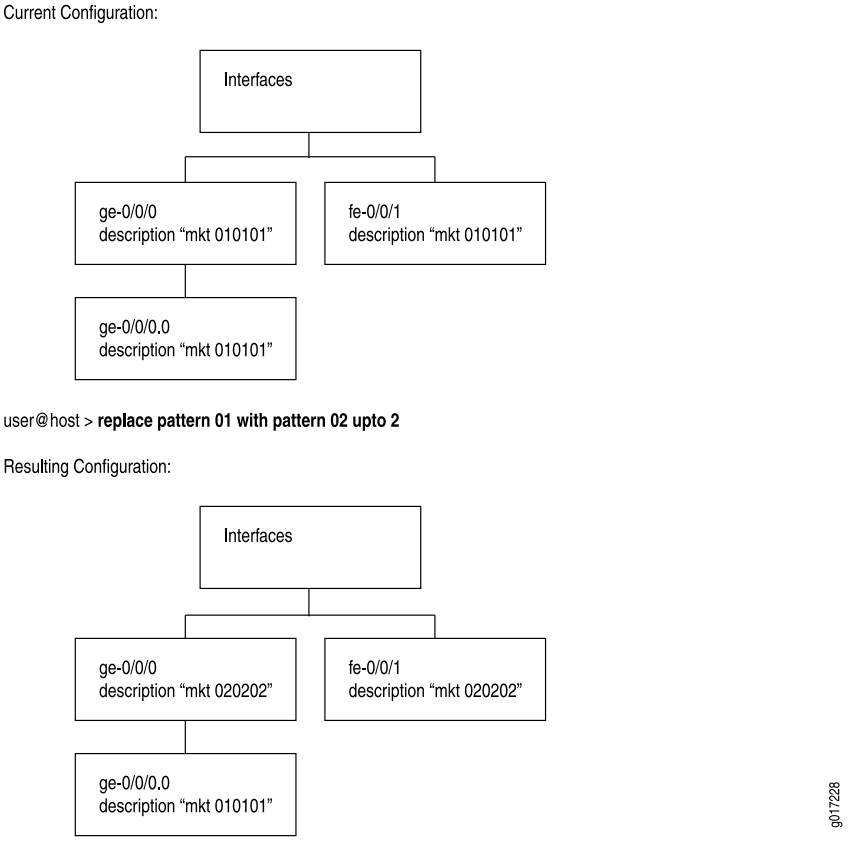
```
}
user@host# show protocols
ospf {
   area 0.0.0.0 {
      interface so-1/1/0.0 {
         hello-interval 5;
      }
   }
}
```

After you have confirmed that the configuration is correct, enter the **commit** command.

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

Consider the hierarchy shown in Figure 5 on page 113. The text string **010101** appears in three places: the description sections of **ge-0/0/0**, **ge-0/0/0.0**, and **fe-0/0/1**. These three instances are three objects. The following example shows how you can use the **upto** option to perform replacements in a JUNOS configuration:

Figure 5: Replacement by Object



An **upto 2** option in the **replace** command converts **01** to **02** for two object instances. The objects under the main interfaces **ge-0/0/0** and **fe-0/0/1** will be replaced first (since these are siblings in the hierarchy level). Because of the **upto 2** restriction, the **replace**

command replaces patterns in the first and second instance in the hierarchy (siblings), but not the third instance (child of the first instance).

```
user@host# show interfaces
ge-0/0/0 {
   description "mkt 010101"; #First instance in the hierarchy
   unit 0 {
      description "mkt 010101"; #Third instance in the hierarchy (child of the first
      instance)
   }
}
fe-0/0/1 {
   description "mkt 010101"; #second instance in the hierarchy (sibling of the first
   instance)
   unit 0 {
      family inet {
         address 200.200.20.2/24;
      }
   }
}
[edit]
user@host# replace pattern 01 with 02 upto 2
[edit]
user@host# commit
commit complete
```

```
[edit]
user@host# show interfaces
ge-0/0/0 {
   description "mkt 020202"; #First instance in the hierarchy
   unit 0 {
      description "mkt 010101"; #Third instance in the hierarchy (child of the first
      instance)
   }
}
fe-0/0/1 {
   description "mkt 020202"; #second instance in the hierarchy (sibling of the first
   instance)
   unit 0 {
      family inet {
         address 200.200.20.2/24;
      }
   }
}
```

Using Regular Expressions to Delete Related Items from a Junos OS Configuration

The Junos OS command-line interface (CLI) enables you to delete related configuration items simultaneously, such as channelized interfaces or static routes, by using a single command and regular expressions. Deleting a statement or an identifier effectively “unconfigures” the functionality associated with that statement or identifier, returning that functionality to its default condition.

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You can only delete certain parts of the configuration where you normally put multiple items, for example, interfaces. However, you cannot delete "groups" of different items; for example:

```
user@host# show system services
ftp;
rlogin;
rsh;
ssh {
   root-login allow;
}
telnet;
[edit]
user@host# wildcard delete system services *
syntax error.
```

When you delete a statement, the statement and all its subordinate statements and identifiers are removed from the configuration.

To delete related configuration items, issue the **wildcard** configuration mode command with the **delete** option and specify the statement path, the items to be summarized with a regular expression, and the regular expression.

```
user@host# wildcard delete <statement-path> <identifier> <regular-expression>
```

NOTE: When you use the wildcard command to delete related configuration items, the regular expression must be the final statement.

If the Junos OS matches more than eight related items, the CLI displays only the first eight items.

Deleting Interfaces from the Configuration

Delete multiple T1 interfaces in the range from **t1-0/0/0:0** through **t1-0/0/0:23**:

```
user@host# wildcard delete interfaces t1-0/0/0:.*
matched: t1-0/0/0:0
matched: t1-0/0/0:1
matched: t1-0/0/0:2
Delete 3 objects? [yes,no] (no) no
```

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Deleting Routes from the Configuration

Delete static routes in the range from **172.0.0.0** to **172.255.0.0**:

```
user@host# wildcard delete routing-options static route 172.*
matched: 172.16.0.0/12
matched: 172.16.14.0/24
matched: 172.16.100.0/24
matched: 172.16.128.0/19
matched: 172.16.160.0/24
matched: 172.17.12.0/23
matched: 172.17.24.0/23
matched: 172.17.28.0/23
...
Delete 13 objects? [yes,no] (no)
```

See Also

- Disabling Inheritance of a Junos OS Configuration Group on page 127

Adding Comments in a Junos OS Configuration

You can include comments in a Junos configuration to describe any statement in the configuration. You can add comments interactively in the CLI and by editing the ASCII configuration file.

When configuring interfaces, you can add comments about the interface by including the **description** statement at the **[edit interfaces *interface-name*]** hierarchy level. Any comments you include appear in the output of the **show interfaces** commands. For more information about the **description** statement, see the *Junos OS Network Interfaces Library for Routing Devices*.

- Adding Comments in the CLI on page 116
- Adding Comments in a File on page 117

Adding Comments in the CLI

When you add comments in configuration mode, they are associated with a statement at the current level. Each statement can have one single-line comment associated with it. Before you can associate a comment with a statement, the statement must exist. The comment is placed on the line preceding the statement.

To add comments to a configuration, use the **annotate** configuration mode command:

```
user@host# annotate statement "comment-string"
```

statement is the configuration statement to which you are attaching the comment; it must be at the current hierarchy level. If a comment for the specified ***statement*** already exists, it is deleted and replaced with the new comment.

comment-string is the text of the comment. The comment text can be any length, and you must type it on a single line. If the comment contains spaces, you must enclose it in quotation marks. In the comment string, you can include the comment delimiters **/* */**

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or **#**. If you do not specify any, the comment string is enclosed with the **/* */** comment delimiters.

To delete an existing comment, specify an empty comment string:

```
user@host# annotate statement ""
```

If you add comments with the **annotate** command, you can view the comments within the configuration by entering the **show** configuration mode command or the **show configuration** operational mode command.

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

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

Adding Comments in a File

When you edit the ASCII configuration file and add comments, they can be one or more lines and must precede the statement they are associated with. If you place the comments in other places in the file, such as on the same line following a statement or on a separate line following a statement, they are removed when you use the **load** command to open the configuration into the CLI.

The following excerpt from a configuration example illustrates how to place and how not to place comments in a configuration file:

```
/* This comment goes with routing-options */
routing-options {
   /* This comment goes with routing-options traceoptions */
   traceoptions {
      /* This comment goes with routing-options traceoptions tracefile */
      tracefile rpd size 1m files 10;
      /* This comment goes with routing-options traceoptions traceflag task */
      traceflag task;
      /* This comment goes with routing-options traceoptions traceflag general */
      traceflag general;
   }
   autonomous-system 10458; /* This comment is dropped */
}
```

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```
routing-options {
   rib-groups {
      ifrg {
         import-rib [ inet.0 inet.2 ];
         /* A comment here is dropped */
      }
      dvmrp-rib {
         import-rib inet.2;
         export-rib inet.2;
         /* A comment here is dropped */
      }
      /* A comment here is dropped */
   }
   /* A comment here is dropped */
}
```

When you include comments in the configuration file directly, you can format comments in the following ways:

- Start the comment with a **/*** and end it with a ***/**. The comment text can be on a single line or can span multiple lines.
- Start the comment with a **#** and end it with a new line (carriage return).

Example: Including Comments in a Junos OS Configuration by Using the CLI

Adding comments to a Junos OS configuration makes the configuration file readable and more readily understood by users. Using the Junos OS CLI, you can include comments as you configure by using the **annotate** statement. In this example, comments are added by using the CLI for an already existing configuration:

- Requirements on page 118
- Overview on page 119
- Configuration on page 119

Requirements

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

Before you add a comment, you must configure the following hierarchy on the router.

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

```
set protocols ospf area 0.0.0.0 interface so-0/0/0.0 hello-interval 5
```

Now, check that you have this hierarchy configured.

```
user@host# show protocols
```


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```
ospf {
  area 0.0.0.0 {
    interface so-0/0/0 {
      hello-interval 5;
    }
  }
}
```

Overview

When you add comments by using the CLI, you do so in configuration mode using the **annotate** statement. Each comment you add is associated with a statement at the current level. Each statement can have one single-line comment associated with it.

To configure the **annotate** statement, move to the level of the statement with which you want to associate a comment. To view the comments, go to the top of the configuration hierarchy and use the **show** command.

Configuration

CLI Quick Configuration

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

```
edit protocols ospf
annotate area 0.0.0.0 "Backbone area configuration added June 15, 1998"
edit area 0.0.0.0
annotate interface so-0/0/0.0 "Interface from router sj1 to router sj2"
```

Notice that the commands are moving you down the hierarchy as you annotate different sections of the hierarchy.

Including Comments in the CLI Configuration Mode

Step-by-Step Procedure

This procedure assumes that you have already configured the initial configuration.

To add comments to a configuration:

1. Move to the first hierarchy level to which you need to add a comment.

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

2. Add a comment to the **area** configuration statement by using the **annotate** statement.

   ```
   [edit protocols ospf]
   user@host# annotate area 0.0.0.0 "Backbone area configuration added June 15,
     1998"
   ```

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3. Move down a level to the **interface** configuration statement.

```
[edit protocols ospf]
user@host# edit area 0.0.0.0
```

4. Add a comment to interface so-0/0/0.0 by using the **annotate** statement.

```
[edit protocols ospf area 0.0.0.0]
user@host# annotate interface so-0/0/0.0 "Interface from router sj1 to router sj2"
```

Results

Move to the top of the hierarchy and use the **show** command to see the comments you added. The comments precede the statement they are associated with.

```
[edit]
user@host# show protocols
ospf {
  /* Backbone area configuration added June 15, 1998 */
  area 0.0.0.0 {
    /* Interface from router sj1 to router sj2 */
    interface so-0/0/0.0 {
      hello-interval 5;
    }
  }
}
```

After you have confirmed that the configuration is correct, enter the **commit** command.

Related Documentation

- Day One: Exploring the Junos CLI

Using Configuration Groups to Quickly Configure Devices

Configuration groups are used to set up and apply common elements that are reused within the same configuration. For more information, se the following topics:

- Understanding Junos OS Configuration Groups on page 121
- Creating a Junos OS Configuration Group on page 122
- Applying a Junos OS Configuration Group on page 124
- Example: Creating and Applying Junos OS Configuration Groups on page 125
- Example: Creating and Applying Configuration Groups on a TX Matrix Router on page 126
- Disabling Inheritance of a Junos OS Configuration Group on page 127
- Using the junos-defaults Configuration Group on page 129
- Using Wildcards with Configuration Groups on page 130
- Improving Commit Time When Using Configuration Groups on page 133

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- Example: Configuring Sets of Statements with Configuration Groups on page 133
- Example: Configuring Interfaces Using Configuration Groups on page 134
- Example: Configuring a Consistent IP Address for the Management Interface Using Configuration Groups on page 137
- Example: Configuring Peer Entities Using Configuration Groups on page 138
- Example: Establishing Regional Configurations Using Configuration Groups on page 140
- Example: Configuring Wildcard Configuration Group Names on page 141
- Example: Referencing the Preset Statement From the Junos OS defaults Group on page 142
- Example: Viewing Default Statements That Have Been Applied to the Configuration on page 143
- Setting Up Routing Engine Configuration Groups on page 144
- Using Conditions to Apply Configuration Groups on page 146
- Example: Configuring Conditions for Applying Configuration Groups on page 146

Understanding Junos OS Configuration Groups

This topic provides an overview of the configuration groups feature and the inheritance model in Junos OS, and contains the following sections:

- Configuration Groups Overview on page 121
- Inheritance Model on page 122
- Configuring Configuration Groups on page 122

Configuration Groups Overview

The configuration groups feature in Junos OS enables you to create a group containing configuration statements and to direct the inheritance of that group's statements in the rest of the configuration. The same group can be applied to different sections of the configuration, and different sections of one group's configuration statements can be inherited in different places in the configuration.

Configuration groups enable you to create smaller, more logically constructed configuration files, making it easier to configure and maintain Junos OS. For example, you can group statements that are repeated in many places in the configuration, such as when configuring interfaces, and thereby limit updates to just the group.

You can also use wildcards in a configuration group to allow configuration data to be inherited by any object that matches a wildcard expression.

The configuration group mechanism is separate from the grouping mechanisms used elsewhere in the configuration, such as BGP groups. Configuration groups provide a generic mechanism that can be used throughout the configuration but that are known only to the Junos OS CLI. The individual software processes that perform the actions directed by the configuration receive the expanded form of the configuration—they have no knowledge of configuration groups.

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Inheritance Model

Configuration groups use true inheritance, which involves a dynamic, ongoing relationship between the source of the configuration data and the target of that data. Data values changed in the configuration group are automatically inherited by the target. The target does not need to contain the inherited information, although the inherited values can be overridden in the target without affecting the source from which they were inherited.

This inheritance model allows you to see only the instance-specific information without seeing the inherited details. A command pipe in configuration mode allows you to display the inherited data.

Configuring Configuration Groups

For areas of your configuration to inherit configuration statements, you must first put the statements into a configuration group and then apply that group to the levels in the configuration hierarchy that require the statements.

To configure configuration groups and inheritance, you can include the **groups** statement at the **[edit]** hierarchy level:

```
[edit]
groups {
  group-name {
    configuration-data;
  }
}
```

Include the **apply-groups [** *group-names* **]** statement anywhere in the configuration where the configuration statements contained in a configuration group are needed.

Creating a Junos OS Configuration Group

To create a configuration group, include the **groups** statement at the **[edit]** hierarchy level:

```
[edit]
groups {
  group-name {
    configuration-data;
  }
  lcc n-re0 {
    configuration-data;
  }
  lcc n-re1 {
    configuration-data;
  }
}
```

group-name is the name of a configuration group. You can configure more than one configuration group by specifying multiple ***group-name*** statements. However, you cannot use the prefix **junos-** in a group name because it is reserved for use by Junos OS. Similarly, the configuration group **juniper-ais** is reserved exclusively for Juniper Advanced Insight

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Solutions (AIS)-related configuration. For more information on the **juniper-ais** configuration group, see the Juniper Networks *Advanced Insight Solutions Guide*.

One reason for the naming restriction is a configuration group called **junos-defaults**. This preset configuration group is applied to the configuration automatically. You cannot modify or remove the **junos-defaults** configuration group. For more information about the Junos default configuration group, see "Using the junos-defaults Configuration Group" on page 129.

On routers that support multiple Routing Engines, you can also specify two special group names:

- **re0**—Configuration statements applied to the Routing Engine in slot 0.
- **re1**—Configuration statements applied to the Routing Engine in slot 1.

NOTE: **The configuration statements re0 and re1 are case senstive.**

The configuration specified in group **re0** is only applied if the current Routing Engine is in slot 0; likewise, the configuration specified in group **re1** is only applied if the current Routing Engine is in slot 1. Therefore, both Routing Engines can use the same configuration file, each using only the configuration statements that apply to it. Each **re0** or **re1** group contains at a minimum the configuration for the hostname and the management interface (**fxp0**). If each Routing Engine uses a different management interface, the group also should contain the configuration for the backup router and static routes.

In addition, the TX Matrix router supports group names for the Routing Engines in each T640 router attached to the routing matrix. Providing special group names for all Routing Engines in the routing matrix allows you to configure the individual Routing Engines in each T640 router differently. Parameters that are not configured at the **[edit groups]** hierarchy level apply to all Routing Engines in the routing matrix.

configuration-data contains the configuration statements applied elsewhere in the configuration with the **apply-groups** statement. To have a configuration inherit the statements in a configuration group, include the **apply-groups** statement. For information about the **apply-groups** statement, see "Applying a Junos OS Configuration Group" on page 124.

The group names for Routing Engines on the TX Matrix router have the following formats:

- **lcc*n*-re0**—Configuration statements applied to the Routing Engine in slot 0 in a specified T640 router.
- **lcc*n*-re1**—Configuration statements applied to the Routing Engine in slot 1 in a specified T640 router.

n identifies the T640 router and can be from 0 through 3. For example, to configure Routing Engine 1 properties for **lcc3**, you include statements at the **[edit groups lcc3–re1]** hierarchy level. For information about the TX Matrix router and routing matrix, see the *User Access and Authentication Feature Guide*.

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NOTE: The management Ethernet interface used for the TX Matrix Plus router, T1600 or T4000 routers in a routing matrix, and PTX Series Packet Transport Routers, is em0. Junos OS automatically creates the router's management Ethernet interface, em0.

Applying a Junos OS Configuration Group

To have the Junos OS configuration inherit the statements from a configuration group, include the **apply-groups** statement:

```
apply-groups [ group-names ];
```

If you specify more than one group name, list them in order of inheritance priority. The configuration data in the first group takes priority over the data in subsequent groups.

For routers that support multiple Routing Engines, you can specify **re0** and **re1** group names. The configuration specified in group **re0** is only applied if the current Routing Engine is in slot 0; likewise, the configuration specified in group **re1** is only applied if the current Routing Engine is in slot 1. Therefore, both Routing Engines can use the same configuration file, each using only the configuration statements that apply to it. Each **re0** or **re1** group contains at a minimum the configuration for the hostname and the management interface (**fxp0**). If each Routing Engine uses a different management interface, the group also should contain the configuration for the backup router and static routes.

NOTE: The management Ethernet interface used for the TX Matrix Plus router, T1600 routers in a routing matrix, and PTX Series Packet Transport Switches, is em0.

You can include only one **apply-groups** statement at each specific level of the configuration hierarchy. The **apply-groups** statement at a specific hierarchy level lists the configuration groups to be added to the containing statement's list of configuration groups.

Values specified at the specific hierarchy level override values inherited from the configuration group.

Groups listed in nested **apply-groups** statements take priority over groups in outer statements. In the following example, the BGP neighbor **10.0.0.1** inherits configuration data from group **one** first, then from groups **two** and **three**. Configuration data in group **one** overrides data in any other group. Data from group **ten** is used only if a statement is not contained in any other group.

```
apply-groups [ eight nine ten ];
protocols {
   apply-groups seven;
   bgp {
      apply-groups [ five six ];
```


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```
    group some-bgp-group {
      apply-groups four;
      neighbor 10.0.0.1 {
        apply-groups [ one two three ];
      }
    }
  }
}
```

When you configure a group defined for the root level—that is, in the default logical system–you cannot successfully apply that group to a nondefault logical system under the **[edit logical-systems *logical-system-name*]** hierarchy level. Although the router accepts the commit if you apply the group, the configuration group does not take effect for the nondefault logical system. You can instead create an additional configuration group at the root level and apply it within the logical system. Alternatively, you can modify the original group so that it includes configuration for both the default and nondefault logical system hierarchy levels.

Example: Creating and Applying Junos OS Configuration Groups

In this example, the SNMP configuration is divided between the group **basic** and the normal configuration hierarchy.

There are a number of advantages to placing the system-specific configuration (SNMP contact) into a configuration group and thus separating it from the normal configuration hierarchy—the user can replace (using the **load replace** command) either section without discarding data from the other.

In addition, setting a contact for a specific box is now possible because the group data would be hidden by the router-specific data.

```
[edit]
groups {
  basic { # User-defined group name
    snmp { # This group contains some SNMP data
      contact "My Engineering Group";
      community BasicAccess {
        authorization read-only;
      }
    }
  }
}
apply-groups basic; # Enable inheritance from group "basic"
snmp { # Some normal (non-group) configuration
  location "West of Nowhere";
}
```

This configuration is equivalent to the following:

```
[edit]
snmp {
  location "West of Nowhere";
```

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```
    contact "My Engineering Group";
    community BasicAccess {
      authorization read-only;
    }
}
```

For information about how to disable inheritance of a configuration group, see "Disabling Inheritance of a Junos OS Configuration Group" on page 127.

Example: Creating and Applying Configuration Groups on a TX Matrix Router

The following example shows how to configure and apply configuration groups on a TX Matrix Router:

```
[edit]
groups {
    re0 { # Routing Engine 0 on TX Matrix router
        system {
            host-name hostname;
            backup-router ip-address;
        }
        interfaces {
            fxp0 {
                unit 0 {
                    family inet {
                        address ip-address;
                    }
                }
            }
        }
    }
    re1 { # Routing Engine 1 on TX Matrix router
        system {
            host-name hostname;
            backup-router ip-address;
        }
        interfaces {
            fxp0 {
                unit 0 {
                    family inet {
                        address ip-address;
                    }
                }
            }
        }
    }
    lcc0-re0 { # Routing Engine 0 on T640 router numbered 0
        system {
            host-name hostname;
            backup-router ip-address;
        }
        interfaces {
            fxp0 {
                unit 0 {
```


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```
            family inet {
              address ip-address;
            }
          }
        }
      }
    }
    lcc0-re1 { # Routing Engine 1 on T640 router numbered 0
      system {
        host-name hostname;
        backup-router ip-address;
      }
      interfaces {
        fxp0 {
          unit 0 {
            family inet {
              address ip-address;
            }
          }
        }
      }
    }
}
apply-groups [ re0 re1 lcc0-re0 lcc0-re1 ];
```

Disabling Inheritance of a Junos OS Configuration Group

To disable inheritance of a configuration group at any level except the top level of the hierarchy, include the **apply-groups-except** statement:

```
apply-groups-except [ group-names ];
```

This statement is useful when you use the **apply-group** statement at a specific hierarchy level but also want to override the values inherited from the configuration group for a specific parameter.

Example: Disabling Inheritance on Interface so-1/1/0

In the following example, the **apply-groups** statement is applied globally at the interfaces level. The **apply-groups-except** statement is also applied at interface **so-1/1/0** so that it uses the default values for the **hold-time** and **link-mode** statements.

```
[edit]
groups { # "groups" is a top-level statement
  global { # User-defined group name
    interfaces {
      <*> {
        hold-time down 640;
        link-mode full-duplex;
      }
    }
  }
}
apply-groups global;
interfaces {
```

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```
    so-1/1/0 {
        apply-groups-except global;  # Disables inheritance from group "global"
        # so-1/1/0 uses default value for “hold-time”
        # and "link-mode"
    }
}
```

For information about applying a configuration group, see “Applying a Junos OS Configuration Group” on page 124.

Configuration groups can add some confusion regarding the actual values used by the router, because configuration data can be inherited from configuration groups. To view the actual values used by the router, use the **display inheritance** command after the pipe (|) in a **show** command. This command displays the inherited statements at the level at which they are inherited and the group from which they have been inherited.

```
[edit]
user@host# show | display inheritance
snmp {
    location "West of Nowhere";
    ##
    ## 'My Engineering Group' was inherited from group 'basic'
    ##
    contact "My Engineering Group";
    ##
    ## 'BasicAccess' was inherited from group 'basic'
    ##
    community BasicAccess {
        ##
        ## 'read-only' was inherited from group 'basic'
        ##
        authorization read-only;
    }
}
```

To display the expanded configuration (the configuration, including the inherited statements) without the ## lines, use the **except** command after the pipe in a **show** command:

```
[edit]
user@host# show | display inheritance | except ##
snmp {
    location "West of Nowhere";
    contact "My Engineering Group";
    community BasicAccess {
        authorization read-only;
    }
}
```


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NOTE: Using the **display inheritance | except ##** option removes all the lines with **##**. Therefore, you might also not be able to view information about passwords and other important data where **##** is used. To view the complete configuration details with all the information without just the comments marked with **##**, use the **no-comments** option with the **display inheritance** command:

```
[edit]
user@host# show | display inheritance no-comments
snmp {
   location "West of Nowhere";
   contact "My Engineering Group";
   community BasicAccess {
      authorization read-only;
   }
}
```

Using the junos-defaults Configuration Group

Junos OS provides a hidden and immutable configuration group called **junos-defaults** that is automatically applied to the configuration of your router. The **junos-defaults** group contains preconfigured statements that contain predefined values for common applications. Some of the statements must be referenced to take effect, such as definitions for applications (for example, FTP or telnet settings). Other statements are applied automatically, such as terminal settings.

NOTE: Many identifiers included in the **junos-defaults** configuration group begin with the name **junos-**. Because identifiers beginning with the name **junos-** are reserved for use by Juniper Networks, you cannot define any configuration objects using this name.

You cannot include **junos-defaults** as a configuration group name in an **apply-groups** statement.

To view the full set of available preset statements from the Junos defaults group, issue the **show groups junos-defaults** configuration mode command at the top level of the configuration. The following example displays a partial list of Junos defaults groups:

```
user@host# show groups junos-defaults
# Make vt100 the default for the console port
system {
   ports {
      console type vt100;
   }
}
applications {
   # File Transfer Protocol
   application junos-ftp {
```

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```
    application-protocol ftp;
    protocol tcp;
    destination-port 21;
  }
  # Trivial File Transfer Protocol
  application junos-tftp {
    application-protocol tftp;
    protocol udp;
    destination-port 69;
  }
  # RPC port mapper on TCP
  application junos-rpc-portmap-tcp {
    application-protocol rpc-portmap;
    protocol tcp;
    destination-port 111;
  }
  # RPC port mapper on UDP
}
```

To reference statements available from the **junos-defaults** group, include the selected **junos-** ***default-name*** statement at the applicable hierarchy level.

Using Wildcards with Configuration Groups

You can use wildcards to identify names and allow one statement to provide data for a variety of statements. For example, grouping the configuration of the **sonet-options** statement over all SONET/SDH interfaces or the dead interval for OSPF over all Asynchronous Transfer Mode (ATM) interfaces simplifies configuration files and eases their maintenance.

Using wildcards in normal configuration data is done in a style that is consistent with that used with traditional UNIX shell wildcards. In this style, you can use the following metacharacters:

- Asterisk (*****)—Matches any string of characters.
- Question mark (**?**)—Matches any single character.
- Open bracket (**[**)—Introduces a character class.
- Close bracket (**]**)—Indicates the end of a character class. If the close bracket is missing, the open bracket matches a **[** rather than introduce a character class.
- A character class matches any of the characters between the square brackets. Within a configuration group, an interface name that includes a character class must be enclosed in quotation marks.
- Hyphen (**-**)—Specifies a range of characters.
- Exclamation point (**!**)—The character class can be complemented by making an exclamation point the first character of the character class. To include a close bracket (**]**) in a character class, make it the first character listed (after the **!**, if any). To include a minus sign, make it the first or last character listed.

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NOTE: If used inside the **groups** hierarchy, an identifier name cannot start with < unless you are defining a wildcard statement, in which case the wildcard statement must have a closing >.

Wildcarding in configuration groups follows the same rules, but < and > have a special meaning when used under the **groups** hierarchy. In the **groups** hierarchy, any term using a wildcard pattern must be enclosed in angle brackets <*pattern*> to differentiate it from other wildcarding in the configuration file.

```
[edit]
groups {
   sonet-default {
      interfaces {
         <so-*> {
            sonet-options {
               payload-scrambler;
               rfc-2615;
            }
         }
      }
   }
}
```

Wildcard expressions match (and provide configuration data for) existing statements in the configuration that match their expression only. In the previous example, the expression **<so-*>** passes its **sonet-options** statement to any interface that matches the expression **so-***.

The following example shows how to specify a range of interfaces:

```
[edit]
groups {
   gigabit-ethernet-interfaces {
      interfaces {
         "<ge-1/2/[5-8]>" {
            description "These interfaces reserved for Customer ABC";
         }
      }
   }
}
```

Angle brackets allow you to pass normal wildcarding through without modification. In any matching within the configuration, whether it is done with or without wildcards, the first item encountered in the configuration that matches is used. In the following example, data from the wildcarded BGP groups is inherited in the order in which the groups are listed. The preference value from **<*a*>** overrides the preference in **<*b*>**, just as the **p** value from **<*c*>** overrides the one from **<*d*>**. Data values from any of these groups override the data values from **abcd**.

```
[edit]
```

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```
user@host# show
groups {
  one {
    protocols {
      bgp {
        group <*a*> {
          preference 1;
        }
        group <*b*> {
          preference 2;
        }
        group <*c*> {
          out-delay 3;
        }
        group <*d*> {
          out-delay 4;
        }
        group abcd {
          preference 10;
          hold-time 10;
          out-delay 10;
        }
      }
    }
  }
}
protocols {
  bgp {
    group abcd {
      apply-groups one;
    }
  }
}
[edit]
user@host# show | display inheritance
protocols {
  bgp {
    group abcd {
      ##
      ## '1' was inherited from group 'one'
      ##
      preference 1;
      ##
      ## '10' was inherited from group 'one'
      ##
      hold-time 10;
      ##
      ## '3' was inherited from group 'one'
      ##
      out-delay 3;
    }
  }
}
```


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Improving Commit Time When Using Configuration Groups

Configuration groups are used for applying configurations across other hierarchies without re-entering configuration data. Some configuration groups specify every configuration detail. Other configuration groups make use of wildcards to configure ranges of data, without detailing each configuration line. Some configurations have an inheritance path that includes a long string of configurations to be applied.

When a configuration that uses configuration groups is committed, the commit process expands and reads all of the configuration data of the group into memory in order to apply the configurations as intended. The commit performance can be negatively impacted if many configuration groups are being applied, especially if the configuration groups use wildcards extensively.

If your system uses many configuration groups that use wildcards, you can configure the **persist-groups-inheritance** statement at the **[edit system commit]** hierarchy level to improve commit time performance.

Using this option allows the system to build the inheritance path for each configuration group inside the database, instead of in the process memory. This can improve commit time performance. However, it can also can increase the database size by up to 22 percent.

Example: Configuring Sets of Statements with Configuration Groups

When sets of statements exist in configuration groups, all values are inherited. For example:

```
[edit]
user@host# show
groups {
   basic {
      snmp {
         interface so-1/1/1.0;
      }
   }
}
apply-groups basic;
snmp {
   interface so-0/0/0.0;
}
[edit]
user@host# show | display inheritance
snmp {
   ##
   ## 'so-1/1/1.0' was inherited from group 'basic'
   ##
   interface [ so-0/0/0.0 so-1/1/1.0 ];
}
```

For sets that are not displayed within brackets, all values are also inherited. For example:

```
[edit]
```

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```
user@host# show
groups {
   worldwide {
      system {
         name-server {
            10.0.0.100;
            10.0.0.200;
         }
      }
   }
}
apply-groups worldwide;
system {
   name-server {
      10.0.0.1;
      10.0.0.2;
   }
}
[edit]
user@host# show | display inheritance
system {
   name-server {
      ##
      ## '10.0.0.100' was inherited from group 'worldwide'
      ##
      10.0.0.100;
      ##
      ## '10.0.0.200' was inherited from group 'worldwide'
      ##
      10.0.0.200;
      10.0.0.1;
      10.0.0.2;
   }
}
```

Example: Configuring Interfaces Using Configuration Groups

You can use configuration groups to separate the common interface media parameters from the interface-specific addressing information. The following example places configuration data for ATM interfaces into a group called **atm-options**:

```
[edit]
user@host# show
groups {
   atm-options {
      interfaces {
         <at-*> {
            atm-options {
               vpi 0 maximum-vcs 1024;
            }
            unit <*> {
               encapsulation atm-snap;
               point-to-point;
               family iso;
```


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```
        }
      }
    }
  }
}
apply-groups atm-options;
interfaces {
  at-0/0/0 {
    unit 100 {
      vci 0.100;
      family inet {
        address 10.0.0.100/30;
      }
    }
    unit 200 {
      vci 0.200;
      family inet {
        address 10.0.0.200/30;
      }
    }
  }
}
[edit]
user@host# show | display inheritance
interfaces {
  at-0/0/0 {
    ##
    ## "atm-options" was inherited from group "atm-options"
    ##
    atm-options {
      ##
      ## "1024" was inherited from group "atm-options"
      ##
      vpi 0 maximum-vcs 1024;
    }
    unit 100 {
      ##
      ## "atm-snap" was inherited from group "atm-options"
      ##
      encapsulation atm-snap;
      ##
      ## "point-to-point" was inherited from group "atm-options"
      ##
      point-to-point;
      vci 0.100;
      family inet {
        address 10.0.0.100/30;
      }
      ##
      ## "iso" was inherited from group "atm-options"
      ##
      family iso;
    }
    unit 200 {
      ##
```

```
        ## "atm-snap" was inherited from group "atm-options"
        ##
        encapsulation atm-snap;
        ##
        ## "point-to-point" was inherited from group "atm-options"
        ##
        point-to-point;
        vci 0.200;
        family inet {
          address 10.0.0.200/30;
        }
        ##
        ## "iso" was inherited from group "atm-options"
        ##
        family iso;
      }
    }
}
[edit]
user@host# show | display inheritance | except ##
interfaces {
    at-0/0/0 {
        atm-options {
            vpi 0 maximum-vcs 1024;
        }
        unit 100 {
            encapsulation atm-snap;
            point-to-point;
            vci 0.100;
            family inet {
                address 10.0.0.100/30;
            }
            family iso;
        }
        unit 200 {
            encapsulation atm-snap;
            point-to-point;
            vci 0.200;
            family inet {
                address 10.0.0.200/30;
            }
            family iso;
        }
    }
}
```

See Also

- Interface Naming Conventions Used in the Junos OS Operational Commands on page 250

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Example: Configuring a Consistent IP Address for the Management Interface Using Configuration Groups

On routers with multiple Routing Engines, each Routing Engine is configured with a separate IP address for the management interface (**fxp0**). To access the master Routing Engine, you must know which Routing Engine is active and use the appropriate IP address.

Optionally, for consistent access to the master Routing Engine, you can configure an additional IP address and use this address for the management interface regardless of which Routing Engine is active. This additional IP address is active only on the management interface for the master Routing Engine. During switchover, the address moves to the new master Routing Engine.

In the following example, address **10.17.40.131** is configured for both Routing Engines and includes a **master-only** statement. With this configuration, the **10.17.40.131** address is active only on the master Routing Engine. The address remains consistent regardless of which Routing Engine is active. Address **10.17.40.132** is assigned to **fxp0** on **re0**, and **10.17.40.133** is assigned to **fxp0** on **re1**.

```
[edit groups re0 interfaces fxp0]
unit 0 {
   family inet {
      address 10.17.40.131/25 {
         master-only;
      }
      address 10.17.40.132/25;
   }
}
[edit groups re1 interfaces fxp0]
unit 0 {
   family inet {
      address 10.17.40.131/25 {
         master-only;
      }
      address 10.17.40.133/25;
   }
}
```

This feature is available on all routers that include dual Routing Engines. On a routing matrix composed of the TX Matrix router, this feature is applicable to the switch-card chassis (SCC) only. Likewise, on a routing matrix composed of a TX Matrix Plus router, this feature is applicable to the switch-fabric chassis (SFC) only.

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NOTE:

- If you configure the same IP address for a management interface or internal interface such as fxp0 and an external physical interface such as ge-0/0/1, when graceful Routing Engine switchover (GRES) is enabled, the CLI displays an appropriate commit error message that identical addresses have been found on the private and public interfaces. In such cases, you must assign unique IP addresses for the two interfaces that have duplicate addresses.
- The management Ethernet interface used for the TX Matrix Plus router, T1600 routers in a routing matrix, and PTX Series Packet Transport Routers, is em0. Junos OS automatically creates the router's management Ethernet interface, em0.

Example: Configuring Peer Entities Using Configuration Groups

In this example, we create a group **some-isp** that contains configuration data relating to another Internet service provider (ISP). We can then insert **apply-group** statements at any point to allow any location in the configuration hierarchy to inherit this data.

```
[edit]
user@host# show
groups {
  some-isp {
    interfaces {
      <xe-*> {
        gigether-options {
          flow-control;
        }
      }
    }
    protocols {
      bgp {
        group <*> {
          neighbor <*> {
            remove-private;
          }
        }
      }
      pim {
        interface <*> {
          version 1;
        }
      }
    }
  }
}
interfaces {
  xe-0/0/0 {
    apply-groups some-isp;
    unit 0 {
```


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```
        family inet {
          address 10.0.0.1/24;
        }
      }
    }
}
protocols {
    bgp {
      group main {
        neighbor 10.254.0.1 {
          apply-groups some-isp;
        }
      }
    }
    pim {
      interface xe-0/0/0.0 {
        apply-groups some-isp;
      }
    }
}
[edit]
user@host# show | display inheritance
interfaces {
    xe-0/0/0 {
      ##
      ## "gigether-options" was inherited from group "some-isp"
      ##
      gigether-options {
        ##
        ## "flow-control" was inherited from group "some-isp"
        ##
        flow-control;
      }
      unit 0 {
        family inet {
          address 10.0.0.1/24;
        }
      }
    }
}
protocols {
    bgp {
      group main {
        neighbor 10.254.0.1 {
          ##
          ## "remove-private" was inherited from group "some-isp"
          ##
          remove-private;
        }
      }
    }
    pim {
      interface xe-0/0/0.0 {
        ##
        ## "1" was inherited from group "some-isp"
```

```
        ##
        version 1;
      }
    }
}
```

Example: Establishing Regional Configurations Using Configuration Groups

In this example, one group is populated with configuration data that is standard throughout the company, while another group contains regional deviations from this standard:

```
[edit]
user@host# show
groups {
  standard {
    interfaces {
      <t3-*> {
        t3-options {
          compatibility-mode larscom subrate 10;
          idle-cycle-flag ones;
        }
      }
    }
  }
  northwest {
    interfaces {
      <t3-*> {
        t3-options {
          long-buildout;
          compatibility-mode kentrox;
        }
      }
    }
  }
}
apply-groups standard;
interfaces {
  t3-0/0/0 {
    apply-groups northwest;
  }
}
[edit]
user@host# show | display inheritance
interfaces {
  t3-0/0/0 {
    ##
    ## "t3-options" was inherited from group "northwest"
    ##
    t3-options {
      ##
      ## "long-buildout" was inherited from group "northwest"
      ##
      long-buildout;
```


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```
        ##
        ## "kentrox" was inherited from group "northwest"
        ##
        compatibility-mode kentrox;
        ##
        ## "ones" was inherited from group "standard"
        ##
        idle-cycle-flag ones;
    }
  }
}
```

Example: Configuring Wildcard Configuration Group Names

Wildcards are configuration group names that use special characters to create a pattern that can be applied to multiple statements. Wildcards are useful for copying one set of configuration options to a large number of different configuration groups. It is important to set up your wildcard name properly to ensure that the wildcard configuration options get copied to the appropriate configuration groups.

In this example, you configure different values for the **<*-major>** and **<*-minor>** wildcard groups under the **label-switched-path** statement. The asterisk (*) character represents a section of the wildcard name that can match any string of characters. For example the configuration options under **label-switched-path <*-major>** are passed onto **label-switched-path metro-major** and any other **label-switched-path** configuration group containing **-major** in its name.

```
[edit]
user@host# show
groups {
  mpls-conf {
    protocols {
      mpls {
        label-switched-path <*-major> {
          retry-timer 5;
          bandwidth 155m;
          optimize-timer 60;
        }
        label-switched-path <*-minor> {
          retry-timer 15;
          bandwidth 64k;
          optimize-timer 120;
        }
      }
    }
  }
}
apply-groups mpls-conf;
protocols {
  mpls {
    label-switched-path metro-major {
      to 10.0.0.10;
    }
```

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```
      label-switched-path remote-minor {
        to 10.0.0.20;
      }
    }
}
[edit]
user@host# show | display inheritance
protocols {
    mpls {
      label-switched-path metro-major {
        to 10.0.0.10;
        ##
        ## "5" was inherited from group "mpls-conf"
        ##
        retry-timer 5;
        ## "155m" was inherited from group "mpls-conf"
        ##
        bandwidth 155m;
        ##
        ## "60" was inherited from group "mpls-conf"
        ##
        optimize-timer 60;
      }
      label-switched-path remote-minor {
        to 10.0.0.20;
        ##
        ## "15" was inherited from group "mpls-conf"
        ##
        retry-timer 15;
        ##
        ## "64k" was inherited from group "mpls-conf"
        ##
        bandwidth 64k;
        ##
        ## "120" was inherited from group "mpls-conf"
        ##
        optimize-timer 120;
      }
    }
}
```

Example: Referencing the Preset Statement From the Junos OS defaults Group

The following example is a preset statement from the Junos defaults group that is available for FTP in a stateful firewall:

```
[edit]
groups {
    junos-defaults {
      applications {
        application junos-ftp {# Use FTP default configuration
        application-protocol ftp;
        protocol tcp;
        destination-port 21;
```


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```
    }
  }
}
```

To reference a preset Junos default statement from the Junos defaults group, include the **junos-*default-name*** statement at the applicable hierarchy level. For example, to reference the Junos default statement for FTP in a stateful firewall, include the **junos-ftp** statement at the **[edit services stateful-firewall rule my-rule term my-term from applications]** hierarchy level:

```
[edit]
services {
  stateful-firewall {
    rule my-rule {
      term my-term {
        from {
          applications junos-ftp; #Reference predefined statement, junos-ftp
        }
      }
    }
  }
}
```

Example: Viewing Default Statements That Have Been Applied to the Configuration

To view the Junos defaults that have been applied to the configuration, issue the **show | display inheritance defaults** command. For example, to view the inherited Junos defaults at the **[edit system ports]** hierarchy level:

```
user@host# show system ports | display inheritance defaults
## ## 'console' was inherited from group 'junos-defaults'
## 'vt100' was inherited from group 'junos-defaults'
## console type vt100;
```

If you choose not to use existing Junos default statements, you can create your own configuration groups manually.

To view the complete configuration information without the comments marked with **##**, use the **no-comments** option with the **display inheritance** command.

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Setting Up Routing Engine Configuration Groups

In a router with two Routing Engines, one configuration should be shared between both Routing Engines. This ensures that both Routing Engine configurations are identical. Within this configuration, create two Routing Engine groups, one for each Routing Engine. Within these groups, you specify the Routing Engine–specific parameters.

For more information about creating configuration groups, see the *CLI User Guide*.

For more information about the initial configuration for redundant Routing Engine systems and the re0 group, see *High Availability Feature Guide*.

1. Create the configuration group **re0**. The **re0** group is a special group designator that is only used by **RE0** in a redundant routing platform.

```
[edit]
root# set groups re0
```

2. Navigate to the **groups re0** level of the configuration hierarchy.

```
[edit]
root#  edit groups re0
```

3. Specify the router hostname.

```
[edit groups re0]
root# set system host-name host-name
```

NOTE: The hostname specified in the router configuration is not used by the DNS server to resolve to the correct IP address. This hostname is used to display the name of the Routing Engine in the CLI. For example, the hostname appears at the command-line prompt when the user is logged in to the CLI:

```
user-name@host-name>
```

4. Configure the IP address and prefix length for the router Ethernet interface.

   - For all devices *except* the TX Matrix Plus router, T1600 or T4000 routers in a routing matrix, and PTX Series Packet Transport Routers:

```
[edit]
root@# set interfaces fxp0 unit 0 family inet address address/prefix-length
```

   - For the TX Matrix Plus router, T1600 or T4000 routers in a routing matrix only, and PTX Series Packet Transport Routers:

```
[edit]
```


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```
root@# set interfaces em0 unit 0 family inet address address/prefix-length
```

To use **em0** as an out-of-band management Ethernet interface, you must configure its logical port, **em0.0**, with a valid IP address.

- For a T1600 standalone router (not connected to a TX Matrix Plus router and not in a routing matrix):

```
[edit]
root@# set interfaces fxp0 unit 0 family inet address address/prefix-length
```

5. Return to the top level of the hierarchy.

```
[edit groups re0]
root# top
```

6. Create the configuration group **re1**.

```
[edit]
root# set groups re1
```

7. Navigate to the **groups re1** level of the configuration hierarchy.

```
[edit]
root# edit groups re1
```

8. Specify the router hostname.

```
[edit groups re1]
root# set system host-name host-name
```

9. Configure the IP address and prefix length for the router Ethernet interface.

   - For all devices *except* the TX Matrix Plus router, T1600 or T4000 routers in a routing matrix, and PTX Series Packet Transport Routers:

```
[edit]
root@# set interfaces fxp0 unit 0 family inet address address/prefix-length
```

   - For the TX Matrix Plus router and T1600 or T4000 routers in a routing matrix only:

```
[edit]
root@# set interfaces em0 unit 0 family inet address address/prefix-length
```

   To use **em0** as an out-of-band management Ethernet interface, you must configure its logical port, **em0.0**, with a valid IP address.

   - For a T1600 standalone router (not connected to a TX Matrix Plus router, and not in a routing matrix):

```
[edit]
root@# set interfaces fxp0 unit 0 family inet address address/prefix-length
```

10. Return to the top level of the hierarchy.

```
[edit groups re0]
root# top
```

11. Specify the group application order.

```
[edit]
root# set apply-groups [ re0 re1 ]
```

Using Conditions to Apply Configuration Groups

You can use the **when** statement at the **[edit groups *group-name*]** hierarchy level to define conditions under which a configuration group should be applied.

You can configure a group to be applied based on the type of chassis, model, or Routing Engine, virtual chassis member, cluster node, and start and optional end time of day or date.

For example, you could use the **when** statement to create a generic configuration group for each type of node and then apply the configuration based on certain node properties, such as chassis or model.

Example: Configuring Conditions for Applying Configuration Groups

This example shows how to configure conditions under which a specified configuration group is to be applied.

- Requirements on page 146
- Overview on page 146
- Configuration on page 147

Requirements

No special configuration beyond device initialization is required before you configure this example.

Overview

You can configure your group configuration data at the **[edit groups *group-name*]** hierarchy level, then use the **when** statement to have the group applied based on conditions including: type of chassis, model, routing-engine, virtual chassis member, cluster node, and start and optional end time of day or date.

If you specify multiple conditions in a single configuration group, all conditions must be met before the configuration group is applied.

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You can specify the start time or the time duration for the configuration group to be applied. If only the start time is specified, the configuration group is applied at the specified time and it remains in effect until the time is changed. If the end time is specified, then on each day, the applied configuration group is started and stopped at the specified times.

This example sets conditions in a configuration group, **test1**, such that this group is applied only when all of the following conditions are met: the router is a model MX240 router with chassis type LCC0, with a Routing Engine operating as RE0, is member0 of the virtual chassis on node0, and the configuration group will only be in effect from 9:00 a.m. until 5:00 p.m. each day.

Configuration

CLI Quick Configuration

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

```
set groups test1 when model mx240
set groups test1 when chassis lcc0
set groups test1 when routing-engine re0
set groups test1 when member member0
set groups test1 when node node0
set groups test1 when time 9 to 5
```

Step-by-Step Procedure

To configure conditions for configuration group **test1**:

1. Set the condition that identifies the model MX240 router.

```
[edit groups test1 when]
user@host# set model mx240
```

2. Set the condition that identifies the chassis type as LCC0.

```
[edit groups test1 when]
user@host# set chassis lcc0
```

3. Set the condition that identifies the Routing Engine operating as **RE0**.

```
[edit groups test1 when]
user@host# set routing-engine re0
```

4. Set the condition that identifies the virtual chassis **member0**.

```
[edit groups test1 when]
user@host# set member member0
```

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5. Set the condition that identifies the cluster **node0**.

```
[edit groups test1 when]
user@host# set node node0
```

6. Set the condition that applies the group only between the hours of 9:00 a.m. and 5:00 p.m. daily.

```
[edit groups test1 when]
user@host# set time 9 to 5
```

NOTE: The syntax for specifying the time is: time *<start-time>* [to *<end-time>*] using the time format yyyy-mm-dd.hh:mm, hh:mm, or hh.

7. Commit the configuration.

```
user@host# commit
```

Results From configuration mode, confirm your configuration by entering the **show groups test1** command. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@host# show groups test1
when {
   time 9 to 5;
   chassis lcc0;
   model mx240;
   routing-engine re0;
   member member0;
   node node0;
}
```

Verification

Confirm that the configuration is working properly.

- Checking Group Inheritance with Conditional Data on page 148

Checking Group Inheritance with Conditional Data

Purpose Verify that conditional data from a configuration group is inherited when applied.

Action The **show | display inheritance** operational command can be issued with the **when** data to display the conditional inheritance. Using this example, you could issue one of these commands to determine that the conditional data was inherited:

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```
user@host> show | display inheritance when model mx240
user@host> show | display inheritance when chassis lcc0
user@host> show | display inheritance when routing-engine re0
user@host> show | display inheritance when member member0
user@host> show | display inheritance when node node0
user@host> show | display inheritance when time 9 to 5
```

Related Documentation

- Day One: Exploring the Junos CLI

Viewing the Configuration

The **show** configuration mode command displays the current configuration for a device running Junos OS. For more information on how to display the information about the configuration, see the following topics:

- Displaying the Current Junos OS Configuration on page 149
- Example: Displaying the Current Junos OS Configuration on page 150
- Displaying Additional Information About the Junos OS Configuration on page 151
- Displaying set Commands from the Junos OS Configuration on page 154

Displaying the Current Junos OS Configuration

To display the current configuration for a device running Junos OS, use the **show** configuration mode command. This command displays the configuration at the current hierarchy level or at the specified level.

```
user@host# show <statement-path>
```

The configuration statements appear in a fixed order, interfaces appear alphabetically by type, and then in numerical order by slot number, PIC number, and port number. Note that when you configure the router, you can enter statements in any order.

You also can use the CLI operational mode **show configuration** command to display the last committed current configuration, which is the configuration currently running on the router:

```
user@host> show configuration
```

When you show a configuration, a timestamp at the top of the configuration indicates when the configuration was last changed:

```
## Last commit: 2006-07-18 11:21:58 PDT by echen
version 8.3
```

If you have omitted a required statement at a particular hierarchy level, when you issue the **show** command in configuration mode, a message indicates which statement is missing. As long as a mandatory statement is missing, the CLI continues to display this message each time you issue a **show** command. For example:

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```
[edit]
user@host# show
protocols {
   pim {
      interface so-0/0/0 {
         priority 4;
         version 2;
         # Warning: missing mandatory statement(s): 'mode'
      }
   }
}
```

When you issue the **show configuration** command with the **| display set** pipe option to view the configuration as **set** commands, those portions of the configuration that you do not have permissions to view are substituted with the text **ACCESS-DENIED**.

Unsupported statements included in the CLI configuration are displayed with the "unsupported" text in the configuration. For example, if a statement is configured on an unsupported platform, the CLI displays a message that the statement is ignored in the configuration because it is configured on an unsupported platform. When you issue the **show** command with the **| display xml** option, you can see the **unsupported="unsupported"** attribute for configuration that is unsupported.

The "unsupported" attribute included in text configuration or XML configuration is provided to scripts when the **unsupported="unsupported"** attribute is included in the **<get-configuration>** RPC call.

Example: Displaying the Current Junos OS Configuration

The following example shows how you can display the current Junos configuration.

Set a configuration:

```
[edit]
user@host# set protocols ospf area 0.0.0.0 interface so-0/0/0 hello-interval 5
```

To display the current configuration:

```
[edit]
user@host# show
protocols {
   ospf {
      area 0.0.0.0 {
         interface so-0/0/0 {
            hello-interval 5;
         }
      }
   }
}
```

Display a particular hierarchy in the configuration:

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```
[edit]
user@host# show protocols ospf area 0.0.0.0
interface so-0/0/0 {
   hello-interval 5;
}
```

Move down a level and display the configuration at that level:

```
[edit]
user@host# edit protocols ospf area 0.0.0.0
[edit protocols ospf area 0.0.0.0]
user@host# show
interface so-0/0/0 {
   hello-interval 5;
}
```

Set and commit a configuration:

```
[edit]
user@host# set protocols ospf area 0.0.0.0 interface so-0/0/0 hello-interval 5
[edit]
user@host# commit
commit complete
[edit]
user@host# quit
exiting configuration mode
```

Display the last committed configuration:

```
user@host> show configuration
## Last commit: 2006-08-10 11:21:58 PDT by user
version 8.3
protocols {
ospf {
   area 0.0.0.0 {
      interface so-0/0/0 {
         hello-interval 5;
      }
   }
}
}
```

Displaying Additional Information About the Junos OS Configuration

In configuration mode only, to display additional information about the configuration, use the **display detail** command after the pipe (|) in conjunction with a **show** command. The additional information includes the help string that explains each configuration statement and the permission bits required to add and modify the configuration statement.

```
user@host# show <hierarchy-level> | display detail
```

For example:

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```
[edit]
user@host# show | display detail
##
## version: Software version information
## require: system
##
version "3.4R1 [tlim]";
system {
    ##
    ## host-name: Host name for this router
    ## match: ^[[:alnum:]._-]+$
    ## require: system
    ##
}
host-name router-name;
##
## domain-name: Domain name for this router
## match: ^[[:alnum:]._-]+$
## require: system
##
domain-name isp.net;
##
## backup-router: Address of router to use while booting
##
backup-router 192.168.100.1;
root-authentication {
    ##
    ## encrypted-password: Encrypted password string
    ##
    encrypted-password "$ABC123"; # SECRET-DATA
}
##
## name-server: DNS name servers
## require: system
##
name-server {
    ##
    ## name-server: DNS name server address
    ##
    208.197.1.0;
}
login {
    ##
    ## class: User name (login)
    ## match: ^[[:alnum:]_-]+$
    ##
    class super-user {
        ##
        ## permissions: Set of permitted operation categories
        ##
        permissions all;
    }
    ...
    ##
    ## services: System services
```


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```
    ## require: system
    ##
    services {
        ## services: Service name
        ##
        ftp;
        ##
        ## services: Service name
        ##
        telnet;
        ##
    }
    syslog {
        ##
        ## file-name: File to record logging data
        ##
        file messages {
            ##
            ## Facility type
            ## Level name
            ##
            any notice;
            ##
            ## Facility type
            ## Level name
            ##
            authorization info;
        }
    }
}
chassis {
    alarm {
        sonet {
            ##
            ## lol: Loss of light
            ## alias: loss-of-light
            ##
            lol red;
        }
    }
}
interfaces {
    ##
    ## Interface name
    ##
    at-2/1/1 {
        atm-options {
            ##
            ## vpi: Virtual path index
            ## range: 0 .. 255
            ## maximum-vcs: Maximum number of virtual circuits on this VP
            ##
            vpi 0 maximum-vcs 512;
        }
        ##
```

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```
      ## unit: Logical unit number
      ## range: 0 .. 16384
      ##
      unit 0 {
        ##
        ## vci: ATM point-to-point virtual circuit identifier ([vpi.]vci)
      }
      ##
      vci 0.128;
    }
}
...
```

Displaying set Commands from the Junos OS Configuration

In configuration mode, you can display the configuration as a series of configuration mode commands required to re-create the configuration. This is useful if you are not familiar with how to use configuration mode commands or if you want to cut, paste, and edit the displayed configuration.

To display the configuration as a series of configuration mode commands, which are required to re-create the configuration from the top level of the hierarchy as **set** commands, issue the **show** configuration mode command with the **display set** option:

```
user@host# show | display set
```

This topic contains the following examples:

- Example: Displaying set Commands from the Configuration on page 154
- Example: Displaying Required set Commands at the Current Hierarchy Level on page 155
- Example: Displaying set Commands with the match Option on page 155

Example: Displaying set Commands from the Configuration

Display the **set** commands from the configuration at the [**edit interfaces**] hierarchy level:

```
[edit interfaces fe-0/0/0]
user@host# show
unit 0 {
    family inet {
        address 192.107.1.230/24;
    }
    family iso;
    family mpls;
}
inactive: unit 1 {
    family inet {
        address 10.0.0.1/8;
    }
}
user@host# show | display set
```


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```
set interfaces fe-0/0/0 unit 0 family inet address 192.107.1.230/24
set interfaces fe-0/0/0 unit 0 family iso
set interfaces fe-0/0/0 unit 0 family mpls
set interfaces fe-0/0/0 unit 1 family inet address 10.0.0.1/8
deactivate interfaces fe-0/0/0 unit 1
```

To display the configuration as a series of configuration mode commands required to re-create the configuration from the current hierarchy level, issue the **show** configuration mode command with the **display set relative** option:

```
user@host# show | display set relative
```

Example: Displaying Required set Commands at the Current Hierarchy Level

Display the configuration as a series of configuration mode commands required to re-create the configuration from the current hierarchy level:

```
[edit interfaces fe-0/0/0]
user@host# show
unit 0 {
    family inet {
        address 192.107.1.230/24;
    }
    family iso;
    family mpls;
}
inactive: unit 1 {
    family inet {
        address 10.0.0.1/8;
    }
}
user@host# show | display set relative
set unit 0 family inet address 192.107.1.230/24
set unit 0 family iso
set unit 0 family mpls
set unit 1 family inet address 10.0.0.1/8
deactivate unit 1
```

To display the configuration as **set** commands and search for text matching a regular expression by filtering output, specify the **match** option after the pipe (|):

```
user@host# show | display set | match regular-expression
```

Example: Displaying set Commands with the match Option

Display IP addresses associated with an interface:

```
xe-2/3/0 {
    unit 0 {
        family inet {
            address 192.107.9.106/30;
        }
```

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```
    }
  }
  so-5/1/0 {
    unit 0 {
      family inet {
        address 192.107.9.15/32 {
          destination 192.107.9.192;
        }
      }
    }
  }
  lo0 {
    unit 0 {
      family inet {
        address 127.0.0.1/32;
      }
    }
  }
user@host# show interfaces | display set | match address
set interfaces xe-2/3/0 unit 0 family inet address 192.168.9.106/30
set interfaces so-5/1/0 unit 0 family inet address 192.168.9.15/32 destination 192.168.9.192
set interfaces lo0 unit 0 family inet address 127.0.0.1/32
```

Related Documentation

- Day One: Exploring the Junos CLI

Verifying the Junos OS Configuration

To verify that the syntax of a Junos configuration is correct, use the configuration mode **commit check** command:

```
[edit]
user@host# commit check
configuration check succeeds
[edit]
user@host#
```

If the **commit check** command finds an error, a message indicates the location of the error.

Related Documentation

- Adding Junos OS Configuration Statements and Identifiers on page 89
- Committing a Junos OS Configuration on page 158

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Committing a Configuration

To commit a configuration, the **commit** configuration mode command enables you to save the Junos OS configuration changes to the configuration database and to activate the configuration on the router. For more information, see the following topics:

- Junos OS Commit Model for Configurations on page 157
- Committing a Junos OS Configuration on page 158
- Commit Operation When Multiple Users Configure the Software on page 161
- Commit Preparation and Activation Overview on page 162
- Committing Junos OS Configurations in Two Steps: Preparation and Activation on page 163
- Activating a Junos OS Configuration but Requiring Confirmation on page 165
- Scheduling a Junos OS Commit Operation on page 166
- Monitoring the Junos OS Commit Process on page 167
- Adding a Comment to Describe the Committed Configuration on page 168
- Junos OS Batch Commits Overview on page 169
- Example: Configuring Batch Commit Server Properties on page 170
- Backing Up the Committed Configuration on the Alternate Boot Drive on page 178

Junos OS Commit Model for Configurations

The device configuration is saved using a commit model—a candidate configuration is modified as desired and then committed to the system. When a configuration is committed, the device checks the configuration for syntax errors, and if no errors are found, the configuration is saved as **juniper.conf.gz** and activated. The formerly active configuration file is saved as the first rollback configuration file (**juniper.conf.1.gz**), and any other rollback configuration files are incremented by 1. For example, **juniper.conf.1.gz** is incremented to **juniper.conf.2.gz**, making it the second rollback configuration file. The device can have a maximum of 49 rollback configurations (numbered 1 through 49) saved on the system.

On the device, the active configuration file and the first three rollback files (**juniper.conf.gz.1, juniper.conf.gz.2, juniper.conf.gz.3**) are located in the **/config** directory. If the file **rescue.conf.gz** is saved on the system, this file should also be saved in the **/config** directory. The factory default files are located in the **/etc/config** directory.

There are two mechanisms used to propagate the configurations between Routing Engines within a device:

- Synchronization—Propagates a configuration from one Routing Engine to a second Routing Engine within the same device chassis.

NOTE: The QFX3500 switch has only one Routing Engine.

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To synchronize configurations, use the **commit synchronize** CLI command. If one of the Routing Engines is locked, the synchronization fails. If synchronization fails because of a locked configuration file, you can use the **commit synchronize force** command. This command overrides the lock and synchronizes the configuration files.

- Distribution—Propagates a configuration across the routing plane on a multichassis device. Distribution occurs automatically. There is no user command available to control the distribution process. If a configuration is locked during a distribution of a configuration, the locked configuration does not receive the distributed configuration file, so the synchronization fails. You need to clear the lock before the configuration and resynchronize the routing planes.

NOTE: When you use the **commit synchronize force** CLI command on a multichassis platform, the forced synchronization of the configuration files does not affect the distribution of the configuration file across the routing plane. If a configuration file is locked on a device remote from the device where the command was issued, the synchronization fails on the remote device. You need to clear the lock and reissue the **synchronization** command.

Committing a Junos OS Configuration and Exiting Configuration Mode

To save Junos OS configuration changes, activate the configuration on the device and exit configuration mode, using the **commit and-quit** configuration mode command. This command succeeds only if the configuration contains no errors.

```
[edit]
user@host# commit and-quit
commit complete
exiting configuration mode
user@host>
```

NOTE: We do not recommend performing a commit operation on the backup Routing Engine when graceful Routing Engine switchover is enabled on the router.

See Also

- *Configuring Junos OS for the First Time on a Router or Switch with a Single Routing Engine*

Committing a Junos OS Configuration

To save Junos OS configuration changes to the configuration database and to activate the configuration on the router, use the **commit** configuration mode command. You can issue the **commit** command from any hierarchy level:

```
[edit]
user@host# commit
commit complete
```


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

When you enter the **commit** command, the configuration is first checked for syntax errors (**commit check**). Then, if the syntax is correct, the configuration is activated and becomes the current, operational router configuration.

You can issue the **commit** command from any hierarchy level.

A configuration commit can fail for any of the following reasons:

- The configuration includes incorrect syntax, which causes the commit check to fail.
- The candidate configuration that you are trying to commit is larger than 700 MB.
- The configuration is locked by a user who entered the **configure exclusive** command.

If the configuration contains syntax errors, a message indicates the location of the error, and the configuration is not activated. The error message has the following format:

```
[edit edit-path]
'offending-statement;'
error-message
```

For example:

```
[edit firewall filter login-allowed term allowed from]
'icmp-type [ echo-request echo-reply ];'
keyword 'echo-reply' unrecognized
```

You must correct the error before recommitting the configuration. To return quickly to the hierarchy level where the error is located, copy the path from the first line of the error and paste it at the configuration mode prompt at the **[edit]** hierarchy level.

The uncommitted, candidate configuration file is **/var/rundb/juniper.db**. It is limited to 700 MB. If the commit fails with a message **configuration database size limit exceeded**, view the file size from configuration mode by entering the command **run file list /var/rundb detail**. You can simplify the configuration and reduce the file size by creating configuration groups with wildcards or defining less specific match policies in your firewall filters.

NOTE: CLI commit-time warnings displayed for configuration changes at the [edit interfaces] hierarchy level are removed and are logged as system log messages.

This is also applicable to VRRP configuration at the following hierarchy levels:

- [edit interfaces *interface-name* unit *logical-unit-number* family (*inet* | *inet6*) address *address*]
- [edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number* family (inet | inet6) address *address*]

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When you commit a configuration, you commit the entire configuration in its current form. If more than one user is modifying the configuration, committing it saves and activates the changes of all the users.

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*.

  To save Junos OS configuration changes, activate the configuration on the device and exit configuration mode, using the **commit and-quit** configuration mode command. This command succeeds only if the configuration contains no errors.

  ```
  [edit]
  user@host# commit and-quit
  commit complete
  exiting configuration mode
  user@host>
  ```

- We do not recommend performing a commit operation on the backup Routing Engine when graceful Routing Engine switchover is enabled on the router.

-

  NOTE: If you configure the same IP address for a management interface or internal interface such as **fxp0** and an external physical interface such as **ge-0/0/1**, when graceful Routing Engine switchover (GRES) is enabled, the CLI displays an appropriate commit error message that identical addresses have been found on the private and public interfaces. In such cases, you must assign unique IP addresses for the two interfaces that have duplicate addresses.

  The management Ethernet interface used for the TX Matrix Plus router, T1600 or T4000 routers in a routing matrix, and PTX Series Packet Transport Routers, is **em0**. Junos OS automatically creates the router's management Ethernet interface, **em0**.

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See Also

Commit Operation When Multiple Users Configure the Software

Up to 32 users can be in configuration mode simultaneously, and they all can be making changes to the configuration. All changes made by all users are visible to everyone editing the configuration—the changes become visible as soon as the user presses the Enter key at the end of a command that changes the configuration, such as **set**, **edit**, or **delete**.

When any of the users editing the configuration issues a **commit** command, all changes made by all users are checked and activated.

If you enter configuration mode with the **configure private** command, each user has a private candidate configuration to edit somewhat independently of other users. When you commit the configuration, only your own changes get committed. To synchronize your copy of the configuration after other users have committed changes, you can run the **update** command in configuration mode. A commit operation also updates all of the private candidate configurations. For example, suppose user X and user Y are both in **configure private** mode, and user X commits a configuration change. When user Y performs a subsequent commit operation and then views the new configuration, the new configuration seen by user Y includes the changes made by user X.

If you enter configuration mode with the **configure exclusive** command, you lock the candidate configuration for as long as you remain in configuration mode, allowing you to make changes without interference from other users. Other users can enter and exit configuration mode, but they cannot commit the configuration. This is true even if the other users entered configuration mode before you enter the **configure exclusive** command. For example, suppose user X is already in the **configure private** or **configure** mode. Then suppose user Y enters the **configure exclusive** mode. User X cannot commit any changes to the configuration, even if those changes were entered before user Y logged in. If user Y exits **configure exclusive** mode, user X can then commit the changes made in **configure private** or **configure** mode.

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Commit Preparation and Activation Overview

To save Junos configuration changes to the configuration database and to activate the configuration on the router, the configuration mode command **commit** is used.

Starting in Junos OS Release 17.3R1, you can complete the commit process in two steps. This feature enables you to configure a number of devices and simultaneously activate the configurations. Prior to Junos OS Release 17.3R1, the commit process was completed in a single step. The purpose of decoupling these stages of commit is to provide a definitive time window for the commit to be effective on the system. You are allowed to enter into commit mode after the commit is prepared, but you receive a message informing that the commit is pending activation.

In the first step, known as the preparation stage, the commit is validated and a new database with the necessary files is generated. If the configuration contains syntax errors, an appropriate error message is displayed, and the configuration is not prepared. In the event of failure during the preparation stage, the error message **commit check-out failed** is displayed.

In the second step, referred to as the activation stage, the previously prepared configuration is activated. Next, if you need to clear the prepared configuration, you can do so by using **clear system commit prepared** command. A log message is generated upon successful clearing of the pending commit.

NOTE: **Commit operations cannot be performed in between preparation and activation stages.**

The two-step commit process is superior to the single-step process for time-critical commits. In the single-step process, the preparation time can vary depending on the existing configuration on the device. In the two-step process, the complex preparation work is more efficiently handled.

Configuration commands are provided that allow you to prepare the configuration cache and activate the configuration. You can prepare the devices with new configurations and activate them at the exact times you want.

The **commit prepare** command validates the configurations, and the **commit activate** command activates the configurations. The commands have the following configuration options:

- **and-quit**
- **no-synchronize**
- **peers-synchronize**
- **synchronize**

The **commit prepare** and **commit activate** commands are available for private, exclusive and shared commits only. The commands are not applicable for dynamic and ephemeral

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modes. This feature is applicable for multichassis devices, but it is not applicable for batch commits.

To support this functionality using Network Configuration Protocol (NETCONF), the following new remote procedure calls (RPCs) are provided:

- <commit-configuration>< prepare/></commit-configuration>
- <commit-configuration><activate/></commit-configuration>
- <clear-system-commit><prepared/></clear-system-commit>

NOTE:

- In an MX Series Virtual Chassis setup the following applies: When **commit prepare** is issued on one Routing Engine followed by switchover, the Routing Engine where the switchover command is issued reboots. Therefore, the prepared cache gets cleared in that Routing Engine.
- In an MX Series Virtual Chassis setup, it is advisable to execute **clear system commit prepared** command only on VC master.

Committing Junos OS Configurations in Two Steps: Preparation and Activation

To save Junos OS configuration changes to the configuration database and to activate the configuration on the router, the configuration mode command **commit** is used.

Starting in Junos OS Release 17.3, you can complete the commit process in two steps. This enables you to configure a number of devices, and the configurations can be activated simultaneously. In the first step, known as the preparation stage, the commit is validated and a new database along with necessary files is generated. If the configuration contains syntax errors, an appropriate error message is displayed, and the configuration is not prepared. In the second step, referred to as the activation stage, the previously prepared configuration is activated and becomes the current, operational router configuration.

To prepare the configuration:

1. At the **[edit]** hierarchy level in configuration mode, make the necessary changes to the configuration.

   For example, to configure the scripts of the system, issue the following command:

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

   For example:

   ```
   [edit]
   user@host#set system scripts language python
   ```

2. Issue the **commit prepare** command.

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```
[edit]
user@host# commit prepare
```

The message **commit prepare successful** is displayed.

3. To verify the output of the **show system commit** command after **commit prepare** is issued, issue the following command:

```
user@host> show system commit
commit prepared by user via cli is pending activation
```

In the event of failure during the preparation stage, the error message **commit check-out failed** is displayed.

```
[edit]
user@host# set interfaces ge-0/0/0 unit 0 family inet address 1.1.1.2/2
[edit]
user@host# set interfaces ge-0/0/1 unit 0 family inet address 1.1.1.2/24
[edit]
user@host# commit prepare
[edit interfaces ge-2/0/0 unit 0 family inet]
'address 1.1.1.2/24'
Cannot have the same local address on the same unit of an interface
error: configuration check-out failed
```

To activate the prepared configuration:

1. Issue the **commit activate** command

```
[edit]
user@host# commit activate
```

The message **commit complete** is displayed.

2. To verify the activated system configuration, issue the following command:

```
user@host> show configuration system scripts
language python;
```


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To verify the output of the **show system commit** and **show system commit revision detail** commands after **commit activate** is issued, issue the following commands.

```
user@host> show system commit
0 2017-07-12 22:54:46 PDT by user via cli commit activate
```

```
user@host> show system commit revision detail
Revision: re0-1499925285-2214
User : user
Client : cli
Time : 2017-07-12 22:54:46 PDT
Comment : commit activate
```

Activating a Junos OS Configuration but Requiring Confirmation

When you commit the current candidate configuration, you can require an explicit confirmation for the commit to become permanent. This is useful if you want to verify that a configuration change works correctly and does not prevent access to the router. If the change prevents access or causes other errors, the router automatically returns to the previous configuration and restores access after the rollback confirmation timeout passes. This feature is called automatic rollback.

To commit the current candidate configuration but require an explicit confirmation for the commit to become permanent, use the **commit confirmed** configuration mode command:

```
[edit]
user@host# commit confirmed
commit confirmed will be automatically rolled back in 10 minutes unless confirmed
commit complete
#commit confirmed will be rolled back in 10 minutes
[edit]
user@host#
```

Once you have verified that the change works correctly, you can keep the new configuration active by entering a **commit** or **commit check** command within 10 minutes of the **commit confirmed** command. For example:

```
[edit]
user@host# commit check
commit confirmed will be automatically rolled back in 10 minutes unless confirmed
commit complete
#commit confirmed will be rolled back in 10 minutes
[edit]
user@host#
```

If the commit is not confirmed within a certain time (10 minutes by default), Junos OS automatically rolls back to the previous configuration and a broadcast message is sent to all logged-in users.

To show when a rollback is scheduled after a **commit confirmed** command, enter the **show system commit** command. For example:

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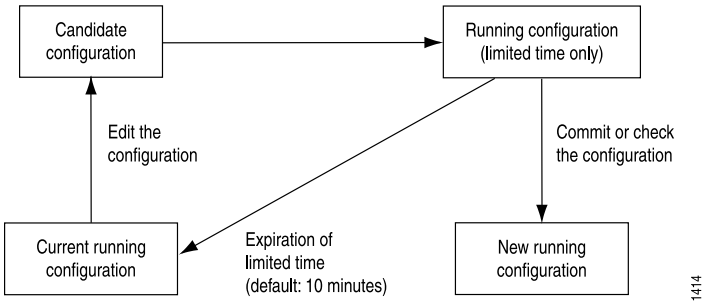
```
user@host>show system commit
0 2005-01-05 15:00:37 PST by root via cli commit confirmed, rollback in 3mins
```

Like the **commit** command, the **commit confirmed** command verifies the configuration syntax and reports any errors. If there are no errors, the configuration is activated temporarily (10 minutes by default), and begins running on the router.

Figure 6 on page 166 illustrates how the **commit confirmed** command works.

Figure 6: Confirm a Configuration



To change the amount of time before you have to confirm the new configuration, specify the number of minutes when you issue the command:

```
[edit]
user@host# commit confirmed minutes
commit complete
[edit]
user@host#
```

In Junos OS Release 11.4 and later, you can also use the **commit confirmed** command in the **[edit private]** configuration mode.

Scheduling a Junos OS Commit Operation

You can schedule when you want your candidate configuration to become active. To save Junos OS configuration changes and activate the configuration on the router at a future time or upon reboot, use the **commit at** configuration mode command, specifying **reboot** or a future time at the [**edit**] hierarchy level:

```
[edit]
user@host # commit at string
```

Where ***string*** is **reboot** or the future time to activate the configuration changes. 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 mode 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.

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- 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.

Enclose the ***string*** value in quotation marks (" "). 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 immediately 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 Junos OS fails before the configuration changes become active, all configuration changes are lost.

You cannot enter the **commit at** configuration command after you issue the **request system reboot** command.

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 cancel a scheduled configuration by means of the **clear** command, see the CLI Explorer.

NOTE: We do not recommend performing a commit operation on the backup Routing Engine when graceful Routing Engine switchover is enabled on the router.

Monitoring the Junos OS Commit Process

To monitor the Junos commit process, use the **display detail** command after the pipe with the **commit** command:

```
user@host# commit | display detail
```

For example:

```
[edit]
user@host# commit | display detail
2003-09-22 15:39:39 PDT: exporting juniper.conf
2003-09-22 15:39:39 PDT: setup foreign files
2003-09-22 15:39:39 PDT: propagating foreign files
2003-09-22 15:39:39 PDT: complete foreign files
2003-09-22 15:39:40 PDT: copying configuration to juniper.data+
```

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```
2003-09-22 15:39:40 PDT: dropping unchanged foreign files
2003-09-22 15:39:40 PDT: daemons checking new configuration
2003-09-22 15:39:41 PDT: commit wrapup...
2003-09-22 15:39:42 PDT: activating '/var/etc/ntp.conf'
2003-09-22 15:39:42 PDT: activating '/var/etc/kmd.conf'
2003-09-22 15:39:42 PDT: activating '/var/db/juniper.data'
2003-09-22 15:39:42 PDT: notifying daemons of new configuration
2003-09-22 15:39:42 PDT: signaling 'Firewall daemon', pid 24567, signal 1,
status 0
2003-09-22 15:39:42 PDT: signaling 'Interface daemon', pid 24568, signal 1,
status 0
2003-09-22 15:39:43 PDT: signaling 'Routing protocol daemon', pid 25679,
signal 1, status 0
2003-09-22 15:39:43 PDT: signaling 'MIB2 daemon', pid 24549, signal 1,
status 0
2003-09-22 15:39:43 PDT: signaling 'NTP daemon', pid 37863, signal 1, status 0
2003-09-22 15:39:43 PDT: signaling 'Sonet APS daemon', pid 24551, signal 1,
status 0
2003-09-22 15:39:43 PDT: signaling 'VRRP daemon', pid 24552, signal 1,
status 0
2003-09-22 15:39:43 PDT: signaling 'PFE daemon', pid 2316, signal 1, status 0
2003-09-22 15:39:43 PDT: signaling 'Traffic sampling control daemon', pid 24553
signal 1, status 0
2003-09-22 15:39:43 PDT: signaling 'IPsec Key Management daemon', pid
24556, signal 1, status 0
2003-09-22 15:39:43 PDT: signaling 'Forwarding UDP daemon', pid 2320,
signal 1, status 0
commit complete
```

Adding a Comment to Describe the Committed Configuration

You can include a comment that describes changes to the committed configuration. To do so, include the commit **comment** statement. The comment can be as long as 512 bytes and you must type it on a single line.

```
[edit]
user@host# commit comment comment-string
```

comment-string is the text of the comment.

NOTE: You cannot include a comment with the **commit check** command.

To add a comment to the **commit** command, include the **comment** statement after the **commit** command:

```
[edit]
user@host# commit comment "add user joe"
commit complete
[edit]
user@host#
```


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To add a comment to the **commit confirmed** command, include the **comment** statement after the **commit confirmed** command:

```
[edit]
user@host# commit confirmed comment "add customer to port 27"
commit confirmed will be automatically rolled back in 10 minutes unless confirmed
commit complete
[edit]
user@host#
```

To view these commit comments, issue the **show system commit** operational mode command.

In Junos OS Release 11.4 and later, you can also use the **commit confirmed** command in the **[edit private]** configuration mode.

Junos OS Batch Commits Overview

Junos OS provides a batch commit feature that aggregates or merges multiple configuration edits from different CLI sessions or users and adds them to a batch commit queue. A batch commit server running on the device takes one or more jobs from the batch commit queue, applies the configuration changes to the shared configuration database, and then commits the configuration changes in a single commit operation.

Batches are prioritized by the commit server based on priority of the batch specified by the user or the time when the batch job is added. When one batch commit is complete, the next set of configuration changes are aggregated and loaded into the batch queue for the next session of the batch commit operation. Batches are created until there are no commit entries left in the queue directory.

When compared to the regular commit operation where all commits are independently committed sequentially, batch commits save time and system resources by committing multiple small configuration edits in a single commit operation.

Batch commits are performed from the **[edit batch]** configuration mode. The commit server properties can be configured at the **[edit system commit server]** hierarchy level.

Aggregation and Error Handling

When there is a load-time error in one of the aggregated jobs, the commit job that encounters the error is discarded and the remaining jobs are aggregated and committed.

For example, if there are five commit jobs (**commit-1**, **commit-2**, **commit-3**, **commit-4**, and **commit-5**) being aggregated, and **commit-3** encounters an error while loading, **commit-3** is discarded and **commit-1**, **commit-2**, **commit-4**, and **commit-5** are aggregated and committed.

If there is an error during the commit operation when two or more jobs are aggregated and committed, the aggregation is discarded and each of those jobs is committed individually like a regular commit operation.

For example, if there are five commit jobs (**commit-1**, **commit-2**, **commit-3**, **commit-4**, and **commit-5**) that are aggregated and if there is a commit error caused because of **commit-3**,

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the aggregation is discarded, **commit-1**, **commit-2**, **commit-3**, **commit-4**, and **commit-5** are committed individually, and the CLI reports a commit error for **commit-3**.

Example: Configuring Batch Commit Server Properties

This example shows how to configure batch commit server properties to manage batch commit operations.

- Requirements on page 170
- Overview on page 170
- Configuration on page 170
- Verification on page 173

Requirements

This example uses the following hardware and software components:

- MX Series 5G Universal Routing Platform
- Junos OS Release 12.1 or later running on the device

Overview

You can control how the batch commit queue is handled by the commit server by configuring the server properties at the **[edit system commit server]** hierarchy level. This enables you to control how many commit jobs are aggregated or merged into a single batch commit, the maximum number of jobs that can be added to the queue, days to keep batch commit error logs, interval between two batch commits, and tracing operations for batch commit operations.

Configuration

CLI Quick Configuration

To quickly configure this section of the example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level. You can configure the commit server properties from either the regular **[edit]** mode or the **[edit batch]** mode.

Device R0

```
set system commit server maximum-aggregate-pool 4
set system commit server maximum-entries 500
set system commit server commit-interval 5
set system commit server days-to-keep-error-logs 30
set system commit server traceoptions file commitd_nov
set system commit server traceoptions flag all
```

Configuring the Commit Server Properties

Step-by-Step Procedure

1. (Optional) Configure the number of commit transactions to aggregate or merge in a single commit operation.

   The default value for **maximum-aggregate-pool** is **5**.

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NOTE: Setting **maximum-aggregate-pool** to 1 commits each of the jobs individually.

In this example, the number of commit transactions is set to **4** indicating that four different commit jobs are aggregated into a single commit before the commit operation is initiated.

```
[edit system commit server]
user@R0# set maximum-aggregate-pool 4
```

2. (Optional) Configure the maximum number of jobs allowed in a batch.

   This limits the number of commits jobs that are added to the queue.

```
[edit system commit server]
user@R0# set maximum-entries 500
```

NOTE: If you set **maximum-entries** to 1, the commit server cannot add more than one job to the queue, and the CLI displays an appropriate message when you try to commit more than one job.

3. (Optional) Configure the time (in seconds) to wait before starting the next batch commit operation.

```
[edit system commit server]
user@R0# set commit-interval 5
```

4. (Optional) Configure the number of days to keep error logs.

   The default value is **30** days.

```
[edit system commit server]
user@R0# set days-to-keep-error-logs 30
```

5. (Optional) Configure tracing operations to log batch commit events.

   In this example, the filename for logging batch commit events is **commitd_nov**, and all traceoption flags are set.

```
[edit system commit server]
user@R0# set traceoptions commitd_nov
user@R0# set traceoptions flag all
```

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

```
user@R0# show system commit server
maximum-aggregate-pool 4;
maximum-entries 500;
commit-interval 5;
days-to-keep-error-logs 30;
traceoptions {
   file commitd_nov;
   flag all;
}
```

Committing the Configuration from Batch Configuration Mode

Step-by-Step Procedure To commit the configuration from the **[edit batch]** mode, do one of the following:

- Log in to the device and enter **commit**.

```
[edit batch]
user@R0# commit
  Added to commit queue request-id: 1000
```

- To assign a higher priority to a batch commit job, issue the **commit** command with the **priority** option.

```
[edit batch]
user@R0# commit priority
  Added to commit queue request-id: 1001
```

- To commit a configuration without aggregating the configuration changes with other commit jobs in the queue, issue the **commit** command with the **atomic** option.

```
[edit batch]
user@R0# commit atomic
  Added to commit queue request-id: 1002
```

- To commit a configuration without aggregating the configuration changes with other commit jobs in the queue, and issuing a higher priority to the commit job, issue the **commit** command with the **atomic priority** option.

```
[edit batch]
user@R0# commit atomic priority
  Added to commit queue request-id: 1003
```


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Verification

Confirm that the configuration is working properly.

- Checking the Batch Commit Server Status on page 173
- Checking the Batch Commit Status on page 173
- Viewing the Patch Files in a Batch Commit Job on page 174
- Viewing the Trace Files for Batch Commit Operations on page 176

Checking the Batch Commit Server Status

Purpose Check the status of the batch commit server.

Action

```
user@R0> show system commit server
Commit server status : Not running
```

By default, the status of the commit server is **Not running**. The commit server starts running only when a batch commit job is added to the queue.

When a batch commit job is added to the queue, the status of the commit server changes to **Running**.

```
user@R0> show system commit server

Commit server status : Running
Jobs in process:
  1003 1004 1005
```

Meaning The **Jobs in process** field lists the commit IDs of jobs that are in process.

Checking the Batch Commit Status

Purpose Check the commit server queue for the status of the batch commits.

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Action

```
user@R0> show system commit server queue

Pending commits:
  Id: 1005
  Last Modified: Tue Nov  1 23:56:43 2011

Completed commits:
  Id: 1000
  Last Modified: Tue Nov  1 22:46:43 2011
  Status: Successfully committed 1000

  Id: 1002
  Last Modified: Tue Nov  1 22:50:35 2011
  Status: Successfully committed 1002

  Id: 1004
  Last Modified: Tue Nov  1 22:51:48 2011
  Status: Successfully committed 1004

  Id: 1007
  Last Modified: Wed Nov  2 01:08:04 2011
  Status: Successfully committed 1007

  Id: 1009
  Last Modified: Wed Nov  2 01:16:45 2011
  Status: Successfully committed 1009

  Id: 1010
  Last Modified: Wed Nov  2 01:19:25 2011
  Status: Successfully committed 1010

  Id: 1011
  Last Modified: Wed Nov  2 01:28:16 2011
  Status: Successfully committed 1011


Error commits:
  Id: 1008
  Last Modified: Wed Nov  2 01:08:18 2011
  Status: Error while commiting 1008
```

Meaning **Pending commits** displays commit jobs that are added to the commit queue but are not committed yet. **Completed commits** displays the list of commit jobs that are successful. **Error commits** are commits that failed because of an error.

Viewing the Patch Files in a Batch Commit Job

Purpose View the timestamps, patch files, and the status of each of the commit jobs. Patch files show the configuration changes that occur in each commit operation that is added to the batch commit queue.

Action

1. Issue the **show system commit server queue patch** command to view the patches for all commit operations.

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```
user@R0> show system commit server queue patch
Pending commits:
  none


Completed commits:
  Id: 1000
  Last Modified: Tue Nov  1 22:46:43 2011
  Status: Successfully committed 1000

Patch:
[edit groups]
  re1 { ... }
+ GRP-DHCP-POOL-NOACCESS {
+     access {
+         address-assignment {
+             pool <*> {
+                 family inet {
+                     dhcp-attributes {
+                         maximum-lease-time 300;
+                         grace-period 300;
+                         domain-name verizon.net;
+                         name-server {
+                             4.4.4.1;
+                             4.4.4.2;
+                         }
+                     }
+                 }
+             }
+         }
+     }
+ }
  Id: 1002
  Last Modified: Tue Nov  1 22:50:35 2011
  Status: Successfully committed 1002

Patch:
[edit]
+ snmp {
+     community abc;
+ }
  Id: 1010
  Last Modified: Wed Nov  2 01:19:25 2011
  Status: Successfully committed 1010

Patch:
[edit system syslog]
  file test { ... }
+ file j {
+     any any;
+ }

Error commits:
  Id: 1008
  Last Modified: Wed Nov  2 01:08:18 2011
  Status: Error while commiting 1008

Patch:
[edit system]
+ radius-server {
```

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```
+     10.1.1.1 port 222;
+ }
```

The output shows the changes in configuration for each commit job ID.

2. To view the patch for a specific commit job ID, issue the **show system commit server queue patch id *<id-number>*** command.

```
user@R0> show system commit server queue patch id 1000
Completed commits:
  Id: 1000
  Last Modified: Tue Nov  1 22:46:43 2011
  Status: Successfully committed 1000

Patch:
[edit system]
+ radius-server {
+     192.168.69.162 secret teH.bTc/RVbPM;
+     192.168.64.10 secret teH.bTc/RVbPM;
+     192.168.60.52 secret teH.bTc/RVbPM;
+     192.168.60.55 secret teH.bTc/RVbPM;
+     192.168.4.240 secret teH.bTc/RVbPM;
+ }
```

Meaning The output shows the patch created for a commit job. The **+** or **-** sign indicates the changes in the configuration for a specific commit job.

Viewing the Trace Files for Batch Commit Operations

Purpose View the trace files for batch commit operations. You can use the trace files for troubleshooting purposes.

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Action

- Issue the **file show /var/log/*<filename>*** command to view all entries in the log file.

  user@R0> **file show/var/log/commitd_nov**

  The output shows commit server event logs and other logs for batch commits.

```
Nov  1 22:46:43 Successfully committed 1000
Nov  1 22:46:43 pausing after commit for 0 seconds
...
Nov  1 22:46:43 Done working on queue
...

Nov  1 22:47:17 maximum-aggregate-pool = 5
Nov  1 22:47:17 maximum-entries= 0
Nov  1 22:47:17 asynchronous-prompt = no
Nov  1 22:47:17 commit-interval = 0
Nov  1 22:47:17 days-to-keep-error-logs = -1
...
Nov  1 22:47:17 Added to commit queue request-id: 1001
Nov  1 22:47:17 Commit server status=running
Nov  1 22:47:17 No need to pause
...

Nov  1 22:47:18 Error while commiting 1001
Nov  1 22:47:18 doing rollback
...
```

- To view log entries only for successful batch commit operations, issue the **file show /var/log/*<filename>*** command with the **| match committed** pipe option.

  user@R0> **file show/var/log/commitd_nov | match committed**

  The output shows batch commit job IDs for successful commit operations.

```
Nov  1 22:46:43 Successfully committed 1000
Nov  1 22:50:35 Successfully committed 1002
Nov  1 22:51:48 Successfully committed 1004
Nov  2 01:08:04 Successfully committed 1007
Nov  2 01:16:45 Successfully committed 1009
Nov  2 01:19:25 Successfully committed 1010
Nov  2 01:28:16 Successfully committed 1011
```

- To view log entries only for failed batch commit operations, issue the **file show /var/log/*<filename>*** command with the **| match “Error while”** pipe option.

  user@R0> **file show/var/log/commitd_nov | match “Error while”**

  The output shows commit job IDs for failed commit operations.

```
Nov  1 22:47:18 Error while commiting 1001
Nov  1 22:51:10 Error while commiting 1003
Nov  1 22:52:15 Error while commiting 1005
...
```

- To view log entries only for commit server events, issue the **file show /var/log/*<filename>*** command with the **| match “commit server”** pipe option.

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user@R0> **file show/var/log/commitd_nov | match “commit server”**

The output shows commit server event logs.

```
Nov  1 22:46:39 Commit server status=running
Nov  1 22:46:39 Commit server jobs=1000
Nov  1 22:46:43 Commit server status=not running
Nov  1 22:46:43 Commit server jobs=
Nov  1 22:47:17 Commit server status=running
Nov  1 22:47:18 Commit server jobs=1001
Nov  1 22:47:18 2 errors reported by commit server
Nov  1 22:47:18 Commit server status=not running
Nov  1 22:47:18 Commit server jobs=
Nov  1 22:50:31 Commit server status=running
Nov  1 22:50:31 Commit server jobs=1002
Nov  1 22:50:35 Commit server status=not running
Nov  1 22:50:35 Commit server jobs=
Nov  1 22:51:09 Commit server status=running
Nov  1 22:51:10 Commit server jobs=1003
Nov  1 22:51:10 2 errors reported by commit server
Nov  1 22:51:10 Commit server status=not running
...
```

Backing Up the Committed Configuration on the Alternate Boot Drive

After you commit the configuration and are satisfied that it is running successfully, you should issue the **request system snapshot** command to back up the new software onto the **/altconfig** file system. If you do not issue the **request system snapshot** command, the configuration on the alternate boot drive will be out of sync with the configuration on the primary boot drive.

The **request system snapshot** command backs up the root file system to **/altroot**, and **/config** to **/altconfig**. The root and **/config** file systems are on the router’s flash drive, and the **/altroot** and **/altconfig** file systems are on the router’s hard disk (if available).

NOTE: For more information about backing up the file system on an ACX Series Universal Metro Router, see *Understanding System Snapshot on an ACX Series Router*.

After you issue the **request system snapshot** command, you cannot return to the previous version of the software because the running and backup copies of the software are identical.

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Release History Table

Release	Description
17.3R1	Starting in Junos OS Release 17.3R1, you can complete the commit process in two steps. This feature enables you to configure a number of devices and simultaneously activate the configurations

Related Documentation

- commit on page 297
- Configure Command Overview on page 82
- Day One: Exploring the Junos CLI

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CHAPTER 4

Managing Configurations

- Configuration Files Overview on page 181
- Managing Configurations on page 183
- Autoinstallation of Configuration Files on page 200
- Loading Configuration Files on page 205
- Backing Up Configurations to an Archive Site on page 217
- Factory Default Configuration on page 219
- Rescue Configuration on page 224
- Encrypting and Decrypting Configuration Files on page 227
- Synchronizing Configurations Across Routing Engines on page 238

Configuration Files Overview

A configuration file stores the complete configuration of a device. The active (running) configuration is the operational file of the device. The candidate configuration is the working copy storing configuration updates. For more information, see the following topics:

- Understanding Configuration Files on page 181
- Understanding How the Junos OS Configuration Is Stored on page 182

Understanding Configuration Files

A configuration file stores the complete configuration of a switch. The current configuration of a switch is called the active configuration. You can alter this current configuration and you can also return to a previous configuration or to a rescue configuration.

Juniper Networks Junos OS saves the 50 most recently committed configuration files on a switch so that you can return to a previous configuration. The configuration files are named:

- **juniper.conf.gz**—The current active configuration.
- **juniper.conf.1.gz** to **juniper.conf.49.gz**—Rollback configurations.

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To make changes to the configuration file, you have to work in configuration mode in the CLI. When making changes to a configuration file, you are viewing and changing the candidate configuration file. The candidate configuration allows you to make configuration changes without causing operational changes to the active configuration or causing potential damage to your current network operations. Once you commit the changes made to the candidate configuration, the system updates the active configuration.

Configuration File Terms

Table 10 on page 182 lists the various configuration file terms and their definitions.

Table 10: Configuration File Terms

Term	Definition
active configuration	Current committed configuration of a switch.
candidate configuration	Working copy of the configuration that allows users to make configurational changes without causing any operational changes until this copy is committed.
configuration group	Group of configuration statements that can be inherited by the rest of the configuration.
commit a configuration	Check configuration for proper syntax, activate and mark as the current configuration file running on the switching platform.
configuration hierarchy	Junos OS configuration consists of a hierarchy of statements. There are two types of statements: container statements, which contain other statements, and leaf statements, which do not contain other statements. All the container and leaf statements together form the configuration hierarchy.
default configuration	Default configuration contains the initial values set for each configuration parameter when a switch is shipped.
rescue configuration	Well-known configuration that recovers a switch from a configuration that denies management access. You set a current committed configuration to be the rescue configuration through the CLI.
roll back a configuration	Return to a previously committed configuration.

See Also

- Uploading a Configuration File on page 215
- Reverting to the Rescue Configuration on page 225
- *Uploading a Configuration File (CLI Procedure)*
- Reverting to the Rescue Configuration for the EX Series Switch on page 226

Understanding How the Junos OS Configuration Is Stored

When you edit a configuration, you work in a copy of the current configuration to create a candidate configuration. The changes you make to the candidate configuration are visible in the CLI immediately, so if multiple users are editing the configuration at the same time, all users can see all changes.

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To have a candidate configuration take effect, you *commit* the changes. At this point, the candidate file is checked for proper syntax, activated, and marked as the current, operational software configuration file. If multiple users are editing the configuration, when you commit the candidate configuration, all changes made by all the users take effect.

In addition to saving the current configuration, the CLI saves the current operational version and the previous 49 versions of committed configurations. The most recently committed configuration is version 0, which is the current operational version and the default configuration that the system returns to if you roll back to a previous configuration. The oldest saved configuration is version 49.

By default, Junos OS saves the current configuration and three previous versions of the committed configuration on the CompactFlash card. The currently operational Junos OS configuration is stored in the file **juniper.conf.gz**, and the last three committed configurations are stored in the files **juniper.conf.1.gz**, **juniper.conf.2.gz**, and **conf.3.gz**. These four files are located in the router or switch's CompactFlash card in the directory /config.

The remaining 46 previous versions of committed configurations, the files **juniper.conf.4** through **juniper.conf.49**, are stored in the directory **/var/db/config** on the hard disk.

See Also

- *Using Junos OS to Specify the Number of Configurations Stored on the CompactFlash Card*
- Returning to the Most Recently Committed Junos OS Configuration on page 191
- Returning to a Previously Committed Junos OS Configuration on page 191
- Loading a Configuration from a File or the Terminal on page 206

Related Documentation

- Day One: Exploring the Junos CLI

Managing Configurations

- Understanding the show | compare | display xml Command Output on page 184
- Returning to the Most Recently Committed Junos OS Configuration on page 191
- Returning to a Previously Committed Junos OS Configuration on page 191
- Saving a Configuration to a File on page 194
- Compressing the Current Configuration File on page 195
- Freeing Up System Storage Space on page 197
- Understanding Automatic Refreshing of Scripts on EX Series Switches on page 198
- Cleaning Up Files with the CLI on page 198

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Understanding the show | compare | display xml Command Output

The **compare | display xml** filter compares the candidate configuration with the current committed configuration and displays the differences between the two configurations in XML. To compare configurations, enter **compare | display xml** after the pipe (|) symbol in either operational or configuration mode.

Example in operational mode:

```
user@host> show configuration | compare | display xml
```

Example in configuration mode:

```
[edit]
user@host# show | compare | display xml
```

You can enter a specific configuration hierarchy immediately preceding the **compare** filter, for example, **show configuration system syslog | compare | display xml**. In configuration mode, you can navigate to a hierarchy where the command is applied.

The differences from the compare filter function are output in XML. The **configuration** tag starts the output. The context for changes is established with hierarchy name tags relative to the root of the compare. For element changes, an **operation** attribute are output in the tag where a change occurs. This attribute has the value **create**, **delete**, or **merge**. For metadata changes, the metadata name is specified. For example, if a statement is marked inactive, the **inactive="inactive"** attribute and value are output. The nc namespace is used when necessary to indicate that an attribute is in the NETCONF namespace rather than the Junos OS namespace.

NOTE: Starting in Junos OS Release 16.2R2, the **show | compare | display xml** command omits the **<configuration>** tag in the XML output if the comparison returns no differences or if the comparison returns only differences for non-native configuration data, for example, configuration data associated with an OpenConfig data model.

The following sections explain the XML that is generated for particular types of configuration changes. The corresponding text changes are shown for comparison.

- Adding a Statement (create Operation) on page 185
- Deleting a Statement (delete Operation) on page 185
- Changing a Statement (delete and create Operations) on page 186
- Changing Metadata (inactive Attribute and Operation) on page 187
- Adding an Annotation (comment Tag and create Operation) on page 188
- Changing an Annotation (comment Tag, and delete and create Operations) on page 189

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- Adding a Statement Inside a Container (create Operation, and insert and key Attributes) on page 189
- Changing the Order Inside a Container (merge Operation, and insert and key Attributes) on page 190

Adding a Statement (create Operation)

The following example shows the addition of IPv4 address 2.2.2.2 to unit 1. The tags through **name** provide the context for the addition. The **operation="create"** attribute indicates that a **unit** statement was created and is defined by the configuration within the **unit** tag.

```
[edit interfaces ge-0/0/0]
user@host> show configuration | compare
[edit interfaces ge-0/0/0]
+    unit 1 {
+        family inet {
+            address 2.2.2.2/32;
+        }
+    }

[edit interfaces ge-0/0/0]
user@host# show | compare | display xml
<configuration>
     <interfaces>
         <interface>
             <name>ge-0/0/0</name>
             <unit nc:operation="create">
                 <name>1</name>
                 <family>
                     <inet>
                         <address>
                             <name>2.2.2.2/32</name>
                         </address>
                     </inet>
                 </family>
             </unit>
         </interface>
     </interfaces>
</configuration>
```

Deleting a Statement (delete Operation)

The following example shows the deletion of a simple statement in the configuration hierarchy. The tags through **system** provide the context for the deletion. The **operation="delete"** attribute indicates that the **services** statement was deleted. The configuration following the **services** statement was deleted though is not output.

```
[edit system]
user@host> show configuration | compare
[edit system]
-   services {
-       ftp;
-   }
```

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```
[edit system]
user@host# show | compare | display xml
<configuration>
     <system>
         <services operation="delete"/>
     </system>
  </configuration>
```

The following example shows the deletion of unit 1 from the ge-0/0/0 interface. The configuration following the **unit** statement was deleted though is not output.

```
[edit interfaces ge-0/0/0]
user@host> show configuration | compare
[edit interfaces ge-0/0/0]
-    unit 1 {
-        family inet {
-            address 2.2.2.2/32;
-        }
-    }

[edit interfaces ge-0/0/0]
user@host# show | compare | display xml
<configuration>
     <interfaces>
         <interface>
             <name>ge-0/0/0</name>
             <unit nc:operation="delete">
                 <name>1</name>
             </unit>
         </interface>
     </interfaces>
</configuration>
```

The following example shows the deletion of the **apply-groups** configuration. The groups that are deleted are not output.

```
[edit]
user@host# delete apply-groups

[edit]
user@host> show configuration | compare
[edit]
- apply-groups [ g1 g2 g3 ];

[edit]
user@host# show | compare | display xml
<configuration>
       <apply-groups operation="delete"/>
</configuration>
```

Changing a Statement (delete and create Operations)

The following example shows a change in a statement in the hierarchy. The tags through **system** provide the context for the change. The **operation="delete"** attribute indicates

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that the **host-name** statement was deleted. The configuration following the **host-name** statement was deleted though is not output. The **operation="create"** attribute indicates that a **host-name** statement was created and is defined by the configuration within the **host-name** tag.

```
[edit system]
user@host> show configuration | compare
[edit system]
-  host-name router1;
+  host-name router2;

[edit system]
user@host# show | compare | display xml
<configuration>
     <system>
         <host-name nc:operation="delete"/>
         <host-name nc:operation="create">router2</host-name>
     </system>
</configuration>
```

Changing Metadata (inactive Attribute and Operation)

The following example shows the inactivation of a statement in the hierarchy. The tags through **system** provide the context for the change. The **inactive="inactive"** attribute indicates that the **syslog** statement was inactivated.

```
[edit system]
user@host> show configuration | compare
[edit system]
!    inactive: syslog { ... }

[edit system]
user@host# show | compare | display xml
<configuration>
     <system>
         <syslog inactive="inactive"/>
     </system>
</configuration>
```

The following example shows the addition of an inactive **syslog** statement. The **operation="create"** attribute indicates that the **syslog** statement was created and is defined by the configuration within the **syslog** tag. The **inactive="inactive"** attribute indicates that the **syslog** statement was inactivated.

```
[edit system]
user@host> show configuration | compare
[edit system]
+   inactive: syslog {
+       file foo {
+           any any;
+       }
+   }

[edit system]
```

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```
user@host# show | compare | display xml
<configuration>
     <system>
         <syslog nc:operation="create"
                 inactive="inactive">
             <file>
                 <name>foo</name>
                 <contents>
                     <name>any</name>
                     <any/>
                 </contents>
             </file>
         </syslog>
     </system>
</configuration>
```

Adding an Annotation (comment Tag and create Operation)

The following example shows the addition of a comment to a statement. The tags through **syslog** provide the context for the annotation. The **operation="create"** attribute for the **junos:comment** tag indicates that a comment was added to the **[edit system syslog]** hierarchy.

```
[edit system]
user@host> show configuration | compare
[edit system]
+   /* my-comments-simple */
     syslog { ... }

[edit system]
user@host# show | compare | display xml
<configuration>
     <system>
         <junos:comment nc:operation="create">/* my-comments-simple
*/</junos:comment>
         <syslog/>
     </system>
</configuration>
```

The following example shows the addition of a comment to a statement. The tags through **syslog** provide the context for the annotation. The **operation="create"** attribute for the **junos:comment** tag indicates that a comment was added to the **[edit system syslog]** hierarchy for the statement output within the **syslog** tag.

```
[edit system syslog]
user@host> show configuration | compare
+    /* my-comments-ele */
      file f1 { ... }

[edit system syslog]
user@host# show | compare | display xml
<configuration>
     <system>
         <syslog>
             <junos:comment nc:operation="create">/* my-comments-elem
```


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```
*/</junos:comment>
            <file>
                <name>f1</name>
            </file>
        </syslog>
    </system>
</configuration>
```

Changing an Annotation (comment Tag, and delete and create Operations)

The following example shows the change of a comment for a statement. The tags through **system** provide the context for the annotation. The **operation="delete"** attribute for the **junos:comment** tag indicates that a comment was deleted from the **[edit system]** hierarchy at the **syslog** statement. The **operation="create"** attribute for the **junos:comment** tag indicates that a comment was added to the **[edit system]** hierarchy for the **syslog** statement.

```
[edit system]
user@host> show configuration | compare
-   /* my-comments-1 */
+   /* my-comments-2 */
     syslog { ... }

[edit system]
user@host# show | compare | display xml
<configuration>
     <system>
         <junos:comment nc:operation="delete"/>
         <junos:comment nc:operation="create">/* my-comments-2
*/</junos:comment>
         <syslog/>
     </system>
</configuration>
```

Adding a Statement Inside a Container (create Operation, and insert and key Attributes)

The following example shows the addition of a **file** statement at the **[edit system syslog]** hierarchy. The tags through **syslog** provide the context for the addition. The **operation="create"** attribute for the **file** tag indicates that a **file** statement was added. The **yang:insert="after"** attribute indicates that the file was added after the position indicated by the **yang:key="[name='file-1']"** attribute. The file-1 value represents the position within the existing **file** statements, where one is the first file. In this example, the new **file** statement was added after the first file.

```
[edit system syslog]
user@host> show configuration | compare
[edit system syslog]
     file file-1 { ... }
+    file file-2 {
+        any any;
+    }
```

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```
[edit system syslog]
user@host# show | compare | display xml
<configuration>
     <system>
         <syslog>
             <file nc:operation="create"
                   yang:insert="after"
                   yang:key="[name='file-1']">
                 <name>file-2</name>
                 <contents>
                     <name>any</name>
                     <any/>
                 </contents>
             </file>
         </syslog>
     </system>
</configuration>
```

Changing the Order Inside a Container (merge Operation, and insert and key Attributes)

The following example shows the change in order of **file** statements at the **[edit system syslog]** hierarchy. The tags through **syslog** provide the context for the change. The **operation="merge"** attribute for the **file** tag indicates that an existing **file** statement was moved. The **yang:insert="after"** attribute indicates that the file was moved after the file in the position indicated by the **yang:key="[name='file-1']"** attribute. The file-1 value represents a position within the existing **file** statements, where one is the first file. The value at the **name** tag, file-3, represents a position within the existing file statements. In this example, the **file** statement in the third position was moved after the first file.

```
[edit system syslog]
user@host> show configuration | compare
[edit system syslog]
     file f1 { ... }
!    file f3 { ... }

[edit system syslog]
user@host# show | compare | display xml
<configuration>
     <system>
         <syslog>
             <file nc:operation="merge"
                   yang:insert="after"
                   yang:key="[name='file-1']">
                 <name>file-3</name>
             </file>
         </syslog>
     </system>
</configuration>
```

See Also

- Using Regular Expressions with the Pipe (|) Symbol to Filter Junos OS Command Output on page 271
- Pipe (|) Filter Functions in the Junos OS Command-Line Interface on page 272

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- Using the Pipe (|) Symbol to Filter Junos OS Command Output on page 270

Returning to the Most Recently Committed Junos OS Configuration

To return to the most recently committed configuration and load it into configuration mode without activating it, use the **rollback** configuration mode command:

```
[edit]
user@host# rollback
```

```
load complete
```

To activate the configuration to which you rolled back, use the **commit** command:

```
[edit]
user@host# rollback
load complete
[edit]
user@host# commit
```

See Also

- Rolling Back Junos OS Configuration Changes on page 43
- Understanding How the Junos OS Configuration Is Stored on page 182

Returning to a Previously Committed Junos OS Configuration

This topic explains how you can return to a configuration prior to the most recently committed one, and contains the following sections:

- Returning to a Configuration Prior to the One Most Recently Committed on page 191
- Displaying Previous Configurations on page 192
- Comparing Configuration Changes with a Prior Version on page 193

Returning to a Configuration Prior to the One Most Recently Committed

To return to a configuration prior to the most recently committed one, include the configuration number, 0 through 49, in the **rollback** command. The most recently saved configuration is number 0 (which is the default configuration to which the system returns), and the oldest saved configuration is number 49.

```
[edit]
user@host# rollback number
load complete
```

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Displaying Previous Configurations

To display previous configurations, including the rollback number, date, time, the name of the user who committed changes, and the method of commit, use the **rollback ?** command.

```
[edit]
user@host# rollback ?
Possible completions:
<[Enter]> Execute this command
<number> Numeric argument
0              2005-02-27 12:52:10 PST by abc via cli
1              2005-02-26 14:47:42 PST by def via cli
2              2005-02-14 21:55:45 PST by ghi via cli
3              2005-02-10 16:11:30 PST by jkl via cli
4              2005-02-10 16:02:35 PST by mno via cli
5              2005-03-16 15:10:41 PST by pqr via cli
6              2005-03-16 14:54:21 PST by stu via cli
7              2005-03-16 14:51:38 PST by vwx via cli
8              2005-03-16 14:43:29 PST by yzz via cli
9              2005-03-16 14:15:37 PST by abc via cli
10             2005-03-16 14:13:57 PST by def via cli
11             2005-03-16 12:57:19 PST by root via other
12             2005-03-16 10:45:23 PST by root via other
13             2005-03-16 10:08:13 PST by root via other
14             2005-03-16 01:20:56 PST by root via other
15             2005-03-16 00:40:37 PST by ghi via cli
16             2005-03-16 00:39:29 PST by jkl via cli
17             2005-03-16 00:32:36 PST by mno via cli
18             2005-03-16 00:31:17 PST by pqr via cli
19             2005-03-15 19:59:00 PST by stu via cli
20             2005-03-15 19:53:39 PST by vwx via cli
21             2005-03-15 18:07:19 PST by yzz via cli
22             2005-03-15 17:59:03 PST by abc via cli
23             2005-03-15 15:05:14 PST by def via cli
24             2005-03-15 15:04:51 PST by ghi via cli
25             2005-03-15 15:03:42 PST by jkl via cli
26             2005-03-15 15:01:52 PST by mno via cli
27             2005-03-15 14:58:34 PST by pqr via cli
28             2005-03-15 13:09:37 PST by root via other
29             2005-03-12 11:01:20 PST by stu via cli
30             2005-03-12 10:57:35 PST by vwx via cli
31             2005-03-11 10:25:07 PST by yzz via cli
32             2005-03-10 23:40:58 PST by abc via cli
33             2005-03-10 23:40:38 PST by def via cli
34             2005-03-10 23:14:27 PST by ghi via cli
35             2005-03-10 23:10:16 PST by jkl via cli
36             2005-03-10 23:01:51 PST by mno via cli
37             2005-03-10 22:49:57 PST by pqr via cli
38             2005-03-10 22:24:07 PST by stu via cli
39             2005-03-10 22:20:14 PST by vwx via cli
40             2005-03-10 22:16:56 PST by yzz via cli
41             2005-03-10 22:16:41 PST by abc via cli
42             2005-03-10 20:44:00 PST by def via cli
```


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```
43              2005-03-10 20:43:29 PST by ghi via cli
44              2005-03-10 20:39:14 PST by jkl via cli
45              2005-03-10 20:31:30 PST by root via other
46              2005-03-10 18:57:01 PST by mno via cli
47              2005-03-10 18:56:18 PST by pqr via cli
48              2005-03-10 18:47:49 PST by stu via cli
49              2005-03-10 18:47:34 PST by vw via cli
| Pipe through a command
[edit]
```

Comparing Configuration Changes with a Prior Version

In configuration mode only, when you have made changes to the configuration and want to compare the candidate configuration with a prior version, you can use the **compare** command to display the configuration. The **compare** command compares the candidate configuration with either the current committed configuration or a configuration file and displays the differences between the two configurations. To compare configurations, specify the **compare** command after the pipe:

```
[edit]
user@host# show | compare (filename| rollback n)
```

filename is the full path to a configuration file. The file must be in the proper format: a hierarchy of statements.

n is the index into the list of previously committed configurations. The most recently saved configuration is number 0, and the oldest saved configuration is number 49. If you do not specify arguments, the candidate configuration is compared against the active configuration file (**/config/juniper.conf**).

The comparison output uses the following conventions:

- Statements that are only in the candidate configuration are prefixed with a plus sign (+).
- Statements that are only in the comparison file are prefixed with a minus sign (-).
- Statements that are unchanged are prefixed with a single blank space ( ).

The following example shows various changes, then a comparison of the candidate configuration with the active configuration, showing only the changes made at the **[edit protocols bgp]** hierarchy level:

```
[edit]
user@host# edit protocols bgp
[edit protocols bgp]
user@host# show
group my-group {
    type internal;
    hold-time 60;
    advertise-inactive;
    allow 10.1.1.1/8;
}
```

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```
group fred {
    type external;
    peer-as 33333;
    allow 10.2.2.2/8;
}
group test-peers {
    type external;
    allow 10.3.3.3/8;
}
[edit protocols bgp]
user@host# set group my-group hold-time 90
[edit protocols bgp]
user@host# delete group my-group advertise-inactive
[edit protocols bgp]
user@host# set group fred advertise-inactive
[edit protocols bgp]
user@host# delete group test-peers
[edit protocols bgp]
user@host# show | compare
[edit protocols bgp group my-group]
-hold-time 60;
+hold-time 90;
-advertise-inactive;
[edit protocols bgp group fred]
+advertise-inactive;
[edit protocols bgp]
-group test-peers {
    -type external;
    -allow 10.3.3.3/8;
}
[edit protocols bgp]
user@host# show
group my-group {
    type internal;
    hold-time 90;
    allow 10.1.1.1/8;
}
group fred {
    type external;
    advertise-inactive;
    peer-as 3333;
    allow 10.2.2.2/8;
}
```

See Also

- Loading a Configuration from a File or the Terminal on page 206
- Viewing Files and Directories on a Device Running Junos OS on page 257

Saving a Configuration to a File

Save Junos OS configuration to a file so that you can edit it with a text editor of your choice. You can save your current configuration to an ASCII file, which saves the

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configuration in its current form, including any uncommitted changes. If more than one user is modifying the configuration, all changes made by all users are saved.

To save software configuration changes to an ASCII file, use the **save** configuration mode command:

```
[edit]
user@host# save filename
[edit]
user@host#
```

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.

By default, the configuration is saved to a file in your home directory, which is on the flash drive.

When you issue this command from anywhere in the hierarchy (except the top level), a **replace** tag is automatically included at the beginning of the file. You can use the **replace** tag to control how a configuration is loaded from a file.

```
user@host> file show /var/home/user/myconf
replace:
protocols {
    bgp {
        disable;
        group int {
            type internal;
        }
    }
    isis {
        disable;
        interface all {
            level 1 disable;
        }
        interface fxp0.0 {
            disable;
        }
    }
    ospf {
        traffic-engineering;
        reference-bandwidth 4g;
        ...
    }
}
```

Compressing the Current Configuration File

By default, the current operational configuration file is compressed and is stored in the file **juniper.conf.gz** the **/config** file system, along with the last three committed versions of the configuration. If you have large networks, the current configuration file might exceed the available space in the **/config** file system. Compressing the current configuration file

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enables the file to fit in the file system, typically reducing the size of the file by 90 percent. You might want to compress your current operation configuration files when they reach 3 megabytes (MB) in size.

When you compress the current configuration file, the names of the configuration files change. To determine the size of the files in the **/config** file system, issue the **file list /config detail** command.

NOTE: We recommend that you compress the configuration files (this is the default) to minimize the amount of disk space that they require.

- If you want to compress the current configuration file, include the **compress-configuration-files** statement at the **[edit system]** hierarchy level:

```
[edit system]
compress-configuration-files;
```

- Commit the current configuration file to include the **compression-configuration-files** statement. Commit the configuration again to compress the current configuration file:

```
[edit system]
user@host# set compress-configuration-files
user@host# commit
commit complete
user@host# commit
commit complete
```

- If you do not want to compress the current operational configuration file, include the **no-compress-configuration-files** statement at the **[edit system]** hierarchy level:

```
[edit system]
no-compression-configuration-files;
```

- Commit the current configuration file to include the **no-compress-configuration-files** statement. Commit the configuration again to uncompress the current configuration file:

```
[edit system]
user@host# commit
commit complete
user@host# commit
commit complete
```

See Also

- Junos OS Commit Model for Configurations on page 157
- *compress-configuration-files*

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Freeing Up System Storage Space

Problem **Description:** The system file storage space on the switch is full. Rebooting the switch does not solve the problem.

The following error message is displayed during a typical operation on the switch after the file storage space is full.

```
user@switch% cli
user@switch> configure
/var: write failed, filesystem is full
```

Solution Clean up the file storage on the switch by deleting system files.

1. Request to delete system files on the switch.

   ```
   user@switch> request system storage cleanup
   ```

   The list of files to be deleted is displayed.

   ```
   List of files to delete:

            Size Date         Name
       11B Jul 26 20:55 /var/jail/tmp/alarmd.ts
     124B Aug  4 18:05 /var/log/default-log-messages.0.gz
    1301B Jul 26 20:42 /var/log/install.0.gz
     387B Jun  3 14:37 /var/log/install.1.gz
    4920B Aug  4 18:05 /var/log/messages.0.gz
    20.0K Jul 26 21:00 /var/log/messages.1.gz
    16.3K Jun 25 13:45 /var/log/messages.2.gz
     804B Aug  4 18:05 /var/log/security.0.gz
    16.8K Aug  3 11:15 /var/log/security.1.gz
     487B Aug  4 18:04 /var/log/wtmp.0.gz
     855B Jul 29 22:54 /var/log/wtmp.1.gz
     920B Jun 30 16:32 /var/log/wtmp.2.gz
      94B Jun  3 14:36 /var/log/wtmp.3.gz
   353.2K Jun  3 14:37 /var/sw/pkg/jloader-qfx-11.2I20110303_1117_dc-builder.tgz

   124.0K Jun  3 14:30 /var/tmp/gres-tp/env.dat
       0B Apr 14 16:20 /var/tmp/gres-tp/lock
       0B Apr 14 17:37 /var/tmp/if-rtsdb/env.lck
    12.0K Jul 26 20:55 /var/tmp/if-rtsdb/env.mem
  2688.0K Jul 26 20:55 /var/tmp/if-rtsdb/shm_usr1.mem
   132.0K Jul 26 20:55 /var/tmp/if-rtsdb/shm_usr2.mem
  2048.0K Jul 26 20:55 /var/tmp/if-rtsdb/trace.mem
     155B Jul 26 20:55 /var/tmp/krt_gencfg_filter.txt
       0B Jul 26 20:55 /var/tmp/rtsdb/if-rtsdb
  1400.6K Aug  3 10:13 /var/tmp/sfid.core.0.gz
  1398.9K Aug  3 17:01 /var/tmp/sfid.core.1.gz
  Delete these files ? [yes,no] (no)
   ```

2. Enter **yes** to delete the files.

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3. Reboot the switch.

BEST PRACTICE: We recommend that you regularly request a system file storage cleanup to optimize the performance of the switch.

See Also

- *request system storage cleanup*

Understanding Automatic Refreshing of Scripts on EX Series Switches

You can automatically refresh **commit**, **event**, and **op** scripts using operational mode commands on EX Series switches. The commands are:

- **request system scripts refresh-from commit**
- **request system scripts refresh-from event**
- **request system scripts refresh-from op**

The existing Junos operating system (Junos OS) command-line interface (CLI) **refresh** and **refresh-from** configuration mode statements have been extended to work with Junos XML management protocol and NETCONF XML management protocol sessions.

See Also

- Understanding Autoinstallation of Configuration Files on page 200
- *CLI User Interface Overview*
- *Junos OS Junos XML Management Protocol Guide*
- *Junos OS NETCONF XML Management Protocol Guide*

Cleaning Up Files with the CLI

You can use the CLI **request system storage cleanup** command to rotate log files and delete unnecessary files on the device. If you are running low on storage space, the file cleanup procedure quickly identifies files that can be deleted.

The file cleanup procedure performs the following tasks:

- Rotates log files—Archives all information in the current log files, deletes old archives, and creates fresh log files.
- Deletes log files in **/var/log**—Deletes any files that are not currently being written to.
- Deletes temporary files in **/var/tmp**—Deletes any files that have not been accessed within two days.

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- Deletes all crash files in **/var/crash**—Deletes any core files that the device has written during an error.
- Deletes all software images (***.tgz** files) in **/var/sw/pkg**—Deletes any software images copied to this directory during software upgrades.

To rotate log files and delete unnecessary files with the CLI:

1. Enter operational mode in the CLI.
2. Rotate log files and identify the files that can be safely deleted.

   ```
   user@host> request system storage cleanup
   ```

   The device rotates log files and displays the files that you can delete.
3. Enter **yes** at the prompt to delete the files.

NOTE: You can issue the **request system storage cleanup dry-run** command to review the list of files that can be deleted with the **request system storage cleanup** command, without actually deleting the files.

NOTE:

On SRX Series devices, the /var hierarchy is hosted in a separate partition (instead of the root partition). If Junos OS installation fails as a result of insufficient space:

- Use the **request system storage cleanup** command to delete temporary files.
- Delete any user-created files in both the root partition and under the /var hierarchy.

See Also

- *Cleaning Up Files in J-Web*
- *Managing Accounting Files*
- Encrypting Configuration Files on page 227
- Decrypting Configuration Files on page 229

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Release History Table

Release	Description
16.2R2	Starting in Junos OS Release 16.2R2, the **show | compare | display xml** command omits the **<configuration>** tag in the XML output if the comparison returns no differences or if the comparison returns only differences for non-native configuration data, for example, configuration data associated with an OpenConfig data model.

Related Documentation

- Day One: Exploring the Junos CLI

Autoinstallation of Configuration Files

Autoinstallation is the automatic configuration of devices over the network without manual intervention, or without any need for any configuration. For more information, see the following topics:

- Understanding Autoinstallation of Configuration Files on page 200
- Configuring Autoinstallation of Configuration Files (CLI Procedure) on page 203

Understanding Autoinstallation of Configuration Files

Autoinstallation is the automatic configuration of a device over the network from a preexisting configuration file that you create and store on a configuration server—typically a Trivial File Transfer Protocol (TFTP) server. You can use autoinstallation to configure new devices automatically and to deploy multiple devices from a central location in the network.

You enable autoinstallation so that the switches in your network implement autoinstallation when they are powered on. To configure autoinstallation, you specify a configuration server, an autoinstallation interface, and a protocol for IP address acquisition.

NOTE: **The QFX5200 switches only work with HTTP for autoinstallation. TFTP and FTP protocols are not supported.**

This topic describes:

- Typical Uses for Autoinstallation on page 200
- Autoinstallation Configuration Files and IP Addresses on page 201
- Typical Autoinstallation Process on a New Switch on page 201

Typical Uses for Autoinstallation

Typical uses for autoinstallation of the software include:

- To deploy and update multiple devices from a central location in the network.
- To update a device—Autoinstallation occurs when a device that has been manually configured for autoinstallation is powered on.

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Autoinstallation Configuration Files and IP Addresses

For the autoinstallation process to work, you must store one or more host-specific or default configuration files on a configuration server in the network and have a service available—typically Dynamic Host Configuration Protocol (DHCP)—to assign an IP address to the switch.

You can set up the following configuration files for autoinstallation on the switch:

- **network.conf**—Default configuration file for autoinstallation, in which you specify IP addresses and associated hostnames for devices on the network.
- **switch.conf**—Default configuration file for autoinstallation with a minimum configuration sufficient for you to telnet to the device and configure it manually.
- ***hostname*.conf**—Host-specific configuration file for autoinstallation on a device that contains all the configuration information necessary for the switch. In the filename, ***hostname*** is replaced with the hostname assigned to the switch.

If the server with the autoinstallation configuration file is not on the same LAN segment as the new device, or if a specific device is required by the network, you must configure an intermediate device directly attached to the new switch, through which the new switch can send TFTP, Boot Protocol (BOOTP), and Domain Name System (DNS) requests. In this case, you specify the IP address of the intermediate device as the location to receive TFTP requests for autoinstallation.

Typical Autoinstallation Process on a New Switch

When the switch configured for autoinstallation is powered on, it performs the following autoinstallation tasks:

1. The switch sends out DHCP or BOOTP requests on each connected interface simultaneously to obtain an IP address.

   If a DHCP server responds to these requests, it provides the switch with some or all of the following information:

   - An IP address and subnet mask for the autoinstallation interface.
   - The location of the (typically) TFTP server, Hypertext Transfer Protocol (HTTP) server, or FTP server on which the configuration file is stored.
   - The name of the configuration file to be requested from the TFTP server.
   - The IP address or hostname of the TFTP server.

     If the DHCP server provides the server's hostname, a DNS server must be available on the network to resolve the name to an IP address.
   - The IP address of an intermediate device if the configuration server is on a different LAN segment from the switch.

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2. After the switch acquires an IP address, the autoinstallation process on the switch attempts to download a configuration file in the following ways:

   a. If the DHCP server specifies the host-specific configuration file ***hostname*.conf**, the switch uses that filename in the TFTP server request. The autoinstallation process on the new switch makes three unicast TFTP requests for ***hostname*.conf**. If these attempts fail, the switch broadcasts three requests to any available TFTP server for the file.

   b. If the switch does not locate a ***hostname*.conf** file, the autoinstallation process sends three unicast TFTP requests for a **network.conf** file that contains the switch's hostname-to-IP-address mapping information. If these attempts fail, the switch broadcasts three requests to any available TFTP server for the file.

   c. If the switch fails to find a **network.conf** file that contains a hostname entry for the switch, the autoinstallation process sends out a DNS request and attempts to resolve the switch's IP address to a hostname.

   d. If the switch determines its hostname, it sends a TFTP request for the ***hostname*.conf** file.

   e. If the switch is unable to map its IP address to a hostname, it sends TFTP requests for the default configuration file **switch.conf**. The TFTP request procedure is the same as for the **network.conf** file.

3. After the switch locates a configuration file on a TFTP server, the autoinstallation process downloads the file, installs the file on the switch, and commits the configuration.

NOTE: Please refer to the product Data Sheets for details, or contact your Juniper Account Team or Juniper Partner. Please refer to the Juniper Licensing Guide for general information about License Management.

See Also

- *Connecting and Configuring an EX Series Switch (CLI Procedure)*
- *Connecting and Configuring an EX Series Switch (J-Web Procedure)*
- *Configuration Files Terms*

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Configuring Autoinstallation of Configuration Files (CLI Procedure)

Autoinstallation is the automatic configuration of a device over the network from a pre-existing configuration file that you create and store on a configuration server—typically a Trivial File Transfer Protocol (TFTP) server. You can use autoinstallation to automatically deploy multiple devices from a central location in the network.

To specify autoinstallation to run when you power on a switch already installed in your network, you can enable it by specifying one or more interfaces, protocols, and configuration servers to be used for autoinstallation.

Before you explicitly enable and configure autoinstallation on the switch, perform these tasks as needed for your network's configuration:

- Have a service available—typically Dynamic Host Configuration Protocol (DHCP)—to assign an IP address to the switch
- Configure a DHCP server on your network to meet your network requirements. You can configure a switch to operate as a DHCP server. For more information, see *Configuring a DHCP Server on Switches (CLI Procedure)*.
- Create one of the following configuration files, and store it on a TFTP server (or HTTP server or FTP server) in the network:
  - A host-specific file with the name ***hostname*.conf** for each switch undergoing autoinstallation. Replace ***hostname*** with the name of a switch. The ***hostname*.conf** file typically contains all the configuration information necessary for the switch with this hostname.
  - A default configuration file named **switch.conf** with the minimum configuration necessary to enable you to telnet into the new switch for further configuration.
- Physically attach the switch to the network using a Gigabit Ethernet port.
- If you configure the DHCP server to provide only the TFTP server hostname, add an IP address-to-hostname mapping entry for the TFTP server to the DNS database file on the Domain Name System (DNS) server in the network.
- If the switch is not on the same network segment as the DHCP server (or other device providing IP address resolution), configure an existing device as an intermediate device to receive TFTP and DNS requests and forward them to the TFTP server and the DNS server. You must configure the LAN or serial interface on the intermediate device with the IP addresses of the hosts providing TFTP and DNS services. Connect this interface to the switch.
- If you are using ***hostname*.conf** files for autoinstallation, you must also complete the following tasks:
  - Configure the DHCP server to provide a ***hostname*.conf** filename to each switch. Each switch uses its ***hostname*.conf** filename to request a configuration file from the TFTP server. Copy the necessary ***hostname*.conf** configuration files to the TFTP server.
  - Create a default configuration file named **network.conf**, and copy it to the TFTP server. This file contains IP-address-to-hostname mapping entries. If the DHCP

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server does not send a ***hostname*.conf** filename to a new switch, the switch uses **network.conf** to resolve its hostname based on its IP address.

Alternatively, you can add the IP-address-to-hostname mapping entry for the switch to a DNS database file.

The switch uses the hostname to request a ***hostname*.conf** file from the TFTP server.

To configure autoinstallation:

1. Specify the URL address of one or more servers from which to obtain configuration files.

```
[edit system]
user@switch# set autoinstallation configuration-servers tftp://tftpconfig.example.com
```

NOTE: You can also use an FTP address, for example, **ftp://*user*:*password*@sftpconfig.example.com.**

2. Configure one or more Ethernet interfaces to perform autoinstallation and one or two procurement protocols for each interface. The switch uses the protocols to send a request for an IP address for the interface:

```
[edit system]
user@switch# set autoinstallation interfaces ge-0/0/0 bootp
```


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To verify autoinstallation:

1. From the CLI, enter the **show system autoinstallation status** command.

```
user@switch> show system autoinstallation status
Autoinstallation status:
Master state: Active
Last committed file: None
Configuration server of last committed file: 10.25.100.1
Interface:
  Name: ge-0/0/0
  State: Configuration Acquisition
  Acquired:
    Address: 192.168.124.75
    Hostname: host-ge-000
    Hostname source: DNS
    Configuration filename: switch-ge-000.conf
    Configuration filename server: 10.25.100.3
  Address acquisition:
    Protocol: DHCP Client
    Acquired address: None
    Protocol: RARP Client
    Acquired address: None
Interface:
  Name: ge-0/0/1
  State: None
  Address acquisition:
    Protocol: DHCP Client
    Acquired address: None
    Protocol: RARP Client
    Acquired address: None
```

See Also
- *Understanding DHCP Services for Switches*

Related Documentation
- Day One: Exploring the Junos CLI

Loading Configuration Files

Loading configuration files on the device are helpful for loading parts of configuration files that might be common across many devices within a network.

- Loading a Configuration from a File or the Terminal on page 206
- Understanding Character Encoding on Devices Running Junos OS on page 208
- Additional Details About Specifying Junos OS Statements and Identifiers on page 210
- Examples: Loading a Configuration from a File on page 213
- Uploading a Configuration File on page 215

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Loading a Configuration from a File or the Terminal

You can create a file containing configuration data for a device running Junos OS, copy the file to the local router, and then load the file into the CLI. After you have loaded the file, you can commit it to activate the configuration on the router, or you can edit the configuration interactively using the CLI and commit it at a later time.

You can also create a configuration while typing at the terminal and then load it. Loading a configuration from the terminal is generally useful when you are cutting existing portions of the configuration and pasting them elsewhere in the configuration.

To load an existing configuration file that is located on the router, use the **load** configuration mode command:

```
[edit]
user@host# load (factory-default  | merge | override | patch | replace | set | update)
  filename <relative> <json>
```

For information about specifying the filename, see "Viewing Files and Directories on a Device Running Junos OS" on page 257.

To load a configuration from the terminal, use the following version of the **load** configuration mode command. Press Ctrl-d to end the input.

```
[edit]
user@host# load (factory-default | merge | override | patch | replace | set | update)
terminal <relative> <json>
```

To replace an entire configuration, specify the **override** option at any level of the hierarchy. A **load override** operation completely replaces the current candidate configuration with the file you are loading. Thus, if you saved a complete configuration, use this option.

An **override** operation discards the current candidate configuration and loads the configuration in ***filename*** or the configuration that you type at the terminal. When you use the **override** option and commit the configuration, all system processes reparse the configuration. .

To replace portions of a configuration, specify the **replace** option. The **load replace** operation looks for **replace:** tags that you added to the loaded file, and replaces the parts of the candidate configuration with whatever is specified after the tag. This is useful when you want more control over exactly what is being changed. For this operation to work, you must include **replace:** tags in the file or configuration you type at the terminal. The software searches for the **replace:** tags, deletes the existing statements of the same name, if any, and replaces them with the incoming configuration. If there is no existing statement of the same name, the **replace** operation adds to the configuration the statements marked with the **replace:** tag.

If, in an **override** or **merge** operation, you specify a file or type text that contains **replace:** tags, the **replace:** tags are ignored and the **override** or **merge** operation is performed.

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If you are performing a **replace** operation and the file you specify or text you type does not contain any **replace:** tags, the **replace** operation is effectively equivalent to a **merge** operation. This might be useful if you are running automated scripts and cannot know in advance whether the scripts need to perform a **replace** or a **merge** operation. The scripts can use the **replace** operation to cover either case.

The **load merge** operation merges the configuration from the saved file or terminal with the existing candidate configuration. This is useful if you are adding new configuration sections. For example, suppose that you are adding a BGP configuration to the **[edit protocols]** hierarchy level, where there was no BGP configuration before. You can use the **load merge** operation to combine the incoming configuration with the existing candidate configuration. If the existing configuration and the incoming configuration contain conflicting statements, the statements in the incoming configuration override those in the existing configuration.

To replace only those parts of the configuration that have changed, specify the **update** option at any level of the hierarchy. The **load update** operation compares the candidate configuration and the new configuration data, and only changes the parts of the candidate configuration that are different from the new configuration. You would use this, for example, if there is an existing BGP configuration and the file you are loading changes it in some way.

The **merge**, **override**, and **update** options support loading configuration data in JavaScript Object Notation (JSON) format. When loading configuration data that uses JSON format, you must specify the **json** option in the command.

To change part of the configuration with a patch file, specify the **patch** option. The **load patch** operation loads a file or terminal input that contains configuration changes. First, on a device that already has the configuration changes, you type the **show | compare** command to output the differences between two configurations. Then you can load the differences on another router. The advantage of the **load patch** command is that it saves you from having to copy snippets from different hierarchy levels into a text file prior to loading them into the target device. This might be a useful time saver if you are configuring several devices with the same options. For example, suppose that you configure a routing policy on router1 and you want to replicate the policy configuration on router2, router3, and router4. You can use the **load patch** operation.

First, run the **show | compare** command.

```
user@router1# show | compare rollback 3
[edit protocols ospf]
+   export default-static;
-   export static-default
[edit policy-options]
+   policy-statement default-static {
+       from protocol static;
+       then accept;
+   }
```

Copy the output of the **show | compare** command to the clipboard, making sure to include the hierarchy levels. On router2, router3, and router4, type **load patch terminal** and paste

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the output. Press Enter and then press Ctrl-d to end the operation. If the patch input specifies different values for an existing statement, the patch input overrides the existing statement.

To use the **merge**, **replace**, **set**, or **update** option without specifying the full hierarchy level, specify the **relative** option. This option loads the incoming configuration relative to your current edit point in the configuration hierarchy. For example:

```
[edit system]
user@host# show static-host-mapping
bob sysid 987.654.321ab
[edit system]
user@host# load replace terminal relative
[Type ^D at a new line to end input]
replace: static-host-mapping {
   bob sysid 0123.456.789bc;
}
load complete
[edit system]
user@host# show static-host-mapping
bob sysid 0123.456.789bc;
```

To load a configuration that contains **set** configuration mode commands, specify the **set** option. 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**.

To copy a configuration file from another network system to the local router, you can use the SSH and Telnet utilities, as described in the CLI Explorer.

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*.

Understanding Character Encoding on Devices Running Junos OS

Junos OS configuration data and operational command output might contain non-ASCII characters, which are outside of the 7-bit ASCII character set. When displaying operational or configuration data in certain formats or within a certain type of session, Junos OS escapes and encodes these characters using the equivalent UTF-8 decimal character reference.

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The Junos OS command-line interface (CLI) attempts to display any non-ASCII characters in configuration data that is emitted in text, set, or JSON format, and similarly attempts to display these characters in command output that is emitted in text format. In the exception cases, which include configuration data in XML format and command output in XML or JSON format, the Junos OS CLI displays the UTF-8 decimal character reference instead. In NETCONF and Junos XML protocol sessions, if you request configuration data or command output that contains non-ASCII characters, the server returns the equivalent UTF-8 decimal character reference for those characters for all formats.

For example, suppose the following user account, which contains the Latin small letter n with a tilde (ñ), is configured on the device running Junos OS.

```
[edit]
user@host# set system login user mariap class super-user uid 2007 full-name "Maria
  Peña"
```

When you display the resulting configuration in text format, the CLI prints the corresponding character.

```
[edit]
user@host# show system login user mariap
full-name "Maria Peña";
uid 2007;
class super-user;
```

When you display the resulting configuration in XML format in the CLI or display the configuration in any format in a NETCONF or Junos XML protocol session, the ñ character maps to its equivalent UTF-8 decimal character reference **Ã±**.

```
[edit]
user@host# show system login user mariap | display xml
<rpc-reply xmlns:junos="http://xml.juniper.net/junos/17.2R1/junos">
    <configuration junos:changed-seconds="1494033077"
junos:changed-localtime="2017-05-05 18:11:17 PDT">
            <system>
                <login>
                    <user>
                        <name>mariap</name>
                        <full-name>Maria Pe&amp;#195;&amp;#177;a</full-name>
                        <uid>2007</uid>
                        <class>super-user</class>
                    </user>
                </login>
            </system>
    </configuration>
    <cli>
        <banner>[edit]</banner>
    </cli>
</rpc-reply>
```

When you load configuration data onto a device running Junos OS, you can load non-ASCII characters using their equivalent UTF-8 decimal character reference.

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Additional Details About Specifying Junos OS Statements and Identifiers

This topic provides more detailed information about CLI container and leaf statements so that you can better understand how you must specify them when creating ASCII configuration files. It also describes how the CLI performs type checking to verify that the data you entered is in the correct format.

- Specifying Statements on page 210
- Performing CLI Type Checking on page 212

Specifying Statements

Statements are shown one of two ways, either with braces or without:

- Statement name and identifier, with one or more lower level statements enclosed in braces:

```
statement-name1 identifier-name {
  statement-name2;
  additional-statements;
}
```

- Statement name, identifier, and a single identifier:

```
statement-name identifier-name1 identifier-name2;
```

The ***statement-name*** is the name of the statement.

The ***identifier-name*** is a name or other string that uniquely identifies an instance of a statement. An identifier is used when a statement can be specified more than once in a configuration.

When specifying a statement, you must specify either a statement name or an identifier name, or both, depending on the statement hierarchy.

You specify identifiers in one of the following ways:

- ***identifier-name***—The ***identifier-name*** is a keyword used to uniquely identify a statement when a statement can be specified more than once in a statement.
- ***identifier-name value***—The ***identifier-name*** is a keyword, and the ***value*** is a required option variable.
- ***identifier-name* [*value1 value2 value3 ...*]**—The ***identifier-name*** is a keyword that accepts multiple values. The brackets are required when you specify a set of values; however, they are optional when you specify only one value.

The following examples illustrate how statements and identifiers are specified in the configuration:

```
protocol {      # Top-level statement (statement-name).
 ospf {          # Statement under "protocol" (statement-name).
```


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```
  area 0.0.0.0 {     # OSPF area "0.0.0.0" (statement-name identifier-name),
   interface so-0/0/0 { # which contains an interface named "so-0/0/0."
    hello-interval 25; # Identifier and value (identifier-name value).
    priority 2;     # Identifier and value (identifier-name value).
    disable;      # Flag identifier (identifier-name).
   }
   interface so-0/0/1;   # Another instance of "interface," named so-0/0/1,
  }             # this instance contains no data, so no braces
 }               # are displayed.
}
policy-options {    # Top-level statement (statement-name).
 term term1 {     # Statement under "policy-options"
           # (statement-name value).
  from {       # Statement under "term" (statement-name).
   route-filter 10.0.0.0/8 orlonger reject;   # One identifier ("route-filter")
with
   route-filter 127.0.0.0/8 orlonger reject;   # multiple values.
   route-filter 128.0.0.0/16 orlonger reject;
   route-filter 149.20.64.0/24 orlonger reject;
   route-filter 172.16.0.0/12 orlonger reject;
   route-filter 191.255.0.0/16 orlonger reject;
  }
  then {       # Statement under "term" (statement-name).
   next term;    # Identifier (identifier-name).
  }
 }
}
```

When you create an ASCII configuration file, you can specify statements and identifiers in one of the following ways. However, each statement has a preferred style, and the CLI uses that style when displaying the configuration in response to a configuration mode **show** command.

- Statement followed by identifiers:

  statement-name identifier-name [...] ***identifier-name value*** [...];

- Statement followed by identifiers enclosed in braces:

  statement-name {
    identifier-name;
    [...]
    identifier-name value;
    [...]
  }

- For some repeating identifiers, you can use one set of braces for all the statements:

  statement-name {
    identifier-name value1;
    identifier-name value2;
  }

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Performing CLI Type Checking

When you specify identifiers and values, the CLI performs type checking to verify that the data you entered is in the correct format. For example, for a statement in which you must specify an IP address, the CLI requires you to enter an address in a valid format. If you have not, an error message indicates what you need to type. Table 11 on page 212 lists the data types the CLI checks.

Table 11: CLI Configuration Input Types

Data Type	Format	Examples
Physical interface name (used in the **[edit interfaces]** hierarchy)	*type-fpc/pic/port*	**Correct:** so-0/0/1 **Incorrect:** so-0
Full interface name	*type-fpc/pic/port*<:*channel*>.*logical*	**Correct:** so-0/0/1.0 **Incorrect:** so-0/0/1
Full or abbreviated interface name (used in places other than the **[edit interfaces]** hierarchy)	*type-*<*fpc*</*pic/port*>><<<:*channel*>.*logical*>	**Correct:** so, so-1, so-1/2/3:4.5
IP address	0x*hex-bytesoctet*<.*octet*<.*octet*.<*octet*>>>	**Correct:** 1.2.3.4, 0x01020304, 128.8.1, 128.8 **Sample translations:** **1.2.3** becomes **1.2.3.0** **0x01020304** becomes **1.2.3.4** **0x010203** becomes **0.1.2.3**
IP address (destination prefix) and prefix length	0x*hex-bytes*</*length*>*octet*<*octet*<*octet*.<*octet*>>></*length*>	**Correct:** 10/8, 128.8/16, 1.2.3.4/32, 1.2.3.4 **Sample translations:** **1.2.3** becomes **1.2.3.0/32** **0x01020304** becomes **1.2.3.4/32** **0x010203** becomes **0.1.2.3/32** **default** becomes **0.0.0.0/0**
International Organization for Standardization (ISO) address	*hex-nibble*<*hex-nibble* ...>	**Correct:** 47.1234.2345.3456.00, 47123423453456.00, 47.12.34.23.45.34.56.00 **Sample translations:** **47123456** becomes **47.1234.56** **47.12.34.56** becomes **47.1234.56** **4712.3456** becomes **47.1234.56**

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Table 11: CLI Configuration Input Types (continued)

Data Type	Format	Examples
OSPF area identifier (ID)	0x*hex-bytesoctet*<.*octet*<.*octet*.< *octet* >>> *decimal-number*	**Correct:** 54, 0.0.0.54, 0x01020304, 1.2.3.4 **Sample translations:** 54 becomes **0.0.0.54** 257 becomes **0.0.1.1** 128.8 becomes **128.8.0.0** 0x010203 becomes **0.1.2.3**

See Also • Entering and Exiting the Junos OS CLI Configuration Mode on page 76

Examples: Loading a Configuration from a File

Figure 7: Overriding the Current Configuration

Current configuration:

```
interfaces {
 lo0 {
  unit 0 {
   family inet {
    address 127.0.0.1;
   }
  }
 }
 so-3/0/0 {
  unit 0 {
   family inet {
    address 204.69.248.181/28:
   }
  }
 }
}
```

File contents:

```
interfaces {
replace:
 so-3/0/0 {
  unit 0 {
   family inet {
    address 10.0.0.1/8;
   }
  }
 }
}
```

`load override` →

New contents:

```
interfaces {
 so-3/0/0 {
  unit 0 {
   family inet {
    address 10.0.0.1/8;
   }
  }
 }
}
```

1628

Figure 8: Using the replace Option

Current configuration:

```
interfaces {
 lo0 {
  unit 0 {
   family inet {
    address 127.0.0.1;
   }
  }
 }
 so-3/0/0 {
  unit 0 {
   family inet {
    address 204.69.248.181/28:
   }
  }
 }
}
```

File contents:

```
interfaces {
replace:
 so-3/0/0 {
  unit 0 {
   family inet {
    address 10.0.0.1/8;
   }
  }
 }
}
```

`load replace` →

New contents:

```
interfaces {
 lo0 {
  unit 0 {
   family inet {
    address 127.0.0.1;
   }
  }
 }
so-3/0/0 {
 unit 0 {
  family inet {
   address 10.0.0.1/8;
   }
  }
 }
}
```

h1629

Figure 9: Using the merge Option

Current configuration:

```
interfaces {
 lo0 {
  unit 0 {
   family inet {
    address 127.0.0.1;
   }
  }
 }
 so-3/0/0 {
  unit 0 {
   family inet {
    address 204.69.248.181/28;
   }
  }
 }
}
```

File contents:

```
interfaces {
replace:
 so-3/0/0 {
  unit 0 {
   family inet {
    address 10.0.0.1/8;
   }
  }
 }
}
```

load merge →

New contents:

```
interfaces {
 lo0 {
  unit 0 {
   family inet {
    address 127.0.0.1;
   }
  }
 }
 so-3/0/0 {
  unit 0 {
   family inet {
    address 10.0.0.1/8;
    address 204.69.248.181/28;
   }
  }
 }
}
```

1705

Figure 10: Using a Patch File

Current configuration:

```
interfaces {
 fxp0 {
  unit 0 {
   family inet {
    address 192.168.6.193/24;
   }
  }
 }
lo0 {
  unit 0 {
   family inet {
    address 127.0.0.1/32;
   }
  }
 }
}
```

File contents:

```
{edit interfaces}
+ so-0/0/0 {
+  unit 0 {
+   family inet {
+    address 10.0.0.1/8;
+   }
+  }
+ }
```

load patch →

New contents:

```
interfaces {
 so-0/0/0 {
  unit 0 {
   family inet {
    address 10.0.0.1/8;
   }
  }
 }
fxp0 {
  unit 0 {
   family inet {
    address 192.168.6.193/24;
   }
  }
 }
lo0 {
 unit 0 {
  family inet {
   address 127.0.0.1/32;
   }
  }
 }
}
```

h1969

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Figure 11: Using the set Option

File contents:

```
edit access
set profile p1 client cl ike
edit profile p1 client cl ike
set pre-shared-key ascii-text "abcd"
set allowed-proxy-pair local 1.1.1.1 remote 2.2.2.2
exit
deactivate profile p1
top
edit system
set radius-server 1.1.1.1
```

```
load set
```


New contents:

```
system {
  radius-server {
    1.1.1.1;
  }
}
access {
  inactive: profile p1 {
    client cl {
      ike {
        allowed-proxy-pair local 1.1.1.1/32 remote 2.2.2.2/32;
        pre-shared-key ascii-text "$9$Ydg4ZDjqf5FVw"; ## SECRET-DATA
      }
    }
  }
}
```

g017215

Uploading a Configuration File

You can create a configuration file on your local system, copy the file to the switch, and then load the file into the CLI. After you have loaded the configuration file, you can commit it to activate the configuration on the switch. You can also edit the configuration interactively using the CLI and commit it at a later time.

To upload a configuration file from your local system:

1. Create the configuration file using a text editor such as Notepad, making sure that the syntax of the configuration file is correct. For more information about testing the syntax of a configuration file, see the *Junos OS System Basics and Services Command Reference* at https://www.juniper.net/documentation/software/junos/index.html.

2. In the configuration text file, use an option to perform the required action when the file is loaded. Table 12 on page 216 lists and describes some options for the **load** command.

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Table 12: Options for the load Command

Options	Description
merge	Combines the current active configuration and the configuration in the filename you specify or the one that you type at the terminal. A **merge** operation is useful when you are adding a new section to an existing configuration. If the active configuration and the incoming configuration contain conflicting statements, the statements in the incoming configuration override those in the active configuration.
override	Discards the current candidate configuration and loads the configuration in the filename you specify or the one that you type at the terminal. When you use the **override** option and commit the configuration, all system processes reparse the configuration. You can use the **override** option at any level of the hierarchy.
replace	Searches for the **replace** tags, deletes the existing statements of the same name, if any, and replaces them with the incoming configuration. If there is no existing statement of the same name, the **replace** operation adds the statements marked with the **replace** tag to the active configuration. NOTE: For this operation to work, you must include **replace** tags in the text file or in the configuration you type at the terminal.

3. Press Ctrl+a to select all the text in the configuration file.

4. Press Ctrl+c to copy the contents of the configuration text file to the Clipboard.

5. Log in to the switch using your username and password.

6. Enter configuration mode:
   user@switch> **configure**

   [edit]
   user@switch#

7. Load the configuration file:
   [edit]
   user@switch# **load merge terminal**

8. At the cursor, paste the contents of the Clipboard using the mouse and the Paste icon:
   [edit]
   user@switch# **load merge terminal**
   [Type ^D at a new line to end input]
   >Cursor is here. Paste the contents of the clipboard here<

9. Press Enter.

10. Press Ctrl+d to set the end-of-file marker.

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To view results of the configuration steps before committing the configuration, type the **show** command at the user prompt.

To commit these changes to the active configuration, type the **commit** command at the user prompt. You can also edit the configuration interactively using the CLI and commit it at a later time.

See Also
- Understanding Configuration Files on page 181

Related Documentation
- Day One: Exploring the Junos CLI

Backing Up Configurations to an Archive Site

You can configure a device to transfer its configuration to an archive file periodically. The following tasks describe how to transfer the configuration to an archive site:

1. Configuring the Transfer of the Currently Active Configuration to an Archive Site on page 217
2. Configuring the Periodic Transfer of the Active Configuration to an Archive Site on page 218
3. Configuring the Transfer of the Currently Active Configuration When a Configuration Is Committed on page 218
4. Configuring Archive Sites for the Transfer of Active Configuration Files on page 218

Configuring the Transfer of the Currently Active Configuration to an Archive Site

If you want to back up your device's current configuration to an archive site, you can configure the device to transfer its currently active configuration by FTP or secure copy (SCP) periodically or after each commit.

To configure the device to transfer its currently active configuration to an archive site, include statements at the **[edit system archival configuration]** hierarchy level:

```
[edit system archival configuration]
archive-sites {
   ftp://username<:password>@host-address<:port>/url-path;
   scp://username<:password>@host-address<:port>/url-path;
}
transfer-interval interval;
transfer-on-commit;
```

NOTE: When specifying a URL in a Junos OS statement using an IPv6 host address, you must enclose the entire URL in quotation marks ("") and enclose the IPv6 host address in brackets ([ ]). For example, "ftp://*username*<:*password*>@[*ipv6-host-address*]<:*port*>/*url-path*"

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Configuring the Periodic Transfer of the Active Configuration to an Archive Site

To configure the device to periodically transfer its currently active configuration to an archive site, include the **transfer-interval** statement at the **[edit system archival configuration]** hierarchy level:

```
[edit system archival configuration]
transfer-interval interval;
```

The ***interval*** is a period of time ranging from 15 through 2880 minutes.

Configuring the Transfer of the Currently Active Configuration When a Configuration Is Committed

To configure the device to transfer its currently active configuration to an archive site each time you commit a candidate configuration, include the **transfer-on-commit** statement at the **[edit system archival configuration]** hierarchy level:

```
[edit system archival configuration]
transfer-on-commit;
```

NOTE: When specifying a URL in a Junos OS statement using an IPv6 host address, you must enclose the entire URL in quotation marks ("") and enclose the IPv6 host address in brackets ([ ]). For example, "scp://*username*<:*password*>@[*ipv6-host-address*]<:*port*>/*url-path*"

Configuring Archive Sites for the Transfer of Active Configuration Files

When you configure the device to transfer its configuration files, you specify an archive site to which the files are transferred. If you specify more than one archive site, the device attempts to transfer files to the first archive site in the list, moving to the next site only if the transfer fails.

When you use the **archive-sites** statement, you can specify a destination as an FTP URL, or SCP-style remote file specification. The URL type **file://** is also supported.

To configure the archive site, include the **archive-sites** statement at the **[edit system archival configuration]** hierarchy level:

```
[edit system archival configuration]
archive-sites {
   ftp://username@host:<port>url-path password password;
   scp://username@host:<port>url-path password password;
   file://<path>/<filename>;
}
```


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NOTE: When specifying a URL in a Junos OS statement using an IPv6 host address, you must enclose the entire URL in quotation marks ("") and enclose the IPv6 host address in brackets ([ ]). For example, "scp://*username*<:*password*>@[*ipv6-host-address*]<:*port*>/*url-path*"

When you specify the archive site, do not add a forward slash (/) to the end of the URL.

The destination filename is saved in the following format, where *n* corresponds to the number of the compressed configuration rollback file that has been archived:

```
<router-name>_YYYYMMDD_HHMMSS_juniper.conf.n.gz
```

NOTE: The time included in the destination filename is always in Coordinated Universal Time (UTC) regardless of whether the time on the router is configured as UTC or the local time zone. The default time zone on the device is UTC.

See Also
- archive-sites on page 293
- Junos OS Commit Model for Configurations on page 157

Factory Default Configuration

The default factory configuration which contains the basic configuration settings is the first configuration of the device, and is loaded when the device is first installed and powered on. For more information, see the following topics:

- Reverting to the Default Factory Configuration on page 219
- Reverting to the Default Factory Configuration for the EX Series Switch on page 220

Reverting to the Default Factory Configuration

If for any reason the current active configuration fails, you can revert to the default factory configuration. The default factory configuration contains the basic configuration settings. This is the first configuration of the switch, and it is loaded when the switch is first installed and powered on.

The **load factory default** command is a standard Junos OS configuration command. This configuration command replaces the current active configuration with the default factory configuration.

To revert the switch to the rescue configuration:

```
[edit]
user@switch# load factory-default
[edit]
```

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```
user@switch# delete system commit factory-settings
[edit]
user@switch# commit
```

See Also

- Understanding Configuration Files on page 181
- Reverting to the Rescue Configuration on page 225

Reverting to the Default Factory Configuration for the EX Series Switch

If for any reason the current active configuration fails, you can revert to the factory-default configuration.

You can also roll back to a previous configuration, as described in "Rolling Back Junos OS Configuration Changes" on page 43, or revert to the rescue configuration, as described in "Reverting to the Rescue Configuration for the EX Series Switch" on page 226.

TIP: If you have lost the root password, it is not necessary to revert to the factory-default configuration to reset it. See *Troubleshooting Loss of the Root Password*.

The factory-default configuration contains the basic configuration settings for the switch. This is the first configuration of the switch and it is loaded when the switch is first powered on. For the factory-default configuration file for your switch, see the hardware documentation for your switch.

TIP: You can run the EZsetup script to complete the initial configuration of the switch *after* reverting to the factory-default configuration. (The EZsetup script is available only on fixed configuration switches, it is not available on modular switches.) For information on completing the initial configuration using either the CLI or the J-Web interface, see *Connecting and Configuring an EX Series Switch (CLI Procedure)* or *Connecting and Configuring an EX Series Switch (J-Web Procedure)*.

You can revert to the factory-default configuration by using the **Menu** button to the right of the LCD panel on switches with LCD panel or by using the **request system zeroize** operational command or the **load factory-default** configuration command. (If your switch model does not have an LCD panel, use these commands.) You can also use the **load factory-default** command to revert to the factory-default configuration file that contains all default settings *except* the root password setting, which is retained.

These procedures are described in the following sections:

- Reverting to the Factory-Default Configuration by Using the LCD Panel on page 221
- Reverting to the Factory-Default Configuration by Using the request system zeroize Command on page 222

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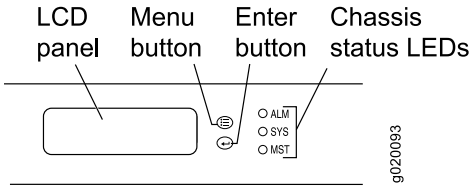
- Reverting to the Factory-Default Configuration by Using the load factory-default Command on page 222
- Reverting to the Factory-Default Configuration by Using the Factory Reset/Mode button on EX2300 and EX3400 Switches on page 223

Reverting to the Factory-Default Configuration by Using the LCD Panel

To set the switch to the factory-default configuration, use the LCD panel and buttons on the front panel of the switch shown in Figure 12 on page 221. If the switch model does not have an LCD panel, use one of the procedures described in the following sections.

Figure 12: EX Series Switch LCD Panel



NOTE: To revert a member switch of a Virtual Chassis to the factory-default configuration, first disconnect the cables connected to the Virtual Chassis ports (VCPs) to avoid affecting Virtual Chassis configuration parameters (member ID, mastership priority, and setting of VCP uplinks) on other members. See *Disconnecting a Fiber-Optic Cable*, *Disconnecting a Virtual Chassis Cable from an EX4200 Switch*, or *Disconnecting a Virtual Chassis Cable from an EX4500 Switch*.

To revert to the factory-default configuration by using the LCD panel:

1. Press the **Menu** button until you see MAINTENANCE MENU on the panel.
2. Press the **Enter** button.
3. Press **Menu** until you see FACTORY DEFAULT.
4. Press **Enter**. The display says RESTORE DEFAULT?
5. Press **Enter**. The screen flashes **FACTORY DEFAULT IN PROGRESS** and returns to the idle menu.
6. Complete the initial configuration of the switch. See *Connecting and Configuring an EX Series Switch (CLI Procedure)* or *Connecting and Configuring an EX Series Switch (J-Web Procedure)*.

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Reverting to the Factory-Default Configuration by Using the request system zeroize Command

The **request system zeroize** command is a standard Junos OS operational mode command that removes all configuration information and resets all key values. The operation unlinks all user-created data files, including customized configuration and log files, from their directories. The switch then reboots and reverts to the factory-default configuration.

To completely erase user-created data so that it is unrecoverable, use the **request system zeroize media** command.

CAUTION: Before issuing request system zeroize, use the request system snapshot command to back up the files currently used to run the switch to a secondary device.

To revert to the factory-default configuration by using the **request system zeroize** command:

1.
```
user@switch> request system zeroize
warning: System will be rebooted and may not boot without configuration
Erase all data, including configuration and log files? [yes,no] (yes)
```

2. Type **yes** to remove configuration and log files and revert to the factory-default configuration.

NOTE: The auto-image-upgrade statement is added under the [edit chassis] hierarchy level when you use this procedure, and thus the automatic image upgrade feature is made available on the switch.

Reverting to the Factory-Default Configuration by Using the load factory-default Command

The **load factory-default** command is a standard Junos OS configuration command that replaces the current active configuration with the factory-default configuration (except the root password setting, which by default is not set but which you must set in order to commit the new configuration in this procedure).

If you want to run the EZsetup script to complete the initial configuration of the switch after you revert to the factory-default configuration, do not use the **load factory-default** command. Instead do the reversion using either the LCD panel or the **request system zeroize** command. If you use the **load factory-default** command to revert to the factory-default configuration, the configuration for the root password is retained and the EZsetup script will not run. (The EZsetup script is available only on fixed configuration switches, it is not available on modular switches.)

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NOTE: The **load factory-default** command by itself is not supported on EX3300, EX4200, EX4500, and EX4550 switches configured in a Virtual Chassis.

To revert to the factory-default configuration by using the **load factory-default** command:

NOTE: If you use this procedure, you must delete the system commit factory settings, set the root password, and commit the configuration. These steps are not required when you revert to the factory-default configuration by using **request system zeroize**. Also, the **auto-image-upgrade** statement is not added to the configuration when you use this procedure; it *is* added to the configuration when you use **request system zeroize**.

1. [edit]
   user@switch# **load factory-default**

2. [edit]
   user@switch# **delete system commit factory-settings**

3. [edit]
   user@switch# **set system root-authentication plain-text-password**

4. [edit]
   user@switch# **commit**

5. Check the member ID and mastership priority with the **show virtual-chassis** command and check to see whether there are remaining settings for uplink VCPs by using the **show virtual-chassis vc-port** command.

Reverting to the Factory-Default Configuration by Using the Factory Reset/Mode button on EX2300 and EX3400 Switches

To set the EX2300 switches except the EX2300-24MP and EX2300-48MP switches, EX2300-C switches, and EX3400 switches to the factory-default configuration, use the Factory Reset/Mode button located on the far right side of the front panel.

NOTE: To revert a member switch of a Virtual Chassis to the factory-default configuration, disconnect the cables connected to the VCPs to avoid affecting Virtual Chassis configuration parameters (member ID, mastership priority, and setting of VCP uplinks) on other members. See *Disconnecting a Fiber-Optic Cable*.

To revert to the factory-default configuration by using the Factory Reset/Mode button:

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1. Press the Factory Reset/Mode button for 10 seconds. The switch transitions into factory-default configuration and the console displays **committing factory default configuration**.

2. Press the Factory Reset/Mode button for 10 more seconds. The switch transitions into initial setup mode and the console displays **committing ezsetup config**.

See Also

- *Connecting and Configuring an EX Series Switch (CLI Procedure)*
- *Connecting and Configuring an EX Series Switch (J-Web Procedure)*
- Understanding Configuration Files on page 181

Related Documentation

- Day One: Exploring the Junos CLI

Rescue Configuration

A rescue configuration is the known working configuration. If the active configuration is corrupted, the device automatically loads the rescue configuration file as the active configuration. For more information, see the following topics:

- Creating and Returning to a Rescue Configuration on page 224
- Reverting to the Rescue Configuration on page 225
- Reverting to the Rescue Configuration for the EX Series Switch on page 226
- Setting or Deleting the Rescue Configuration on page 226

Creating and Returning to a Rescue Configuration

A rescue configuration allows you to define a known working configuration or a configuration with a known state that you can roll back to at any time. This alleviates the necessity of having to remember the rollback number with the **rollback** command. You use the rescue configuration when you need to roll back to a known configuration or as a last resort if your router or switch configuration and the backup configuration files become damaged beyond repair.

To save the most recently committed configuration as the rescue configuration so that you can return to it at any time, issue the **request system configuration rescue save** command:

```
user@host> request system configuration rescue save
```

To return to the rescue configuration, use the **rollback rescue** configuration mode command:

```
[edit]
user@host# rollback rescue
load complete
```


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NOTE: If the rescue configuration does not exist, or if the rescue configuration is not a complete, viable configuration, then the **rollback** command fails, an error message appears, and the current configuration remains active.

To activate the rescue configuration that you have loaded, use the **commit** command:

```
[edit]
user@host# rollback rescue
load complete
[edit]
user@host# commit
```

To delete an existing rescue configuration, issue the **request system configuration rescue delete** command:

```
user@host> request system configuration rescue delete
user@host>
```

For more information about the **request system configuration rescue delete** and **request system configuration rescue save** commands, see the CLI Explorer.

See Also

- Comparing Configuration Changes with a Prior Version on page 193
- Returning to a Previously Committed Junos OS Configuration on page 191
- Saving a Configuration to a File on page 194

Reverting to the Rescue Configuration

If someone inadvertently commits a configuration that denies management access to a device and the console port is not accessible, you can overwrite the invalid configuration and replace it with the rescue configuration. The rescue configuration is a previously committed, valid configuration.

To revert the switch to the rescue configuration:

1. Enter the **load override** command.

   ```
   [edit]
   user@switch# load override filename
   ```

2. Commit your changes.

   ```
   [edit]
   user@switch# commit filename
   ```

See Also

- Reverting to the Default Factory Configuration on page 219

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Reverting to the Rescue Configuration for the EX Series Switch

If someone inadvertently commits a configuration that denies management access to an EX Series switch and the console port is not accessible, you can overwrite the invalid configuration and replace it with the rescue configuration by using the LCD panel on the switch. The rescue configuration is a previously committed, valid configuration.

You can also revert to the default factory configuration, as described in "Reverting to the Default Factory Configuration for the EX Series Switch" on page 220.

Before you begin to revert to the rescue configuration:

- Ensure that you have physical access to the switch.
- A rescue configuration for the switch must have been previously set.

To revert the switch to the rescue configuration:

1. At the LCD panel on the switch, press **Menu** until you see **MAINTENANCE MENU**.
2. Press **Enter**.
3. Press **Menu** until you see **Load Rescue**.
4. Press **Enter**.
5. When **Commit Rescue** is displayed, press **Enter**.

   The LCD panel displays the message **Commit Rescue in Progress**. When the reversion is complete, it displays the idle menu.

NOTE: If there is no rescue configuration saved on the switch, the message **Commit rescue failed** is displayed.

Setting or Deleting the Rescue Configuration

A *rescue configuration* is a user-defined configuration that restores connectivity to the device. You set a current committed configuration to be the rescue configuration through the CLI. If someone inadvertently commits a configuration that denies management access to a device and the console port is not accessible, you can overwrite the invalid configuration and replace it with the rescue configuration. The rescue configuration is a previously committed, valid configuration. We recommend that the rescue configuration include the IP address (accessible from the network) for the management port.

To set the current active configuration as the rescue configuration:

```
user@switch> request system configuration rescue save
```


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To delete an existing rescue configuration:

```
user@switch> request system configuration rescue delete
```

See Also

- Reverting to the Default Factory Configuration on page 219
- CLI Explorer

Related Documentation

- Day One: Exploring the Junos CLI

Encrypting and Decrypting Configuration Files

Encrypting configuration file enables you to store configuration data or sensitive information in a configuration file. Decrypting is disabling the encryption of configuration files on a device and make them readable to all. For more information, see the following topics:

- Encrypting Configuration Files on page 227
- Decrypting Configuration Files on page 229
- Modifying the Encryption Key on page 229
- Example: Protecting the Junos OS Configuration from Modification or Deletion on page 230

Encrypting Configuration Files

To configure an encryption key in EEPROM and determine the encryption process, enter one of the **request system set-encryption-key** commands in operational mode described in Table 13 on page 227.

NOTE: The **request system set-encryption-key** command is not supported on SRX3400, SRX3600, SRX5400, SRX5600, and SRX5800 devices; therefore, this task does not apply to such devices.

Table 13: request system set-encryption-key Commands

CLI Command	Description
request system set-encryption-key	Sets the encryption key and enables default configuration file encryption: • AES encryption for the Canada and U.S. version of Junos OS • DES encryption for the international version of Junos OS
request system set-encryption-key algorithm des	Sets the encryption key and specifies configuration file encryption by DES.

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Table 13: request system set-encryption-key Commands (continued)

CLI Command	Description
request system set-encryption-key unique	Sets the encryption key and enables default configuration file encryption with a unique encryption key that includes the chassis serial number of the device. Configuration files encrypted with the unique key can be decrypted only on the current device. You cannot copy such configuration files to another device and decrypt them.
request system set-encryption-key des unique	Sets the encryption key and specifies configuration file encryption by DES with a unique encryption key.

To encrypt configuration files on a device:

1. Enter operational mode in the CLI.

2. Configure an encryption key in EEPROM and determine the encryption process; for example, enter the **request system set-encryption-key** command.

```
user@host> request system set-encryption-key
Enter EEPROM stored encryption key:
```

3. At the prompt, enter the encryption key. The encryption key must have at least six characters.

```
Enter EEPROM stored encryption key:juniper1
Verifying EEPROM stored encryption key:
```

4. At the second prompt, reenter the encryption key.

5. Enter configuration mode in the CLI.

6. Enable configuration file encryption to take place.

```
[edit]
user@host# edit system
user@host# set encrypt-configuration-files
```

7. Begin the encryption process by committing the configuration.

```
[edit]
user@host# commit
commit complete
```


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Decrypting Configuration Files

To disable the encryption of configuration files on a device and make them readable to all:

1. Enter operational mode in the CLI.

2. Verify your permission to decrypt configuration files on this device by entering the encryption key for the device.

```
user@host> request system set-encryption-key
Enter EEPROM stored encryption key:
Verifying EEPROM stored encryption key:
```

3. At the second prompt, reenter the encryption key.

4. Enter configuration mode in the CLI.

5. Enable configuration file decryption.

```
[edit]
user@host# edit system
user@host# set no-encrypt-configuration-files
```

6. Begin the decryption process by committing the configuration.

```
[edit]
user@host# commit
commit complete
```

Modifying the Encryption Key

When you modify the encryption key, the configuration files are decrypted and then reencrypted with the new encryption key.

To modify the encryption key:

1. Enter operational mode in the CLI.

2. Configure a new encryption key in EEPROM and determine the encryption process; for example, enter the **request system set-encryption-key** command.

```
user@host> request system set-encryption-key
Enter EEPROM stored encryption key:
```

3. At the prompt, enter the new encryption key. The encryption key must have at least six characters.

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```
Enter EEPROM stored encryption key:juniperone
Verifying EEPROM stored encryption key:
```

4. At the second prompt, reenter the new encryption key.

Example: Protecting the Junos OS Configuration from Modification or Deletion

This example shows how to use the **protect** and **unprotect** commands in the configuration mode to protect and unprotect the CLI configuration.

- Requirements on page 230
- Overview on page 230
- Protecting a Parent-Level Hierarchy on page 231
- Protecting a Child Hierarchy on page 231
- Protecting a Configuration Statement Within a Hierarchy on page 232
- Protecting a List of Identifiers for a Configuration Statement on page 232
- Protecting an Individual Member from a Homogenous List on page 233
- Unprotecting a Configuration on page 233
- Verification on page 234

Requirements

This example uses the following hardware and software components:

- A M Series, MX Series, PTX Series, or T Series device
- Junos OS 11.2 or later running on all devices

Overview

The Junos OS enables you to protect the device configuration from being modified or deleted by other users. This can be accomplished by using the **protect** command in the configuration mode of the CLI. Likewise, you can also unprotect a protected configuration by using the **unprotect** command.

These commands can be used at any level of the configuration hierarchy—a top-level parent hierarchy or a configuration statement or an identifier within the lowest level of the hierarchy.

If a configuration hierarchy is protected, users cannot perform the following activities:

- Deleting or modifying a hierarchy or a statement or identifier within the protected hierarchy
- Inserting a new configuration statement or an identifier within the protected hierarchy
- Renaming a statement or identifier within the protected hierarchy
- Copying a configuration into a protected hierarchy

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- Activating or deactivating statements within a protected hierarchy
- Annotating a protected hierarchy

Protecting a Parent-Level Hierarchy

Step-by-Step Procedure

To protect a configuration at the top level of the hierarchy:

- Identify the hierarchy that you want to protect and issue the **protect** command for the hierarchy at the **[edit]** hierarchy level.

  For example, if you want to protect the entire **[edit access]** hierarchy level, issue the following command:

```
[edit]
user@host# protect access
```

Results Protects all elements under the parent hierarchy.

NOTE:

- If you issue the **protect** command for a hierarchy that is not used in the configuration, the Junos OS CLI displays the following error message:

```
[edit]
user@host# protect access
warning: statement not found
```

Protecting a Child Hierarchy

Step-by-Step Procedure

To protect a child hierarchy contained within a parent hierarchy:

- Navigate to the parent container hierarchy. Use the **protect** command for the hierarchy at the parent level.

  For example, if you want to protect the **[edit system syslog console]** hierarchy level, use the following command at the **[edit system syslog]** hierarchy level.

```
[edit system syslog]
user@host# protect console
```

Results Protects all elements under the child hierarchy.

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Protecting a Configuration Statement Within a Hierarchy

Step-by-Step Procedure

To protect a configuration statement within a hierarchy level:

- Navigate to the hierarchy level containing the statement that you want to protect and issue the **protect** command for the hierarchy.

  For example, if you want to protect the **host-name** statement under the **[edit system]** hierarchy level, issue the following command:

  ```
  [edit system]
  user@host# protect host-name
  ```

Protecting a List of Identifiers for a Configuration Statement

Step-by-Step Procedure

Some configuration statements can take multiple values. For example, the **address** statement at the **[edit system login deny-sources]** hierarchy level can take a list of hostnames, IPv4 addresses, or IPv6 addresses. Suppose you have the following configuration:

```
[edit system login]
deny-sources {
   address [ 172.17.28.19 172.17.28.20 172.17.28.21 172.17.28.22];
}
```

- To protect all the addresses for the **address** statement, issue the following command at the **[edit]** level:

  ```
  [edit]
  user@host# protect system login deny-sources address
  ```

Results

All the addresses ([172.17.28.19 172.17.28.20 172.17.28.21 172.17.28.22]) for the **address** statement are protected.

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Protecting an Individual Member from a Homogenous List

Step-by-Step Procedure

Suppose you have the following configuration:

```
[edit groups ]
test1 {
   system {
      name-server {
         10.1.2.1;
         10.1.2.2;
         10.1.2.3;
         10.1.2.4;
      }
   }
}
```

- To protect one or more individual addresses for the **name-server** statement, issue the following command at the **[edit]** level:

  ```
  [edit]
  user@host# protect groups test1 system name-server 10.1.2.1
  user@host# protect groups test1 system name-server 10.1.2.4
  ```

Results

Addresses 10.1.2.1 and 10.1.2.4 are protected.

Unprotecting a Configuration

Step-by-Step Procedure

Suppose you have the following configuration at the **[edit system]** hierarchy level:

```
protect: system {
   host-name bigping;
   domain-search 10.1.2.1;
   login {
      deny-sources {
         protect: address [ 172.17.28.19 172.17.28.173 172.17.28.0 174.0.0.0 ];
      }
   }
}
```

- To unprotect the entire **[edit system]** hierarchy level, issue the following command at the **[edit]** level:

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

Results

The entire **system** hierarchy level is unprotected.

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Verification

Verify That a Hierarchy Is Protected Using the show Command

Purpose To check that a configuration hierarchy is protected.

Action In the configuration mode, issue the **show** command at the **[edit]** hierarchy level to see all the configuration hierarchies and configuration statements that are protected.

NOTE: All protected hierarchies or statements are prefixed with a **protect:** string.

```
...
protect: system {
   host-name bigping;
   domain-search 10.1.2.1;
   login {
      deny-sources {
         protect: address [ 172.17.28.19 172.17.28.173 172.17.28.0 174.0.0.0 ];
      }
   }
}
...
```

Verify That a Hierarchy Is Protected by Attempting to Modify a Configuration

Purpose To verify that a configuration is protected by trying to modify the configuration using the **activate**, **copy**, **insert**, **rename**, and **delete** commands.

Action To verify that a configuration is protected:

1. Try using the **activate**, **copy**, **insert**, **rename**, and **delete** commands for a top-level hierarchy or a child-level hierarchy or a statement within the hierarchy.

   For a protected hierarchy or statement, the Junos OS displays an appropriate warning that the command has not executed. For example:

   ```
   protect: system {
      host-name a;
      inactive: domain-search [ a b ];
   }
   ```

2. To verify that the hierarchy is protected, try issuing the **activate** command for the **domain-search** statement:

   [edit system]

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```
user@host# activate system domain-search
```

The Junos OS CLI displays an appropriate message:

```
warning: [system] is protected, 'system domain-search' cannot be activated
```

Verify Usage of the protect Command

Purpose To view the **protect** commands used for protecting a configuration.

Action

1. Navigate to the required hierarchy.
2. Issue the **show | display set relative** command.

```
user@host> show | display set relative
set system host-name bigping
set system domain-search 10.1.2.1
set system login deny-sources address 172.17.28.19
set system login deny-sources address 172.17.28.173
set system login deny-sources address 172.17.28.0
set system login deny-sources address 174.0.0.0
protect system login deny-sources address
protect system
```

View the Configuration in XML

Purpose To check if the protected hierarchies or statements are also displayed in the XML. Protected hierarchies, statements, or identifiers are displayed with the **| display xml** attribute in the XML.

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Action To view the configuration in XML:

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1. Navigate to the hierarchy you want to view and issue the **show** command with the pipe symbol and option **| display xml**:

   [edit system]

   user@host# show | display xml

```
[edit]
user@host# show system | display xml
<rpc-reply xmlns:junos="http://xml.juniper.net/junos/11.2I0/junos">
    <configuration junos:changed-seconds="1291279234"
junos:changed-localtime="2010-12-02 00:40:34 PST">
            <system protect="protect">
                <host-name>bigping</host-name>
                <domain-search>10.1.2.1</domain-search>
                <login>
                    <message>


        \jnpr

        \tUNAUTHORIZED USE OF THIS ROUTER
        \tIS STRICTLY PROHIBITED!


    </message>
                <class>
                    <name>a</name>
                    <allow-commands>commit-synchronize</allow-commands>
                    <deny-commands>commit</deny-commands>
                </class>
                <deny-sources>
                    <address protect="protect">172.17.28.19</address>
                    <address protect="protect">172.17.28.173</address>
                    <address protect="protect">172.17.28.0</address>
                    <address protect="protect">174.0.0.0</address>
                </deny-sources>
            </login>
            <syslog>
                <archive>
                </archive>
            </syslog>
        </system>
</configuration>
<cli>
    <banner>[edit]</banner>
</cli>
    </rpc-reply>
```

NOTE: Loading an XML configuration with the **unprotect="unprotect"** tag unprotects an already protected hierarchy. For example, suppose you load the following XML hierarchy:

```
<protocols unprotect="unprotect">
 <ospf>
     <area>
  <name>0.0.0.0</name>
```

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```
 <interface>
     <name>all</name>
 </interface>
    </area>
</ospf>
   </protocols>
```

The **[edit protocols]** hierarchy becomes unprotected if it is already protected.

Related Documentation

- *Managing Accounting Files*
- Day One: Exploring the Junos CLI

Synchronizing Configurations Across Routing Engines

On devices with redundant Routing Engines, you can perform a **commit synchronize**, which activates and synchronizes the configuration on both Routing Engines. For more information, see the following topics:

- Synchronizing Routing Engines on page 238
- Configuring Multiple Routing Engines to Synchronize Committed Configurations Automatically on page 242

Synchronizing Routing Engines

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 (requesting 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: We recommend that you use the **force** option only if you are unable to resolve the issues that caused the **commit synchronize** command to fail.

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For example, if you are logged in to **re1 (**requesting Routing Engine**)** and you want **re0** (responding Routing Engine) to have the same configuration as **re1**, issue the **commit synchronize** command on **re1**. **re1** copies and loads its candidate configuration to **re0**. Both Routing Engines then perform a syntax check on the candidate configuration file being committed. If no errors are found, **re1**'s candidate configuration is activated and becomes the current operational configuration on both Routing Engines.

NOTE: When you issue the **commit synchronize** command, you must use the groups **re0** and **re1**. For information about how to use the **apply-groups** statement, see "Applying a Junos OS Configuration Group" on page 124.

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

For information about issuing the **commit synchronize** command on a routing matrix, see the *Junos OS Administration Library*.

To synchronize a Routing Engine's current operational configuration file with the other, log in to the Routing Engine from which you want to synchronize and issue the **commit synchronize** command:

```
[edit]
user@host# commit synchronize
re0:
configuration check succeeds
re1:
commit complete
re0:
commit complete
```

NOTE: You can also add the **commit synchronize** statement at the **[edit system]** hierarchy level so that a **commit** command automatically invokes a **commit synchronize** command by default. For more information, see the *Junos OS Administration Library*.

To enforce a commit synchronize on the Routing Engines, log in to the Routing Engine from which you want to synchronize and issue the **commit synchronize** command with the **force** option:

```
[edit]
user@host# commit synchronize force
re0:
re1:
commit complete
re0:
commit complete
[edit]
user@host#
```

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NOTE:

- If you have nonstop routing enabled on your router, you must enter the **commit synchronize** command from the master Routing Engine after you make any changes to the configuration. If you enter this command on the backup Routing Engine, the Junos OS displays a warning and commits the configuration.
- Starting with Junos OS Release 9.3, accounting of backup Routing Engine events or operations is not supported on accounting servers such as TACACS+ or RADIUS. Accounting is only supported for events or operations on a master Routing Engine.

For the commit synchronization process, the master Routing Engine commits the configuration and sends a copy of the configuration to the backup Routing Engine. Then the backup Routing Engine loads and commits the configuration. So, the commit synchronization between the master and backup Routing Engines takes place one Routing Engine at a time. If the configuration has a large text size or many apply-groups, commit times can be longer than desired.

You can use the **commit fast-synchronize** statement to have the synchronization between the master and backup Routing Engines occur simultaneously instead of sequentially. This can reduce the time needed for synchronization because the commits on the master and backup Routing Engines occur in parallel.

Include the **fast-synchronize** statement at the **[edit system]** hierarchy level to have the synchronization occur simultaneously between the master and the backup Routing Engines:

```
[edit system]
commit fast-synchronize;
```

NOTE:

- When the **fast-synchronize** statement is configured, the commits on the master Routing Engine and the backup Routing Engine run in parallel. In this process, the configuration is validated only on the Routing Engine where you execute the **commit** command. Therefore, it is recommended not to include too many configuration details in groups like re0 and re1, because the configuration specified in group re0 is applied only if the current Routing Engine is in slot 0. Likewise, the configuration specified in group re1 is applied only if the current Routing Engine is in slot 1.
- Ensure that the Junos OS software version running on both the Routing Engines is same.

You can use the **commit synchronize scripts** command to synchronize a Routing Engine's configuration and all commit, event, lib, op, and SNMP scripts with the other Routing Engine. If the **load-scripts-from-flash** statement is configured for the requesting Routing

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Engine, the device synchronizes the scripts from flash memory on the requesting Routing Engine to flash memory on the responding Routing Engine. Otherwise, the device synchronizes the scripts from the hard disk on the requesting Routing Engine to the hard disk on the responding Routing Engine. The device synchronizes all scripts regardless of whether they are enabled in the configuration or have been updated since the last synchronization.

To synchronize a Routing Engine's configuration file and all scripts with the other Routing Engine, log in to the Routing Engine from which you want to synchronize, and issue the **commit synchronize scripts** command:

```
[edit]
user@host# commit synchronize scripts
re0:
configuration check succeeds
re1:
commit complete
re0:
commit complete
```

If the commit check operation fails for the requesting Routing Engine, the process stops, and the scripts are not copied to the responding Routing Engine. If the commit check or commit operation fails for the responding Routing Engine, the scripts are still synchronized, since the synchronization occurs prior to the commit check operation on the responding Routing Engine.

Include the **synchronize** statement at the **[edit system scripts]** hierarchy level to synchronize scripts every time you issue a **commit synchronize** command.

```
[edit system scripts]
synchronize;
```

NOTE:

- If commit fails on either Routing Engine, the commit process is rolled back on the other Routing Engine as well. This ensures that both Routing Engines have the same configuration.
- When the **fast-synchronize** statement is configured, the commits on the master Routing Engine and the backup Routing Engine run in parallel. In this process, the configuration is validated only on the Routing Engine where you execute the **commit** command. Therefore, it is recommended not to include too many configuration details in groups like re0 and re1, because the configuration specified in group re0 is applied only if the current Routing Engine is in slot 0. Likewise, the configuration specified in group re1 is applied only if the current Routing Engine is in slot 1.
- Ensure that the Junos OS software version running on both the Routing Engines is same.

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Configuring Multiple Routing Engines to Synchronize Committed Configurations Automatically

If your router or switch has multiple Routing Engines, you can manually direct one Routing Engine to synchronize its configuration with the others by issuing the **commit synchronize** command.

To make the Routing Engines synchronize automatically whenever a configuration is committed, include the **commit synchronize** statement at the **[edit system]** hierarchy level:

```
[edit system]
commit synchronize;
```

The Routing Engine on which you execute the **commit** command (requesting Routing Engine) copies and loads its candidate configuration to the other (responding) Routing Engines. All 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 all Routing Engines.

For the commit synchronization process, the master Routing Engine commits the configuration and sends a copy of the configuration to the backup Routing Engine. Then the backup Routing Engine loads and commits the configuration. So, the commit synchronization between the master and backup Routing Engines takes place one Routing Engine at a time. If the configuration has a large text size or many apply-groups, commit times can be longer than desired.

You can use the **commit fast-synchronize** statement to have the synchronization between the master and backup Routing Engines occur simultaneously instead of sequentially. This can reduce the time needed for synchronization because the commits on the master and backup Routing Engines occur in parallel.

Include the **fast-synchronize** statement at the **[edit system]** hierarchy level to have synchronize occur simultaneously between the master and the backup Routing Engines:

```
[edit system]
commit fast-synchronize
```


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NOTE:

- If commit fails on either Routing Engine, the commit process is rolled back on the other Routing Engine as well. This ensures that both Routing Engines have the same configuration.
- When the **fast-synchronize** statement is configured, the commits on the master Routing Engine and the backup Routing Engine run in parallel. In this process, the configuration is validated only on the Routing Engine where you execute the **commit** command. Therefore, it is recommended not to include too many configuration details in groups like re0 and re1, because the configuration specified in group re0 is applied only if the current Routing Engine is in slot 0. Likewise, the configuration specified in group re1 is applied only if the current Routing Engine is in slot 1.
- Ensure that the Junos OS software version running on both the Routing Engines is same.

Related Documentation

- *Configuring the Junos OS to Support Redundancy on Routers Having Multiple Routing Engines or Switching Boards*
- *Junos OS Routing Engine Components and Processes*
- *Configuring Junos OS for the First Time on a Device with Dual Routing Engines*
- Junos OS Commit Model for Configurations on page 157
- Day One: Exploring the Junos CLI

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CHAPTER 5

Using Operational Commands to Monitor a Device

- CLI Operational Mode Overview on page 245
- Using Operational Commands to Monitor a Device on page 252
- Filtering Operational Command Output on page 270

CLI Operational Mode Overview

In the operational mode, you use the CLI to monitor and troubleshoot the device. The **monitor**, **ping**, **show**, **test**, and **traceroute** commands let you display information and test network connectivity for the device. For more information, see the following topics:

- Overview of Junos OS CLI Operational Mode Commands on page 245
- Junos OS Operational Mode Commands That Combine Other Commands on page 248
- Understanding the brief, detail, extensive, and terse Options of Junos OS Operational Commands on page 249
- Interface Naming Conventions Used in the Junos OS Operational Commands on page 250
- Using Wildcard Characters in Interface Names on page 251

Overview of Junos OS CLI Operational Mode Commands

This topic provides an overview of Junos OS CLI operational mode commands and contains the following sections:

- CLI Command Categories on page 245
- Commonly Used Operational Mode Commands on page 247

CLI Command Categories

When you log in to a device running Junos OS and the CLI starts, there are several broad groups of CLI commands:

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- Commands for controlling the CLI environment—Some set commands in the **set** hierarchy configure the CLI display screen. For information about these commands, see "Understanding the Junos OS CLI Modes, Commands, and Statement Hierarchies" on page 25.
- Commands for monitoring and troubleshooting—The following commands display information and statistics about the software and test network connectivity. Detailed command descriptions are provided in the *Junos OS Interfaces Command Reference*.
  - **clear**—Clear statistics and protocol database information.
  - **mtrace**—Trace mtrace packets from source to receiver.
  - **monitor**—Perform real-time debugging of various software components, including the routing protocols and interfaces.
  - **ping**—Determine the reachability of a remote network host.
  - **show**—Display the current configuration and information about interfaces, routing protocols, routing tables, routing policy filters, system alarms, and the chassis.
  - **test**—Test the configuration and application of policy filters and autonomous system (AS) path regular expressions.
  - **traceroute**—Trace the route to a remote network host.
- Commands for connecting to other network systems—The **ssh** command opens Secure Shell connections, and the **telnet** command opens telnet sessions to other hosts on the network. For information about these commands, see the CLI Explorer.
- Commands for copying files—The **copy** command copies files from one location on the router or switch to another, from the router or switch to a remote system, or from a remote system to the router or switch. For information about these commands, see the CLI Explorer.
- Commands for restarting software processes—The commands in the **restart** hierarchy restart the various Junos OS processes, including the routing protocol, interface, and SNMP. For information about these commands, see the CLI Explorer.
- A command—**request**—for performing system-level operations, including stopping and rebooting the router or switch and loading Junos OS images. For information about this command, see the CLI Explorer.
- A command—**start**—to exit the CLI and start a UNIX shell. For information about this command, see the CLI Explorer.
- A command—**configure**—for entering configuration mode, which provides a series of commands that configure Junos OS, including the routing protocols, interfaces, network management, and user access. For information about the CLI configuration commands, see "Understanding Junos OS CLI Configuration Mode" on page 69.
- A command—**quit**—to exit the CLI. For information about this command, see the CLI Explorer.
- For more information about the CLI operational mode commands, see the CLI Explorer.
  .

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Commonly Used Operational Mode Commands

Table 14 on page 247 lists some operational commands you may find useful for monitoring router or switch operation. For a complete description of operational commands, see the Junos OS command references.

NOTE: The QFX3500 switch does not support the IS-IS, OSPF, BGP, MPLS, and RSVP protocols.

Table 14: Commonly Used Operational Mode Commands

Items to Check	Description	Command
Software version	Versions of software running on the router or switch	**show version**
Log files	Contents of the log files	**monitor**
	Log files and their contents and recent user logins	**show log**
Remote systems	Host reachability and network connectivity	**ping**
	Route to a network system	**traceroute**
Configuration	Current system configuration	**show configuration**
Manipulate files	List of files and directories on the router or switch	**file list**
	Contents of a file	**file show**
Interface information	Detailed information about interfaces	**show interfaces**
Chassis	Chassis alarm status	**show chassis alarms**
	Information currently on craft display	**show chassis craft-interface**
	Router or switch environment information	**show chassis environment**
	Hardware inventory	**show chassis hardware**
Routing table information	Information about entries in the routing tables	**show route**
Forwarding table information	Information about data in the kernel's forwarding table	**show route forwarding-table**
IS-IS	Adjacent routers or switches	**show isis adjacency**
OSPF	Display standard information about OSPF neighbors	**show ospf neighbor**
BGP	Display information about BGP neighbors	**show bgp neighbor**

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Table 14: Commonly Used Operational Mode Commands (continued)

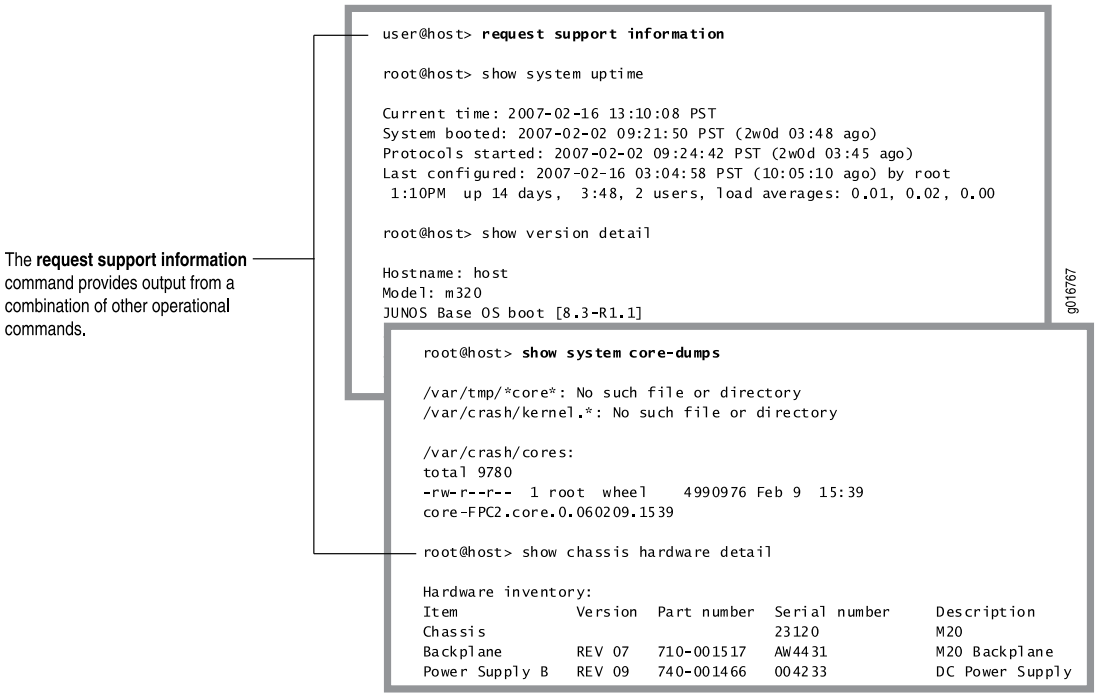
Items to Check	Description	Command
MPLS	Status of interfaces on which MPLS is running	**show mpls interface**
	Configured LSPs on the router or switch, as well as all ingress, transit, and egress LSPs	**show mpls lsp**
	Routes that form a label-switched path	**show route label-switched-path**
RSVP	Status of interfaces on which RSVP is running	**show rsvp interface**
	Currently active RSVP sessions	**show rsvp session**
	RSVP packet and error counters	**show rsvp statistics**

See Also
- *Configuring the Bandwidth Subscription Percentage for LSPs*

Junos OS Operational Mode Commands That Combine Other Commands

In some cases, some Junos OS operational commands are created from a combination of other operational commands. These commands can be useful shortcuts for collecting information about the device, as shown in Figure 13 on page 248.

Figure 13: Commands That Combine Other Commands



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Understanding the brief, detail, extensive, and terse Options of Junos OS Operational Commands

The Junos OS operational mode commands can include **brief**, **detail**, **extensive**, or **terse** options. You can use these options to control the amount of information you want to view.

1. Use the ? prompt to list options available for the command. For example:

```
user@host> show interfaces fe-1/1/1 ?
Possible completions:
<[Enter]>            Execute this command
  brief              Display brief output
  descriptions       Display interface description strings
  detail             Display detailed output
  extensive          Display extensive output
  media              Display media information
  snmp-index         SNMP index of interface
  statistics         Display statistics and detailed output
  terse              Display terse output
  |                  Pipe through a command
```

2. Choose the option you wish to use with the command. (See Figure 14 on page 249.)

Figure 14: Command Output Options

Command output with the **brief** option.

```
user@host> show interfaces fe-1/1/1 brief
Physical interface: fe-1/1/1, Enabled, Physical link is Down
  Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback:
Disabled, Source filtering: Disabled,
  Flow control: Enabled
  Device flags   : Present Running Down
  Interface flags: Hardware-Down SNMP-Traps Internal: 0x4000
  Link flags     : None
```

Command output with the **terse** option.

```
user@host> show interfaces fe-1/1/1 terse
Interface               Admin Link Proto    Local                 Remote
fe-1/1/1                up    down
```

Command output with the **extensive** option.

```
user@host> show interfaces fe-1/1/1 extensive
Physical interface: fe-1/1/1, Enabled, Physical link is Down
  Interface index: 141, SNMP ifIndex: 33, Generation: 24
  Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback:
Disabled, Source filtering: Disabled,
  Flow control: Enabled
  Device flags  : Present Running Down
  Interface flags: Hardware-Down SNMP-Traps Internal: 0x4000
  Link flags    : None
  CoS queues    : 4 supported, 4 maximum usable queues
  Hold-times    : Up 0 ms, Down 0 ms
  Current address: 00:90:69:d0:f8:9e, Hardware address: 00:90:69:d0:f8:9e
  Last flapped  : 2007-02-02 09:26:25 PST (2w0d 03:40 ago)
  Statistics last cleared: Never
  Traffic statistics:
   Input bytes :                    0                   0 bps
   Output bytes :                   0                   0 bps
   Input packets:                   0                   0 pps
   Output packets:                  0                   0 pps
---(more)---
```

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See Also

- Controlling the Scope of an Operational Mode Command on page 253

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Interface Naming Conventions Used in the Junos OS Operational Commands

This topic explains the interface naming conventions used in the Junos OS operational commands, and contains the following sections:

- Physical Part of an Interface Name on page 250
- Logical Part of an Interface Name on page 250
- Channel Identifier Part of an Interface Name on page 250

Physical Part of an Interface Name

The physical interface naming conventions for Junos OS platforms is as follows:

- On SRX devices, the unique name of each network interface has the following format to identify the physical device that corresponds to a single physical network connector:

  ```
  type-slot/pim-or-ioc/port
  ```

- On other platforms, when you display information about an interface, you specify the interface type, the slot in which the Flexible PIC Concentrator (FPC) is installed, the slot on the FPC in which the PIC is located, and the configured port number.

  In the physical part of the interface name, a hyphen (-) separates the media type from the FPC number, and a slash (/) separates the FPC, PIC, and port numbers:

  ```
  type-fpc/pic/port
  ```

NOTE: Exceptions to the *type-fpc/pic/port* physical description include the aggregated Ethernet and aggregated SONET/SDH interfaces, which use the syntax ae*number* and as*number*, respectively.

Logical Part of an Interface Name

The logical unit part of the interface name corresponds to the logical unit number, which can be a number from 0 through 16,384. In the virtual part of the name, a period (.) separates the port and logical unit numbers:

- SRX devices:

  ```
  type-slot/pim-or-ioc/port:channel.unit
  ```

- Other platforms:

  ```
  type-fpc/pic/port.logical
  ```

Channel Identifier Part of an Interface Name

The channel identifier part of the interface name is required only on channelized interfaces. For channelized interfaces, channel 0 identifies the first channelized interface. For

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channelized intelligent queuing (IQ) interfaces, channel 1 identifies the first channelized interface.

NOTE: Depending on the type of channelized interface, up to three levels of channelization can be specified. For more information, see the *Junos Network Interfaces Configuration Guide*.

A colon (:) separates the physical and virtual parts of the interface name:

- SRX devices:

```
type-slot/pim-or-ioc/port:channel
type-slot/pim-or-ioc/port:channel:channel
type-slot/pim-or-ioc/port:channel:channel:channel
```

- Other platforms:

```
type-fpc/pic/port:channel
type-fpc//pic/port:channel:channel
type-fpc/pic/port:channel:channel:channel
```

See Also

- Example: Configuring Interfaces Using Configuration Groups on page 134
- *Junos OS Network Interfaces Library for Routing Devices*

Using Wildcard Characters in Interface Names

You can use wildcard characters in the Junos OS operational commands to specify groups of interface names without having to type each name individually. Table 15 on page 251 lists the available wildcard characters. You must enclose all wildcard characters except the asterisk (*) in quotation marks (“ ”).

Table 15: Wildcard Characters for Specifying Interface Names

Wildcard Character	Description
*** (asterisk)**	Match any string of characters in that position in the interface name. For example, **so*** matches all SONET/SDH interfaces.
"[*character*<*character*...>]"	Match one or more individual characters in that position in the interface name. For example, **so-“[03]”*** matches all SONET/SDH interfaces in slots 0 and 3.
"[!*character*<*character*...>]"	Match all characters except the ones included in the brackets. For example, **so-“[!03]”*** matches all SONET/SDH interfaces except those in slots 0 and 3.
"[*character1-character2*]"	Match a range of characters. For example, **so-“[0-3]” *** matches all SONET/SDH interfaces in slots 0, 1, 2, and 3.

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Table 15: Wildcard Characters for Specifying Interface Names (continued)

Wildcard Character	Description
"[!*character1-character2*]"	Match all characters that are not in the specified range of characters. For example, **so-"[!0-3]"*** matches all SONET/SDH interfaces in slots 4, 5, 6, and 7.

See Also

- Using Keyboard Sequences to Move Around and Edit the Junos OS CLI on page 35
- Using Global Replace in the Junos OS Configuration on page 107

Related Documentation

- Day One: Exploring the Junos CLI

Using Operational Commands to Monitor a Device

Operational mode CLI commands enable you to monitor and control the operation of a device running the Junos OS. The operational mode commands exist in a hierarchical structure. For more information, see the following topics:

- Examples: Using the Junos OS CLI Command Completion on page 252
- Controlling the Scope of an Operational Mode Command on page 253
- Monitoring Who Uses the Junos OS CLI on page 256
- Viewing Files and Directories on a Device Running Junos OS on page 257
- Displaying Junos OS Information on page 261
- Managing Programs and Processes Using Junos OS Operational Mode Commands on page 263
- Using the Junos OS CLI Comment Character # for Operational Mode Commands on page 268
- Example: Using Comments in Junos OS Operational Mode Commands on page 268
- Displaying the Junos OS CLI Command and Word History on page 269

Examples: Using the Junos OS CLI Command Completion

The following examples show how you can use the command completion feature in Junos OS. Issue the **show interfaces** command:

```
user@host> sh<Space>ow i<Space>
'i' is ambiguous.
Possible completions:
igmp                   Show information about IGMP
interface              Show interface information
isis                   Show information about IS-IS
```

```
user@host> show in<Space>terfaces
Physical interface: at-0/1/0, Enabled, Physical link is Up
Interface index: 11, SNMP ifIndex: 65
```


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```
Link-level type: ATM-PVC, MTU: 4482, Clocking: Internal, SONET mode
Speed: OC12, Loopback: None, Payload scrambler: Enabled
Device flags: Present Running
Link flags: 0x01
...
```

```
user@host>
```

Display a list of all log files whose names start with the string “messages,” and then display the contents of one of the files:

```
user@myhost> show log mes?
```

```
Possible completions:
  <filename>Log file to display
messagesSize: 1417052, Last changed: Mar 3 00:33
messages.0.gzSize:  145575, Last changed: Mar 3 00:00
messages.1.gzSize:  134253, Last changed: Mar 2 23:00
messages.10.gzSize: 137022, Last changed: Mar 2 14:00
messages.2.grSize:  137112, Last changed: Mar 2 22:00
messages.3.gzSize:  121633, Last changed: Mar 2 21:00
messages.4.gzSize:  135715, Last changed: Mar 2 20:00
messages.5.gzSize:  137504, Last changed: Mar 2 19:00
messages.6.gzSize:  134591, Last changed: Mar 2 18:00
messages.7.gzSize:  132670, Last changed: Mar 2 17:00
messages.8.gzSize:  136596, Last changed: Mar 2 16:00
messages.9.gzSize:  136210, Last changed: Mar 2 15:00
```

```
user@myhost> show log mes<Tab>sages.4<Tab>.gz<Enter>
```

```
Jan 15 21:00:00 myhost newsyslog[1381]: logfile turned over
...
```

Controlling the Scope of an Operational Mode Command

The Junos OS CLI operational commands include options that you can use to identify specific components on a device running Junos OS. For example:

1. Type the **show interfaces** command to display information about all interfaces on the router.

```
user@host> show interfaces
Physical interface: so-0/0/0, Enabled, Physical link is Up
  Interface index: 128, SNMP ifIndex: 23
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: OC3,

  Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps Internal: 0x4000
  Link flags     : Keepalives
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 13861 (00:00:05 ago), Output: 13891 (00:00:01 ago)
  LCP state: Opened
  NCP state: inet: Opened, inet6: Not-configured, iso: Opened, mpls:
Not-configured
  CHAP state: Closed
  PAP state: Closed
  CoS queues     : 4 supported, 4 maximum usable queues
```

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```
  Last flapped   : 2008-06-02 17:16:14 PDT (1d 14:21 ago)
  Input rate     : 40 bps (0 pps)
  Output rate    : 48 bps (0 pps)

---(more)---
```

2. To display information about a specific interface, type that interface as a command option:

```
user@host> show interfaces fe-0/1/3
Physical interface: fe-0/1/3, Enabled, Physical link is Up
  Interface index: 135, SNMP ifIndex: 30
  Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, MAC-REWRITE Error:
None,
  Loopback: Disabled, Source filtering: Disabled, Flow control: Enabled
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Link flags     : None
  CoS queues     : 4 supported, 4 maximum usable queues
  Current address: 00:05:85:8f:c8:22, Hardware address: 00:05:85:8f:c8:22
  Last flapped   : 2008-06-02 17:16:15 PDT (1d 14:28 ago)
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)
  Active alarms  : None
  Active defects : None

user@host>
```

Operational Mode Commands on a TX Matrix Router or TX Matrix Plus Router

When you issue operational mode commands on the TX Matrix router, CLI command options allow you to restrict the command output to show only a component of the routing matrix rather than the routing matrix as a whole.

These are the options shown in the CLI:

- **scc**—The TX Matrix router (or switch-card chassis)
- **sfc**—The TX Matrix Plus router (also referred to as or switch-fabric chassis)
- **lcc *number***—A specific router in a routing matrix based on a TX Matrix router or a TX Matrix Plus router.
- **all-lcc**—All T640 routers (in a routing matrix based on a TX Matrix router) or all T1600 routers or T4000 routers (in a routing matrix based on a TX Matrix Plus router).

If you specify none of these options, then the command applies by default to the whole routing matrix.

Examples of Routing Matrix Command Options

The following output samples, using the **show version** command, demonstrate some different options for viewing information about the routing matrix.

```
user@host> show version ?
```


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```
Possible completions:
  <[Enter]>            Execute this command
  all-lcc              Show software version on all LCC chassis
  brief                Display brief output
  detail               Display detailed output
  lcc                  Show software version on specific LCC (0..3)
  scc                  Show software version on the SCC
  |                    Pipe through a command
```

Sample Output: No Routing Matrix Options Specified

```
user@host> show version
scc-re0:
--------------------------------------------------------------------------
Hostname: scc
Model: TX Matrix
JUNOS Base OS boot [7.0-20040630.0]
JUNOS Base OS Software Suite [7.0-20040629.0]
JUNOS Kernel Software Suite [7.0-20040630.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.0-20040630.0]
JUNOS Routing Software Suite [7.0-20040630.0]
JUNOS Online Documentation [7.0-20040630.0]
JUNOS Crypto Software Suite [7.0-20040630.0]
lcc0-re0:
--------------------------------------------------------------------------
Hostname: lcc0
Model: t640
JUNOS Base OS boot [7.0-20040630.0]
JUNOS Base OS Software Suite [7.0-20040629.0]
JUNOS Kernel Software Suite [7.0-20040630.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.0-20040630.0]
JUNOS Routing Software Suite [7.0-20040630.0]
JUNOS Online Documentation [7.0-20040630.0]
JUNOS Crypto Software Suite [7.0-20040630.0]
JUNOS Support Tools Package [7.0-20040630.0]
lcc1-re0:
--------------------------------------------------------------------------
Hostname: lcc1
Model: t640
JUNOS Base OS boot [7.0-20040630.0]
JUNOS Base OS Software Suite [7.0-20040629.0]
JUNOS Kernel Software Suite [7.0-20040630.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.0-20040630.0]
JUNOS Routing Software Suite [7.0-20040630.0]
JUNOS Online Documentation [7.0-20040630.0]
JUNOS Crypto Software Suite [7.0-20040630.0]
JUNOS Support Tools Package [7.0-20040630.0]
```

Sample Output: TX Matrix Router Only (scc Option)

```
user@host> show version scc
Hostname: scc
Model: TX Matrix
JUNOS Base OS boot [7.0-20040630.0]
JUNOS Base OS Software Suite [7.0-20040629.0]
JUNOS Kernel Software Suite [7.0-20040630.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.0-20040630.0]
```

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```
JUNOS Routing Software Suite [7.0-20040630.0]
JUNOS Online Documentation [7.0-20040630.0]
JUNOS Crypto Software Suite [7.0-20040630.0]
```

Sample Output: Specific T640 Router (lcc number Option)

```
user@host> show version lcc 0
```

```
lcc0-re0:
--------------------------------------------------------------------------
Hostname: lcc0
Model: t640
JUNOS Base OS boot [7.0-20040630.0]
JUNOS Base OS Software Suite [7.0-20040629.0]
JUNOS Kernel Software Suite [7.0-20040630.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.0-20040630.0]
JUNOS Routing Software Suite [7.0-20040630.0]
JUNOS Online Documentation [7.0-20040630.0]
JUNOS Crypto Software Suite [7.0-20040630.0]
JUNOS Support Tools Package [7.0-20040630.0]
```

Sample Output: All T640 Routers (all-lcc Option)

```
user@host> show version all-lcc
```

```
lcc0-re0:
--------------------------------------------------------------------------
Hostname: lcc0
Model: t640
JUNOS Base OS boot [7.0-20040630.0]
JUNOS Base OS Software Suite [7.0-20040629.0]
JUNOS Kernel Software Suite [7.0-20040630.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.0-20040630.0]
JUNOS Routing Software Suite [7.0-20040630.0]
JUNOS Online Documentation [7.0-20040630.0]
JUNOS Crypto Software Suite [7.0-20040630.0]
JUNOS Support Tools Package [7.0-20040630.0]
lcc1-re0:
--------------------------------------------------------------------------
Hostname: lcc1
Model: t640
JUNOS Base OS boot [7.0-20040630.0]
JUNOS Base OS Software Suite [7.0-20040629.0]
JUNOS Kernel Software Suite [7.0-20040630.0]
JUNOS Packet Forwarding Engine Support (T-Series) [7.0-20040630.0]
JUNOS Routing Software Suite [7.0-20040630.0]
JUNOS Online Documentation [7.0-20040630.0]
JUNOS Crypto Software Suite [7.0-20040630.0]
JUNOS Support Tools Package [7.0-20040630.0]
```

See Also

- Interface Naming Conventions Used in the Junos OS Operational Commands on page 250

Monitoring Who Uses the Junos OS CLI

Depending upon how you configure Junos OS, multiple users can log in to the router, use the CLI, and configure or modify the software configuration.

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If, when you enter configuration mode, another user is also in configuration mode, a notification message is displayed that indicates who the user is and what portion of the configuration the person is viewing or editing:

```
user@host> configure
Entering configuration mode
Users currently editing the configuration:
  root terminal d0 (pid 4137) on since 2008-04-09 23:03:07 PDT, idle 7w6d 08:22
      [edit]
The configuration has been changed but not committed

[edit]
user@host#
```

See Also

- Entering and Exiting the Junos OS CLI Configuration Mode on page 76
- Controlling the Junos OS CLI Environment on page 57

Viewing Files and Directories on a Device Running Junos OS

Junos OS stores information in files on the device, including configuration files, log files, and router software files. This topic shows some examples of operational commands that you can use to view files and directories on a device running Junos OS.

Sections include:

- Directories on the Router or Switch on page 257
- Listing Files and Directories on page 258
- Specifying Filenames and URLs on page 260

Directories on the Router or Switch

Table 16 on page 257 lists some standard directories on a device running Junos OS.

Table 16: Directories on the Router

Directory	Description
/config	This directory is located on the device's router's internal flash drive. It contains the active configuration (**juniper.conf**) and rollback files 1, 2, and 3.
/var/db/config	This directory is located on the router'sdevice's hard drive and contains rollback files 4 through 49.
/var/tmp	This directory is located on thedevice's hard drive. It holds core files from the various processes on the Routing Engines. Core files are generated when a particular process crashes and are used by Juniper Networks engineers to diagnose the reason for failure.
/var/log	This directory is located on the device's hard drive. It contains files generated by both the device's logging function as well as the **traceoptions** command.

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Table 16: Directories on the Router (continued)

Directory	Description
/var/home	This directory is located on the device's hard drive. It contains a subdirectory for each configured user on the device. These individual user directories are the default file location for many Junos OS commands.
/altroot	This directory is located on the device's hard drive and contains a copy of the root file structure from the internal flash drive. This directory is used in certain disaster recovery modes where the internal flash drive is not operational.
/altconfig	This directory is located on the device's hard drive and contains a copy of the **/config** file structure from the internal flash drive. This directory is also used in certain disaster recovery modes when the internal flash drive is not operational.

Listing Files and Directories

You can view the device's directory structure as well as individual files by issuing the **file** command in operational mode.

1. To get help about the **file** command, type the following:

```
user@host> file ?
Possible completions:
  <[Enter]>            Execute this command
  archive              Archives files from the system
  checksum             Calculate file checksum
  compare              Compare files
  copy                 Copy files (local or remote)
  delete               Delete files from the system
  list                 List file information
  rename               Rename files
  show                 Show file contents
  source-address       Local address to use in originating the connection
  |                    Pipe through a command
user@host> file
```

   Help shows that the **file** command includes several options for manipulating files.

2. Use the **list** option to see the directory structure of the device. For example, to show the files located in your home directory on the device:

```
user@host> file list
.ssh/
common
```

   The default directory for the **file list** command is the home directory of the user logged in to the device. In fact, the user's home directory is the default directory for most of Junos OS commands requiring a filename.

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3. To view the contents of other file directories, specify the directory location. For example:

```
user@host> file list /config
juniper.conf
juniper.conf.1.gz
juniper.conf.2.gz
juniper.conf.3.gz
```

4. You can also use the device's context-sensitive help system to locate a directory. For example:

```
user@host> file list /?
Possible completions:
  <[Enter]>            Execute this command
  <path>               Path to list
  /COPYRIGHT           Size: 6355, Last changed: Feb 13 2005
  /altconfig/          Last changed: Aug 07 2007
  /altroot/            Last changed: Aug 07 2007
  /bin/                Last changed: Apr 09 22:31:35
  /boot/               Last changed: Apr 09 23:28:39
  /config/             Last changed: Apr 16 22:35:35
  /data/               Last changed: Aug 07 2007
  /dev/                Last changed: Apr 09 22:36:21
  /etc/                Last changed: Apr 11 03:14:22
  /kernel              Size: 27823246, Last changed: Aug 07 2007
  /mfs/                Last changed: Apr 09 22:36:49
  /mnt/                Last changed: Jan 11 2007
  /modules/            Last changed: Apr 09 22:33:54
  /opt/                Last changed: Apr 09 22:31:00
  /packages/           Last changed: Apr 09 22:34:38
  /proc/               Last changed: May 07 20:25:46
  /rdm.taf             Size: 498, Last changed: Apr 09 22:37:31
  /root/               Last changed: Apr 10 02:19:45
  /sbin/               Last changed: Apr 09 22:33:55
  /staging/            Last changed: Apr 09 23:28:41
  /tmp/                Last changed: Apr 11 03:14:49
  /usr/                Last changed: Apr 09 22:31:34
  /var/                Last changed: Apr 09 22:37:30
user@host> file list /var/?
<[Enter]>            Execute this command
  <path>               Path to list
  /var/account/        Last changed: Jul 09 2007
  /var/at/             Last changed: Jul 09 2007
  /var/backups/        Last changed: Jul 09 2007
  /var/bin/            Last changed: Jul 09 2007
  /var/crash/          Last changed: Apr 09 22:31:08
  /var/cron/           Last changed: Jul 09 2007
  /var/db/             Last changed: May 07 20:28:40
  /var/empty/          Last changed: Jul 09 2007
  /var/etc/            Last changed: Apr 16 22:35:36
  /var/heimdal/        Last changed: Jul 10 2007
  /var/home/           Last changed: Apr 09 22:59:18
  /var/jail/           Last changed: Oct 31 2007
  /var/log/            Last changed: Apr 17 02:00:10
  /var/mail/           Last changed: Jul 09 2007
  /var/msgs/           Last changed: Jul 09 2007
  /var/named/          Last changed: Jul 10 2007
```

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```
  /var/packages/       Last changed: Jan 18 02:38:59
  /var/pdb/            Last changed: Oct 31 2007
  /var/preserve/       Last changed: Jul 09 2007
  /var/run/            Last changed: Apr 17 02:00:01
  /var/rundb/          Last changed: Apr 17 00:46:00
  /var/rwho/           Last changed: Jul 09 2007
  /var/sdb/            Last changed: Apr 09 22:37:31
  /var/spool/          Last changed: Jul 09 2007
  /var/sw/             Last changed: Jul 09 2007
  /var/tmp/            Last changed: Apr 09 23:28:41
  /var/transfer/       Last changed: Jul 09 2007
  /var/yp/             Last changed: Jul 09 2007
user@host> file list /var/
```

5. You can also display the contents of a file. For example:

```
user@host>file show /var/log/inventory
Jul  9 23:17:46 CHASSISD release 8.4I0 built by builder on 2007-06-12 07:58:27
 UTC
Jul  9 23:18:05 CHASSISD release 8.4I0 built by builder on 2007-06-12 07:58:27
 UTC
Jul  9 23:18:06 Routing Engine 0 - part number 740-003239, serial number
9000016755
Jul  9 23:18:15 Routing Engine 1 - part number 740-003239, serial number
9001018324
Jul  9 23:19:03 SSB 0 - part number 710-001951, serial number AZ8025
Jul  9 23:19:03 SSRAM bank 0 - part number 710-001385, serial number 243071
Jul  9 23:19:03 SSRAM bank 1 - part number 710-001385, serial number 410608
...
```

Specifying Filenames and URLs

In some CLI commands and configuration statements—including **file copy**, **file archive, load, save**, **set system login user** *username* **authentication** *load-key-file*, and **request system software add**—you can include a filename. On a routing matrix, you can include chassis information as part of the filename (for example, **lcc0**, **lcc0-re0**, or **lcc0-re1)**.

You can specify a filename or URL in one of the following ways:

- ***filename***—File in the user's current directory on the local flash drive. You can use wildcards to specify multiple source files or a single destination file. Wildcards are not supported in Hypertext Transfer Protocol (HTTP) or FTP.

  NOTE: **Wildcards are supported only by the file (compare | copy | delete | list | rename | show) commands. When you issue the file show command with a wildcard, it must resolve to one filename.**

- ***path/filename***—File on the local flash disk.
- **/var/***filename* or **/var/***path/filename*—File on the local hard disk. You can also specify a file on a local Routing Engine for a specific T640 router on a routing matrix:

  ```
  user@host> file delete lcc0-re0:/var/tmp/junk
  ```


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- **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 **%2F**; for example, **ftp://*hostname*/%2F*path/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 an 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. You can also specify a file on a local Routing Engine for a specific T640 router on a routing matrix:

```
user@host> show log lcc0-re1:chassisd
```

Displaying Junos OS Information

You can display Junos OS version information and other status to determine if the version of Junos OS that you are running supports particular features or hardware.

To display Junos OS information:

1. Make sure you are in operational mode.
2. To display brief information and status for the kernel and Packet Forwarding Engine, enter the **show version brief** command. This command shows version information for Junos OS packages installed on the router. For example:

```
user@host> show version brief
Hostname: host
Model: m7i
JUNOS Base OS boot [9.1R1.8]
JUNOS Base OS Software Suite [9.1R1.8]
JUNOS Kernel Software Suite [9.1R1.8]
JUNOS Crypto Software Suite [9.1R1.8]
```

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```
JUNOS Packet Forwarding Engine Support (M/T Common) [9.1R1.8]
JUNOS Packet Forwarding Engine Support (M7i/M10i) [9.1R1.8]
JUNOS Online Documentation [9.1R1.8]
JUNOS Routing Software Suite [9.1R1.8]

user@host>
```

If the **Junos Crypto Software Suite** is listed, the router has Canada and USA encrypted Junos OS. If the **Junos Crypto Software Suite** is not listed, the router is running worldwide nonencrypted Junos OS.

3. To display detailed version information, enter the **show version detail** command. This command display shows the hostname and version information for Junos OS packages installed on your router. It also includes the version information for each software process. For example:

```
user@host> show version detail

Hostname: host
Model: m20
JUNOS Base OS boot [8.4R1.13]
JUNOS Base OS Software Suite [8.4R1.13]
JUNOS Kernel Software Suite [8.4R1.13]
JUNOS Crypto Software Suite [8.4R1.13]
JUNOS Packet Forwarding Engine Support (M/T Common) [8.4R1.13]
JUNOS Packet Forwarding Engine Support (M20/M40) [8.4R1.13]
JUNOS Online Documentation [8.4R1.13]
JUNOS Routing Software Suite [8.4R1.13]
KERNEL 8.4R1.13 #0 built by builder on 2007-08-08 00:33:41 UTC
MGD release 8.4R1.13 built by builder on 2007-08-08 00:34:00 UTC
CLI release 8.4R1.13 built by builder on 2007-08-08 00:34:47 UTC
RPD release 8.4R1.13 built by builder on 2007-08-08 00:45:21 UTC
CHASSISD release 8.4R1.13 built by builder on 2007-08-08 00:36:59 UTC
DFWD release 8.4R1.13 built by builder on 2007-08-08 00:39:32 UTC
DCD release 8.4R1.13 built by builder on 2007-08-08 00:34:24 UTC
SNMPD release 8.4R1.13 built by builder on 2007-08-08 00:42:24 UTC
MIB2D release 8.4R1.13 built by builder on 2007-08-08 00:46:47 UTC
APSD release 8.4R1.13 built by builder on 2007-08-08 00:36:39 UTC
VRRPD release 8.4R1.13 built by builder on 2007-08-08 00:45:44 UTC
ALARMD release 8.4R1.13 built by builder on 2007-08-08 00:34:30 UTC
PFED release 8.4R1.13 built by builder on 2007-08-08 00:41:54 UTC
CRAFTD release 8.4R1.13 built by builder on 2007-08-08 00:39:03 UTC
SAMPLED release 8.4R1.13 built by builder on 2007-08-08 00:36:05 UTC
ILMID release 8.4R1.13 built by builder on 2007-08-08 00:36:51 UTC
RMOPD release 8.4R1.13 built by builder on 2007-08-08 00:42:04 UTC
COSD release 8.4R1.13 built by builder on 2007-08-08 00:38:39 UTC
FSAD release 8.4R1.13 built by builder on 2007-08-08 00:43:01 UTC
IRSD release 8.4R1.13 built by builder on 2007-08-08 00:35:37 UTC
FUD release 8.4R1.13 built by builder on 2007-08-08 00:44:36 UTC
RTSPD release 8.4R1.13 built by builder on 2007-08-08 00:29:14 UTC
SMARTD release 8.4R1.13 built by builder on 2007-08-08 00:13:32 UTC
KSYNCD release 8.4R1.13 built by builder on 2007-08-08 00:33:17 UTC
SPD release 8.4R1.13 built by builder on 2007-08-08 00:43:50 UTC
L2TPD release 8.4R1.13 built by builder on 2007-08-08 00:43:12 UTC
HTTPD release 8.4R1.13 built by builder on 2007-08-08 00:36:27 UTC
PPPOED release 8.4R1.13 built by builder on 2007-08-08 00:36:04 UTC
RDD release 8.4R1.13 built by builder on 2007-08-08 00:33:49 UTC
PPPD release 8.4R1.13 built by builder on 2007-08-08 00:45:13 UTC
```


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```
DFCD release 8.4R1.13 built by builder on 2007-08-08 00:39:11 UTC
DLSWD release 8.4R1.13 built by builder on 2007-08-08 00:42:37 UTC
LACPD release 8.4R1.13 built by builder on 2007-08-08 00:35:41 UTC
USBD release 8.4R1.13 built by builder on 2007-08-08 00:30:01 UTC
LFMD release 8.4R1.13 built by builder on 2007-08-08 00:35:52 UTC
CFMD release 8.4R1.13 built by builder on 2007-08-08 00:34:45 UTC
JDHCPD release 8.4R1.13 built by builder on 2007-08-08 00:35:40 UTC
PGCPD release 8.4R1.13 built by builder on 2007-08-08 00:46:31 UTC
SSD release 8.4R1.13 built by builder on 2007-08-08 00:36:17 UTC
MSPD release 8.4R1.13 built by builder on 2007-08-08 00:33:42 UTC
KMD release 8.4R1.13 built by builder on 2007-08-08 00:44:02 UTC
PPMD release 8.4R1.13 built by builder on 2007-08-08 00:36:03 UTC
LMPD release 8.4R1.13 built by builder on 2007-08-08 00:33:49 UTC
LRMUXD release 8.4R1.13 built by builder on 2007-08-08 00:33:55 UTC
PGMD release 8.4R1.13 built by builder on 2007-08-08 00:36:01 UTC
BFDD release 8.4R1.13 built by builder on 2007-08-08 00:44:22 UTC
SDXD release 8.4R1.13 built by builder on 2007-08-08 00:36:18 UTC
AUDITD release 8.4R1.13 built by builder on 2007-08-08 00:34:40 UTC
L2ALD release 8.4R1.13 built by builder on 2007-08-08 00:40:05 UTC
EVENTD release 8.4R1.13 built by builder on 2007-08-08 00:39:55 UTC
L2CPD release 8.4R1.13 built by builder on 2007-08-08 00:41:04 UTC
MPLSOAMD release 8.4R1.13 built by builder on 2007-08-08 00:45:11 UTC
jroute-dd release 8.4R1.13 built by builder on 2007-08-08 00:31:01 UTC
jkernel-dd release 8.4R1.13 built by builder on 2007-08-08 00:30:30 UTC
jcrypto-dd release 8.4R1.13 built by builder on 2007-08-08 00:30:12 UTC
jdocs-dd release 8.4R1.13 built by builder on 2007-08-08 00:02:52 UTC

user@host>
```

Managing Programs and Processes Using Junos OS Operational Mode Commands

This topic shows some examples of Junos operational commands that you can use to manage programs and processes on a device running Junos OS.

Sections include:

- Showing Software Processes on page 263
- Restarting the Junos OS Process on page 265
- Stopping Junos OS on page 266
- Rebooting Junos OS on page 267

Showing Software Processes

To verify system operation or to begin diagnosing an error condition, you may need to display information about software processes running on the device.

To show software processes:

1. Make sure you are in operational mode.
2. Type the **show system processes extensive** command. This command shows the CPU utilization on the device and lists the processes in order of CPU utilization. For example:

   ```
   user@host> show system processes extensive
   ```

```
last pid: 28689;  load averages:  0.01,  0.00,  0.00  up 56+06:16:13    04:52:04
73 processes:  1 running, 72 sleeping

Mem: 101M Active, 101M Inact, 98M Wired, 159M Cache, 69M Buf, 286M Free
Swap: 1536M Total, 1536M Free


  PID USERNAME    PRI NICE  SIZE    RES STATE    TIME   WCPU    CPU COMMAND
 3365 root          2   0 21408K  4464K select 511:23  0.00%  0.00% chassisd
 3508 root          2   0  3352K  1168K select  32:45  0.00%  0.00% l2ald
 3525 root          2   0  3904K  1620K select  13:40  0.00%  0.00% dcd
 5532 root          2   0 11660K  2856K kqread  10:36  0.00%  0.00% rpd
 3366 root          2   0  2080K   828K select   8:33  0.00%  0.00% alarmd
 3529 root          2   0  2040K   428K select   7:32  0.00%  0.00% irsd
 3375 root          2   0  2900K  1600K select   6:01  0.00%  0.00% ppmd
 3506 root          2   0  5176K  2568K select   5:38  0.00%  0.00% mib2d
 4957 root          2   0  1284K   624K select   5:16  0.00%  0.00% ntpd
    6 root         18   0     0K     0K syncer   4:49  0.00%  0.00% syncer
 3521 root          2   0  2312K   928K select   2:14  0.00%  0.00% lfmd
 3526 root          2   0  5192K  1988K select   2:04  0.00%  0.00% snmpd
 3543 root          2   0     0K     0K peer_s   1:46  0.00%  0.00% peer proxy

 3512 root          2   0  3472K  1044K select   1:44  0.00%  0.00% rmopd
 3537 root          2   0     0K     0K peer_s   1:30  0.00%  0.00% peer proxy

 3527 root          2   0  3100K  1176K select   1:14  0.00%  0.00% pfed
 3380 root          2   0  3208K  1052K select   1:11  0.00%  0.00% bfdd
 4136 root          2   0 11252K  3668K select   0:54  0.00%  0.00% cli
 3280 root          2   0  2248K  1420K select   0:28  0.00%  0.00% eventd
 3528 root          2   0  2708K   672K select   0:28  0.00%  0.00% dfwd
    7 root         -2   0     0K     0K vlruwt   0:26  0.00%  0.00% vnlru
 3371 root          2   0  1024K   216K sbwait   0:25  0.00%  0.00% tnp.sntpd

   13 root        -18   0     0K     0K psleep   0:24  0.00%  0.00% vmuncacheda

 3376 root          2   0  1228K   672K select   0:22  0.00%  0.00% smartd
    5 root        -18   0     0K     0K psleep   0:17  0.00%  0.00% bufdaemon

 3368 root          2   0 15648K  9428K select   0:17  0.00%  0.00% mgd
 3362 root          2   0  1020K   204K select   0:15  0.00%  0.00% watchdog
 3381 root          2   0  2124K   808K select   0:15  0.00%  0.00% lacpd
 3524 root          2   0  6276K  1492K select   0:14  0.00%  0.00% kmd
 3343 root         10   0  1156K   404K nanslp   0:14  0.00%  0.00% cron
---(more)---
```

Table 17 on page 265 lists and describes the output fields included in this example. The fields are listed in alphabetical order.

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Table 17: show system process extensive Command Output Fields

Field	Description
COMMAND	Command that is running.
CPU	Raw (unweighted) CPU usage. The value of this field is used to sort the processes in the output.
last pid	Last process identifier assigned to the process.
load averages	Three load averages, followed by the current time.
Mem	Information about physical and virtual memory allocation.
NICE	UNIX "nice" value. The nice value allows a process to change its final scheduling priority.
PID	Process identifier.
PRI	Current kernel scheduling priority of the process. A lower number indicates a higher priority.
processes	Number of existing processes and the number of processes in each state (**sleeping, running, starting, zombies,** and **stopped**).
RES	Current amount of resident memory, in KB.
SIZE	Total size of the process (**text, data,** and **stack**), in KB.
STATE	Current state of the process (**sleep**, **wait**, **run**, **idle**, **zombi**, or **stop**).
Swap	Information about physical and virtual memory allocation.
USERNAME	Owner of the process.
WCPU	Weighted CPU usage.

Restarting the Junos OS Process

To correct an error condition, you might need to restart a software process running on the device. You can use the **restart** command to force a restart of a software process.

CAUTION: Do not restart a software process unless specifically asked to do so by your Juniper Networks customer support representative. Restarting a software process during normal operation of a device could cause interruption of packet forwarding and loss of data.

To restart a software process:

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1. Make sure you are in operational mode.
2. Type the following command:

   ```
   user@host> restart process-name < (immediately | gracefully | soft) >
   ```

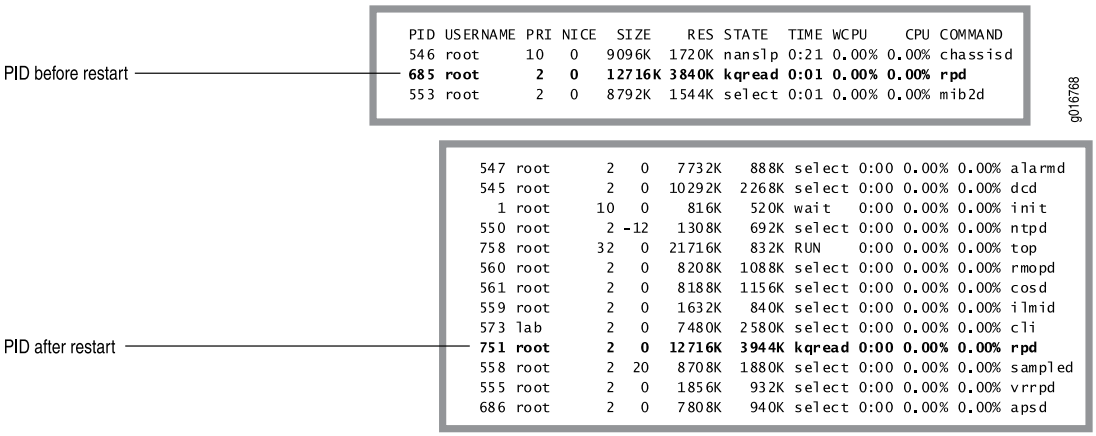
   - ***process-name*** is the name of the process that you want to restart. For example, **routing** or **class-of-service**. You can use the command completion feature of Junos OS to see a list of software processes that you can restart using this command.
   - **gracefully** restarts the software process after performing clean-up tasks.
   - **immediately** restarts the software process without performing any clean-up tasks.
   - **soft** rereads and reactivates the configuration without completely restarting the software processes. For example, BGP peers stay up and the routing table stays constant.

The following example shows how to restart the routing process:

```
user@host> restart routing
Routing protocol daemon started, pid 751
```

When a process restarts, the process identifer (PID) is updated. (See Figure 15 on page 266.)

Figure 15: Restarting a Process



Stopping Junos OS

To avoid damage to the file system and to prevent loss of data, you must always gracefully shut down Junos OS before powering off the device.

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NOTE: SRX Series Services Gateway devices for the branch and EX Series Ethernet Switches support resilient dual-root partitioning.

If you are unable to shut down a device gracefully because of unexpected circumstances such as a power outage or a device failure, resilient dual-root partitioning prevents file corruption and enables a device to remain operational. In addition, it enables a device to boot transparently from the second root partition if the system fails to boot from the primary root partition.

Resilient dual-root partitioning serves as a backup mechanism for providing additional resiliency to a device when there is an abnormal shutdown. However, it is not an alternative to performing a graceful shutdown under normal circumstances.

To stop Junos OS:

1. Make sure you are in operational mode.
2. Enter the **request system halt** command. This command stops all system processes and halts the operating system. For example:

```
user@host> request system halt
Halt the system? [yes,no] (no)  yes
shutdown: [pid 3110]
Shutdown NOW!
*** FINAL System shutdown message from root@host ***
System going down IMMEDIATELY
user@host> Dec 17 17:28:40 init: syslogd (PID 2514) exited with status=0 Normal
 Exit
Waiting (max 60 seconds) for system process `bufdaemon' to stop...stopped
Waiting (max 60 seconds) for system process `syncer' to stop...stopped
syncing disks... 4
done
Uptime: 3h31m41s
ata0: resetting devices.. done
The operating system has halted.
Please press any key to reboot.
```

Rebooting Junos OS

After a software upgrade or to recover (occasionally) from an error condition, you must reboot Junos OS.

To reboot Junos OS:

1. Make sure you are in operational mode.
2. Enter the **request system reboot** command. This command displays the final stages of the system shutdown and executes the reboot. Reboot requests are recorded to the system log files, which you can view with the **show log messages** command. For example:

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```
user@host>request system rebootReboot the system? [yes,no] (no)yes

shutdown: [pid 845]
Shutdown NOW!
*** FINAL System shutdown message from root@host ***
System going down IMMEDIATELY
user@host> Dec 17 17:34:20 init: syslogd (PID 409) exited with status=0 Normal
 Exit
Waiting (max 60 seconds) for system process `bufdaemon' to stop...stopped
Waiting (max 60 seconds) for system process `syncer' to stop...stopped
syncing disks... 10 6
done
Uptime: 2m45s
ata0: resetting devices.. done
Rebooting...
```

See Also

- Checking the Status of a Device Running Junos OS on page 41

Using the Junos OS CLI Comment Character # for Operational Mode Commands

The comment character in Junos OS enables you to copy operational mode commands that include comments from a file and paste them into the CLI. A pound sign (#) at the beginning of the command-line indicates a comment line. This is useful for describing frequently used operational mode commands; for example, a user's work instructions on how to monitor the network. To add a comment to a command file, the first character of the line must be #. When you start a command with #, the rest of the line is disregarded by Junos OS.

To add comments in operational mode, start with a # and end with a new line (carriage return):

```
user@host> # comment-string
```

comment-string is the text of the comment. The comment text can be any length, but each comment line must begin with a #.

Example: Using Comments in Junos OS Operational Mode Commands

The following example shows how to use comments in a file:

```
#Command 1: Show the router version
show version
#Command 2: Show all router interfaces
show interfaces terse
```

The following example shows how to copy and paste contents of a file into the CLI:

```
user@host> #Command 1: Show the router version
user@host> show version
Hostname: myhost
Model: m5
```


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```
Junos Base OS boot [6.4-20040511.0]
Junos Base OS Software Suite [6.4-20040511.0]
Junos Kernel Software Suite [6.4-20040511.0]
Junos Packet Forwarding Engine Support (M5/M10) [6.4-20040511.0] Junos Routing
  Software Suite [6.4-20040511.0] Junos Online Documentation [6.4-20040511.0] Junos
  Crypto Software Suite [6.4-20040511.0]
user@host> # Command 2: Show all router interfaces
user@host> show interfaces terse
Interface Admin Link Proto Local Remote
fe-0/0/0 up up
fe-0/0/1 up down
fe-0/0/2 up down
mo-0/1/0 up
mo-0/1/0.16383 up up inet 10.0.0.1 --> 10.0.0.17
so-0/2/0 up up
so-0/2/1 up up
dsc up up
fxp0 up up
fxp0.0 up up inet 192.168.70.62/21
fxp1 up up
fxp1.0 up up tnp 4
gre up up
ipip up up
lo0 up up
lo0.0 up up inet 127.0.0.1 --> 0/0
lo0.16385 up up inet
```

Displaying the Junos OS CLI Command and Word History

To display a list of recent commands that you issued, use the **show cli history** command:

```
user@host> show cli history 3
01:01:44 -- show bgp next-hop-database
01:01:51 -- show cli history
01:02:51 -- show cli history 3
```

You can press Esc+. (period) or Alt+. (period) to insert the last word of the previous command. Repeat Esc+. or Alt+. to scroll backwards through the list of recently entered words. For example:

```
user@host> show interfaces terse fe-0/0/0
Interface      Admin    Link    Proto     Local    Remote
fe-0/0/0       up       up
fe-0/0/0.0     up       up      inet     192.168.220.1/30

user@host> <Esc>
user@host> fe-0/0/0
```

If you scroll completely to the beginning of the list, pressing Esc+. or Alt+. again restarts scrolling from the last word entered.

See Also

- Junos OS CLI Online Help Features on page 54

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Related Documentation

- Day One: Exploring the Junos CLI

Filtering Operational Command Output

The pipe **|** symbol lets you filter the command output in both operational and configuration modes. For more information on the pipe **|** filter functions, see the following topics:

- Using the Pipe (|) Symbol to Filter Junos OS Command Output on page 270
- Using Regular Expressions with the Pipe (|) Symbol to Filter Junos OS Command Output on page 271
- Pipe (|) Filter Functions in the Junos OS Command-Line Interface on page 272
- Filtering Operational Mode Command Output in a QFabric System on page 284

Using the Pipe (|) Symbol to Filter Junos OS Command Output

The Junos OS enables you to filter command output by adding the pipe (**|**) symbol when you enter a command.

For example:

```
user@host> show rip neighbor ?
Possible completions:
  <[Enter]>            Execute this command
  <name>               Name of RIP neighbor
  instance             Name of RIP instance
  logical-system       Name of logical system, or 'all'
  |                    Pipe through a command
```

The following example lists the filters that can be used with the pipe symbol (|):

```
user@host> show interfaces | ?
user@host> show interfaces | ?
Possible completions:
  append               Append output text to file
  count                Count occurrences
  display              Show additional kinds of information
  except               Show only text that does not match a pattern
  find                 Search for first occurrence of pattern
  hold                 Hold text without exiting the --More-- prompt
  last                 Display end of output only
  match                Show only text that matches a pattern
  no-more              Don't paginate output
  refresh              Refresh a continuous display of the command
  request              Make system-level requests
  resolve              Resolve IP addresses
  save                 Save output text to file
  tee                  Write to standard output and file
  trim                 Trim specified number of columns from start of line
```


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For the **show configuration** command only, an additional compare filter is available:

```
user@host> show configuration | ?
Possible completions:
  compare             Compare configuration changes with prior version
...
```

You can enter any of the pipe filters in conjunction. For example:

```
user@host>command | match regular-expression | save filename
```

NOTE: This topic describes *only* the filters that can be used for operational mode command output. For information about filters that can be used in configuration mode, see the *Junos OS Administration Library*.

Using Regular Expressions with the Pipe (|) Symbol to Filter Junos OS Command Output

The **except**, **find**, and **match** filters used with the pipe symbol employ regular expressions to filter output. Juniper Networks uses the regular expressions as defined in POSIX 1003.2. If the regular expressions contain spaces, operators, or wildcard characters, enclose the expression in quotation marks.

Table 18: Common Regular Expression Operators in Operational Mode Commands

Operator	Function
|	Indicates that a match can be one of the two terms on either side of the pipe.
^	Used at the beginning of an expression, denotes where a match should begin.
$	Used at the end of an expression, denotes that a term must be matched exactly up to the point of the $ character.
[]	Specifies a range of letters or digits to match. To separate the start and end of a range, use a hyphen (**-**).
( )	Specifies a group of terms to match.

For example, if a command produces the following output:

```
12
22
321
4
```

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a pipe filter of **| match 2** displays the following output:

```
1 2
2 2
3 2 1
```

and a pipe filter of **| except 1** displays the following output:

```
2 2
4
```

Pipe (|) Filter Functions in the Junos OS Command-Line Interface

This topic describes the pipe (|) filter functions that are supported in the Junos OS command-line interface (CLI):

- Comparing Configurations and Displaying the Differences in Text on page 272
- Comparing Configurations and Displaying the Differences in XML on page 274
- Counting the Number of Lines of Output on page 275
- Displaying Output in XML Tag Format on page 275
- Displaying Static Configuration Data on page 275
- Displaying Ephemeral Configuration Data on page 276
- Displaying Output in JSON Format on page 276
- Displaying the Configuration with YANG Translation Scripts Applied on page 277
- Displaying the RPC Tags for a Command on page 279
- Ignoring Output That Does Not Match a Regular Expression on page 279
- Displaying Output from the First Match of a Regular Expression on page 279
- Retaining Output After the Last Screen on page 280
- Displaying Output Beginning with the Last Entries on page 280
- Displaying Output That Matches a Regular Expression on page 281
- Preventing Output from Being Paginated on page 281
- Sending Command Output to Other Users on page 281
- Resolving IP Addresses on page 282
- Saving Output to a File on page 282
- Appending Output to a File on page 282
- Displaying Output on Screen and Writing to a File on page 283
- Trimming Output by Specifying the Starting Column on page 283
- Refreshing the Output of a Command on page 283

Comparing Configurations and Displaying the Differences in Text

The **compare** filter compares the candidate configuration with either the current committed configuration or a configuration file and displays the differences between

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the two configurations with text characters. To compare configurations, enter **compare** after the pipe (|) symbol:

```
[edit]
user@host# show | compare [filename| rollback n]
```

filename is the full path to a configuration file.

n is the index into the list of previously committed configurations. The most recently saved configuration is 0. If you do not specify arguments, the candidate configuration is compared against the active configuration file (**/config/juniper.conf**).

The comparison output uses the following conventions:

- Statements that are only in the candidate configuration are prefixed with a plus sign (+).
- Statements that are only in the comparison file are prefixed with a minus sign (–).
- Statements that are unchanged are prefixed with a single blank space ( ).

For example:

```
user@host> show configuration system | compare rollback 9
[edit system]
+ host-name device;
+ backup-router 192.168.71.254;
- ports {
-     console log-out-on-disconnect;
- }
[edit system name-server]
+  172.17.28.11;
   172.17.28.101 { ... }
[edit system name-server]
   172.17.28.101 { ... }
+  172.17.28.100;
+  172.17.28.10;
[edit system]
-  scripts {
-      commit {
-          allow-transients;
-      }
-  }
+  services {
+      ftp;
+      rlogin;
+      rsh;
+      telnet;
+  }
```

Starting with Junos OS Release 8.3, output from the **show | compare** command has been enhanced to more accurately reflect configuration changes. This includes more intelligent

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handling of order changes in lists. For example, consider names in a group that are reordered as follows:

```
groups {
          groups {
               group_xmp;      group_xmp;
               group_cmp;     group_grp:
               group_grp;     group_cmp;
          }
 }
```

In previous releases, output from the **show | compare** command looked like the following:

```
[edit groups]
  - group_xmp;
  - group_cmp;
  - group_grp;
  + group_xmp;
  + group_grp;
  + group_cmp;
```

Now, output from the **show | compare** command looks like the following:

```
[edit groups]
group_xmp {...}
!  group_grp {...}
```

Comparing Configurations and Displaying the Differences in XML

The **compare | display xml** filter compares the candidate configuration with the current committed configuration and displays the differences between the two configurations in XML. To compare configurations, enter **compare | display xml** after the pipe (|) symbol in either operational or configuration mode.

Example in operational mode:

```
user@host> show configuration | compare | display xml
```

Example in configuration mode:

```
[edit]
user@host# show | compare | display xml
```

You can enter a specific configuration hierarchy prior to **| compare**. In configuration mode, you can navigate to a hierarchy where the command is applied.

For a description of the XML output, see "Understanding the show | compare | display xml Command Output" on page 184.

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NOTE: Starting in Junos OS Release 16.2R2, the **show | compare | display xml** command omits the <configuration> tag in the XML output if the comparison returns no differences or if the comparison returns only differences for non-native configuration data, for example, configuration data associated with an OpenConfig data model.

Counting the Number of Lines of Output

To count the number of lines in the output from a command, enter **count** after the pipe symbol (|). For example:

```
user@host> show configuration | count
Count: 269 lines
```

Displaying Output in XML Tag Format

To display command output in XML tag format, enter **display xml** after the pipe symbol (|).

The following example displays the **show cli directory** command output as XML tags:

```
user@host> show cli directory | display xml
<rpc-reply xmlns:junos="http://xml.juniper.net/junos/7.5I0/junos">
    <cli>
        <working-directory>/var/home/user</working-directory>
    </cli>
    <cli>
        <banner></banner>
    </cli>
</rpc-reply>
```

If the configuration data or command output contains characters that are outside of the 7-bit ASCII character set, the Junos OS CLI displays the equivalent UTF-8 decimal character reference for those characters in the XML output. For more information, see "Understanding Character Encoding on Devices Running Junos OS" on page 208

To display the change in the candidate and active configurations in XML tag format, see "Comparing Configurations and Displaying the Differences in XML" on page 274.

Displaying Static Configuration Data

To view the inherited configuration data and information about the source group from which the configuration has been inherited with respect to the static configuration database, issue the **show configuration | display inheritance** command.

```
user@host> show configuration | display inheritance
## Last commit: 2018-03-29 15:54:17 PDT
version 16.2R2;
system {
```

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```
...
}
```

Displaying Ephemeral Configuration Data

Juniper Extension Toolkit (JET) applications and NETCONF and Junos XML protocol client applications can configure the ephemeral configuration database. The ephemeral database is an alternate configuration database that provides a fast programmatic interface for performing configuration updates.

In Junos OS Release 18.1 and earlier, to view the complete post-inheritance configuration merged with the configuration data in all instances of the ephemeral configuration database, issue the **show ephemeral-configuration | display merge** command.

```
user@host> show ephemeral-configuration | display merge
## Last changed: 2017-02-01 09:47:20 PST
version 16.2R2;
system {
...
}
```

NOTE: Starting in Junos OS Release 18.2R1, the **display merge** option is deprecated. To view the complete post-inheritance configuration merged with the configuration data in all instances of the ephemeral database, issue the **show ephemeral-configuration merge** command.

Displaying Output in JSON Format

Starting in Junos OS Release 14.2, you can display the configuration or command output in JavaScript Object Notation (JSON) format by entering **display json** after the pipe symbol (|).

The following example displays the **show cli directory** command output in JSON format:

```
user@host> show cli directory | display json

{
    "cli" : [
    {
        "working-directory" : [
        {
            "data" : "/var/home/username"
        }
        ]
    }
    ]
}
```


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If the operational command output contains characters that are outside of the 7-bit ASCII character set, the Junos OS CLI displays the equivalent UTF-8 decimal character reference for those characters in the JSON output. For more information, see "Understanding Character Encoding on Devices Running Junos OS" on page 208

NOTE: Starting in Junos OS Release 16.1, devices running Junos OS emit JSON-formatted configuration data using a new default implementation for serialization.

NOTE: Starting in Junos OS Releases 16.1R4, 16.2R2, and 17.1R1, integers in Junos OS configuration data emitted in JSON format are not enclosed in quotation marks. In earlier releases, integers in JSON configuration data were treated as strings and enclosed in quotation marks.

NOTE: Starting in Junos OS Release 17.3R1, OpenConfig supports the operational state emitted by daemons directly in JSON format in addition to XML format. To configure JSON compact format, specify the following CLI command:
set system export-format state-data json compact.
This CLI command converts XML format to compact JSON format. Else, it emits the JSON in non-compact format.

Displaying the Configuration with YANG Translation Scripts Applied

Starting in Junos OS Release 16.1, you can load YANG modules onto devices running Junos OS to augment the configuration hierarchy with data models that are not natively supported by Junos OS but can be supported by translation. The active and candidate configurations contain the configuration data for non-native YANG data models in the syntax defined by that model, but they do not explicitly display the corresponding translated Junos OS syntax, which is committed as a transient change.

The **| display translation-scripts** filter displays the complete post-inheritance configuration, with the translated configuration data from all enabled translation scripts explicitly included in the output. To display the configuration with all enabled YANG translation scripts applied, append the **| display translation-scripts** filter to the **show configuration** command in operational mode or the **show** command in configuration mode. For example:

```
user@host> show configuration | display translation-scripts
```

To view just the non-native configuration data after translation, use the **| display translation-scripts translated-config** filter in either operational or configuration mode.

```
user@host> show configuration | display translation-scripts translated-config
```

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In configuration mode, to display just the configuration differences in the hierarchies corresponding to non-native YANG data models before or after translation scripts are applied, append the **configured-delta** or **translated-delta** keyword, respectively, to the **show | display translation-scripts** command. In both cases, the XML output displays the deleted configuration data, followed by the new configuration data.

`user@host#` **show | display-translation-scripts (configured-delta | translated-delta)**

The following example displays a sample configuration with and without translation scripts applied. The **show** command displays the configuration, which includes the non-native configuration data in the syntax defined by the YANG data model. The **| display translation-scripts** filter displays the non-native configuration data in both the syntax defined by the YANG data model and the translated Junos OS syntax. Both commands display the entire configuration, which has been truncated for brevity in this example. However, the **show** command returns the pre-inhertitance configuration, whereas the **show | display translation-scripts** command returns the post-inheritance configuration.

`user@host#` **show**

```
...
myint:intconfig {
    interfaces {
        interface ge-0/0/0 {
            config {
                description test;
            }
        }
    }
}
...
```

`user@host#` **show | display translation-scripts**

```
...
interfaces {
    ge-0/0/0 {
        description test;
        gigether-options {
            no-flow-control;
        }
    }
}
...
```

```
myint:intconfig {
    interfaces {
        interface ge-0/0/0 {
            config {
                description test;
            }
        }
    }
}
...
```


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Displaying the RPC Tags for a Command

To display the remote procedure call (RPC) XML tags for an operational mode command, enter **display xml rpc** after the pipe symbol (|).

The following example displays the RPC tags for the **show route** command:

```
user@host> show route | display xml rpc
<rpc-reply xmlns:junos="http://xml.juniper.net/junos/10.1I0/junos">
    <rpc>
        <get-route-information>
        </get-route-information>
    </rpc>
    <cli>
        <banner></banner>
    </cli>
</rpc-reply>
```

Ignoring Output That Does Not Match a Regular Expression

To ignore text that matches a regular expression, specify the **except** command after the pipe symbol (|). If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks. For information on common regular expression operators, see "Using Regular Expressions with the Pipe (|) Symbol to Filter Junos OS Command Output" on page 271.

The following example displays all users who are logged in to the router, except for the user **root**:

```
user@host> show system users | except root
 8:28PM  up 1 day, 13:59, 2 users, load averages: 0.01, 0.01, 0.00
USER     TTY FROM                  LOGIN@  IDLE WHAT
user     p0  device1.example.com   7:25PM     - cli
```

Displaying Output from the First Match of a Regular Expression

To display output starting with the first occurrence of text matching a regular expression, enter **find** after the pipe symbol (|). If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks. For information on common regular expression operators, see "Using Regular Expressions with the Pipe (|) Symbol to Filter Junos OS Command Output" on page 271.

The following example displays the routes in the routing table starting at IP address **208.197.169.0**:

```
user@host> show route | find 208.197.169.0
208.197.169.0/24   *[Static/5] 1d 13:22:11
                    > to 192.168.4.254 via so-3/0/0.0
224.0.0.5/32       *[OSPF/10] 1d 13:22:12, metric 1
iso.0: 1 destinations, 1 routes (1 active, 0 holddown, 0 hidden)
+ = Active Route, - = Last Active, * = Both
47.0005.80ff.f800.0000.0108.0001.1921.6800.4015.00/160
```

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```
                    *[Direct/0] 1d 13:22:12
                     > via lo0.0
```

The following example displays the first CCC entry in the forwarding table:

```
user@host> show route forwarding-table | find ccc
Routing table: ccc
MPLS:
Interface.Label    Type RtRef Nexthop       Type Index NhRef Netif
default            perm     0               rjct     3     1
0                  user     0               recv     5     2
1                  user     0               recv     5     2
32769              user     0               ucst    45     1 fe-0/0/0.534
fe-0/0/0. (CCC)    user     0               indr    44     2
                              10.0.16.2     Push 32768, Push
```

Retaining Output After the Last Screen

To not return immediately to the CLI prompt after viewing the last screen of output, enter **hold** after the pipe symbol (|). The following example prevents returning to the CLI prompt after you have viewed the last screen of output from the **show log log-file-1** command:

```
user@host> show log log-file-1 | hold
```

This filter is useful when you want to scroll or search through output.

Displaying Output Beginning with the Last Entries

To display text starting from the end of the output, enter **last <*lines*>** after the pipe symbol (|).

The following example displays the last entries in **log-file-1** file:

```
user@host> show log log-file-1 | last
```

This filter is useful for viewing log files in which the end of the file contains the most recent entries.

NOTE: When the number of lines requested is less than the number of lines that the screen length setting permits you to display, Junos OS returns as many lines as permitted by the screen length setting. That is, if your screen length is set to 20 lines and you have requested only the last 10 lines, Junos OS returns the last 19 lines instead of the last 10 lines.

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Displaying Output That Matches a Regular Expression

To display output that matches a regular expression, enter **match *regular-expression*** after the pipe symbol (|). If the regular expression contains any spaces, operators, or wildcard characters, enclose it in quotation marks. For information on common regular expression operators, see "Using Regular Expressions with the Pipe (|) Symbol to Filter Junos OS Command Output" on page 271.

The following example matches all the Asynchronous Transfer Mode (ATM) interfaces in the configuration:

```
user@host> show configuration | match at-
at-2/1/0 {
at-2/1/1 {
at-2/2/0 {
at-5/2/0 {
at-5/3/0 {
```

Preventing Output from Being Paginated

By default, if output is longer than the length of the terminal screen, you are provided with a **---(more)---** message to display the remaining output. To display the remaining output, press the Spacebar.

To prevent the output from being paginated, enter **no-more** after the pipe symbol (|).

The following example displays output from the **show configuration** command all at once:

```
user@host> show configuration | no-more
```

This feature is useful, for example, if you want to copy the entire output and paste it into an e-mail.

Sending Command Output to Other Users

To display command output on the terminal of a specific user logged in to your router, or on the terminals of all users logged in to your router, enter **request message (all | user *account*@*terminal*)** after the pipe symbol (|).

If you are troubleshooting your router and, for example, talking with a customer service representative on the phone, you can use the **request message** command to send your representative the command output you are currently viewing on your terminal.

The following example sends the output from the **show interfaces** command you enter on your terminal to the terminal of the user **root@ttyp1**:

```
user@host> show interfaces | request message user root@ttyp1
```

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The user **root@ttyp1** sees the following output appear on the terminal screen:

```
Message from user@host on /dev/ttyp0 at 10:32 PST...
Physical interface: dsc, Enabled, Physical link is Up
   Interface index: 5, SNMP ifIndex: 5
   Type: Software-Pseudo, MTU: Unlimited...
```

Resolving IP Addresses

In operational mode only, if the output of a command displays an unresolved IP address, you can enter **| resolve** after the command to display the name associated with the IP address. The **resolve** filter enables the system to perform a reverse DNS lookup of the IP address. If DNS is not enabled, the lookup fails and no substitution is performed.

To perform a reverse DNS lookup of an unresolved IP address, enter **resolve <full-names>** after the pipe symbol (|). If you do not specify the **full-names** option, the name is truncated to fit whatever field width limitations apply to the IP address.

The following example performs a DNS lookup on any unresolved IP addresses in the output from the **show ospf neighbors** command:

```
user@host> show ospf neighbors | resolve
```

Saving Output to a File

When command output is lengthy, when you need to store or analyze the output, or when you need to send the output in an e-mail or by FTP, you can save the output to a file. By default, the file is placed in your home directory on the router.

To save command output to a file, enter **save *filename*** after the pipe symbol (|).

The following example saves the output from the **request support information** command to a file named **my-support-info.txt:**

```
user@host> request support information | save my-support-info.txt
Wrote 1143 lines of output to 'my-support-info.txt'
user@host>
```

Appending Output to a File

When command output is displayed, you can either save the output to a file, which overwrites the existing contents of that file or you can append the output text to a specific file.

To append the command output to the file, enter **append *filename*** after the pipe symbol (|).

The following example appends the output from the **request support information** command to a file named **my-support-info.txt:**

```
user@host> request support information | append my-support-info.txt
```


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```
Wrote 2247 lines of output to 'my-support-info.txt'
user@host>
```

Displaying Output on Screen and Writing to a File

When command output is displayed, you can also write the output to a file. To both display the output and write it to a file, enter **tee *filename*** after the pipe symbol (|).

The following example displays the output from the **show interfaces ge-* terse** command (displaying information about the status of the Gigabit Ethernet interfaces on the device) and diverts the output to a file called **ge-interfaces.txt**:

```
user@host> show interfaces ge-* terse | tee ge-interfaces.txt
Interface               Admin Link Proto    Local                 Remote
ge-0/1/0                up    down
ge-0/1/1                up    up
ge-0/1/2                up    down
ge-0/1/3                up    up
```

Unlike the UNIX **tee** command, only an error message is displayed if the file cannot be opened (instead of displaying the output and then the error message).

```
user@host> show interfaces ge-* terse | tee /home/user/test.txt
error: tee failed: file /home/user/test.txt could not be opened

user@host>
```

Trimming Output by Specifying the Starting Column

Output appears on the terminal screen in terms of rows and columns. The first alphanumeric character starting at the left of the screen is in column 1, the second character is in column 2, and so on. To display output starting from a specific column (thus trimming the leftmost portion of the output), enter **trim columns** after the pipe symbol (|). The **trim** filter is useful for trimming the date and time from the beginning of system log messages.

The following example displays output from the **show system storage** command, filtering out the first 10 columns:

```
user@host> show system storage | trim 11
```

NOTE: The trim command does not accept negative values.

Refreshing the Output of a Command

You can run an operational mode command with the **| refresh** pipe option to refresh the output displayed on the screen periodically. The default refresh occurs every second. However, you can also explicitly specify a refresh interval from 1 through 604,800 seconds.

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For example, to refresh the output of the **show interfaces** command every 5 seconds, you would run the following command:

```
user@host> show interfaces | refresh 5
```

Filtering Operational Mode Command Output in a QFabric System

When you issue an operational mode command in a QFabric system, the output generated can be fairly extensive because of the number of components contained within the system. To make the output more accessible, you can filter the output by appending the **| filter** option to the end of most Junos OS commands.

1. To filter operational mode command output and limit it to a Node group, include the **| filter node-group** *node-group-name* option at the end of your Junos OS operational mode command.

   root@qfabric> show interfaces terse | filter node-group NW-NG-0

   ```
   Interface               Admin Link Proto    Local                 Remote
   NW-NG-0:dsc             up    up
   NW-NG-0:em0             up    up
   NW-NG-0:em1             up    up
   NW-NG-0:gre             up    up
   NW-NG-0:ipip            up    up
   NW-NG-0:lo0             up    up
   NW-NG-0:lo0.16384       up    up   inet     127.0.0.1           --> 0/0
   NW-NG-0:lo0.16385       up    up   inet
   NW-NG-0:lsi             up    up
   NW-NG-0:mtun            up    up
   NW-NG-0:pimd            up    up
   NW-NG-0:pime            up    up
   NW-NG-0:tap             up    up
   Node01:ge-0/0/10        up    up
   Node01:ge-0/0/40        up    up
   Node01:ge-0/0/41        up    up
   vlan                    up    up
   ```

2. To filter operational mode command output and limit it to a set of Node groups, include the **| filter node-group** option at the end of your Junos OS operational mode command and specify the list of Node group names in brackets.

   root@qfabric> show ethernet-switching interfaces | filter node-group [NW-NG-0 RSNG-1]

   ```
   Interface    State  VLAN members        Tag   Tagging  Blocking
   NW-NG-0:ae0.0 up    v200                200   tagged   unblocked
                       v50                 50    tagged   unblocked
                       v51                 51    tagged   unblocked
                       v52                 52    tagged   unblocked
                       v53                 53    tagged   unblocked
   RSNG-1:ae0.0  up    v200                200   untagged unblocked
   RSNG-1:ae47.0 up    v50                 50    tagged   unblocked
                       v51                 51    tagged   unblocked
                       v52                 52    tagged   unblocked
                       v53                 53    tagged   unblocked
   ```


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Release History Table

Release	Description
18.2R1	Starting in Junos OS Release 18.2R1, the **display merge** option is deprecated. To view the complete post-inheritance configuration merged with the configuration data in all instances of the ephemeral database, issue the **show ephemeral-configuration merge** command.
17.3R1	Starting in Junos OS Release 17.3R1, OpenConfig supports the operational state emitted by daemons directly in JSON format in addition to XML format. To configure JSON compact format, specify the following CLI command: **set system export-format state-data json compact**. This CLI command converts XML format to compact JSON format. Else, it emits the JSON in non-compact format.
16.2R2	Starting in Junos OS Release 16.2R2, the **show | compare | display xml** command omits the **<configuration>** tag in the XML output if the comparison returns no differences or if the comparison returns only differences for non-native configuration data, for example, configuration data associated with an OpenConfig data model.
16.1R4	Starting in Junos OS Releases 16.1R4, 16.2R2, and 17.1R1, integers in Junos OS configuration data emitted in JSON format are not enclosed in quotation marks. In earlier releases, integers in JSON configuration data were treated as strings and enclosed in quotation marks.
16.1	Starting in Junos OS Release 16.1, devices running Junos OS emit JSON-formatted configuration data using a new default implementation for serialization.
16.1	Starting in Junos OS Release 16.1, you can load YANG modules onto devices running Junos OS to augment the configuration hierarchy with data models that are not natively supported by Junos OS but can be supported by translation.
14.2	Starting in Junos OS Release 14.2, you can display the configuration or command output in JavaScript Object Notation (JSON) format by entering **display json** after the pipe symbol (|).

Related Documentation

- Day One: Exploring the Junos CLI

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CHAPTER 6

Junos OS Configuration Statements and Commands

- activate
- annotate
- apply-groups on page 291
- apply-groups-except on page 291
- archival on page 292
- archive-sites (Configuration File) on page 293
- autoinstallation on page 295
- clear system commit prepared
- commit
- commit activate on page 302
- commit prepare on page 303
- commit-interval (Batch Commits) on page 304
- configuration on page 305
- configuration-breadcrumbs on page 306
- configuration-servers on page 307
- copy
- days-to-keep-error-logs (Batch Commits) on page 308
- deactivate
- delete
- edit
- exit
- export-format on page 313
- groups on page 315
- help
- insert
- load

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- maximum-aggregate-pool (Batch Commits) on page 321
- maximum-entries (Batch Commits) on page 322
- no-hidden-commands on page 322
- protect
- quit
- rename
- replace
- rollback
- run
- save
- server (Batch Commits) on page 331
- set
- show
- show configuration
- show | display inheritance
- show | display omit
- show | display set
- show | display set relative
- show groups junos-defaults
- status
- synchronize on page 345
- top
- traceoptions (Batch Commits) on page 348
- transfer-interval (Configuration) on page 349
- transfer-on-commit on page 350
- unprotect
- up
- update
- when on page 354
- wildcard delete

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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 309
- Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration on page 105

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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 oneliners. However, annotation of parts (child statements or identifiers within a oneliner) of the oneliner is not supported. For example, in the following sample configuration hierarchy, annotation is supported up to the oneliner 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 OS Configuration on page 116

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apply-groups

Syntax

```
apply-groups [ group-names ];
```

Hierarchy Level All hierarchy levels

Release Information Statement introduced before Junos OS Release 7.4.

Description Apply a configuration group to a specific hierarchy level in a configuration, to have a configuration inherit the statements in the configuration group.

You can specify more than one group name. You must list them in order of inheritance priority. The configuration data in the first group takes priority over the data in subsequent groups.

Options ***group-names***—One or more names specified in the **groups** 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

- Applying a Junos OS Configuration Group on page 124
- groups on page 315

apply-groups-except

Syntax

```
apply-groups-except [ group-names ];
```

Hierarchy Level All hierarchy levels except the top level

Release Information Statement introduced before Junos OS Release 7.4.

Description Disable inheritance of a configuration group.

Options ***group-names***—One or more names specified in the **groups** 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

- groups on page 315
- Disabling Inheritance of a Junos OS Configuration Group on page 127

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archival

Syntax

```
archival {
  configuration {
    archive-sites {
      file://<path>/<filename>;
      ftp://username@host:<port>url-path password password;
      http://username@host:<port>url-path password password;
      pasvftp://username@host:<port>url-path password password;
      scp://username@host:<port>url-path password password;
    }
    transfer-interval interval;
    transfer-on-commit;
  }
}
```

Hierarchy Level

```
[edit system]
```

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Configure copying of the currently active configuration to an archive site. An archive site can be a file, or an FTP, HTTP, or SCP location.

Options

The remaining statements are explained separately.

NOTE: The **[edit system archival]** hierarchy is not available on QFabric systems.

Required Privilege Level

admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- Backing Up Configurations to an Archive Site on page 217

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archive-sites (Configuration File)

Syntax

```
archive-sites {
  file://<path>/<filename>;
  ftp://username@host:<port>url-path password password;
  pasvftp://username@host:<port>url-path password password;
  scp://username@host:<port>url-path password password;
}
```

Hierarchy Level

[edit system archival configuration]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Specify where to transfer the current configuration files. When specifying a URL in a Junos OS statement using an IPv6 host address, you must enclose the entire URL in quotation marks (" ") and enclose the IPv6 host address in brackets ([ ]). For example, **"scp://*username*<:*password*>@[*ipv6-host-address*]<:*port*>/*url-path*"**

If you specify more than one archive site, the router or switch attempts to transfer the configuration files to the first archive site in the list, moving to the next only if the transfer fails.

The destination filename is saved in the following format, where *n* corresponds to the number of the compressed configuration rollback file that has been archived:

*router-name_YYYYMMDD_HHMMSS*_juniper.conf.*n*.gz

NOTE: The time included in the destination filename is always in Coordinated Universal Time (UTC) regardless of whether the time on the router or switch is configured as UTC or the local time zone. The default time zone on the router or switch is UTC.

NOTE: The **[edit system archival]** hierarchy is not available on QFabric systems.

Options

The prefix used in the configuration statement determines the form of transfer:

file:// —transfer on a path to a named file

ftp:// —transfer using active FTP server

pasvftp:// —transfer to a device that only accepts passive FTP services

scp:// —transfer to a known host using background SCP file transfers

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring Archive Sites for the Transfer of Active Configuration Files on page 218
- Junos OS Commit Model for Configurations on page 157
- configuration on page 305
- transfer-on-commit on page 350

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autoinstallation

Syntax

```
autoinstallation {
  configuration-servers {
    url;
  }
  interfaces {
    interface-name {
      bootp;
      rarp;
    }
  }
}
```

Hierarchy Level

```
[edit system]
```

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.1 for EX Series switches.
Statement introduced in Junos OS Release 12.2 for ACX Series Universal Metro Routers.

Description

Download a configuration file automatically from an FTP, Hypertext Transfer Protocol (HTTP), or Trivial FTP (TFTP) server. When you power on a router or switch configured for autoinstallation, it requests an IP address from a Dynamic Host Configuration Protocol (DHCP) server. Once the router or switch has an address, it sends a request to a configuration server and downloads and installs a configuration.

Options

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *ACX Series Autoinstallation Overview*
- *Before You Begin Autoinstallation on an ACX Series Universal Metro Router*
- *Autoinstallation Configuration of ACX Series Universal Metro Routers*
- *USB Autoinstallation on ACX Series Routers*
- *Verifying Autoinstallation on ACX Series Universal Metro Routers*
- *show system autoinstallation status*
- *Upgrading Software by Using Automatic Software Download for Switches*
- configuration-servers on page 307
- *idle-timeout*

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clear system commit prepared

Syntax

```
clear system commit prepared
```

Release Information Command introduced in Junos OS Release 17.3.

Description Clear the prepared commit. This initiates cleanup of the saved database data structures and the necessary files that are generated as a result of the commit preparation stage and unlinks the pending activation file. A log message is generated upon successful clearing of the pending commit.

Options This command has no options.

Required Privilege Level maintenance (or the actual user who scheduled the commit)

Related Documentation

- clear system commit on page 379

List of Sample Output

clear system commit prepared on page 296
clear system commit prepared (None Prepared) on page 296

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear system commit prepared

```
user@host> clear system commit prepared
Prepared commit cleared.
```

clear system commit prepared (None Prepared)

```
user@host> clear system commit prepared
No commit prepared.
```


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commit

Syntax

```
commit
<activate>
<and-quit>
<at "string">
<check>
<comment <comment-string>
<confirmed>
<peers-synchronize>
<prepare>
<scripts>
<synchronize | no-synchronize>
< | >
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Option **synchronize scripts** introduced in Junos OS Release 13.2.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Option **no-synchronize** introduced in Junos OS Release 17.2R1

Description

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

Options

none—Execute the **commit** command without any options to commit the configuration changes to the configuration database.

activate—Complete commit in two steps of preparing the configuration for commit and later activating the configuration. This enables you configure a number of devices and simultaneously activate the configurations on multiple devices.

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

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 by at least one minute 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 device.

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- 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 "2018-03-10 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 Junos OS fails before the configuration changes become active, all configuration changes are lost.
- You cannot enter the **commit at** configuration mode 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 system commit** command to cancel a scheduled commit configuration, see *clear system commit*.

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 **commit check** command. Enclose ***comment-string*** in quotation marks (" "). For example, **commit comment "Includes changes recommended by user".**

confirmed <*<in 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.

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- The timeout for the **commit confirmed** command is calculated based on the system time, when the **commit confirmed** command is issued. In case the system time is modified while a **commit confirmed** is pending, the remaining time until commit execution might get shortened (in case the old system time is behind) or prolonged (in case the old system time is ahead) from the intended interval.
- In Junos OS Release 11.4 and later, you can also use the **commit confirmed** command in the **[edit private]** configuration mode.

no-synchronize—(Optional) Configure the **commit** command to run without synchronization. This can be useful in situations, for example, where a Routine Engine configuration is corrupted such that a commit synchronization is not possible or will block the commit.

- This option allows you to commit only on the current Routing Engine even if **set system commit synchronize** is configured.
- This option overrides the **commit peer-synchronize** configuration as well. If you have configured the commit synchronize using **set system commit synchronize** and then use the command **commit no-synchronize**, the commit will happen only on the device issuing the command.
- When using **commit synchronize**, the commit is first done in the other Routing Engine and then in the current one. If the other Routine Engine is corrupted, the commit will fail. In such cases, you can use **commit no-synchronize**. This command cannot be configured using **set**. It can only be run.

peers-synchronize—(Optional) Configure the commit command to automatically perform a peers-synchronize action between peers. The local peer (or requesting peer) on which you enable the peers-synchronize statement copies and loads its configuration to the remote (or responding) peer. Each peer then performs a syntax check on the configuration file being committed. If no errors are found, the configuration is activated and becomes the current operational configuration on both peers.

synchronize—(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 (the request Routing Engine) copies and loads its candidate configuration to the other Routing Engine (the 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 **synchronize** option has the following two additional options:

- **<force>**—(Optional) Enforce commit synchronization on the Routing Engines by using the **force** option.

  The **commit synchronize** command does not work if the responding Routing Engine has uncommitted configuration changes. You can enforce commit synchronization

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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 are terminated and the configuration is synchronized with that on the Routing Engine from which you issued the command.

- **<scripts>**—(Optional) Synchronize all commit, event, lib, op, and SNMP scripts from the requesting Routing Engine to the responding Routing Engine and commit and synchronize the configuration.

  If the **commit check** operation fails for the requesting Routing Engine, the process stops, and the scripts are not copied to the responding Routing Engine. If the **commit check** or **commit** operation fails for the responding Routing Engine, the scripts are still synchronized, since the synchronization occurs prior to the **commit check** operation on the responding Routing Engine.

- If the **load-scripts-from-flash** statement is configured at the **[edit system scripts]** hierarchy level for the requesting Routing Engine, the device synchronizes the scripts from flash memory on the requesting Routing Engine to flash memory on the responding Routing Engine. Otherwise, the device synchronizes the scripts from the hard disk on the requesting Routing Engine to the hard disk on the responding Routing Engine. The device synchronizes all scripts regardless of whether they are enabled in the configuration or have been updated since the last synchronization.

NOTE:

- It can happen that the **commit synchronize** command is initiated at the same time from both Routing Engines, which causes the process to hang. As of Junos OS Release 15.1, this is a temporary (20 seconds) anomaly, after which the user can try the **commit sychronize** command again.

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 OS Configuration Group" on page 127.

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

prepare—(Optional) Prepare the configuration to activate at a later stage. During the preparation stage, all the required files and databases are generated and the configuration is validated. A file is created that indicates if the commit is pending for activation. In the event of failure during the preparation stage, the log message commit preparation failed is generated.

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scripts—(Optional) Commit newly enabled scripts during the commit operation and push scripts to the other Routing Engine.

|—(Optional) Use the (**| (pipe)**) options to filter the output of the **commit** command.

Additional Information

NOTE: Beginning in Junos OS 12.3, it is possible that FPCs brought offline using the **request chassis fpc slot** *fpc-slot* **offline** operational-mode CLI command can come online during a configuration commit or power-supply replacement procedure. As an alternative, use the **set fpc** *fpc-slot* **power off** configuration-mode command at the **[edit chassis]** hierarchy level to ensure that the FPCs remain offline.

| 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.

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

- | (pipe) on page 401
- Verifying the Junos OS Configuration on page 156, Committing a Configuration on page 157
- Scheduling a Junos OS Commit Operation on page 166

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- Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration on page 105
- Monitoring the Junos OS Commit Process on page 167
- Adding a Comment to Describe the Committed Configuration on page 168
- *Committing Configurations on a Routing Matrix with a TX Matrix Plus Router*
- *Commit Script Overview*

commit activate

Syntax

```
commit activate{
  comment;
  and-quit;
  peers-synchronize;
  synchronize;
}
```

Hierarchy Level

```
[edit system]
```

Release Information

Statement introduced in Junos OS Release 17.3R1.

Description

Activate a previously prepared commit. Upon successful validation, during the activation stage, previously prepared commits are activated. Also, pending activation files are checked during this stage. If there are pending activation files, the existence of required files and daemon map present in the database data structures are checked. If there is any failure, a log message is generated that informs you that the commit has failed.

Options

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

no-synchronize—(Optional) Do not synchronize the commit. Configure the **commit prepare** statement to run without synchronization.

peers-synchronize—(Optional) Synchronize the commit on remote peers.

synchronize—(Optional) Synchronize the commit on both Routing Engines.

Required Privilege Level

configure—To enter configuration mode.
system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Commit Preparation and Activation Overview on page 162
- Committing Junos OS Configurations in Two Steps: Preparation and Activation on page 163

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commit prepare

Syntax

```
commit prepare{
  and-quit;
  no-synchronize;
  peers-synchronize;
synchronize;
  }
```

Hierarchy Level

```
[edit system]
```

Release Information

Statement introduced in Junos OS Release 17.3.

Description

Prepare for an upcoming commit activation. Prepare the configurations that can be activated at a later stage. During the preparation stage, all the required files and databases are generated and the configuration is validated. A file is created that indicates if the commit is pending for activation. In the event of failure during the preparation stage, the log message **commit preparation failed** is generated.

Options

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

no-synchronize—(Optional) Do not synchronize the commit. Configure the **commit prepare** statement to run without synchronization.

peers-synchronize—(Optional) Synchronize the commit on remote peers.

synchronize—(Optional) Synchronize the commit on both Routing Engines.

Required Privilege Level

configure—To enter configuration mode.
system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Commit Preparation and Activation Overview on page 162
- Committing Junos OS Configurations in Two Steps: Preparation and Activation on page 163

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commit-interval (Batch Commits)

Syntax commit-interval *schedule name for low priority commits*;

Hierarchy Level [edit system commit server],
[edit system commit synchronize server]

Release Information Statement introduced in Junos OS Release 12.1.

Description Scheduling profile for asynchronous low priority commits.

Options ***number-of-seconds-between-commits***—Time interval (in seconds) between two commit operations.

Range: 1 through 30 seconds.

Default: 5 seconds.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring Batch Commit Server Properties on page 170

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configuration

Syntax

```
configuration {
  transfer-interval interval;
  transfer-on-commit;
  archive-sites {
    file://<path>/<filename>;
    ftp://username@host:<port>url-path password password;
    http://username@host:<port>url-path password password;
    pasvftp://username@host:<port>url-path password password;
    scp://username@host:<port>url-path password password;
  }
}
```

Hierarchy Level

```
[edit system archival]
```

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Configure the router or switch to periodically transfer its currently active configuration (or after each commit).

NOTE: The **[edit system archival]** hierarchy is not available on QFabric systems.

Options

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Backing Up Configurations to an Archive Site on page 217
- *archive*
- archive-sites on page 293
- transfer-interval on page 349
- transfer-on-commit on page 350

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configuration-breadcrumbs

Syntax configuration-breadcrumbs;

Hierarchy Level [edit system login class]

Release Information Statement introduced in Junos OS Release 12.2.

Description Enable the configuration breadcrumbs view in the CLI to display the location in the configuration hierarchy.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- Example: Enabling Configuration Breadcrumbs on page 66
- *Defining Junos OS Login Classes*
- *class*
- *login*

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configuration-servers

Syntax

```
configuration-servers {
  url;
}
```

Hierarchy Level

[edit system autoinstallation]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description

For EX Series switches only, configure the URL address of a server from which to obtain configuration files. Examples of URLs:

tftp://*hostname/path/filename*

ftp://*username:prompt@ftp.hostname.net/filename /*

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Upgrading Software by Using Automatic Software Download for Switches*
- Getting Started Guide for your router model
- autoinstallation on page 295
- *idle-timeout*

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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 OS Statement in the Configuration on page 92

days-to-keep-error-logs (Batch Commits)

Syntax days-to-keep-error-logs *days-to-keep-error-log-entries*;

Hierarchy Level [edit system commit server],
[edit system commit synchronize server]

Release Information Statement introduced in Junos OS Release 12.1.

Description For Junos OS batch commits, specify the number of days to keep the error logs.

Options ***days-to-keep-error-log-entries***—Number of days to keep the error logs.
Range: 1 through 366 days
Default: 1 day

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- Example: Configuring Batch Commit Server Properties on page 170

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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 289
- delete on page 310
- Deactivating and Reactivating Statements and Identifiers in a Junos OS Configuration on page 105.

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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 309
- Deleting a Statement from a Junos OS Configuration on page 90

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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 333
- Displaying the Current Junos OS Configuration on page 149

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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 347
- up on page 352
- Displaying the Current Junos OS Configuration on page 149

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export-format

Syntax

```
export-format {
  json {
    ietf;
  }
}
```

Hierarchy Level

```
[edit system]
```

Release Information

Statement introduced in Junos OS Release 16.1.

Description

Specify the default implementation of the serialization to use for exported data in the given format. This statement only affects Junos OS configuration data that is displayed in the requested format.

Options

json—Define which implementation of the serialization to use for configuration data emitted in JavaScript Object Notation (JSON) format.

Acceptable values include:

- **ietf**—JSON data is emitted according to the encoding rules defined in Internet drafts draft-ietf-netmod-yang-json-09, *JSON Encoding of Data Modeled with YANG*, and draft-ietf-netmod-yang-metadata-06, *Defining and Using Metadata with YANG*.

Default: ietf

NOTE: Starting in Junos OS Release 17.3R1, OpenConfig supports the operational state emitted by daemons directly in JSON format in addition to XML format. To configure JSON compact format, specify the following CLI command:
set system export-format state-data json compact.
This CLI command converts XML format to compact JSON format. Else, it emits the JSON in non-compact format.

Required Privilege Level

maintenance—To view this statement in the configuration.
maintenance-control—To add this statement to the configuration.

Release History Table

Release	Description

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17.3R1	Starting in Junos OS Release 17.3R1, OpenConfig supports the operational state emitted by daemons directly in JSON format in addition to XML format. To configure JSON compact format, specify the following CLI command: **set system export-format state-data json compact**. This CLI command converts XML format to compact JSON format. Else, it emits the JSON in non-compact format.

Related Documentation

- *Mapping Junos OS Command Output to JSON in the CLI*
- *Mapping Junos OS Configuration Statements to JSON*

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groups

Syntax

```
groups {
  group-name {
    configuration-data;
    when {
      chassis chassis-id;
      member member-id;
      model model-id;
      node node-id;
      peers [ names of peers ]
      routing-engine routing-engine-id;
      time <start-time> [to <end-time>];
    }
      conditional-data;
  }
  lccn-re0 {
    configuration-data;
  }
  lccn-re1 {
    configuration-data;
  }
}
```

Hierarchy Level [edit]

Release Information Statement introduced before Junos OS Release 7.4.

Description Create a configuration group.

Options —

group-name——Name of the configuration group. To configure multiple groups, specify more than one ***group-name***.

configuration-data—The configuration statements that are to be applied elsewhere in the configuration with the **apply-groups** statement, to have the target configuration inherit the statements in the group.

when *conditional-data*—Option introduced in Junos 11.3. The conditional statements that are to be applied when this configuration group is applied.

On routers that support multiple Routing Engines, you can also specify two special group names:

re0—Configuration statements that are to be applied to the Routing Engine in slot 0.

re1—Configuration statements that are to be applied to the Routing Engine in slot 1.

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The configuration specified in group **re0** is applied only if the current Routing Engine is in slot 0; likewise, the configuration specified in group **re1** is applied only if the current Routing Engine is in slot 1. Therefore, both Routing Engines can use the same configuration file, each using only the configuration statements that apply to it. Each **re0** or **re1** group contains at a minimum the configuration for the hostname and the management interface (**fxp0**). If each Routing Engine uses a different management interface, the group also should contain the configuration for the backup router and static routes.

(Routing matrix only) The TX Matrix router supports group names for the Routing Engines in each connected T640 router in the following formats:

NOTE: **The management Ethernet interface used for the TX Matrix Plus router, T1600 routers in a routing matrix, and PTX Series Packet Transport Routers, is em0. Junos OS automatically creates the router's management Ethernet interface, em0.**

- **lcc*n*-re0**—Configuration statements applied to the Routing Engine in slot 0 of the specified T640 router that is connected to a TX Matrix router.
- **lcc*n*-re1**—Configuration statements applied to the specified to the Routing Engine in slot 1 of the specified T640 router that is connected to a TX Matrix router.

  n identifies the T640 router and can be from 0 through 3.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level

configure—To enter configuration mode.

Related Documentation

- Creating a Junos OS Configuration Group on page 122
- apply-groups on page 291
- apply-groups-except on page 291

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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 on page 51

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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 OS Configuration on page 100

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load

Syntax

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

QFX Series

```
load (dhcp-snooping filename)
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
json option introduced in Junos OS Release 16.1.

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.

For information on valid filename and URL formats, see *Format for Specifying Filenames and URLs in Junos OS CLI Commands*.

NOTE: **load can be run from configuration mode only.**

Options

dhcp-snooping—(QFX Series switches) Loads DHCP snooping entries.

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. The **factory-default** option cannot be combined with other options.

NOTE: **To load the factory default configuration, you must first unprotect any protected hierarchies in the configuration.**

filename—Name of the file to load. For information about specifying the filename, see "Viewing Files and Directories on a Device Running Junos OS" on page 257.

json—(Optional) Load configuration data that uses JavaScript Object Notation (JSON) format. This option can be used with the **merge**, **override**, or **update** options.

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

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

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

relative—(Optional) Load the new configuration data relative to the current edit point in the configuration hierarchy.

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**.

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 or the Terminal on page 206

Sample Output

The following is an example of a load scenario using Secure Copy (scp).

To Load a Configuration File Using Secure Copy Protocol (scp) with 'source-address' and 'routing-instance' options

To load a configuration file using the scp command with the **source-address** and **routing-instance** options, enter the following command:

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`root@host#` **load merge scp://***`user@hostname/path/filename`* **source-address** *`address`* **routing-instance** ***instance-name***

The scp options **source-address** and **routing-instance** are supported for **load override**, **load patch**, **load replace**, **load set**, and **load update** options also.

maximum-aggregate-pool (Batch Commits)

Syntax

```
maximum-aggregate-pool maximum-number-of-commits-to-aggregate;
```

Hierarchy Level

```
[edit system commit server],
[edit system commit synchronize server]
```

Release Information Statement introduced in Junos OS Release 12.1.

Description For Junos OS batch commits, specify the maximum number of individual commit operations that are aggregated or merged into a single commit operation.

Options ***maximum-number-of-commits-to-aggregate***—Maximum number of individual commit operations that are aggregated or merged into a single commit operation.

Range: 1 through 4294967295

Default: 5

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring Batch Commit Server Properties on page 170

maximum-entries (Batch Commits)

Syntax maximum-entries *number-of-entries*;

Hierarchy Level [edit system commit server],
[edit system commit synchronize server]

Release Information Statement introduced in Junos OS Release 12.1.

Description For Junos OS batch commits, specify the maximum number of commit jobs that are included in the commit queue.

Options ***number-of-entries***—Maximum number of commit jobs that are included in the commit queue.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- Example: Configuring Batch Commit Server Properties on page 170

no-hidden-commands

Syntax no-hidden-commands;

Hierarchy Level [edit system]

Release Information Statement introduced in Junos OS Release 16.1 EX Series, M Series and MX Series.

Description Hidden commands are Junos OS commands that are not published but could be run on a router. Hidden command serve a specific purpose but for most part are not expected to be used by the customers and are not supported. The **no-hidden-commands** statement allows the user to block all hidden commands to all users except root.

Default Hidden commands are enabled by default.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

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protect

Syntax protect (*hierarchy* | *statement* | *identifier*)

Release Information Command introduced in Junos OS Release 11.2.

Description Protect a hierarchy, statement, or identifier from modification or deletion.

Options none

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

- Example: Protecting the Junos OS Configuration from Modification or Deletion on page 230

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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 347
- up on page 352
- Displaying the Current Junos OS Configuration on page 149

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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-0/1/0.0 to ge-0/1/10.0 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 OS Configuration on page 104

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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. For more information, refer to KB30332.

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 the Junos OS Configuration on page 107

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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 (Optional)—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 on page 191
- Creating and Returning to a Rescue Configuration on page 224

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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 on page 69

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save

Syntax save *filename*

QFX Series save (dhcp-snooping *filename*)

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX 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.

For information on valid filename and URL formats, see *Format for Specifying Filenames and URLs in Junos OS CLI Commands*.

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*/%2F*path/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@ftphostname.net//filename
```

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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 OS Configuration on page 105

Sample Output

The following is an example of a save scenario:

Save a File Using Secure Copy Protocol (scp) with 'source-address' and 'routing-instance' options

To use the scp command to save local file to a remote system with the **source-address** and **routing-instance** enter the following command:

```
root@host# save scp://user@hostname/path/filename routing-instance instance-name
source-address address
```


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server (Batch Commits)

Syntax

```
server {
  commit-interval<number-of-seconds-between-commits>;
  commit-schedule-profile;
  days-to-keep-error-logs<days-to-keep-error-log-entries>;
  maximum-aggregate-pool<maximum-number-of-commits-to-aggregate>;
  maximum-entries <number-of-entries>;
  redirect-completion-status;
  retry-attempts;
  retry-interval;
  traceoptions {
    file filename;
    files number;
    flag (all | batch | commit-server | configuration);
    size maximum-file-size;
    (world-readable | no-world-readable);
  }
}
```

Hierarchy Level

```
[edit system commit]
```

Release Information

Statement introduced in Junos OS Release 12.1.

Description

Configure the system commit to occur in batches. Configure parameters for aggregating and saving batch commits.

Options

commit-interval—Configure the interval between commits.

commit-schedule-profile—Configure the scheduling profile for asynchronous low priority commits.

days-to-keep-error-logs—Configure the number of days to keep log entries.

maximum-aggregate-pool—Configure the maximum number of commits to aggregate together.

maximum-entries —Configure the maximum number of commit entries.

redirect-completion-status—Configure the redirect asynchronous commit status to server configured here.

retry-attempts—Configure the retry attempts for commit failure due to db lock error.

retry-interval—Configure the retry interval in seconds for commit failure.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

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Related Documentation

- Example: Configuring Batch Commit Server Properties on page 170

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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 311
- Displaying the Current Junos OS Configuration on page 149

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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 on page 338
- show | display omit on page 339
- show | display set on page 340
- show | display set relative on page 341
- show groups junos-defaults on page 342
- Displaying the Current Junos OS Configuration on page 149

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show configuration

Syntax

```
show configuration
<statement-path>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description

Display the configuration that currently is running on the router or switch, which is the last committed configuration.

Options

none—Display the entire configuration.

statement-path—(Optional) Display one of the following hierarchies in a configuration. (Each ***statement-path*** option has additional suboptions not described here. See the appropriate feature guide or EX Series switch documentation for more information.)

- **access**—Network access configuration.
- **access-profile**—Access profile configuration.
- **accounting-options**—Accounting data configuration.
- **applications**—Applications defined by protocol characteristics.
- **apply-groups**—Groups from which configuration data is inherited.
- **chassis**—Chassis configuration.
- **chassis network-services**—Current running mode.
- **class-of-service**—Class-of-service configuration.
- **diameter**—Diameter base protocol layer configuration.
- **ethernet-switching-options**—(EX Series switch only) Ethernet switching configuration.
- **event-options**—Event processing configuration.
- **firewall**—Firewall configuration.
- **forwarding-options**—Options that control packet sampling.
- **groups**—Configuration groups.
- **interfaces**—Interface configuration.
- **jsrc**—JSRC partition configuration.
- **jsrc-partition**—JSRC partition configuration.
- **logical-systems**—Logical system configuration.
- **poe**—(EX Series switch only) Power over Ethernet configuration.

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- **policy-options**—Routing policy option configuration.
- **protocols**—Routing protocol configuration.
- **routing-instances**—Routing instance configuration.
- **routing-options**—Protocol-independent routing option configuration.
- **security**—Security configuration.
- **services**—Service PIC applications configuration.
- **snmp**—Simple Network Management Protocol configuration.
- **system**—System parameters configuration.
- **virtual-chassis**—(EX Series switch only) Virtual Chassis configuration.
- **vlans**—(EX Series switch only) VLAN configuration.

Additional Information

The portions of the configuration that you can view depend on the user class that you belong to and the corresponding permissions. If you do not have permission to view a portion of the configuration, the text **ACCESS-DENIED** is substituted for that portion of the configuration. If you do not have permission to view authentication keys and passwords in the configuration, because the **secret** permission bit is not set for your user account, the text **SECRET-DATA** is substituted for that portion of the configuration. If an identifier in the configuration contains a space, the identifier is displayed in quotation marks.

Likewise, when you issue the **show configuration** command with the **| display set** pipe option to view the configuration as **set** commands, those portions of the configuration that you do not have permissions to view are substituted with the text **ACCESS-DENIED**.

Required Privilege Level

view

Related Documentation

- Displaying the Current Junos OS Configuration on page 149
- Overview of Junos OS CLI Operational Mode Commands on page 245

List of Sample Output

show configuration on page 336
show configuration policy-options on page 337

Output Fields

This command displays information about the current running configuration.

Sample Output

show configuration

```
user@host> show configuration
## Last commit: 2006-10-31 14:13:00 PST by user1 version "8.2I0 [userb]"; ## last
 changed: 2006-10-31 14:05:53 PST
```


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```
system {
    host-name exhost;
    domain-name ex1.net;
    backup-router 198.51.100.254;
   time-zone America/Los_Angeles;
    default-address-selection;
    name-server {
        192.0.2.254;
        192.0.2.249;
        192.0.2.176;
    }
    services {
        telnet;
    }
    tacplus-server {
        10.2.3.4 {
            secret /* SECRET-DATA */;
            ...
        }
    }
}
interfaces {
    ...
}
protocols {
        isis {
            export "direct routes";
        }
}
policy-options {
    policy-statement "direct routes" {
        from protocol direct;
        then accept;
    }
}
```

show configuration policy-options

```
user@host> show configuration policy-options
```

```
policy-options {
    policy-statement "direct routes" {
        from protocol direct;
        then accept;
    }
}
```

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show | display inheritance

Syntax show | display inheritance <brief | defaults | no-comments | terse>

Release Information Command introduced before Junos OS Release 7.4.

Description Show the inherited configuration data and information about the source group from which the configuration has been inherited. Show interface ranges configuration data in expanded format and information about the source interface-range from which the configuration has been expanded

```
user@host# show system ports | display inheritance defaults
## 'console' was inherited from group 'junos-defaults'
## 'vt100' was inherited from group 'junos-defaults'
## console type vt100;
```

```
user@host# show system login class readonly | display inheritance
## 'interface' was inherited from group global'
## 'network' was inherited from group global'
## 'routing' was inherited from group global'
## 'system' was inherited from group global'
## 'trace' was inherited from group global'
## 'view' was inherited from group global'
##
permissions [ interface network routing system trace view ];
```

```
user@host# show system login class readonly | display inheritance no-comments
permissions [ interface network routing system trace view ];
```

Options

- **brief**—Display brief output for the command.
- **defaults**—Display the Junos OS defaults that have been applied to the configuration.
- **no-comments**—Display configuration information without inline comments marked with **##**.
- **terse**—Display terse output with inheritance details as inline comment.

Required Privilege Level view

Related Documentation

- Using the junos-defaults Configuration Group on page 129

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show | display omit

Syntax

```
show | display omit
```

Release Information

Command introduced in Junos OS Release 8.2.

Description

Display configuration statements (including those marked as hidden by the **apply-flags omit** configuration statement).

```
user@host# show | display omit
  system {
    apply-flags omit;
    login {
      message lengthy-login-message;
    }
  }
```

Required Privilege Level

view

Related Documentation

- show on page 334

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show | display set

Syntax

```
show | display set
```

Release Information

Command introduced before Junos OS Release 7.4.

Description

Display the configuration as a series of configuration mode commands required to re-create the configuration from the top level of the hierarchy as **set** commands

```
user@host# show | display set
   set interfaces fe-0/0/0 unit 0 family inet address 192.168.1.230/24
   set interfaces fe-0/0/0 unit 0 family iso
   set interfaces fe-0/0/0 unit 0 family mpls
   set interfaces fe-0/0/0 unit 1 family inet address 10.0.0.1/8
deactivate interfaces fe-0/0/0 unit 1
```

Required Privilege Level

view

Related Documentation

- show on page 334
- Displaying set Commands from the Junos OS Configuration on page 154

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show | display set relative

Syntax

```
show | display set relative
```

Release Information

Command introduced before Junos OS Release 7.4.

Description

Display the configuration as a series of configuration mode commands required to re-create the configuration from the current hierarchy level.

```
[edit interfaces fe-0/0/0]
   user@host# show
   unit 0 {
      family inet {
         address 192.107.1.230/24;
      }
      family iso;
      family mpls;
   }
   inactive: unit 1 {
      family inet {
         address 10.0.0.1/8;
      }
   }
   user@host# show | display set relative
   set unit 0 family inet address 192.107.1.230/24
   set unit 0 family iso
   set unit 0 family mpls
   set unit 1 family inet address 10.0.0.1/8
deactivate unit 1
```

Required Privilege Level

view

Related Documentation

- Displaying set Commands from the Junos OS Configuration on page 154

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show groups junos-defaults

Syntax

```
show groups junos-defaults
```

Release Information

Command introduced before Junos OS Release 7.4.

Description

Display the full set of available preset statements from the Junos OS defaults group.

```
user@host# show groups junos-defaults
  groups {
    junos-defaults {
      applications {
        # File Transfer Protocol
        application junos-ftp {
          application-protocol ftp;
          protocol tcp;
          destination-port 21;
        }
        # Trivial File Transfer Protocol
        application junos-tftp {
          application-protocol tftp;
          protocol udp;
          destination-port 69;
        }
        # RPC port mapper on TCP
        application junos-rpc-portmap-tcp {
          application-protocol rpc-portmap;
          protocol tcp;
          destination-port 111;
        }
        # RPC port mapper on UDP
      }
    }
  }
```

Required Privilege Level

view

Related Documentation

- Using Junos OS Defaults Groups.

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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.

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- “Displaying Users Currently Editing the Junos OS Configuration” on page 87.

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synchronize

Syntax synchronize;

Hierarchy Level [edit system commit]

Release Information Statement introduced in Junos OS Release 7.4.
Statement introduced in Junos OS Release 10.4 for EX Series switches.

Description For devices with multiple Routing Engines only. Configure the **commit** command to automatically perform a **commit synchronize** action between dual Routing Engines within the same chassis. The Routing Engine on which you execute the **commit** command (the requesting Routing Engine) copies and loads its candidate configuration to the other (the responding) Routing Engine. Each Routing Engine then performs 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.

NOTE: If you configure the **commit synchronize** statement at the **[edit system]** hierarchy level and issue a **commit** in the master Routing Engine, the master configuration is automatically synchronized with the backup. However, if the backup Routing Engine is down when you issue the **commit**, the Junos OS displays a warning and commits the candidate configuration in the master Routing Engine. When the backup Routing Engine comes up, its configuration will automatically be synchronized with the master. A newly inserted backup Routing Engine automatically synchronizes its configuration with the master Routing Engine configuration.

NOTE: When you configure nonstop active routing (NSR), you must configure the **commit synchronize** statement. Otherwise, the commit operation fails.

On the TX Matrix router, synchronization only occurs between the Routing Engines within the same chassis. When synchronization is complete, the new configuration is then distributed to the Routing Engines on the T640 routers. That is, the master Routing Engine on the TX Matrix router distributes the configuration to the master Routing Engine on each T640 router. Likewise, the backup Routing Engine on the TX Matrix router distributes the configuration to the backup Routing Engine on each T640 router.

On the TX Matrix Plus router, synchronization only occurs between the Routing Engines within the switch-fabric chassis and when synchronization is complete, the new configuration is then distributed to the Routing Engines on the line-card chassis (LCC). That is, the master Routing Engine on the TX Matrix Plus router distributes the configuration to the master Routing Engine on each LCC. Likewise, the backup Routing

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Engine on the TX Matrix Plus router distributes the configuration to the backup Routing Engine on each LCC.

In EX Series Virtual Chassis configurations:

- On EX4200 switches in Virtual Chassis, synchronization occurs between the switch in the master role and the switch in the backup role.
- On EX8200 switches in a Virtual Chassis, synchronization occurs only between the master and backup XRE200 External Routing Engines.

Options

and-quit—(Optional) Quit configuration mode if the commit synchronization succeeds.

at—(Optional) Time at which to activate configuration changes.

comment—(Optional) Write a message to the commit log.

force—(Optional) Force a commit synchronization on the other Routing Engine (ignore warnings).

scripts—(Optional) Push scripts to the other Routing Engine.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Synchronizing the Routing Engine Configuration*
- Configuring Multiple Routing Engines to Synchronize Committed Configurations Automatically on page 242

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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 on page 149
- exit on page 312
- up on page 352

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traceoptions (Batch Commits)

Syntax

```
traceoptions {
  file filename;
  files number;
  flag (all | batch | commit-server | configuration);
  size maximum-file-size;
  (world-readable | no-world-readable);
}
```

Hierarchy Level

```
[edit system commit server],
[edit system commit synchronize server]
```

Release Information Statement introduced in Junos OS Release 12.1.

Description For Junos OS batch commits, configure tracing operations.

Options **file *name***—Name of the file to receive the output of the tracing operation.

NOTE: If you configure traceoptions and do not explicitly specify a filename for logging the events, the batch commit events are logged in the commitd file (var/log/commitd) by default.

files *number*—Maximum number of trace files.

flag *flag*—Tracing operation to perform. To specify more than one tracing operation, include multiple **flag** statements. You can include the following flags:

- **all**—All tracing operations flags.
- **batch**—Tracing operations for batch events.
- **commit-server**—Tracing operations for commit server events.
- **configuration**—Tracing operations for the reading of configuration.

size—Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB).

world-readable | no-world-readable—readable—Grant all users permission to read archived log files, or restrict the permission only to the root user and users who have the Junos OS maintenance permission.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

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Related Documentation
- Example: Configuring Batch Commit Server Properties on page 170

transfer-interval (Configuration)

Syntax
```
transfer-interval interval;
```

Hierarchy Level
```
[edit system archival configuration]
```

Release Information
Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.

Description
Configure the router or switch to periodically transfer its currently active configuration to an archive site.

Options
interval—Interval at which to transfer the current configuration to an archive site.
Range: 15 through 2880 minutes

NOTE: **The [edit system archival] hierarchy is not available on QFabric systems.**

Required Privilege Level
system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- Configuring the Periodic Transfer of the Active Configuration to an Archive Site on page 218
- *archive*
- configuration on page 305
- transfer-on-commit on page 350

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transfer-on-commit

Syntax transfer-on-commit;

Hierarchy Level [edit system archival configuration]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Configure the router or switch to transfer its currently active configuration to an archive site each time you commit a candidate configuration.

NOTE: When specifying a URL in a Junos OS statement using an IPv6 host address, you must enclose the entire URL in quotation marks (“ ”) and enclose the IPv6 host address in brackets ([ ]). For example, “ftp://*username*<:*password*>@[*ipv6-host-address*]<:*port*>/*url-path*” .

NOTE: The **[edit system archival]** hierarchy is not available on QFabric systems.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring the Transfer of the Currently Active Configuration When a Configuration Is Committed on page 218
- *archive*
- configuration on page 305
- transfer-interval on page 349

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unprotect

Syntax unprotect (*hierarchy* | *statement* | *identifier*)

Release Information Command introduced in Junos OS Release 11.2.

Description Unprotect a protected hierarchy, configuration statement, or an identifier.

Options none

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 347
- up on page 352
- Displaying the Current Junos OS Configuration on page 149

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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 on page 149
- exit on page 312
- top on page 347

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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 on page 86.

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when

Syntax

```
when {
  chassis chassis-id;
  member member-id;
  model model-id;
  node [ names of peers ]node-id;
  peers [ names of peers  ];
  routing-engine routing-engine-id;
  time <start-time> [to <end-time>];
}
```

Hierarchy Level

```
[edit groups group-name]
```

Release Information

Statement introduced in Junos OS Release 11.3.
peers option added in Junos OS Release 14.2R6 for the MX Series.
peers option added in Junos OS Release 16.1R1 for the EX Series.

Description

Define conditions under which the configuration group should be applied. Conditions include the type of chassis, model, or Routing Engine, virtual chassis member, cluster node, and start and optional end time of day. If you specify multiple conditions in a single configuration group, all conditions must be met before the configuration group is applied.

Options

chassis *chassis-id*—Specify the chassis type of the router. Valid types include SCC0, SCC1, LCC0, LCC1 ... LCC3.

member *member-id*—Specify the name of the member of the virtual chassis.

model *model-id*—Specify the model name of the router, such as m7i or tx100.

node *node-id*—Specify the cluster node.

peers [*names of peers*]—Specify the names of the MC-LAG peers participating in commit synchronization.

routing-engine *routing-engine-id*—Specify the type of Routing Engine, re0 or re1.

time <*start-time*> [to <*end-time*>]—Specify the start time or time duration for this configuration group to be applied. If only the start time is specified, the configuration group is applied at the specified time and remains in effect until the time is changed. If the end time is specified, then on each day, the applied configuration group is started and stopped at the specified times. The syntax for specifying the time is: **time <*start-time*> [to <*end-time*>]** using the time format yyyy-mm-dd.hh:mm, hh:mm, or hh.

Required Privilege Level

configure—To enter configuration mode.

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Related Documentation

- Creating a Junos OS Configuration Group on page 122
- apply-groups on page 291
- apply-groups-except on page 291
- groups on page 315

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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 OS Configuration—Using the upto Option on page 113.

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CHAPTER 7

Junos OS CLI Environment Commands

- set cli complete-on-space
- set cli directory
- set cli idle-timeout
- set cli prompt
- set cli restart-on-upgrade
- set cli screen-length
- set cli screen-width
- set cli terminal
- set cli timestamp
- set date
- show cli
- show cli
- show cli authorization
- show cli directory
- show cli history

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set cli complete-on-space

Syntax

```
set cli complete-on-space (off | on)
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description

Set the command-line interface (CLI) to complete a partial command entry when you type a space or a tab. This is the default behavior of the CLI.

Options

off—Turn off command completion.

on—Allow either a space or a tab to be used for command completion.

Required Privilege Level

view

Related Documentation

- *CLI User Interface Overview*
- show cli on page 368

List of Sample Output

set cli complete-on-space on page 358

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

set cli complete-on-space

In the following example, pressing the Spacebar changes the partial command entry from **com** to **complete-on-space**. The example shows how adding the keyword **off** at the end of the command disables command completion.

```
user@host> set cli com<Space>
user@host>set cli complete-on-space off
Disabling complete-on-space
```


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set cli directory

Syntax set cli directory *directory*

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description Set the current working directory.

Options ***directory***—Pathname of the working directory.

Required Privilege Level view

Related Documentation
- *CLI User Interface Overview*
- *show cli directory*

List of Sample Output set cli directory on page 359

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

set cli directory

```
user@host> set cli directory /var/tmp
Current directory: /var/tmp
```

set cli idle-timeout

Syntax

```
set cli idle-timeout
<minutes>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description

Set the maximum time that an individual session can be idle before the user is logged off the router or switch.

Options

minutes—(Optional) Maximum idle time. The range of values, in minutes, is 0 through 100,000. If you do not issue this command, and the user's login class does not specify this value, the user is never forced off the system after extended idle times. Setting the value to 0 disables the timeout.

Required Privilege Level

view

Related Documentation

- *CLI User Interface Overview*
- show cli on page 368

List of Sample Output

set cli idle-timeout on page 360

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

set cli idle-timeout

```
user@host> set cli idle-timeout 60
Idle timeout set to 60 minutes
```


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set cli prompt

Syntax

```
set cli prompt string
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description

Set the prompt so that it is displayed within the CLI.

Options

string—CLI prompt string. To include spaces in the prompt, enclose the string in quotation marks. By default, the string is ***username@hostname***.

Required Privilege Level

view

Related Documentation

- *CLI User Interface Overview*
- show cli on page 368

List of Sample Output

set cli prompt on page 361

Output Fields

When you enter this command, the new CLI prompt is displayed.

Sample Output

set cli prompt

```
user@host> set cli prompt lab1-router>
lab1-router>
```

set cli restart-on-upgrade

Syntax

```
set cli restart-on-upgrade string (off | on)
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description

For an individual session, set the CLI to prompt you to restart the router or switch after upgrading the software.

Options

off—Disables the prompt.

on—Enables the prompt.

Required Privilege Level

view

Related Documentation

- *CLI User Interface Overview*
- show cli on page 368

List of Sample Output

set cli restart-on-upgrade on page 362

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

set cli restart-on-upgrade

```
user@host> set cli restart-on-upgrade on
Enabling restart-on-upgrade
```


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set cli screen-length

Syntax set cli screen-length *length*

Release Information Command introduced before Junos OS Release 7.4.

Description Set terminal screen length.

```
user@host> set cli screen-length 75
Screen length set to 75
```

Options ***length***—Number of lines of text that the terminal screen displays. The range of values, in number of lines, is **24** through **100,000**. The default is **24**.

The point at which the **---(more)---** prompt appears on the screen is a function of this setting and the settings for the **set cli screen-width** and **set cli terminal** commands.

Required Privilege Level view

Related Documentation

- Setting the Screen Length on page 59
- Setting the Junos OS CLI Screen Length and Width on page 59
- set cli screen-width on page 364
- set cli terminal on page 365
- show cli on page 370

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set cli screen-width

Syntax

```
set cli screen-width width
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description

Set the terminal screen width.

```
user@host> set cli screen-width
Screen width set to 132
```

Options

width—Number of characters in a line. The value is **0** or in the range of **40** through **1024**. The default value is **80**.

NOTE: In Junos OS Release 13.2 and earlier, the value of *width* is in the range of 0 through 1024.

Required Privilege Level

view

Related Documentation

- Setting the Junos OS CLI Screen Length and Width on page 59
- set cli screen-length on page 363
- set cli terminal on page 365
- show cli on page 370

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set cli terminal

Syntax set cli terminal *terminal-type*

Release Information Command introduced before Junos OS Release 7.4.

Description Set the terminal type.

```
user@host> set cli terminal xterm
```

Options *terminal-type*—Type of terminal that is connected to the Ethernet management port:

- **ansi**—ANSI-compatible terminal (80 characters by 24 lines)
- **small-xterm**—Small xterm window (80 characters by 24 lines)
- **vt100**—VT100-compatible terminal (80 characters by 24 lines)
- **xterm**—Large xterm window (80 characters by 65 lines)

Required Privilege Level view

Related Documentation

- Controlling the Junos OS CLI Environment on page 57

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set cli timestamp

Syntax set cli timestamp (format *timestamp-format* | disable)

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description Set a timestamp for CLI output.

Options **format *timestamp-format***—Set the date and time format for the timestamp. The timestamp format you specify can include the following placeholders in any order:

- **%m**—Two-digit month
- **%d**—Two-digit date
- **%T**—Six-digit hour, minute, and seconds

disable—Remove the timestamp from the CLI.

NOTE: A timestamp is displayed by default when no command output is generated.

Required Privilege Level view

Related Documentation
- *CLI User Interface Overview*
- show cli on page 368

List of Sample Output set cli timestamp on page 366

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

set cli timestamp

```
user@host> set cli timestamp format '%m-%d-%T'
'04-21-17:39:13'
CLI timestamp set to: '%m-%d-%T'
```


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set date

Syntax set date (***date-time*** | ntp <***ntp-server***> <source-address ***source-address***>)

Release Information Command introduced before Junos OS Release 7.4.

Description Set the date and time.

```
user@host> set date ntp
21 Apr 17:22:02 ntpdate[3867]: step time server 172.17.27.46 offset 8.759252 sec
```

Options

- ***date-time***—Specify date and time in one of the following formats:
  - *YYYYMMDDHHMM.SS*
  - **"*month DD*, *YYYY HH:MM*(am | pm)"**
- **ntp**—Configure the router to synchronize the current date and time setting with a Network Time Protocol (NTP) server.
- ***ntp-server*—(**Optional) Specify the IP address of one or more NTP servers.
- **source-address *source-address***—(Optional) Specify the source address that is used by the router to contact the remote NTP server.

Required Privilege Level view

Related Documentation

- *Setting the Date and Time Locally*

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show cli

List of Syntax
Syntax on page 368
Syntax (QFX Series and OCX Series) on page 368

Syntax

```
show cli
```

Syntax (QFX Series and OCX Series)

```
show cli
<authorization>
<directory>
<history count>
```

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description
Display configured CLI settings.

Options
This command has no options.

Required Privilege Level
view

List of Sample Output
show cli on page 369

Output Fields
Table 19 on page 368 lists the output fields for the **show cli** command. Output fields are listed in the approximate order in which they appear.

Table 19: show cli Output Fields

Field Name	Field Description
CLI complete-on-space	Capability to complete a partial command entry when you type a space or a tab: **on** or **off**.
CLI idle-timeout	Maximum time that an individual session can be idle before the user is logged out from the router or switch. When this feature is enabled, the number of minutes is displayed. Otherwise, the state is **disabled**.
CLI restart-on-upgrade	CLI is set to prompt you to restart the router or switch after upgrading the software: **on** or **off**.
CLI screen-length	Number of lines of text that the terminal screen displays.
CLI screen-width	Number of characters in a line on the terminal screen.
CLI terminal	Terminal type.

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Table 19: show cli Output Fields (continued)

Field Name	Field Description
CLI is operating in	Mode: **enhanced**.
CLI timestamp	Date and time format for the timestamp. If the timestamp is not set, the state is **disabled**.
CLI working directory	Pathname of the working directory.

Sample Output

show cli

```
user@host> show cli
CLI complete-on-space set to on
CLI idle-timeout disabled
CLI restart-on-upgrade set to on
CLI screen-length set to 47
CLI screen-width set to 132
CLI terminal is 'vt100'
CLI is operating in enhanced mode
CLI timestamp disabled
CLI working directory is '/var/tmp'
```

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show cli

Syntax

```
show cli
```

Release Information

Command introduced before Junos OS Release 7.4.

Description

Display configured CLI settings.

```
user@host> show cli
CLI complete-on-space set to on
CLI idle-timeout disabled
CLI restart-on-upgrade set to on
CLI screen-length set to 47
CLI screen-width set to 132
CLI terminal is 'vt100'
CLI is operating in enhanced mode
CLI timestamp disabled
CLI working directory is '/var/tmp'
```

Required Privilege Level

view

Related Documentation

- show cli authorization on page 371
- show cli directory on page 373

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show cli authorization

Syntax show cli authorization

Release Information Command introduced before Junos OS Release 7.4.

Description Display the permissions for the current user.

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

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Required Privilege Level	view

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show cli directory

Syntax

```
show cli directory
```

Release Information Command introduced before Junos OS Release 7.4.

Description Display the current working directory.

```
user@host> show cli directory
Current directory: /var/tmp
```

Required Privilege Level view

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show cli history

Syntax

```
show cli history <count>
```

Release Information

Command introduced before Junos OS Release 7.4.

Description

Display a list of previous CLI commands.

```
user@host> show cli history
  11:14:14 -- show arp
  11:22:10 -- show cli authorization
  11:27:12 -- show cli history
```

Options

none—Display all previous CLI commands.

count—(Optional) Maximum number of commands to display.

Required Privilege Level

view

Related Documentation

- Displaying the Junos OS CLI Command and Word History on page 269

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CHAPTER 8

Junos OS CLI Operational Mode Commands

- clear log
- clear system commit
- configure
- file
- file archive
- file checksum md5
- file checksum sha1
- file checksum sha-256
- file compare
- file delete
- file list
- file rename
- file show
- help
- | (pipe)
- request
- request system commit server pause
- request system commit server queue cleanup
- request system commit server start
- request system configuration rescue delete
- request system configuration rescue save
- restart
- set
- show system commit
- show system commit server queue
- show system commit server status

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- show system configuration archival
- show system configuration rescue
- show system rollback
- test configuration

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clear log

Syntax

```
clear log filename
<all>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Remove contents of a log file.

Options

filename—Name of the specific log file to delete.

all—(Optional) Delete the specified log file and all archived versions of it.

Required Privilege Level

clear

Related Documentation

- *show log*

List of Sample Output

clear log on page 377

Output Fields

See file list for an explanation of output fields.

Sample Output

clear log

The following sample commands list log file information, clear the contents of a log file, and then display the updated log file information:

```
user@host> file list lcc0-re0:/var/log/sampled detail
lcc0-re0:
--------------------------------------------------------------------------
-rw-r-----  1 root  wheel      26450 Jun 23 18:47 /var/log/sampled
total 1

user@host> clear log lcc0-re0:sampled
lcc0-re0:
--------------------------------------------------------------------------

user@host> file list lcc0-re0:/var/log/sampled detail
lcc0-re0:
--------------------------------------------------------------------------
-rw-r-----  1 root  wheel         57 Sep 15 03:44 /var/log/sampled
total 1
```

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clear system commit

Syntax

```
clear system commit
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Clear any pending commit operation.

Options

This command has no options.

Required Privilege Level

maintenance (or the actual user who scheduled the commit)

Related Documentation

- show system commit on page 425

List of Sample Output

clear system commit on page 379
clear system commit (None Pending) on page 379
clear system commit (User Does Not Have Required Privilege Level) on page 379

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear system commit

```
user@host> clear system commit
Pending commit cleared.
```

clear system commit (None Pending)

```
user@host> clear system commit
No commit scheduled.
```

clear system commit (User Does Not Have Required Privilege Level)

```
user@host> clear system commit
error: Permission denied
```

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configure

Syntax

```
configure
<batch>
<dynamic>
<exclusive>
<private>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description

Enter configuration mode. When this command is entered without any optional keywords, everyone can make configuration changes and commit all changes made to the configuration.

Options

none—Enter configuration mode.

batch—(Optional) Work in the batch commit mode where commit operations are executed in batches.

dynamic—(Optional) Configure routing policies and certain routing policy objects in a dynamic database that is not subject to the same verification required in the standard configuration database. As a result, the time it takes to commit changes to the dynamic database is much shorter than for the standard configuration database. You can then reference these policies and policy objects in routing policies you configure in the standard database.

exclusive—(Optional) Lock the candidate configuration for as long as you remain in configuration mode, allowing you to make changes without interference from other users. Other users can enter and exit configuration mode, but they cannot change the configuration.

private—(Optional) Allow multiple users to edit different parts of the configuration at the same time and to commit only their own changes, or to roll back without interfering with one another's changes. You cannot commit changes in configure private mode when another user is in configure exclusive mode.

Additional Information

For more information about the different methods of entering configuration mode and the restrictions that apply, see the *Junos OS Administration Library*.

Required Privilege Level

configure

Related Documentation

- show configuration on page 335

List of Sample Output

configure on page 381

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Output Fields When you enter this command, you are placed in configuration mode and the system prompt changes from ***hostname>*** to ***hostname#***.

Sample Output

configure

```
user@host> configure
Entering configuration mode
[edit]
user@host#
```

file

Syntax file <archive | checksum | compare | copy | delete | list | rename | show | source address>

Release Information Command introduced before Junos OS Release 7.4.

Description Archive files from the device, copy files to and from the router or switch, calculate the file checksum, compare files, delete a file from the device, list files on the device, rename a file, show file contents, or show the local address to initiate a connection.

Options

archive (Optional)—Archive, and optionally compress, one or multiple local system files as a single file, locally or at a remote location.

checksum (Optional)—Calculate the Message Digest 5 (MD5) checksum of a file.

compare (Optional)—Compare two local files and describe the differences between them in default, context, or unified output styles.

copy (Optional)—Copy files from one place to another on the local switch or between the local switch and a remote system.

delete (Optional)—Delete a file on the local switch.

list (Optional)—Display a list of files on the local switch.

rename (Optional)—Rename a file on the local switch.

show (Optional)—Display the contents of a file.

source address (Optional)—Specify the source address of the local file.

Required Privilege Level maintenance

Related Documentation

- Viewing Files and Directories on a Device Running Junos OS on page 257

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file archive

Syntax

```
file archive destination destination  source source
<compress>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Archive, and optionally compress, one or multiple local system files as a single file, locally or at a remote location.

For information on valid filename and URL formats, see *Format for Specifying Filenames and URLs in Junos OS CLI Commands*.

Options

destination *destination*—Destination of the archived file or files. Specify the destination as a URL or filename. The Junos OS adds one of the following suffixes if the destination filename does not already have it:

- For archived files—The suffix **.tar**
- For archived and compressed files—The suffix **.tgz**

source *source*—Source of the original file or files. Specify the source as a URL or filename.

compress—(Optional) Compress the archived file with the GNU zip (gzip) compression utility. The compressed files have the suffix **.tgz**.

Required Privilege Level

maintenance

Related Documentation

- *Format for Specifying Filenames and URLs in Junos OS CLI Commands*

List of Sample Output

file archive (Multiple Files) on page 384
file archive (Single File) on page 384
file archive (with Compression) on page 384
File Archive Using Secure Copy Protocol (scp) with 'source-address' and 'routing-instance' options on page 384

Output Fields

When you enter this command, you are provided feedback on the status of your request.

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Sample Output

file archive (Multiple Files)

The following sample command archives all messages files in the local directory **/var/log/** as the single file **messages-archive.tar**.

```
user@host> file archive source /var/log/messages* destination /var/log/messages-archive.tar
/usr/bin/tar: Removing leading / from absolute path names in the archive.

user@host>
```

file archive (Single File)

The following sample command archives a single messages file in the local directory **/var/log/** as the single file **messages-archive.tar**.

```
user@host> file archive source /var/log/messages destination /var/log/messages-archive.tar
/usr/bin/tar: Removing leading / from absolute path names in the archive.

user@host>
```

file archive (with Compression)

The following sample command archives and compresses all messages files in the local directory **/var/log/** as the single file **messages-archive.tar**.

```
user@host> file archive compress source /var/log/messages* destination
/var/log/messages-archive.tgz
/usr/bin/tar: Removing leading / from absolute path names in the archive.

user@host>
```

File Archive Using Secure Copy Protocol (scp) with 'source-address' and 'routing-instance' options

To use the scp command to archive a file with the **source-address** and **routing-instance** options, enter the following command:

```
user@host> file archive source source  destination  scp:// destination source-address address
routing-instance instance-name
```


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file checksum md5

Syntax

```
file checksum md5 <pathname> filename
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Calculate the Message Digest 5 (MD5) checksum of a file.

Options

pathname—(Optional) Path to a filename.

filename—Name of a local file for which to calculate the MD5 checksum.

Required Privilege Level

maintenance

Related Documentation

- *Configuring Checksum Hashes for a Commit Script*
- *Configuring Checksum Hashes for an Event Script*
- *Configuring Checksum Hashes for an Op Script*
- *Configuring Checksum Hashes for an SNMP Script*
- *Executing an Op Script from a Remote Site*
- file checksum sha-256 on page 387
- file checksum sha1 on page 386

List of Sample Output

file checksum md5 on page 385

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

file checksum md5

```
user@host> file checksum md5 jbundle-5.3R2.4-export-signed.tgz
MD5 (jbundle-5.3R2.4-export-signed.tgz) = $ABC123
```

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file checksum sha1

Syntax

```
file checksum sha1 <pathname> filename
```

Release Information

Command introduced in Junos OS Release 9.5.
Command introduced in Junos OS Release 9.5 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Calculate the Secure Hash Algorithm (SHA-1) checksum of a file.

Options

pathname—(Optional) Path to a filename.

filename—Name of a local file for which to calculate the SHA-1 checksum.

Required Privilege Level

maintenance

Related Documentation

- *Configuring Checksum Hashes for a Commit Script*
- *Configuring Checksum Hashes for an Event Script*
- *Configuring Checksum Hashes for an Op Script*
- *Configuring Checksum Hashes for an SNMP Script*
- *Executing an Op Script from a Remote Site*
- file checksum md5 on page 385
- file checksum sha-256 on page 387

List of Sample Output

file checksum sha1 on page 386

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

file checksum sha1

```
user@host> file checksum sha1 /var/db/scripts/opscript.slax

SHA1 (/var/db/scripts/commitscript.slax) = $ABC123
```


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file checksum sha-256

Syntax file checksum sha-256 <*pathname*> *filename*

Release Information Command introduced in Junos OS Release 9.5.
Command introduced in Junos OS Release 9.5 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Calculate the Secure Hash Algorithm 2 family (SHA-256) checksum of a file.

Options ***pathname***—(Optional) Path to a filename.

filename—Name of a local file for which to calculate the SHA-256 checksum.

Required Privilege Level maintenance

Related Documentation

- *Configuring Checksum Hashes for a Commit Script*
- *Configuring Checksum Hashes for an Event Script*
- *Configuring Checksum Hashes for an Op Script*
- *Configuring Checksum Hashes for an SNMP Script*
- *Executing an Op Script from a Remote Site*
- file checksum md5 on page 385
- file checksum sha1 on page 386

List of Sample Output file checksum sha-256 on page 387

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

file checksum sha-256

```
user@host> file checksum sha-256 /var/db/scripts/commitscript.slax

SHA256 (/var/db/scripts/commitscript.slax) =$ABC123
```

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file compare

Syntax

```
file compare (files filename filename)
<context | unified>
<ignore-white-space>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Compare two local files and describe the differences between them in default, context, or unified output styles:

- **Default**—In the first line of output, **c** means lines were changed between the two files, **d** means lines were deleted between the two files, and **a** means lines were added between the two files. The numbers preceding this alphabetical marker represent the first file, and the lines after the alphabetical marker represent the second file. A left angle bracket (**<**) in front of output lines refers to the first file. A right angle bracket (**>**) in front of output lines refers to the second file.
- **Context**—The display is divided into two parts. The first part is the first file; the second part is the second file. Output lines preceded by an exclamation point (**!**) have changed. Additions are marked with a plus sign (**+**), and deletions are marked with a minus sign (**-**).
- **Unified**—The display is preceded by the line number from the first and the second file (*xx*,*xxx*,*x*). Before the line number, additions to the file are marked with a plus sign (**+**), and deletions to the file are marked with a minus sign (**-**). The body of the output contains the affected lines. Changes are viewed as additions plus deletions.

Options

files *filename*—Names of two local files to compare.

context—(Optional) Display output in context format.

ignore-white-space—(Optional) Ignore changes in the amount of white space.

unified—(Optional) Display output in unified format.

Required Privilege Level

none

Related Documentation

- *Format for Specifying Filenames and URLs in Junos OS CLI Commands*
- *Viewing Core Files from Junos OS Processes*

List of Sample Output

file compare files on page 390

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file compare files context on page 390
file compare files unified on page 390
file compare files unified ignore-white-space on page 391

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

file compare files

```
user@host> file compare files /tmp/one /tmp/two
```

```
100c100
<             full-name "File 1";
---
>             full-name "File 2";
102c102
<             class foo; # 'foo' is not defined
---
>             class super-user;
```

file compare files context

```
user@host> file compare files /tmp/one /tmp/two context
```

```
*** /tmp/one    Wed Dec  3 17:12:50 2003
--- /tmp/two    Wed Dec  3 09:13:14 2003
***************
*** 97,104 ****
              }
          }
          user bill {
!             full-name "Bill Smith";
!             class foo; # 'foo' is not defined
              authentication {
                  encrypted-password $ABC123;
              }
--- 97,105 ----
              }
          }
          user bill {
!             full-name "Bill Smith";
!             uid 1089;
!             class super-user;
              authentication {
                  encrypted-password $ABC123;
              }
```

file compare files unified

```
user@host> file compare files /tmp/one /tmp/two unified
```

```
--- /tmp/one    Wed Dec  3 17:12:50 2003
+++ /tmp/two    Wed Dec  3 09:13:14 2003
@@ -97,8 +97,9 @@
              }
          }
          user bill {
-             full-name "Bill Smith";
-             class foo; # 'foo' is not defined
+             full-name "Bill Smith";
+             uid 1089;
+             class super-user;
              authentication {
```


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```
                encrypted-password $ABC123;
            }
```

file compare files unified ignore-white-space

```
user@host> file compare files /tmp/one /tmp/two unified ignore-white-space
--- /tmp/one    Wed Dec  3 09:13:10 2003
+++ /tmp/two    Wed Dec  3 09:13:14 2003
@@ -99,7 +99,7 @@
         user bill {
             full-name "Bill Smith";
             uid 1089;
-            class foo; # 'foo' is not defined
+            class super-user;
             authentication {
                  encrypted-password $ABC123; # SECRET-DATA
             }
```

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file delete

Syntax

```
file delete filename
<purge>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Delete a file on the local router or switch.

Options

filename—Name of the file to delete. For a routing matrix, include chassis information in the filename if the file to be deleted is not local to the Routing Engine from which the command is issued.

purge—(Optional) Overwrite regular files before deleting them.

Required Privilege Level

maintenance

List of Sample Output

file delete on page 392
file delete (Routing Matrix) on page 392

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

file delete

```
user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file delete /var/tmp/snmpd.core
user@host> file list /var/tmp
dcd.core
rpd.core
```

file delete (Routing Matrix)

```
user@host> file list lcc0-re0:/var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file delete lcc0-re0:/var/tmp/snmpd.core
```


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```
user@host> file list /var/tmp
dcd.core
rpd.core
```

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file list

Syntax

```
file list <detail | recursive> <path>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Display a list of files on the local router or switch.

Options

none—Display a list of files in the default directory. The default directory is the home directory of the user logged in to the router or switch.

detail—(Optional) Display detailed information about the files. The output is similar to what is displayed by the Linux **ls -l** command.

recursive—(Optional) Display detailed information about the files in the directory and all subdirectories below it.

path—(Optional) List the files in a specified directory path.

Additional Information

To view available directories, enter a space and then a slash (/) after the **file list** command. To view files within a specific directory, include a slash followed by the directory and, optionally, subdirectory name after the **file list** command.

Required Privilege Level

maintenance

List of Sample Output

file list on page 394
file list (detailed) on page 395
file list (recursive) on page 395

Sample Output

file list

The following command lists the contents of the **/var/tmp** directory.

```
user@host> file list /var/tmp

/var/tmp:
trace_debug
package.log
pics/
downloads/
```


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file list (detailed)

The following command lists detailed information about the contents of the **/var/tmp** directory.

```
user@host> file list /var/tmp detail

/var/tmp/:
total blocks: 4276224
-rw-r--r--  1 user  group       1362 Oct 16 11:11 trace_debug
-rw-r--r--  1 user  group        108 Aug 9   2016 package.log
drwxrwxrwx  2 user  group        512 Jun 30  2016 pics/
drwxr-xr-x  3 user  group        512 Aug 9   2016 downloads/
total files: 2
```

file list (recursive)

The following command lists detailed information about the contents of the **/var/tmp** directory and all subdirectories below it.

```
user@host> file list /var/tmp recursive

/var/tmp/:
total blocks: 4276224
-rw-r--r--  1 user  group       1362 Oct 16 11:11 trace_debug
-rw-r--r--  1 user  group        108 Aug 9   2016 package.log
drwxrwxrwx  2 user  group        512 Jun 30  2016 pics/
drwxr-xr-x  3 user  group        512 Aug 9   2016 downloads/
total files: 2

/var/tmp/pics:
total blocks: 5120461
-rw-r--r--  1 user  group       1910 Oct 15  2016 image3.png
-rw-r--r--  1 user  group       1852 Oct 15  2016 image2.png
-rw-r--r--  1 user  group       1310 Aug 9   2016 image1.png
total files: 3

/var/tmp/downloads:
total blocks: 24
-rw-r--r--  1 user  group        108 Aug 21  2016 package2.log
-rw-r--r--  1 user  group        108 Aug 9   2016 package1.log
drwxr-xr-x  2 user  group        512 Aug 9   2016 sub-download/
total files: 2

/var/tmp/downloads/sub-download:
total blocks: 16
total files: 0
```

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file rename

Syntax file rename *source destination*

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Rename a file on the local router or switch.

Options ***destination***—New name for the file.

source—Original name of the file. For a routing matrix, the filename must include the chassis information.

Required Privilege Level maintenance

List of Sample Output file rename on page 396
file rename (Routing Matrix) on page 396

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

file rename

The following example lists the files in **/var/tmp**, renames one of the files, and then displays the list of files again to reveal the newly named file.

```
user@host> file list /var/tmp
dcd.core
rpd.core
snmpd.core

user@host> file rename /var/tmp/dcd.core /var/tmp/dcd.core.990413
user@host> file list /var/tmp
dcd.core.990413
rpd.core
snmpd.core
```

file rename (Routing Matrix)

The following example lists the files in **/var/tmp**, renames one of the files, and then displays the list of files again to reveal the newly named file.

```
user@host> file list lcc0-re1:/var/tmp
```

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```
lcc0-re1:
--------------------------------------------------------------------------

/var/tmp:
.pccardd
sartre.conf
snmpd
syslogd.core-tarball.0.tgz
```

```
user@host> file rename lcc0-re0:/var/tmp/snmpd /var/tmp/snmpd.rr
user@host> file list lcc0-re1:/var/tmp
```

```
lcc0-re1:
--------------------------------------------------------------------------

/var/tmp:
.pccardd
sartre.conf
snmpd.rr
syslogd.core-tarball.0.tgz
```

file show

[Warning: element unresolved in stylesheets: <_bookmark> (in <reference-command-summary>). This is probably a new element that is not yet supported in the stylesheets.]

Syntax

```
file show filename
<encoding (base64 | raw)>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Display the contents of a file.

Options

filename—Name of a file. For a routing matrix, the filename must include the chassis information.

encoding (base64 | raw)—(Optional) Encode file contents with base64 encoding or show raw text.

Required Privilege Level

maintenance

List of Sample Output

file show on page 398
file show (Routing Matrix) on page 398

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

file show

```
user@host> file show /var/log/messages
Apr 13 21:00:08 dev1 /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:00:40 dev1 /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:02:48 dev1 last message repeated 4 times
Apr 13 21:07:04 dev1 last message repeated 8 times
Apr 13 21:07:13 dev1 /kernel: so-1/1/0: Clearing SONET alarm(s) RDI-P
Apr 13 21:07:29 dev1 /kernel: so-1/1/0: Asserting SONET alarm(s) RDI-P
...
```

file show (Routing Matrix)

```
user@host> file show lcc0-re0:/var/tmp/.gdbinit
lcc0-re0:
--------------------------------------------------------------------------
```


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```
##############################################################################
# Settings
##############################################################################

set print pretty

##############################################################################
# Basic stuff
##############################################################################

define msgbuf
        printf "%s", msgbufp->msg_ptr
end
# hex dump of a block of memory
# usage: dump address length
define dump
   p $arg0, $arg1
   set $ch = $arg0
   set $j = 0
   set $n = $arg1
   while ($j < $n)
        #printf "%x %x ",&$ch[$j],$ch[$j]
        printf "%x ",$ch[$j]
        set $j = $j + 1
        if (!($j % 16))
                printf "\n"
        end
   end
end
```

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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.
apropos option added in Junos OS Release 8.0.

Description

Display help about available operational commands, configuration statements, or general information about getting help. Entering the **help** command without an option provides introductory information about how to use the **help** and **?** commands.

Options

apropos *string*—(Optional) Display command 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 a configuration 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.

Required Privilege Level

None

Related Documentation

- Getting Online Help from the Junos OS Command-Line Interface on page 51

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| (pipe)

Syntax

```
| (compare | count | display (changed | commit-scripts | detail | inheritance | json | merge |
  omit | set | translation-scripts <configured-delta | translated-config | translated-delta> |
  xml) | except pattern | find pattern | hold | last lines | match pattern | no-more | refresh
  interval | request message (all | account@terminal) resolve <full-names> | save filename
  | append filename | tee | trim columns )
```

Release Information

Command introduced before Junos OS Release 7.4.
display commit-scripts option added in Junos OS Release 7.4.
tee option added in Junos OS Release 14.1.
display json option added in Junos OS Release 14.2.
compare | display xml option added in Junos OS Release 15.1.
display translation-scripts option added in Junos OS Release 16.1.
display merge option added in Junos OS Release 16.2R2.
display merge option deprecated in Junos OS Release 18.2R1.

Description

Filter the output of an operational mode or a configuration mode command.

Options

append *filename*—Append the output to a file.

compare (filename | rollback *n*)—Compare configuration changes with another configuration file. In operational mode, use the **show configuration** command. In configuration mode, use the **show** command. See "Comparing Configurations and Displaying the Differences in Text" on page 272

compare | display xml—Compare configuration changes with the active configuration and display them in XML format. In operational mode, use the **show configuration** command. In configuration mode, use the **show** command. See "Understanding the show | compare | display xml Command Output" on page 184.

count—Display the number of lines in the output.

display—Display additional information about the configuration contents.

changed—Tag changes with **junos:changed attribute** (XML only).

commit-scripts—(Configuration mode only) Display all statements that are in a configuration, including statements that were generated by transient changes. For more information, see the *Automation Scripting Feature Guide*.

detail—(Configuration mode only) Display configuration data detail.

inheritance <brief | default | no-comments |groups | terse>—(Configuration mode only) Display inherited configuration data and source group.

json—Display the output for operational commands and configuration data in JavaScript Object Notation (JSON) format.

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merge—Use with the **show ephemeral-configuration** command to display the merged view of the static and ephemeral configuration databases in Junos OS Release 18.1 and earlier releases. Issuing the **show ephemeral-configuration | display merge** command displays the configuration data from all instances of the ephemeral configuration database merged with the complete post-inheritance configuration.

Starting in Junos OS Release 18.2R1, to display the merged view of the static and ephemeral configuration databases, use the **show ephemeral-configuration merge** command instead.

omit—(Configuration mode only) Display configuration statements omitted by the **apply-flags omit** configuration statement.

set—Display the configuration as a series of configuration mode commands required to re-create the configuration.

translation-scripts—Display the configuration with YANG translation scripts applied.

To view the complete post-inheritance configuration with the translated configuration data from all enabled YANG translation scripts included in the output, append the **| display translation-scripts** filter to the **show configuration** command in operational mode or the **show** command in configuration mode.

You can also append one of several keywords to display different views of the configuration data corresponding to the non-native YANG data models:

- **configured-delta**—In configuration mode, compare the candidate and active configurations, and display configuration changes in the statements or hierarchies corresponding to non-native YANG data models before any translation is applied. The XML output displays the deleted content, followed by the new content in the syntax defined by the YANG data model.
- **translated-config**—In operational or configuration mode, display all non-native configuration data present in the committed or candidate configuration, respectively, after processing by all enabled translation scripts into Junos OS syntax.
- **translated-delta**—In configuration mode, compare the candidate and active configurations, and display configuration changes in the statements or hierarchies corresponding to non-native YANG data models after translation is applied. The XML output displays the deleted content, followed by the new content in Junos OS syntax.

xml—(Operational mode only) Display the command output as Junos XML protocol (Extensible Markup Language [XML]) tags.

except *pattern*—Ignore text matching a regular expression when searching the output. If the regular expression contains spaces, operators, or wildcard characters, enclose it in quotation marks.

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find ***pattern***—Display the output starting at the first occurrence of text matching a regular expression. If the regular expression contains spaces, operators, or wildcard characters, enclose it in quotation marks (" ").

hold—Hold text without exiting the **--More--** prompt.

last ***lines***—Display the last number of lines you want to view from the end of the configuration. However, when the number of lines requested is less than the number of lines that the screen length setting permits you to display, Junos returns as many lines as permitted by the screen length setting. For more information on using the **last** ***lines*** option, see "Displaying Output Beginning with the Last Entries" on page 280.

match ***pattern***—Search for text matching a regular expression. If the regular expression contains spaces, operators, or wildcard characters, enclose it in quotation marks.

no-more—Display output all at once rather than one screen at a time.

resolve—(Operational mode only) Convert IP addresses into Domain Name System (DNS) names. Truncates to fit original size unless **full-names is** specified. To prevent the names from being truncated, use the **full-names** option.

refresh ***interval***—Refresh the display of the command according to the interval specified. The screen gets refreshed periodically to show you the current output of the command until you quit the command. The default refresh interval is one second. However, you can also explicitly specify a value from **1** through **604800** for the refresh interval.

request message (all | ***account*****@*****terminal*** **)**—Display command output on the terminal of a specific user logged in to your router, or on the terminals of all users logged in to your router.

save ***filename***—Save the output to a file or URL. For information about specifying the filename, see "Viewing Files and Directories on a Device Running Junos OS" on page 257.

tee—Allows you to both display the command output on screen and write it to a file. Unlike the UNIX **tee** command, if the file cannot be opened, just an error message is displayed.

trim ***columns***—Trim specified number of columns from the start line. Only positive values are accepted. An error message appears if a negative value is given.

Required Privilege Level

view

Related Documentation

- Displaying the Current Junos OS Configuration on page 149.
- Using the Pipe (|) Symbol to Filter Junos OS Command Output on page 270
- Using Regular Expressions with the Pipe (|) Symbol to Filter Junos OS Command Output on page 271

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- Pipe (|) Filter Functions in the Junos OS Command-Line Interface on page 272

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request

Syntax

```
request <chassis | ipsec switch | message | mpls | routing-engine | security | services | system
  | flow-collector | support information>
```

Release Information Command introduced before Junos OS Release 7.4.

Description Stop or reboot router components, switch between primary and backup components, display messages, and display system information.

CAUTION: Halt the backup Routing Engine before you remove it or shut off the power to the router; otherwise, you might need to reinstall the Junos OS.

NOTE: If your router contains two Routing Engines and you want to shut the power off to the router or remove a Routing Engine, you must first halt the backup Routing Engine (if it has been upgraded) and then the master Routing Engine. To halt a Routing Engine, enter the **request system halt** command. You can also halt both Routing Engines at the same time by issuing the **request system halt both-routing-engines** command.

If you want to reboot a router that has two Routing Engines, reboot the backup Routing Engine (if you have upgraded it) and then the master Routing Engine.

NOTE: If you reboot the TX Matrix router, all the T640 master Routing Engines connected to the TX Matrix router reboot. If you halt both Routing Engines on a TX Matrix router, all the T640 Routing Engines connected to the TX Matrix router are also halted. Likewise, if you reboot the TX Matrix Plus router, all the T1600 or T4000 master Routing Engines connected to the TX Matrix Plus router reboot. If you halt both Routing Engines on a TX Matrix Plus router, all the T1600 or T4000 Routing Engines connected to the TX Matrix Plus router are also halted.

NOTE: If you insert a Flexible PIC Concentrator (FPC) into your router, you may need to issue the **request chassis fpc** command (or press the **online** button) to bring the FPC online. This applies to FPCs in M20, M40, M40e, M160, M320, and T Series routers. For command usage, see the **request chassis fpc** command description in the CLI Explorer.

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Additional Information Most **request** commands are described in the *Junos System Basics and Services Command Reference*. The following **request** commands are described in the *Junos Interfaces Command Reference*: **request ipsec switch** and **request services**.

Required Privilege Level maintenance

Related Documentation

- Overview of Junos OS CLI Operational Mode Commands on page 245

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request system commit server pause

Syntax **request system commit server pause**

Release Information Command introduced in Junos OS Release 12.1.

Description Pause the commit server.

NOTE: If you issue this command when a commit job is in process, the batch commit server pauses only after the current commit job is completed.

Options This command has no options.

Required Privilege Level view

Related Documentation

- Example: Configuring Batch Commit Server Properties on page 170

Sample Output

When you enter the **request system commit server pause** command, you are provided feedback on the status of your request.

request system commit server pause

```
user@host> request system commit server pause

Successfully paused the commit server.
```

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request system commit server queue cleanup

Syntax

```
request system commit server queue cleanup
<id commit-id>
<job-status (error| pending| success)>
```

Release Information Command introduced in Junos OS Release 12.1.

Description Clean up the batch commit queue.

Options

id *commit-id*—(Optional) Clean up batch commit operation status messages for a specific commit ID.

job-status—(Optional) Clean up batch commit operation status messages for the following:

- **error**—Clean up status messages for batch commit operations that have errors.
- **pending**—Clean up status messages for batch commit operations that are pending.
- **success**—Clean up status messages for batch commit operations that are successful.

Required Privilege Level view

Related Documentation

- Example: Configuring Batch Commit Server Properties on page 170

List of Sample Output

request system commit server queue cleanup id on page 408
request system commit server queue cleanup job-status success on page 408

Sample Output

When you enter the **request system commit server queue cleanup** command, you are provided feedback on the status of your request.

request system commit server queue cleanup id

```
user@host> request system commit server queue cleanup id 1008

Successfully cleaned up jobs.
```

request system commit server queue cleanup job-status success

```
user@host> request system commit server queue cleanup job-status success

Successfully cleaned up jobs.
```


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request system commit server start

Syntax **request system commit server start**

Release Information Command introduced in Junos OS Release 12.1.

Description Start the commit server.

Options This command has no options.

Required Privilege Level view

Related Documentation
- Example: Configuring Batch Commit Server Properties on page 170

Sample Output

When you enter the **request system commit server start** command, you are provided feedback on the status of your request.

request system commit server start

```
user@host> request system commit server start

Successfully started the commit server.
```


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request system configuration rescue delete

Syntax

```
request system configuration rescue delete
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Delete an existing rescue configuration.

NOTE: The **[edit system configuration]** hierarchy is not available on QFabric systems.

Options

This command has no options.

Required Privilege Level

maintenance

Related Documentation

- request system configuration rescue save on page 412
- *request system software rollback*
- show system commit on page 425

List of Sample Output

request system configuration rescue delete on page 411

Output Fields

This command produces no output.

Sample Output

request system configuration rescue delete

```
user@host> request system configuration rescue delete
```

request system configuration rescue save

Syntax request system configuration rescue save

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Save the most recently committed configuration as the rescue configuration so that you can return to it at any time by using the **rollback** command.

NOTE: The **[edit system configuration]** hierarchy is not available on QFabric systems.

Options This command has no options.

Required Privilege Level maintenance

Related Documentation

- *request system software delete*
- *request system software rollback*
- show system commit on page 425

List of Sample Output request system configuration rescue save on page 412

Output Fields This command produces no output.

Sample Output

request system configuration rescue save

```
user@host> request system configuration rescue save
```


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restart

List of Syntax

Syntax on page 413
Syntax (ACX Series Routers) on page 413
Syntax (EX Series Switches) on page 413
Syntax (MX Series Routers) on page 414
Syntax (QFX Series) on page 414
Syntax (Routing Matrix) on page 414
Syntax (TX Matrix Routers) on page 415
Syntax (TX Matrix Plus Routers) on page 415
Syntax (QFX Series) on page 415

Syntax

```
restart
<adaptive-services |ancpd-service | application-identification |audit-process |
  auto-configuration |captive-portal-content-delivery |ce-l2tp-service |chassis-control |
  class-of-service |clksyncd-service |database-replication|datapath-trace-service
  |dhcp-service | diameter-service | disk-monitoring | dynamic-flow-capture |
  ecc-error-logging | ethernet-connectivity-fault-management
  |ethernet-link-fault-management |event-processing | firewall
  |general-authentication-service | gracefully | iccp-service |idp-policy | immediately
  |interface-control | ipsec-key-management | kernel-replication | l2-learning | l2cpd-service
  | l2tp-service | l2tp-universal-edge | lacp | license-service |link-management
  |local-policy-decision-function |mac-validation |mib-process | mountd-service
  |mpls-traceroute |mspd | multicast-snooping |named-service | nfsd-service |
  packet-triggered-subscribers |peer-selection-service |pgm | pic-services-logging | pki-service
  |ppp | ppp-service |pppoe | protected-system-domain-service |
  redundancy-interface-process | remote-operations | root-system-domain-service | routing
  <logical-system logical-system-name> | sampling | sbc-configuration-process | sdk-service
  |service-deployment | services | snmp |soft |static-subscribers |statistics-service|
  subscriber-management | subscriber-management-helper | tunnel-oamd |usb-control|
  vrrp |web-management>
<gracefully | immediately | soft>
```

Syntax (ACX Series Routers)

```
restart
<adaptive-services |audit-process | auto-configuration | autoinstallation |chassis-control |
  class-of-service |clksyncd-service |database-replication| dhcp-service | diameter-service
  | disk-monitoring | dynamic-flow-capture | ethernet-connectivity-fault-management
  |ethernet-link-fault-management |event-processing | firewall
  |general-authentication-service | gracefully | immediately |interface-control |
  ipsec-key-management | l2-learning | lacp |link-management |mib-process | mountd-service
  |mpls-traceroute |mspd | named-service | nfsd-service | pgm | pki-service |ppp | pppoe |
  redundancy-interface-process | remote-operations | routing | sampling | sdk-service
  |secure-neighbor-discovery | service-deployment | services | snmp |soft |statistics-service|
  subscriber-management | subscriber-management-helper | tunnel-oamd | vrrp>
```

Syntax (EX Series Switches)

```
restart
<autoinstallation | chassis-control | class-of-service | database-replication | dhcp |
  dhcp-service | diameter-service | dot1x-protocol | ethernet-link-fault-management |
  ethernet-switching | event-processing | firewall | general-authentication-service |
```

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```
  interface-control | kernel-replication | l2-learning | lacp | license-service | link-management
  | lldpd-service | mib-process | mountd-service | multicast-snooping | pgm |
  redundancy-interface-process | remote-operations | routing | secure-neighbor-discovery
  | service-deployment | sflow-service | snmp | vrrp | web-management>
```

Syntax (MX Series Routers)

```
restart
<adaptive-services | ancpd-service | application-identification | audit-process |
  auto-configuration | bbe-stats-service | captive-portal-content-delivery | ce-l2tp-service
  | chassis-control | class-of-service | clksyncd-service | database-replication |
  datapath-trace-service | dhcp-service | diameter-service | disk-monitoring |
  dynamic-flow-capture | ecc-error-logging | ethernet-connectivity-fault-management |
  ethernet-link-fault-management | event-processing | firewall |
  general-authentication-service | gracefully | iccp-service | idp-policy | immediately
  |interface-control | ipsec-key-management | kernel-replication | l2-learning | l2cpd-service
  | l2tp-service | l2tp-universal-edge | lacp | license-service | link-management |
  local-policy-decision-function | mac-validation | mib-process | mountd-service |
  mpls-traceroute | mspd | multicast-snooping |named-service | nfsd-service |
  packet-triggered-subscribers |peer-selection-service | pgm | pic-services-logging |
  pki-service | ppp | ppp-service | pppoe | protected-system-domain-service |
  redundancy-interface-process | remote-operations | root-system-domain-service | routing
  | routing <logical-system logical-system-name>  | sampling | sbc-configuration-process |
  sdk-service | service-deployment | services | snmp |soft |static-subscribers
  |statistics-service| subscriber-management | subscriber-management-helper | tunnel-oamd
  | usb-control | vrrp | web-management>
<all-members>
<gracefully | immediately | soft>
<local>
<member member-id>
```

Syntax (QFX Series)

```
restart
<adaptive-services | audit-process | chassis-control | class-of-service | dialer-services |
  diameter-service | dlsw | ethernet-connectivity | event-processing | fibre-channel | firewall
  | general-authentication-service | igmp-host-services | interface-control |
  ipsec-key-management | isdn-signaling | l2ald | l2-learning | l2tp-service | mib-process |
  named-service | network-access-service | nstrace-process | pgm | ppp | pppoe |
  redundancy-interface-process | remote-operations |logical-system-name>  | routing |
  sampling |secure-neighbor-discovery | service-deployment | snmp | usb-control |
  web-management>
<gracefully | immediately | soft>
```

Syntax (Routing Matrix)

```
restart
<adaptive-services | audit-process | chassis-control | class-of-service | disk-monitoring |
  dynamic-flow-capture | ecc-error-logging | event-processing | firewall | interface-control
  | ipsec-key-management | kernel-replication | l2-learning | l2tp-service | lacp |
  link-management | mib-process | pgm | pic-services-logging | ppp | ppoe |
  redundancy-interface-process | remote-operations | routing <logical-system
  logical-system-name>  | sampling | service-deployment | snmp>
<all | all-lcc | lcc number>
<gracefully | immediately | soft>
```


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Syntax (TX Matrix Routers)

```
restart
<adaptive-services | audit-process | chassis-control | class-of-service | dhcp-service |
  diameter-service | disk-monitoring | dynamic-flow-capture | ecc-error-logging |
  event-processing | firewall | interface-control | ipsec-key-management | kernel-replication
  | l2-learning | l2tp-service | lacp | link-management | mib-process |pgm | pic-services-logging
  | ppp | pppoe | redundancy-interface-process | remote-operations | routing <logical-system
  logical-system-name>  | sampling | service-deployment | snmp| statistics-service>
<all-chassis | all-lcc | lcc number | scc>
<gracefully | immediately | soft>
```

Syntax (TX Matrix Plus Routers)

```
restart
<adaptive-services | audit-process | chassis-control | class-of-service | dhcp-service |
  diameter-service | disk-monitoring | dynamic-flow-capture | ecc-error-logging |
  event-processing | firewall | interface-control | ipsec-key-management | kernel-replication
  | l2-learning | l2tp-service | lacp | link-management | mib-process | pgm |
  pic-services-logging | ppp | pppoe | redundancy-interface-process | remote-operations |
  routing <logical-system logical-system-name>  | sampling | service-deployment | snmp|
  statistics-service>
<all-chassis | all-lcc | all-sfc | lcc number | sfc number>
<gracefully | immediately | soft>
```

Syntax (QFX Series)

```
restart
<adaptive-services | audit-process | chassis-control | class-of-service | dialer-services |
  diameter-service | dlsw | ethernet-connectivity | event-processing | fibre-channel | firewall
  | general-authentication-service | igmp-host-services | interface-control |
  ipsec-key-management | isdn-signaling | l2ald | l2-learning | l2tp-service | mib-process |
  named-service | network-access-service | nstrace-process | pgm | ppp | pppoe |
  redundancy-interface-process | remote-operations |logical-system-name>  | routing |
  sampling |secure-neighbor-discovery | service-deployment | snmp | usb-control |
  web-management>
<gracefully | immediately | soft>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 12.2 for ACX Series routers.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.
Options added:

- **dynamic-flow-capture** in Junos OS Release 7.4.
- **dlsw** in Junos OS Release 7.5.
- **event-processing** in Junos OS Release 7.5.
- **ppp** in Junos OS Release 7.5.
- **l2ald** in Junos OS Release 8.0.
- **link-management** in Junos Release 8.0.
- **pgcp-service** in Junos OS Release 8.4.

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- **sbc-configuration-process** in Junos OS Release 9.5.
- **services pgcp gateway** in Junos OS Release 9.6.
- **sfc** and **all-sfc** for the TX Matrix Router in Junos OS Release 9.6.
- **bbe-stats-service** in Junos OS Release 18.4R1 on MX Series routers.

Description Restart a Junos OS process.

CAUTION: Never restart a software process unless instructed to do so by a customer support engineer. A restart might cause the router or switch to drop calls and interrupt transmission, resulting in possible loss of data.

Options **none**—Same as **gracefully**.

adaptive-services—(Optional) Restart the configuration management process that manages the configuration for stateful firewall, Network Address Translation (NAT), intrusion detection services (IDS), and IP Security (IPsec) services on the Adaptive Services PIC.

all-chassis—(TX Matrix and TX Matrix Plus routers only) (Optional) Restart the software process on all chassis.

all-lcc—(TX Matrix and TX Matrix Plus routers only) (Optional) For a TX Matrix router, restart the software process on all T640 routers connected to the TX Matrix router. For a TX Matrix Plus router, restart the software process on all T1600 routers connected to the TX Matrix Plus router.

all-members—(MX Series routers only) (Optional) Restart the software process for all members of the Virtual Chassis configuration.

all-sfc—(TX Matrix Plus routers only) (Optional) For a TX Matrix Plus router, restart the software processes for the TX Matrix Plus router (or switch-fabric chassis).

ancpd-service—(Optional) Restart the Access Node Control Protocol (ANCP) process, which works with a special Internet Group Management Protocol (IGMP) session to collect outgoing interface mapping events in a scalable manner.

application-identification—(Optional) Restart the process that identifies an application using intrusion detection and prevention (IDP) to allow or deny traffic based on applications running on standard or nonstandard ports.

audit-process—(Optional) Restart the RADIUS accounting process that gathers statistical data that can be used for general network monitoring, analyzing, and tracking usage patterns, for billing a user based on the amount of time or type of services accessed.

auto-configuration—(Optional) Restart the Interface Auto-Configuration process.

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autoinstallation—(EX Series switches only) (Optional) Restart the autoinstallation process.

bbe-stats-service—(MX Series routers only) (Optional) Restart bbe-statsd, the BBE statistics collection and management process.

captive-portal-content-delivery—(Optional) Restart the HTTP redirect service by specifying the location to which a subscriber's initial Web browser session is redirected, enabling initial provisioning and service selection for the subscriber.

ce-l2tp-service—(M10, M10i, M7i, and MX Series routers only) (Optional) Restart the Universal Edge Layer 2 Tunneling Protocol (L2TP) process, which establishes L2TP tunnels and Point-to-Point Protocol (PPP) sessions through L2TP tunnels.

chassis-control—(Optional) Restart the chassis management process.

class-of-service—(Optional) Restart the class-of-service (CoS) process, which controls the router's or switch's CoS configuration.

clksyncd-service—(Optional) Restart the external clock synchronization process, which uses synchronous Ethernet (SyncE).

database-replication—(EX Series switches and MX Series routers only) (Optional) Restart the database replication process.

datapath-trace-service—(Optional) Restart the packet path tracing process.

dhcp—(EX Series switches only) (Optional) Restart the software process for a Dynamic Host Configuration Protocol (DHCP) server. A DHCP server allocates network IP addresses and delivers configuration settings to client hosts without user intervention.

dhcp-service—(Optional) Restart the Dynamic Host Configuration Protocol process.

dialer-services—(EX Series switches only) (Optional) Restart the ISDN dial-out process.

diameter-service—(Optional) Restart the diameter process.

disk-monitoring—(Optional) Restart disk monitoring, which checks the health of the hard disk drive on the Routing Engine.

dlsw—(QFX Series only) (Optional) Restart the data link switching (DLSw) service.

dot1x-protocol—(EX Series switches only) (Optional) Restart the port-based network access control process.

dynamic-flow-capture—(Optional) Restart the dynamic flow capture (DFC) process, which controls DFC configurations on Monitoring Services III PICs.

ecc-error-logging—(Optional) Restart the error checking and correction (ECC) process, which logs ECC parity errors in memory on the Routing Engine.

ethernet-connectivity-fault-management—(Optional) Restart the process that provides IEEE 802.1ag Operation, Administration, and Management (OAM) connectivity fault

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management (CFM) database information for CFM maintenance association end points (MEPs) in a CFM session.

ethernet-link-fault-management—(EX Series switches and MX Series routers only) (Optional) Restart the process that provides the OAM link fault management (LFM) information for Ethernet interfaces.

ethernet-switching—(EX Series switches only) (Optional) Restart the Ethernet switching process.

event-processing—(Optional) Restart the event process (eventd).

fibre-channel—(QFX Series only) (Optional) Restart the Fibre Channel process.

firewall—(Optional) Restart the firewall management process, which manages the firewall configuration and enables accepting or rejecting packets that are transiting an interface on a router or switch.

general-authentication-service—(EX Series switches and MX Series routers only) (Optional) Restart the general authentication process.

gracefully—(Optional) Restart the software process.

iccp-service—(Optional) Restart the Inter-Chassis Communication Protocol (ICCP) process.

idp-policy—(Optional) Restart the intrusion detection and prevention (IDP) protocol process.

immediately—(Optional) Immediately restart the software process.

interface-control—(Optional) Restart the interface process, which controls the router's or switch's physical interface devices and logical interfaces.

ipsec-key-management—(Optional) Restart the IPsec key management process.

isdn-signaling—(QFX Series only) (Optional) Restart the ISDN signaling process, which initiates ISDN connections.

kernel-replication—(Optional) Restart the kernel replication process, which replicates the state of the backup Routing Engine when graceful Routing Engine switchover (GRES) is configured.

l2-learning—(Optional) Restart the Layer 2 address flooding and learning process.

l2cpd-service—(Optional) Restart the Layer 2 Control Protocol process, which enables features such as Layer 2 protocol tunneling and nonstop bridging.

l2tp-service— (M10, M10i, M7i, and MX Series routers only) (Optional) Restart the Layer 2 Tunneling Protocol (L2TP) process, which sets up client services for establishing Point-to-Point Protocol (PPP) tunnels across a network and negotiating Multilink PPP if it is implemented.

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l2tp-universal-edge—(MX Series routers only) (Optional) Restart the L2TP process, which establishes L2TP tunnels and PPP sessions through L2TP tunnels.

lacp—(Optional) Restart the Link Aggregation Control Protocol (LACP) process. LACP provides a standardized means for exchanging information between partner systems on a link to allow their link aggregation control instances to reach agreement on the identity of the LAG to which the link belongs, and then to move the link to that LAG, and to enable the transmission and reception processes for the link to function in an orderly manner.

lcc *number*—(TX Matrix and TX Matrix Plus routers only) (Optional) For a TX Matrix router, restart the software process for a specific T640 router that is connected to the TX Matrix router. For a TX Matrix Plus router, restart the software process for a specific router that is connected to the TX Matrix Plus router.

Replace *number* with the following values depending on the LCC configuration:

- 0 through 3, when T640 routers are connected to a TX Matrix router in a routing matrix.
- 0 through 3, when T1600 routers are connected to a TX Matrix Plus router in a routing matrix.
- 0 through 7, when T1600 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.
- 0, 2, 4, or 6, when T4000 routers are connected to a TX Matrix Plus router with 3D SIBs in a routing matrix.

license-service—(EX Series switches only) (Optional) Restart the feature license management process.

link-management— (TX Matrix and TX Matrix Plus routers and EX Series switches only) (Optional) Restart the Link Management Protocol (LMP) process, which establishes and maintains LMP control channels.

lldpd-service—(EX Series switches only) (Optional) Restart the Link Layer Discovery Protocol (LLDP) process.

local—(MX Series routers only) (Optional) Restart the software process for the local Virtual Chassis member.

local-policy-decision-function— (Optional) Restart the process for the Local Policy Decision Function, which regulates collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces.

mac-validation— (Optional) Restart the Media Access Control (MAC) validation process, which configures MAC address validation for subscriber interfaces created on demux interfaces in dynamic profiles on MX Series routers.

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member *member-id*—(MX Series routers only) (Optional) Restart the software process for a specific member of the Virtual Chassis configuration. Replace ***member-id*** with a value of **0** or **1**.

mib-process—(Optional) Restart the Management Information Base (MIB) version II process, which provides the router's MIB II agent.

mobile-ip—(Optional) Restart the Mobile IP process, which configures Junos OS Mobile IP features.

mountd-service—(EX Series switches and MX Series routers only) (Optional) Restart the service for NFS mount requests.

mpls-traceroute—(Optional) Restart the MPLS Periodic Traceroute process.

mspd—(Optional) Restart the Multiservice process.

multicast-snooping—(EX Series switches and MX Series routers only) (Optional) Restart the multicast snooping process, which makes Layer 2 devices, such as VLAN switches, aware of Layer 3 information, such as the media access control (MAC) addresses of members of a multicast group.

named-service—(Optional) Restart the DNS Server process, which is used by a router or a switch to resolve hostnames into addresses.

network-access-service—(QFX Series only) (Optional) Restart the network access process, which provides the router's Challenge Handshake Authentication Protocol (CHAP) authentication service.

nfsd-service—(Optional) Restart the Remote NFS Server process, which provides remote file access for applications that need NFS-based transport.

packet-triggered-subscribers—(Optional) Restart the packet-triggered subscribers and policy control (PTSP) process, which allows the application of policies to dynamic subscribers that are controlled by a subscriber termination device.

peer-selection-service—(Optional) Restart the Peer Selection Service process.

pgcp-service—(Optional) Restart the pgcpd service process running on the Routing Engine. This option does not restart pgcpd processes running on mobile station PICs. To restart pgcpd processes running on mobile station PICs, use the **services pgcp gateway** option.

pgm—(Optional) Restart the process that implements the Pragmatic General Multicast (PGM) protocol for assisting in the reliable delivery of multicast packets.

pic-services-logging—(Optional) Restart the logging process for some PICs. With this process, also known as fsad (the file system access daemon), PICs send special logging information to the Routing Engine for archiving on the hard disk.

pki-service—(Optional) Restart the PKI Service process.

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ppp—(Optional) Restart the Point-to-Point Protocol (PPP) process, which is the encapsulation protocol process for transporting IP traffic across point-to-point links.

ppp-service—(Optional) Restart the Universal edge PPP process, which is the encapsulation protocol process for transporting IP traffic across universal edge routers.

pppoe—(Optional) Restart the Point-to-Point Protocol over Ethernet (PPPoE) process, which combines PPP that typically runs over broadband connections with the Ethernet link-layer protocol that allows users to connect to a network of hosts over a bridge or access concentrator.

protected-system-domain-service—(Optional) Restart the Protected System Domain (PSD) process.

redundancy-interface-process—(Optional) Restart the ASP redundancy process.

remote-operations—(Optional) Restart the remote operations process, which provides the ping and traceroute MIBs.

root-system-domain-service—(Optional) Restart the Root System Domain (RSD) service.

routing—(ACX Series routers, QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the routing protocol process.

routing <logical-system *logical-system-name*>—(Optional) Restart the routing protocol process, which controls the routing protocols that run on the router or switch and maintains the routing tables. Optionally, restart the routing protocol process for the specified logical system only.

sampling—(Optional) Restart the sampling process, which performs packet sampling based on particular input interfaces and various fields in the packet header.

sbc-configuration-process—(Optional) Restart the session border controller (SBC) process of the border signaling gateway (BSG).

scc—(TX Matrix routers only) (Optional) Restart the software process on the TX Matrix router (or switch-card chassis).

sdk-service—(Optional) Restart the SDK Service process, which runs on the Routing Engine and is responsible for communications between the SDK application and Junos OS. Although the SDK Service process is present on the router, it is turned off by default.

secure-neighbor-discovery—(QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the secure Neighbor Discovery Protocol (NDP) process, which provides support for protecting NDP messages.

sfc *number*—(TX Matrix Plus routers only) (Optional) Restart the software process on the TX Matrix Plus router (or switch-fabric chassis). Replace ***number*** with **0**.

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service-deployment—(Optional) Restart the service deployment process, which enables Junos OS to work with the Session and Resource Control (SRC) software.

services—(Optional) Restart a service.

services pgcp gateway *gateway-name*—(Optional) Restart the pgcpd process for a specific border gateway function (BGF) running on an MS-PIC. This option does not restart the pgcpd process running on the Routing Engine. To restart the pgcpd process on the Routing Engine, use the **pgcp-service** option.

sflow-service—(EX Series switches only) (Optional) Restart the flow sampling (sFlow technology) process.

snmp—(Optional) Restart the SNMP process, which enables the monitoring of network devices from a central location and provides the router's or switch's SNMP master agent.

soft—(Optional) Reread and reactivate the configuration without completely restarting the software processes. For example, BGP peers stay up and the routing table stays constant. Omitting this option results in a graceful restart of the software process.

static-subscribers—(Optional) Restart the static subscribers process, which associates subscribers with statically configured interfaces and provides dynamic service activation and activation for these subscribers.

statistics-service—(Optional) Restart the process that manages the Packet Forwarding Engine statistics.

subscriber-management—(Optional) Restart the Subscriber Management process.

subscriber-management-helper—(Optional) Restart the Subscriber Management Helper process.

tunnel-oamd—(Optional) Restart the Tunnel OAM process, which enables the Operations, Administration, and Maintenance of Layer 2 tunneled networks. Layer 2 protocol tunneling (L2PT) allows service providers to send Layer 2 protocol data units (PDUs) across the provider's cloud and deliver them to Juniper Networks EX Series Ethernet Switches that are not part of the local broadcast domain.

usb-control—(MX Series routers) (Optional) Restart the USB control process.

vrrp—(ACX Series routers, EX Series switches, and MX Series routers only) (Optional) Restart the Virtual Router Redundancy Protocol (VRRP) process, which enables hosts on a LAN to make use of redundant routing platforms on that LAN without requiring more than the static configuration of a single default route on the hosts.

web-management—(QFX Series, EX Series switches, and MX Series routers only) (Optional) Restart the Web management process.

Required Privilege Level reset

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Related Documentation
- Overview of Junos OS CLI Operational Mode Commands on page 245

List of Sample Output restart interface-control gracefully on page 423

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

restart interface-control gracefully

```
user@host> restart interface-control gracefully
Interface control process started, pid 41129
```

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 311
- Displaying the Current Junos OS Configuration on page 149

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show system commit

Syntax

```
show system commit
<revision>
<server>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Option **server** introduced in Junos OS Release 12.1 for the PTX Series router.
Option **revision** introduced in Junos OS Release 14.1.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Display the system commit history and any pending commit operation.

Options

none—Display the last 50 commit operations listed, most recent to first.

revision—(Optional) Display the revision number of the active configuration of the Routing Engine(s).

server— (Optional) Display commit server status.

NOTE: By default, the status of the commit server is “Not running”. The commit server starts running only when a commit job is added to the batch.

Required Privilege Level

view

Related Documentation

- clear system commit on page 379
- *show system commit revision*

List of Sample Output

show system commit on page 427
show system commit (At a Particular Time) on page 427
show system commit (At the Next Reboot) on page 427
show system commit (Rollback Pending) on page 427
show system commit (QFX Series) on page 427

Output Fields

Table 20 on page 426 describes the output fields for the **show system commit** command. Output fields are listed in the approximate order in which they appear.

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Table 20: show system commit Output Fields

Field Name	Field Description	Level of Output
<number>	Displays the last 50 commit operations listed, most recent to first. The identifier *<number>* designates a configuration created for recovery using the **request system configuration rescue save** command.	**none**
<time-stamp>	Date and time of the commit operation.	**none**
<root>/<username>	User who executed the commit operation.	**none**
<method>	Method used to execute the commit operation: • **CLI**—CLI interactive user performed the commit operation. • **Junos XML protocol**—Junos XML protocol client performed the commit operation. • **synchronize**—The **commit synchronize** command was performed on the other Routing Engine. • **snmp**—An SNMP **set** request caused the commit operation. • **button**—A button on the router or switch was pressed to commit a rescue configuration for recovery. • **autoinstall**—A configuration obtained through autoinstallation was committed. • **other**—When there is no login name associated with the session, the values for user and client default to root and other. For example, during a reboot after package installation, mgd commits the configuration as a system commit, and there is no login associated with the commit.	**none**

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Sample Output

show system commit

```
user@host> show system commit
0   2003-07-28 19:14:04 PDT by root via other
1   2003-07-25 22:01:36 PDT by user via cli
2   2003-07-25 22:01:32 PDT by user via cli
3   2003-07-25 21:30:13 PDT by root via button
4   2003-07-25 13:46:48 PDT by user via cli
5   2003-07-25 05:33:21 PDT by root via autoinstall
...
rescue  2002-05-10 15:32:03 PDT by root via other
```

show system commit (At a Particular Time)

```
user@host> show system commit
commit requested by root via cli at Tue May  7 15:59:00 2002
```

show system commit (At the Next Reboot)

```
user@host> show system commit
commit requested by root via cli at reboot
```

show system commit (Rollback Pending)

```
user@host> show system commit
0 2005-01-05 15:00:37 PST by root via cli commit confirmed, rollback in 3mins
```

show system commit (QFX Series)

```
user@switch> show system commit
0   2011-11-25 19:17:49 PST by root via cli
```

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show system commit server queue

Syntax

```
show system commit server queue
<id commit-id>
<job-status (all| error| pending| success)>
<patch (none | id commit-id) | (job-status (all | error | pending | success)>
```

Release Information Command introduced in Junos OS Release 12.1.

Description Display the status of commit server queue transactions.

NOTE: Only 50 successful commit jobs are stored in the database and displayed in the output. When the fifty-first job is committed, the first job is deleted from the database and is no longer displayed in the output.

Options

id *commit-id*—(Optional) Display the batch commit operation status messages for a specific commit ID.

job-status—(Optional) Display batch commit operation status messages for the following batch commit statuses:

- **all**—Status messages for all batch commit operations.
- **error**—Status messages for batch commit operations that have errors.
- **pending**—Status messages for batch commit operations that are pending.
- **success**—Status messages for batch commit operations that are successful.

patch (none | id *commit-id*) | job-status (all |error | pending | success)—(Optional) Display the patch file containing the configuration changes for all batch commit operations, a specific batch commit ID, or a specific job status.

Required Privilege Level view

Related Documentation

- Example: Configuring Batch Commit Server Properties on page 170

List of Sample Output

show system commit server queue on page 429
show system commit server queue job-status success on page 429
show system commit server queue patch on page 430

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Sample Output

show system commit server queue

```
user@host> show system commit server queue

Pending commits:
  none

Completed commits:
  Id: 1000
  Last Modified: Tue Nov  1 22:46:43 2011
  Status: Successfully committed 1000

  Id: 1002
  Last Modified: Tue Nov  1 22:50:35 2011
  Status: Successfully committed 1002

  Id: 1004
  Last Modified: Tue Nov  1 22:51:48 2011
  Status: Successfully committed 1004

  Id: 1007
  Last Modified: Wed Nov  2 01:08:04 2011
  Status: Successfully committed 1007

  Id: 1009
  Last Modified: Wed Nov  2 01:16:45 2011
  Status: Successfully committed 1009

  Id: 1010
  Last Modified: Wed Nov  2 01:19:25 2011
  Status: Successfully committed 1010

  Id: 1011
  Last Modified: Wed Nov  2 01:28:16 2011
  Status: Successfully committed 1011


Error commits:
  Id: 1008
  Last Modified: Wed Nov  2 01:08:18 2011
  Status: Error while commiting 1008
```

show system commit server queue job-status success

```
user@host> show system commit server queue job-status success

Completed commits:
  Id: 1000
  Last Modified: Tue Nov  1 22:46:43 2011
  Status: Successfully committed 1000

  Id: 1001
  Last Modified: Tue Nov  1 22:47:02 2011
  Status: Successfully committed 1001
```

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show system commit server queue patch

```
user@host> show system commit server queue patch
Pending commits:
  none


Completed commits:
  Id: 1000
  Last Modified: Tue Nov  1 22:46:43 2011
  Status: Successfully committed 1000

Patch:
[edit system commit]
+ server {
+     days-to-keep-error-logs 4294967295;
+     traceoptions {
+         file commitd_nov;
+         flag all;
+     }
+ }
  Id: 1002
  Last Modified: Tue Nov  1 22:50:35 2011
  Status: Successfully committed 1002

Patch:
[edit system commit server]
- days-to-keep-error-logs 4294967295;
  Id: 1004
  Last Modified: Tue Nov  1 22:51:48 2011
  Status: Successfully committed 1004

Patch:
[edit system commit server]
+ days-to-keep-error-logs 4294967295;
  Id: 1007
  Last Modified: Wed Nov  2 01:08:04 2011
  Status: Successfully committed 1007

Patch:
[edit system commit server]
-  days-to-keep-error-logs 4294967295;
+  days-to-keep-error-logs 2;
  Id: 1009
  Last Modified: Wed Nov  2 01:16:45 2011
  Status: Successfully committed 1009

Patch:
[edit]
+ snmp {
+     community abc;
+ }
  Id: 1010
  Last Modified: Wed Nov  2 01:19:25 2011
  Status: Successfully committed 1010

Patch:
[edit system syslog]
  file test { ... }
+ file j {
```


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```
+     any any;
+ }
  Id: 1011
  Last Modified: Wed Nov  2 01:28:16 2011
  Status: Successfully committed 1011


Error commits:
  Id: 1008
  Last Modified: Wed Nov  2 01:08:18 2011
  Status: Error while commiting 1008

Patch:
[edit system]
+ radius-server {
+     10.1.1.1 port 222;
+ }
```

show system commit server status

Syntax **show system commit server status**

Release Information Command introduced in Junos OS Release 12.1.

Description Display commit server status.

NOTE: By default, the status of the commit server is “Not running”. The commit server starts running only when a commit job is added to the batch.

Options This command has no options.

Required Privilege Level view

Related Documentation

- Example: Configuring Batch Commit Server Properties on page 170

List of Sample Output

show system commit server status (When Server Is Inactive) on page 432
show system commit server status (When Server Is Active) on page 432

Sample Output

show system commit server status (When Server Is Inactive)

```
user@host> show system commit server status
Commit server status : Not running
```

show system commit server status (When Server Is Active)

```
user@R0> show system commit server status

Commit server status : Running
Jobs in process:
  1369 1370 1371
```


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show system configuration archival

Syntax show system configuration archival

Release Information Introduced in Junos OS Release 7.6.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Display directory and number of files queued for archival transfer.

NOTE: The **[edit system configuration]** hierarchy is not available on QFabric systems.

Options This command has no options.

Required Privilege Level maintenance

List of Sample Output show system configuration archival on page 433

Sample Output

show system configuration archival

```
user@host> show system configuration archival

/var/transfer/config/:
total 8
```

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show system configuration rescue

Syntax show system configuration rescue

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description Display a rescue configuration, if one exists.

NOTE: The **[edit system configuration]** hierarchy is not available on QFabric systems.

Options This command has no options.

Required Privilege Level maintenance

Related Documentation
- show system configuration archival on page 433

List of Sample Output show system configuration rescue on page 434

Sample Output

show system configuration rescue

```
user@switch> show system configuration rescue
version "7.3"; groups {
    global {
        system {
            host-name router1;
            domain-name customer.net;
            domain-search [ customer.net ];
            backup-router 192.0.2.0;
            name-server {
                192.0.2.11;
                192.0.2.101;
                192.0.2.100;
                192.0.2.10;
            }
            login {
                user user1 {
                    uid 928;
                    class ;
                    shell csh;
                    authentication {
```


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```
                        encrypted-password "$ABC123"; ## SECRET-DATA
                    }
                }
            }
            services {
                ftp;
                rlogin;
                rsh;
                telnet;
            }
        }
    }
....
```

show system rollback

Syntax

```
show system rollback number
<compare number>
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.

Description

Display the contents of a previously committed configuration, or the differences between two previously committed configurations.

NOTE: The **show system rollback** command is a purely operational mode command and cannot be issued with **run** from the configuration mode.

Options

number—Number of a configuration to view. The output displays the configuration. The range of values is 0 through 49.

compare *number* —(Optional) Number of another previously committed (rollback) configuration to compare to rollback ***number***. The output displays the differences between the two configurations. The range of values is 0 through 49.

Required Privilege Level

view

List of Sample Output

show system rollback compare on page 436

Sample Output

show system rollback compare

```
user@host> show system rollback 3 compare 1
[edit]
+  interfaces {
+      ge-1/1/1 {
+          unit 0 {
+              family inet {
+                  filter {
+                      input mf_plp;
+                  }
+                  address 10.1.1.1/10;
+              }
+          }
+      }
+      ge-1/2/1 {
+          unit 0 {
```


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```
+              family inet {
+                  filter {
+                      input mf_plp;
+                  }
+                  address 10.1.1.1/10;
+              }
+          }
+      }
+      ge-1/3/0 {
+          unit 0 {
+              family inet {
+                  filter {
+                      input mf_plp;
+                  }
+                  address 10.1.1.1/10;
+              }
+          }
+      }
+}
```

test configuration

Syntax

```
test configuration filename
syntax-only
```

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Command introduced in Junos OS Release 11.1 for the QFX Series.
syntax-only option introduced in Junos OS Release 12.1.
Command introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

Description

Verify that the syntax of a configuration file is correct. If the configuration contains any syntax or commit check errors, a message is displayed to indicate the line number and column number in which the error was found. This command only accepts text files.

Options

filename—Name of the configuration file.

syntax-only—(Optional) Check the syntax of a partial configuration file, without checking for commit errors.

Required Privilege Level

view

List of Sample Output

test configuration on page 438

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

test configuration

```
user@host> test configuration terminal
[Type ^D to end input]
system {
host-name host;
test1;
login;
}
terminal:3:(8) syntax error: test
  [edit system]
    'test;'
      syntax error
terminal:4:(11) statement must contain additional statements: ;
  [edit system login]
    'login ;'
      statement must contain additional statements
configuration syntax failed
```


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