Junos® OS for EX Series Ethernet Switches

System Services on EX Series Switches

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Table of Contents

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

Part 1 Overview

Chapter 1 **Software Overview 3**

Understanding Software Infrastructure and Processes 3
Routing Engine and Packet Forwarding Engine 3
Junos OS Processes 4

Chapter 2 **DHCP Overview 7**

Understanding DHCP Services for Switches 7
DHCP Client/Server Model 7
Using DHCP 8
DHCP Relay Servers and DHCP Servers 8
Legacy DHCP and Extended DHCP for Server Versions 9
Configuring DHCP on a Switch 10
How DHCP Works 10
DHCP/BOOTP Relay for Switches Overview 11
Understanding the Extended DHCP Relay Agent for EX Series Switches 12
Extended DHCP Relay and Legacy DHCP/BOOTP Relay 12
Interaction Among the DHCP Relay Agent, DHCP Client, and DHCP Servers 12
Suppressing DHCP Access, Access-Internal, and Destination Routes 13

Chapter 3 **Public Key Cryptography Overview 15**

Understanding Public Key Cryptography on Switches 15
Public Key Infrastructure (PKI) and Digital Certificates 16

Chapter 4 **Self-Signed Certificates Overview 17**

Understanding Self-Signed Certificates on EX Series Switches 17

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Chapter 5 Protocol Redirect Mechanism Overview 19
Understanding the Protocol Redirect Mechanism on EX Series Switches 19

Part 2 Configuration

Chapter 6 Configuration Tasks 23
Configuring DHCP Services (J-Web Procedure) 23
Configuring DHCP Services (J-Web Procedure) on EX Series Switches 23
Configuring DHCP Services on EX4300 Switches (J-Web Procedure) 26
Configuring a DHCP SIP Server (CLI Procedure) 31
Configuring a DHCP Client (CLI Procedure) 31
Configuring a DHCP Server on Switches (CLI Procedure) 32
Configuring an Extended DHCP Server on a Switch 33
Configuring a Legacy DHCP Server on a Switch (CLI Procedure) 34
Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) 35
Enabling HTTPS and XNM-SSL Services on Switches Using Self-Signed Certificates (CLI Procedure) 36
Manually Generating Self-Signed Certificates on Switches (CLI Procedure) 37
Generating a Public-Private Key Pair on Switches 37
Generating Self-Signed Certificates on Switches 37
Deleting Self-Signed Certificates (CLI Procedure) 38
Configuring Junos OS to Disable Sending Protocol Redirect Messages on EX Series Switches (CLI Procedure) 38
Preventing DHCP from Installing Access, Access-Internal, and Destination Routes by Default 39

Chapter 7 Configuration Statements 41
[edit system] Configuration Statement Hierarchy on EX Series Switches 44
Supported Statements in the [edit system] Hierarchy Level 44
Unsupported Statements in the [edit system] Hierarchy Level 57
active-server-group 58
address-assignment (Address-Assignment Pools) 59
address-pool 60
aggregate-clients (DHCP Relay Agent) 61
always-write-giaddr 62
authentication (DHCP Local Server) 63
authentication (DHCP Relay Agent) 64
boot-file 65
boot-server (DHCP) 66
bootp 67
ca-name 68
cache-size 69
cache-timeout-negative 70
certificates 71
certification-authority 72
circuit-id (DHCP Relay Agent) 73
client-identifier 75
client-identifier (DHCP Client) 76

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connection-limit . . . 77
crl (Encryption Interface) . . . 78
default-lease-time . . . 78
default-local-server-group . . . 79
default-relay-server-group . . . 79
description (Forwarding Options) . . . 80
dhcp . . . 81
dhcp (DHCP Client) . . . 82
dhcp (DHCP Server) . . . 83
dhcp-attributes (Address-Assignment Pools) . . . 84
dhcp-local-server . . . 85
dhcp-relay (EX Series Switches only) . . . 90
dhcpv6 (DHCP Local Server) . . . 92
dhcpv6 (DHCP Relay Agent) . . . 95
domain . . . 98
domain-name (DHCP) . . . 99
domain-search . . . 99
drop . . . 100
dynamic-profile (DHCP Relay Agent) . . . 101
encoding . . . 102
enrollment-retry . . . 102
enrollment-url . . . 103
family (for EX Series switches) . . . 104
file . . . 107
ftp . . . 108
group (DHCP Local Server) . . . 109
group (DHCP Relay Agent) . . . 112
helpers . . . 115
http . . . 117
https . . . 118
interface (BOOTP) . . . 119
interface (DHCP Relay Agent) . . . 120
interface (DNS and TFTP Packet Forwarding or Relay Agent) . . . 122
interface-client-limit (DHCP Extended Server) . . . 122
interface-client-limit (DHCP Relay Agent) . . . 123
interfaces (for EX Series switches) . . . 125
ip-address-first . . . 132
layer2-unicast-replies . . . 133
ldap-url . . . 134
lease-time . . . 135
load-key-file . . . 136
local . . . 137
local-certificate . . . 138
maximum-certificates . . . 138
maximum-hop-count . . . 139
maximum-lease-time (DHCP) . . . 139
minimum-wait-time . . . 140
name-server . . . 140
no-listen . . . 141

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no-redirects (IPv4 Traffic) . . . 142
no-redirects-ipv6 . . . 143
option-number (DHCP Relay Agent Option) . . . 144
outbound-ssh . . . 145
overrides (DHCP Local Server) . . . 148
overrides (DHCP Relay Agent) . . . 150
path-length . . . 151
pool (System) . . . 152
pool (Address-Assignment Pools) . . . 153
pool-match-order . . . 154
port (HTTP/HTTPS) . . . 155
port (SRC Server) . . . 155
prefix (Address-Assignment Pools) . . . 156
prefix (DHCP Relay Agent) . . . 157
process-inform . . . 158
protocol-version . . . 159
rate-limit . . . 160
reconfigure (DHCP Local Server) . . . 161
relay-agent-interface-id (DHCPv6 Relay Agent) . . . 162
relay-option (DHCP Relay Agent) . . . 163
relay-option-60 . . . 164
relay-option-82 . . . 165
retransmission-attempt . . . 166
retransmission-interval . . . 167
route-suppression (DHCP Local Server and Relay Agent) . . . 168
server (DHCP and BOOTP Relay Agent) . . . 169
server (DNS and TFTP Service) . . . 170
server-address . . . 171
server-group . . . 172
server-identifier . . . 173
servers . . . 174
service-deployment . . . 174
service-profile (DHCP Relay Agent) . . . 175
services (System Services) . . . 176
session (Time-out) . . . 178
sip-server . . . 179
source-address (SRC Software) . . . 179
source-address-giaddr . . . 180
ssh . . . 181
static-binding . . . 182
system-generated-certificate . . . 183
telnet . . . 183
tftp . . . 184
trace (DHCP Relay Agent) . . . 185
traceoptions (DNS and TFTP Packet Forwarding) . . . 186
traceoptions . . . 188
traceoptions (DHCP Server) . . . 190
update-server . . . 192
use-interface-description . . . 193

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use-primary (DHCP Relay Agent) . . . 195
vendor-id . . . 196
vendor-option . . . 197
web-management . . . 198
wins-server (System) . . . 199

Part 3 Administration

Chapter 8 Routine Monitoring . . . 203

Monitoring DHCP Services . . . 203
Verifying and Managing DHCP Relay Configuration for EX Series Switches . . . 207

Chapter 9 Operational Commands . . . 209

clear dhcp relay statistics . . . 210
clear security pki local-certificate . . . 213
clear system services dhcp binding . . . 214
clear system services dhcp conflict . . . 215
clear system services dhcp statistics . . . 216
request ipsec switch . . . 217
request security certificate (signed) . . . 218
request security certificate (unsigned) . . . 220
request security key-pair . . . 221
request security pki generate-key-pair . . . 222
request security pki local-certificate generate-self-signed . . . 223
show dhcp relay statistics . . . 224
show security pki local-certificate . . . 227
show system services dhcp binding . . . 230
show system services dhcp conflict . . . 233
show system services dhcp global . . . 234
show system services dhcp pool . . . 236
show system services dhcp statistics . . . 238
show system services service-deployment . . . 241
ssh . . . 242
telnet . . . 244

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List of Figures

Part 1 Overview

Chapter 2 DHCP Overview 7

Figure 1: DHCP Client/Server Model 8
Figure 2: DHCP Four-Step Transfer 10

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List of Tables

About the Documentation xiii

Table 1: Notice Icons xv
Table 2: Text and Syntax Conventions xv

Part 1 Overview

Chapter 1 Software Overview 3

Table 3: Junos OS Processes 4

Chapter 2 DHCP Overview 7

Table 4: Legacy DHCP and Extended DHCP Server Hierarchy Levels 9

Part 2 Configuration

Chapter 6 Configuration Tasks 23

Table 5: DHCP Service Configuration Pages Summary 24
Table 6: DHCP Service Configuration Pages Summary for EX4300 Switches 27
Table 7: DHCP Client Settings 32

Chapter 7 Configuration Statements 41

Table 8: Unsupported [edit system] Configuration Statements on EX Series Switches 57
Table 9: Protocol Families and Supported Interface Types 106
Table 10: Interface Types and Their Supported Protocol Families 131

Part 3 Administration

Chapter 8 Routine Monitoring 203

Table 11: Summary of DHCP Output Fields 204
Table 12: Summary of DHCP Output Fields for EX4300 Switches 206
Table 13: Summary of the DHCP Statistics Information Output for EX4300 switches 207

Chapter 9 Operational Commands 209

Table 14: clear dhcp relay statistics Output Fields 211
Table 15: show dhcp relay statistics Output Fields 225
Table 16: show security pki local-certificate Output Fields 227
Table 17: show system services dhcp binding Output Fields 230
Table 18: show system services dhcp conflict Output Fields 233
Table 19: show system services dhcp global Output Fields 234
Table 20: show system services dhcp pool Output Fields 236
Table 21: show system services dhcp statistics Output Fields 238

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Table 22: show system services service-deployment Output Fields 241

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About the Documentation

- Documentation and Release Notes on page xiii
- Supported Platforms on page xiii
- Using the Examples in This Manual on page xiii
- Documentation Conventions on page xv
- Documentation Feedback on page xvii
- Requesting Technical Support on page xvii

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Supported Platforms

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

- EX Series

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.

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

Merging a Full Example

To merge a full example, follow these steps:

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

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

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

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

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

Merging a Snippet

To merge a snippet, follow these steps:

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

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

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

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

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```
[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 the *CLI User Guide*.

Documentation Conventions

Table 1 on page xv 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 xv defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

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

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

Convention	Description	Examples
`Fixed-width text like this`	Represents output that appears on the terminal screen.	`user@host>` **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.	
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**.

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

Convention	Description	Examples
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select **Protocols>Ospf**.

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

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- Find product documentation: http://www.juniper.net/techpubs/
- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/

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- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: http://kb.juniper.net/InfoCenter/
- Join and participate in the Juniper Networks Community Forum: http://www.juniper.net/company/communities/
- Open a case online in the CSC Case Management tool: http://www.juniper.net/cm/

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

Opening a Case with JTAC

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

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

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

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PART 1

Overview

- Software Overview on page 3
- DHCP Overview on page 7
- Public Key Cryptography Overview on page 15
- Self-Signed Certificates Overview on page 17
- Protocol Redirect Mechanism Overview on page 19

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CHAPTER 1

Software Overview

- Understanding Software Infrastructure and Processes on page 3

Understanding Software Infrastructure and Processes

Each switch runs the Juniper Networks Junos operating system (Junos OS) for Juniper Networks EX Series Ethernet Switches on its general-purpose processors. Junos OS includes processes for Internet Protocol (IP) routing and for managing interfaces, networks, and the chassis.

The Junos OS runs on the Routing Engine. The Routing Engine kernel coordinates communication among the Junos OS processes and provides a link to the Packet Forwarding Engine.

With the J-Web interface and the command-line interface (CLI) to the Junos OS, you configure switching features and routing protocols and set the properties of network interfaces on your switch. After activating a software configuration, use either the J-Web or CLI user interface to monitor the switch, manage operations, and diagnose protocol and network connectivity problems.

- Routing Engine and Packet Forwarding Engine on page 3
- Junos OS Processes on page 4

Routing Engine and Packet Forwarding Engine

A switch has two primary software processing components:

- Packet Forwarding Engine—Processes packets; applies filters, routing policies, and other features; and forwards packets to the next hop along the route to their final destination.
- Routing Engine—Provides three main functions:
  - Creates the packet forwarding switch fabric for the switch, providing route lookup, filtering, and switching on incoming data packets, then directing outbound packets to the appropriate interface for transmission to the network
  - Maintains the routing tables used by the switch and controls the routing protocols that run on the switch.

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- Provides control and monitoring functions for the switch, including controlling power and monitoring system status.

Junos OS Processes

The Junos OS running on the Routing Engine and Packet Forwarding Engine consists of multiple processes that are responsible for individual functions.

The separation of functions provides operational stability, because each process accesses its own protected memory space. In addition, because each process is a separate software package, you can selectively upgrade all or part of the Junos OS, for added flexibility.

Table 3 on page 4 describes the primary Junos OS processes.

Table 3: Junos OS Processes

Process	Name	Description
Chassis process	chassisd	Detects hardware on the system that is used to configure network interfaces. Monitors the physical status of hardware components and field-replaceable units (FRUs), detecting when environment sensors such as temperature sensors are triggered. Relays signals and interrupts—for example, when devices are taken offline, so that the system can close sessions and shut down gracefully.
Ethernet switching process	eswd	Handles Layer 2 switching functionality such as MAC address learning, Spanning Tree protocol and access port security. The process is also responsible for managing Ethernet switching interfaces, VLANs, and VLAN interfaces. Manages Ethernet switching interfaces, VLANs, and VLAN interfaces.
Forwarding process	pfem	Defines how routing protocols operate on the switch. The overall performance of the switch is largely determined by the effectiveness of the forwarding process.
Interface process	dcd	Configures and monitors network interfaces by defining physical characteristics such as link encapsulation, hold times, and keepalive timers.
Management process	mgd	Provides communication between the other processes and an interface to the configuration database. Populates the configuration database with configuration information and retrieves the information when queried by other processes to ensure that the system operates as configured. Interacts with the other processes when commands are issued through one of the user interfaces on the switch. If a process terminates or fails to start when called, the management process attempts to restart it a limited number of times to prevent thrashing and logs any failure information for further investigation.
Routing protocol process	rpd	Defines how routing protocols such as RIP, OSPF, and BGP operate on the device, including selecting routes and maintaining forwarding tables.

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Related Documentation

- For more information about processes, see *Junos OS Network Operations Guide*
- For more information about basic system parameters, supported protocols, and software processes, see *Junos OS System Basics Configuration Guide*

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CHAPTER 2

DHCP Overview

- Understanding DHCP Services for Switches on page 7
- DHCP/BOOTP Relay for Switches Overview on page 11
- Understanding the Extended DHCP Relay Agent for EX Series Switches on page 12
- Suppressing DHCP Access, Access-Internal, and Destination Routes on page 13

Understanding DHCP Services for Switches

A Dynamic Host Configuration Protocol (DHCP) server on a switch can provide many valuable TCP/IP network services. For example, DHCP can dynamically allocate the four required IP parameters to each computer on the LAN: IP address, network mask, switch address, and name server address. Additionally, DHCP on the switch can automatically upgrade software on client systems.

This topic describes:

- DHCP Client/Server Model on page 7
- Using DHCP on page 8
- DHCP Relay Servers and DHCP Servers on page 8
- Legacy DHCP and Extended DHCP for Server Versions on page 9
- Configuring DHCP on a Switch on page 10
- How DHCP Works on page 10

DHCP Client/Server Model

DHCP IP address allocation works on a client/server model in which the server, in this case a switch, assigns the client reusable IP information from an address pool. A DHCP client might receive offer messages from multiple DHCP servers and can accept any one of the offers; however, the client usually accepts the first offer it receives. See Figure 1 on page 8.

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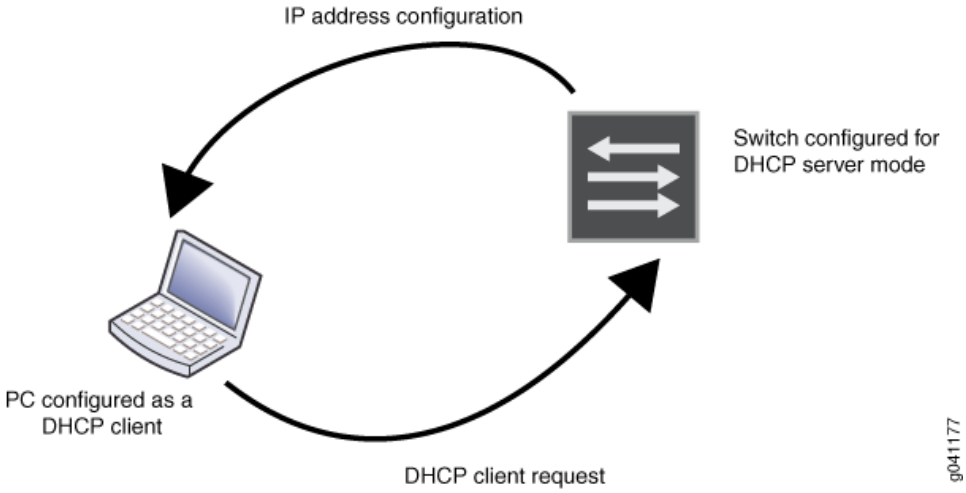
Figure 1: DHCP Client/Server Model



Using DHCP

DHCP automates network-parameter assignment to network devices. Even in small networks, DHCP is useful because it makes it easy to add new machines to the network.

DHCP access service minimizes the overhead required to add clients to the network by providing a centralized, server-based setup, which means that you do not have to manually create and maintain IP address assignments for clients. In addition, when you use DHCP to manage a pool of IP addresses among hosts, you reduce the number of IP addresses needed on the network. DHCP does this by leasing an IP address to a host for a limited period of time, allowing the DHCP server to share a limited number of IP addresses. DHCP also provides a central database of devices that are connected to the network and eliminates duplicate resource assignments. In addition to IP addresses for clients, DHCP provides other configuration information, particularly the IP addresses of local caching Domain Name System (DNS) resolvers, network boot servers, or other service hosts.

Another valuable DHCP feature is automatic software download for installation of software packages on switches. DHCP clients configured for automatic software download receive messages as part of the DHCP message exchange process—when the software package name in the DHCP server message is different from that of the software package that booted the DHCP client switch, the new software is downloaded and installed. See *Upgrading Software by Using Automatic Software Download*.

DHCP Relay Servers and DHCP Servers

You can configure a switch either as a DHCP server or as a DHCP relay server, but not both. Whereas a DHCP server replies to a client with an IP address, a DHCP relay server relays DHCP messages to and from the configured DHCP server, even if the client and server are on different IP networks.

Configure a switch to be a DHCP relay agent if you have locally attached hosts and a remote DHCP server. For directions on configuring a DHCP relay server, see "DHCP/BOOTP Relay for Switches Overview" on page 11.

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Legacy DHCP and Extended DHCP for Server Versions

Two versions of both DHCP server and DHCP relay agent are available on EX Series, QFX Series, and OCX Series switches. The original legacy DHCP server and legacy DHCP relay agent can be used in the same network as the extended DHCP servers and extended DHCP relay agent—extended DHCP is also referred to as virtual router (VR) aware DHCP.

You cannot configure legacy DHCP and extended DHCP versions on the same switch. Because the newer extended DHCP server version has more features, we recommend that you configure the extended DHCP server if it is supported by the switch. See *EX Series Switch Software Features Overview* for a list of switches that support the extended DHCP server.

The extended DHCP server version has the following added features:

- Graceful Routing Engine switchover (GRES), which provides mirroring support for clients. For details, see *High Availability Features for EX Series Switches Overview*.
- Virtual routing and forwarding (VRF), which allows multiple instances of a routing table to simultaneously coexist on the same switch. For details, see *Understanding Virtual Routing Instances on EX Series Switches* .

NOTE: Legacy DHCP supports the circuit ID and the remote ID fields for the relay agent option (option 82). Extended DHCP for the relay agent option supports only circuit ID. See *EX Series Switch Software Features Overview* for a list of switches that support extended DHCP (VR-aware DHCP).

Legacy DHCP and extended DHCP servers can be configured at the hierarchy levels shown in Table 4 on page 9:

Table 4: Legacy DHCP and Extended DHCP Server Hierarchy Levels

DHCP Service	Hierarchy
Extended DHCP server	**edit system services dhcp-local-server**
Extended DHCP address pool	**edit access address-assignment pool**
Legacy DHCP server	**edit system services dhcp**
Legacy DHCP relay	**edit forwarding-options helpers bootp**
Extended DHCP relay	**edit forwarding-options dhcp-relay**
Legacy DHCP address pool	**edit system services dhcp pool**

DHCP clients on a switch are always configured at the hierarchy level **[edit interfaces *interface-name* family dhcp]**.

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Configuring DHCP on a Switch

A DHCP configuration consists of two parts: the configuration for a DHCP server and the configuration for DHCP clients. The DHCP server configuration is simple if you accept the default configurations.

When you configure a legacy DHCP server, you only need to define the DHCP server name and the interface on the switch. You can use the default configuration for the rest of the settings. When you configure an extended DHCP server, you need to only define a DHCP pool, indicate IP addresses for the pool, and create a server group. You can use the default configuration for the rest of the settings.

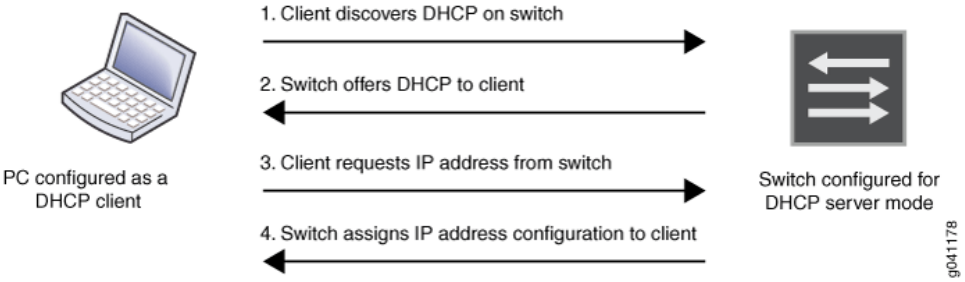
For directions for configuring either a legacy DHCP server or an extended DHCP server, see "Configuring a DHCP Server on Switches (CLI Procedure)" on page 32.

To configure a DHCP client, set the client's DHCP interface address in the **[edit interfaces interface-name unit 0 family inet dhcp]** hierarchy. For directions for configuring a DHCP client on a switch, see "Configuring a DHCP Client (CLI Procedure)" on page 31.

How DHCP Works

DHCP consists of a four-step transfer process beginning with a broadcast DHCP discovery message from the client. As the second step, the client receives a DHCP offer message from the server. This message includes the IP address and mask, and some other specific parameters. The client then sends a DHCP request message to accept the IP address and other parameters that it received from the server in the previous step. The DHCP server sends a DHCP response message and removes the now-allocated address from the DHCP address pool. See Figure 2 on page 10.

Figure 2: DHCP Four-Step Transfer



NOTE: Because the DHCP discovery message from the client is a broadcast message and because broadcast messages cross other segments only when they are explicitly routed, you might have to configure a DHCP relay agent on the switch interface so that all DHCP discovery messages from the clients are forwarded to one DHCP server.

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 31
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35
- Configuring a DHCP SIP Server (CLI Procedure) on page 31
- *Upgrading Software by Using Automatic Software Download*
- Monitoring DHCP Services on page 203

DHCP/BOOTP Relay for Switches Overview

You can configure the switch to act as a Dynamic Host Configuration Protocol (DHCP) or Bootstrap Protocol (BOOTP) relay agent. This means that a locally attached host can issue a DHCP or BOOTP request as a broadcast message. After the switch receives this broadcast message, it relays the message to a specified DHCP or BOOTP server. You must configure the switch to be a DHCP or BOOTP relay agent if you have locally attached hosts and a remote DHCP or BOOTP server.

For detailed information about configuring a DHCP or BOOTP relay agent, see the *Junos OS Policy Framework Configuration Guide*.

You can configure a switch to use the gateway IP address (giaddr) as the source IP address of the switch for relayed DHCP packets when the switch is used as the DHCP relay agent. For information about configuring this option, see the **source-address-giaddr** configuration statement.

NOTE: Because DHCP and BOOTP messages are broadcast and are not directed to a specific server, switch, or router, EX Series switches and the QFX Series cannot function as both a DHCP server and a DHCP or BOOTP relay agent at the same time. The Juniper Networks Junos operating system (Junos OS) generates a commit error if both options are configured at the same time, and the commit operation does not succeed until one of the options is removed.

NOTE: DHCP relay across routing instances is not supported on EX Series switches or on the QFX Series.

Related Documentation

- For information about configuring the switch as a DHCP/BOOTP relay agent, see *Junos OS Policy Framework Configuration Guide*.
- Understanding DHCP Services for Switches on page 7

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Understanding the Extended DHCP Relay Agent for EX Series Switches

You can configure a Juniper Networks EX Series Ethernet switch to act as an extended DHCP relay agent. This means that a locally attached host can issue a DHCP request as a broadcast message and the switch configured for DHCP relay relays the message to a specified DHCP server. Configure a switch to be an extended DHCP relay agent if you have locally attached hosts and a remote DHCP server.

You can use DHCP relay in carrier edge applications such as video/IPTV to obtain configuration parameters, including an IP address, for your subscribers.

DHCP relay supports the attachment of dynamic profiles. You can attach dynamic profiles on a global basis or for a specific group of interfaces.

EX Series switches also support the DHCPv6 relay agent.

This topic covers:

- Extended DHCP Relay and Legacy DHCP/BOOTP Relay on page 12
- Interaction Among the DHCP Relay Agent, DHCP Client, and DHCP Servers on page 12

Extended DHCP Relay and Legacy DHCP/BOOTP Relay

The extended DHCP relay agent options configured with the **dhcp-relay** statement are incompatible with the DHCP/BOOTP relay agent options configured with the **bootp** statement. Therefore, you cannot enable both the extended DHCP relay agent and the legacy DHCP/BOOTP relay agent on a switch at the same time.

For information about the legacy DHCP/BOOTP relay agent, see "DHCP/BOOTP Relay for Switches Overview" on page 11.

Interaction Among the DHCP Relay Agent, DHCP Client, and DHCP Servers

The following steps describe, at a high level, how the DHCP client, DHCP relay agent, and DHCP server interact in a configuration that includes two DHCP servers:

1. The DHCP client sends a discover packet to find a DHCP server in the network from which to obtain configuration parameters, including an IP address, for the subscriber.
2. The DHCP relay agent receives the discover packet and forwards copies of the discover packets to each of the two DHCP servers. The DHCP relay agent then creates an entry in its internal client table to keep track of the client's state.
3. In response to receiving the discover packet, each DHCP server sends an offer packet to the client. The DHCP relay agent receives the offer packets and forwards them to the DHCP client.
4. On receiving the offer packets, the DHCP client selects the DHCP server from which to obtain configuration information. Typically, the client selects the server that offers the longest lease time on the IP address.
5. The DHCP client sends a request packet that specifies the DHCP server from which to obtain configuration information.

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6. The DHCP relay agent receives the request packet and forwards copies of this packet to each of the two DHCP servers.
7. The DHCP server requested by the client sends an acknowledgement (ack) packet that contains the client's configuration parameters.
8. The DHCP relay agent receives the ack packet and forwards it to the client.
9. The DHCP client receives the ack packet and stores the configuration information.
10. If configured to do so, the DHCP relay agent installs a host route and Address Resolution Protocol (ARP) entry for this client.
11. After establishing the initial lease on the IP address, the DHCP client and the DHCP server use unicast transmission to negotiate lease renewal or release. The DHCP relay agent snoops all of the packets unicast between the client and the server that pass through the relay agent to determine when the lease has expired or been released. This process is referred to as *lease shadowing* or *passive snooping*.

Related Documentation

- Configuring a DHCP Server on Switches (CLI Procedure) on page 32
- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35

Suppressing DHCP Access, Access-Internal, and Destination Routes

During the DHCP client binding operation, the DHCP process adds route information for the DHCP sessions by default. The DHCP process adds access-internal and destination routes for DHCPv4 sessions, and access-internal and access routes for DHCPv6 sessions. In some scenarios, you might want to override the default behavior and prevent DHCP from automatically installing the route information. For example, DHCP relay installs destination (host) routes by default—this action is required in certain configurations to enable address renewals from the DHCP server to work properly. However, the default installation of destination routes might cause a conflict when you configure DHCP relay with static subscriber interfaces. To avoid such configuration conflicts you can override the default behavior and prevent DHCP relay from installing the routes.

NOTE: **You cannot suppress access-internal routes when the subscriber is configured with both IA_NA and IA_PD addresses over IP demux interfaces—the IA_PD route relies on the IA_NA route for next hop connectivity.**

You can configure both DHCP local server and DHCP relay agent to override the default route installation behavior, and you can specify the override for both DHCPv4 and DHCPv6 sessions. You can override the route installation globally or for named interface groups. For DHCPv4 you can override the installation of destination routes only or access-internal routes (the access-internal option prevents installation of both destination and access-internal routes). For DHCPv6 you can specify access routes, access-internal routes, or both.

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Related Documentation

- Preventing DHCP from Installing Access, Access-Internal, and Destination Routes by Default on page 39
- *Extended DHCP Local Server Overview*
- *DHCPv6 Local Server Overview*
- *Extended DHCP Relay Agent Overview*
- *DHCPv6 Relay Agent Overview*

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CHAPTER 3

Public Key Cryptography Overview

- Understanding Public Key Cryptography on Switches on page 15

Understanding Public Key Cryptography on Switches

Cryptography describes the techniques related to the following aspects of information security:

- Privacy or confidentiality
- Integrity of data
- Authentication
- Nonrepudiation or nonrepudiation of origin—Nonrepudiation of origin means that signers cannot claim that they did not sign a message while claiming that their private key remains secret. In some nonrepudiation schemes used in digital signatures, a timestamp is attached to the digital signature, so that even if the private key is exposed, the signature remains valid. Public and private keys are described in the following text.

In practice, cryptographic methods protect the data transferred from one system to another over public networks by encrypting the data using an encryption key. Public key cryptography (PKC), which is used on Juniper Networks EX Series Ethernet Switches, uses a pair of encryption keys: a public key and a private key. The public and private keys are created simultaneously using the same encryption algorithm. The private key is held by a user secretly and the public key is published. Data encrypted with a public key can be decrypted only with the corresponding private key and vice versa. When you generate a public/private key pair, the switch automatically saves the key pair in a file in the certificate store, from which it is subsequently used in certificate request commands. The generated key pair is saved as ***certificate-id*.priv.**

NOTE: **The default RSA and DSA key size is 1024 bits. If you are using the Simple Certificate Enrollment Protocol (SCEP), Juniper Networks Junos operating system (Junos OS) supports RSA only.**

This topic describes:

- Public Key Infrastructure (PKI) and Digital Certificates on page 16

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Public Key Infrastructure (PKI) and Digital Certificates

Public key infrastructure (PKI) allows the distribution and use of the public keys in public key cryptography with security and integrity. PKI manages the public keys by using digital certificates. A digital certificate provides an electronic means of verifying the identity of an individual, an organization, or a directory service that can store digital certificates.

A PKI typically consists of a Registration Authority (RA) that verifies the identities of entities, authorizes their certificate requests, and generates unique asymmetric key pairs (unless the users' certificate requests already contain public keys); and a Certificate Authority (CA) that issues corresponding digital certificates for the requesting entities. Optionally, you can use a Certificate Repository that stores and distributes certificates and a certificate revocation list (CRL) identifying the certificates that are no longer valid. Each entity possessing the authentic public key of a CA can verify the certificates issued by that CA.

Digital signatures exploit the public key cryptographic system as follows:

1. A sender digitally signs data by applying a cryptographic operation, involving its private key, on a digest of the data.
2. The resulting signature is attached to the data and sent to the receiver.
3. The receiver obtains the digital certificate of the sender, which provides the sender's public key and confirmation of the link between its identity and the public key. The sender's certificate is often attached to the signed data.
4. The receiver either trusts this certificate or attempts to verify it. The receiver verifies the signature on the data by using the public key contained in the certificate. This verification ensures the authenticity and integrity of the received data.

As an alternative to using a PKI, an entity can distribute its public key directly to all potential signature verifiers, so long as the key's integrity is protected. The switch does it by using a self-signed certificate as a container for the public key and the corresponding entity's identity.

Related Documentation

- Understanding Self-Signed Certificates on EX Series Switches on page 17

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CHAPTER 4

Self-Signed Certificates Overview

- Understanding Self-Signed Certificates on EX Series Switches on page 17

Understanding Self-Signed Certificates on EX Series Switches

When you initialize a Juniper Networks EX Series Ethernet Switch with the factory default configuration, the switch generates a self-signed certificate, allowing secure access to the switch through the Secure Sockets Layer (SSL) protocol. Hypertext Transfer Protocol over Secure Sockets Layer (HTTPS) and XML Network Management over Secure Sockets Layer (XNM-SSL) are the two services that can make use of the self-signed certificates.

NOTE: **Self-signed certificates do not provide additional security as do those generated by Certificate Authorities (CAs). This is because a client cannot verify that the server he or she has connected to is the one advertised in the certificate.**

The switches provide two methods for generating a self-signed certificate:

- Automatic generation

  In this case, the creator of the certificate is the switch. An automatically generated (also called "system-generated") self-signed certificate is configured on the switch by default.

  After the switch is initialized, it checks for the presence of an automatically generated self-signed certificate. If it does not find one, the switch generates one and saves it in the file system.

  A self-signed certificate that is automatically generated by the switch is similar to an SSH host key. It is stored in the file system, not as part of the configuration. It persists when the switch is rebooted, and it is preserved when a **request system snapshot** command is issued.

  The switch uses the following distinguished name for the automatically generated certificate:

  " CN=<device serial number>, CN=system generated, CN=self-signed"

  If you delete the system-generated self-signed certificate on the switch, the switch generates a self-signed certificate automatically.

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- Manual generation

  In this case, you create the self-signed certificate for the switch. At any time, you can use the CLI to generate a self-signed certificate. Manually generated self-signed certificates are stored in the file system, not as part of the configuration.

Self-signed certificates are valid for five years from the time they are generated. When the validity of an automatically generated self-signed certificate expires, you can delete it from the switch so that the switch generates a new self-signed certificate.

System-generated self-signed certificates and manually generated self-signed certificates can coexist on the switch.

Related Documentation

- Understanding Public Key Cryptography on Switches on page 15
- Manually Generating Self-Signed Certificates on Switches (CLI Procedure) on page 37

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CHAPTER 5

Protocol Redirect Mechanism Overview

- Understanding the Protocol Redirect Mechanism on EX Series Switches on page 19

Understanding the Protocol Redirect Mechanism on EX Series Switches

Internet Control Message Protocol (ICMP) redirect, also known as protocol redirect, is a mechanism used by switches and routers to convey routing information to hosts. ICMP redirect messages are used by switches and routers to notify the hosts on the same data link of the best route available for a given destination. All EX series switches support sending ICMP redirect messages for both IPv4 and IPv6 traffic.

NOTE: **EX series switches do not send ICMP redirect messages if the data packet contains routing information.**

The ICMP redirect messages inform a host to update its routing information and to send packets on an alternate route. Suppose a host tries to send a data packet through a switch (say, S1) and S1 sends the data packet to another switch (say, S2). Also, suppose that a direct path from the host to S2 is available (that is, the host and S2 are on the same Ethernet segment). S1 then sends a protocol redirect message to inform the host that the best route for the destination is the direct route to S2. The host should then send packets directly to S2 instead of sending them through S1. S2 still sends the original packet that it received from S1 to the intended destination. Refer to RFC-1122 and RFC-4861 for more details on ICMP redirecting.

By default, the switch sends protocol redirect messages. For security reasons, you might want to disable the switch from sending protocol redirect messages.

Related Documentation

- Configuring Junos OS to Disable Sending Protocol Redirect Messages on EX Series Switches (CLI Procedure) on page 38

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PART 2

Configuration

- Configuration Tasks on page 23
- Configuration Statements on page 41

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CHAPTER 6

Configuration Tasks

- Configuring DHCP Services (J-Web Procedure) on page 23
- Configuring a DHCP SIP Server (CLI Procedure) on page 31
- Configuring a DHCP Client (CLI Procedure) on page 31
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32
- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35
- Enabling HTTPS and XNM-SSL Services on Switches Using Self-Signed Certificates (CLI Procedure) on page 36
- Manually Generating Self-Signed Certificates on Switches (CLI Procedure) on page 37
- Deleting Self-Signed Certificates (CLI Procedure) on page 38
- Configuring Junos OS to Disable Sending Protocol Redirect Messages on EX Series Switches (CLI Procedure) on page 38
- Preventing DHCP from Installing Access, Access-Internal, and Destination Routes by Default on page 39

Configuring DHCP Services (J-Web Procedure)

- Configuring DHCP Services (J-Web Procedure) on EX Series Switches on page 23
- Configuring DHCP Services on EX4300 Switches (J-Web Procedure) on page 26

Configuring DHCP Services (J-Web Procedure) on EX Series Switches

NOTE: **This topic applies only to the J-Web Application package.**

Use the J-Web DHCP Configuration pages to configure DHCP pools for subnets and static bindings for DHCP clients on an ACX Series Universal Access Gateway router or an EX Series Ethernet Switch. If DHCP pools or static bindings are already configured, use the Configure Global DHCP Parameters Configuration page to add settings for these pools and static bindings. Settings that have been previously configured for DHCP pools or static bindings are not overridden when you use the Configure Global DHCP Parameters Configuration page.

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To configure the DHCP server:

1. Select **Configure** > **Services** > **DHCP**
2. Access a DHCP Configuration page:
   - To configure a DHCP pool for a subnet, click **Add** in the DHCP Pools box.
   - To configure a static binding for a DHCP client, click **Add** in the DHCP Static Binding box.
   - To globally configure settings for existing DHCP pools and static bindings, click **Configure Global DHCP Parameters**.
3. Enter information into the DHCP Service Configuration pages as described in Table 5 on page 24
4. To apply the configuration, click **Apply**.

NOTE: After you make changes to the configuration on this page, you must commit the changes for them to take effect. To commit all changes to the active configuration, select **Commit Options** > **Commit**. See Using the Commit Options to Commit Configuration Changes for details about all commit options.

Table 5: DHCP Service Configuration Pages Summary

Field	Function	Your Action
DHCP Pool Information		
DHCP Subnet (required)	Specifies the subnet on which DHCP is configured.	Type an IP address prefix.
Address Range (Low) (required)	Specifies the lowest address in the IP address pool range.	Type an IP address that is part of the subnet specified in DHCP Subnet field .
Address Range (High) (required)	Specifies the highest address in the IP address pool range.	Type an IP address that is part of the subnet specified in DHCP Subnet. This address must be greater than the address specified in the Address Range (Low) field.
Exclude Addresses	Specifies addresses to exclude from the IP address pool.	• To add an excluded address, type the address next to the **Add** button, and click **Add**. • To delete an excluded address, select the address in the Exclude Addresses box, and click **Delete**.
Lease Time		
Maximum Lease Time (Seconds)	Specifies the maximum length of time a client can hold a lease. (Dynamic BOOTP lease lengths can exceed this maximum time.)	Type a number from 60 through 4,294,967,295 (seconds). You can also type **infinite** to specify a lease that never expires.

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Table 5: DHCP Service Configuration Pages Summary *(continued)*

Field	Function	Your Action
Default Lease Time (Seconds)	Specifies the length of time a client can hold a lease for clients that do not request a specific lease length.	Type a number from 60 through 2,147,483,647 (seconds). You can also type **infinite** to specify a lease that never expires.
Server Information		
Server Identifier	Specifies the IP address of the DHCP server reported to a client.	Type the IP address of the server. If you do not specify a server identifier, the primary address of the interface on which the DHCP exchange occurs is used.
Domain Name	Specifies the domain name that clients must use to resolve hostnames.	Type the name of the domain.
Domain Search	Specifies the order—from top to bottom—in which clients must append domain names when resolving hostnames using DNS.	• To add a domain name, type the name next to the **Add** button, and click **Add**. • To delete a domain name, select the name in the Domain Search box, and click **Delete**.
DNS Name Servers	Defines a list of DNS servers that the client can use, in the specified order—from top to bottom.	• To add a DNS server, type an IP address next to the **Add** button, and click **Add**. • To remove a DNS server, select the IP address in the DNS Name Servers box, and click **Delete**.
Gateway Routers	Defines a list of relay agents on the subnet, in the specified order—from top to bottom.	• To add a relay agent, type an IP address next to the **Add** button, and click **Add**. • To remove a relay agent, select the IP address in the Gateway Routers box, and click **Delete**.
WINS Servers	Defines a list of NetBIOS name servers, in the specified order—from top to bottom.	• To add a NetBIOS name server, type an IP address next to the **Add** button, and click **Add**. • To remove a NetBIOS name server, select the IP address in the WINS Servers box, and click **Delete**.
Boot Options		
Boot File	Specifies the path and filename of the initial boot file to be used by the client.	Type a path and filename.
Boot Server	Specifies the Trivial File Transfer Protocol (TFTP) server that the client uses to obtain the client configuration file.	Type the IP address or hostname of the TFTP server.
DHCP Static Binding Information		
DHCP MAC Address (required)	Specifies the MAC address of the client to be permanently assigned a static IP address.	Type the hexadecimal MAC address of the client.

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Table 5: DHCP Service Configuration Pages Summary *(continued)*

Field	Function	Your Action
Fixed IP Addresses (required)	Defines a list of IP addresses permanently assigned to the client. A static binding must have at least one fixed address assigned to it, but multiple addresses are also allowed.	• To add an IP address, type it next to the **Add** button, and click **Add**. • To remove an IP address, select it in the Fixed IP Addresses box, and click **Delete**.
Host Name	Specifies the name of the client used in DHCP messages exchanged between the server and the client. The name must be unique to the client within the subnet on which the client resides.	Type a client hostname.
Client Identifier	Specifies the name of the client used by the DHCP server to index its database of address bindings. The name must be unique to the client within the subnet on which the client resides.	Type a client identifier in string form.
Hexadecimal Client Identifier	Specifies the name of the client, in hexadecimal form, used by the DHCP server to index its database of address bindings. The name must be unique to the client within the subnet on which the client resides.	Type a client identifier in hexadecimal form.

Configuring DHCP Services on EX4300 Switches (J-Web Procedure)

On EX4300 switches, use the DHCP Configuration page to create DHCP pools and set the DHCP parameters for them and to configure DHCP settings for existing DHCP pools and static bindings.

To configure the DHCP services on EX4300 switches:

1. Select **Configure** > **Services** > **DHCP**
2. Access a DHCP Configuration page:
   - To configure a DHCP pool for a subnet, click **Add** in the DHCP Pools box.
   - To configure DHCP groups, click **Add** in the DHCP Groups box.
   - To globally configure settings for existing DHCP pools and static bindings, click **Configure Global DHCP Parameters**.
3. Enter information into the DHCP Service Configuration pages as described in Table 6 on page 27
4. To apply the configuration, click **OK**.

NOTE: After you make changes to the configuration on this page, you must commit the changes for them to take effect. To commit all changes to the active configuration, select **Commit Options** > **Commit**. See Using the Commit Options to Commit Configuration Changes for details about all commit options.

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Table 6: DHCP Service Configuration Pages Summary for EX4300 Switches

Field	Function	Your Action
DHCP Groups		
Group Name	Specifies the name of the group.	Enter the name of the group.
Interfaces	Family inet interface is listed , only if it is already configured with family inet.	Select the interface for the specific group.
DHCP Pool Information		
Pool Name	Specifies the name of an address-assignment pool.	Type the pool name.
Link Pool	Specifies the pool name to which it is linked.	Select the option from the list.
Network Address		
IP Address	Specifies the IP address pool range.	Type an IP address that is part of the subnet specified in the DHCP Subnet field.
Subnet mask	Specifies the subnet specified in DHCP Subnet.	Type a subnet mask that is specified in the DHCP Subnet field.
DHCP Pool Attributes		
Pool Name	Displays the name of an address-assignment pool.	The pool name is displayed.
Server Identifier	Specifies the IP address of the DHCP server reported to a client.	Type the IP address of the server. If you do not specify a server identifier, the primary address of the interface on which the DHCP exchange occurs is used.
TFTP Server	Specifies the Trivial File Transfer Protocol (TFTP) server that the client uses to obtain the client configuration file.	Enter the IP address of the TFTP server.
Maximum Lease Time (Seconds)	Specifies the maximum length of time a client can hold a lease. (Dynamic BOOTP lease lengths can exceed this maximum time.)	Type a number.
Boot File	Specifies the path and filename of the initial boot file to be used by the client.	Type a path and filename.
Boot Server	Specifies the TFTP server that provides the initial boot file to the client.	Type the IP address or hostname of the TFTP server.
Grace Period	Specifies the grace period for which a client can hold a lease.	Type the grace period in seconds.

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Table 6: DHCP Service Configuration Pages Summary for EX4300 Switches *(continued)*

Field	Function	Your Action
DNS Name Servers	Defines a list of DNS servers the client can use.	• To add a DNS server, click **Add**. Type an IP address in the **Add IP Address** pop-up window. • Click **OK** • To remove a DNS server, select the IP address in the DNS Name Servers box, and click **Remove**.
WINS Servers	Defines a list of NetBIOS name servers.	• To add a NetBIOS name server, click **Add**. Type an IP address in the **Add IP Address** pop-up window. • Click **OK**. • To remove a NetBIOS name server, select the IP address in the WINS Servers box, and click **Remove**.
Domain Name	Specifies the domain name that clients must use to resolve hostnames.	Type the name of the domain.
NetBIOS Node Type	Specifies the NetBOIS node that provides the initial node file to the client.	Select the type from the list.
Gateway Routers	Defines a list of relay agents on the subnet, in the specified order—from top to bottom.	• To add a relay agent, click **Add**. Type an IP address in the **Add IP Address** pop-up window. • Click **OK**. • To remove a relay agent, select the IP address in the Gateway Routers box, and click **Remove**.
Option	Specifies the DHCP options.	• To add a DHCP option, click **Add**. The Add DHCP Option pop-up window is displayed. Enter the following: • Enter the DHCP **Code** in the Code box. • Select the DHCP type from the **Type** list. • Select the DHCP subtype from the **Sub Type** list. • Enter the DHCP value in the **Value** box. • Click **OK**. • To remove a DHCP option, select the option in the Option box, and click **Remove**.
Option-82		
Circuit Identifier	Identifies the circuit (interface or VLAN or both) on the switch on which the request was received.	Type the circuit identifier.
Ranges	Specifies the circuit identifier range.	Type the range for the circuit identifier.

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Table 6: DHCP Service Configuration Pages Summary for EX4300 Switches *(continued)*

Field	Function	Your Action
Remote Identifier	By default, the remote ID is the MAC address of the switch	Type the remote identifier.
Ranges	Specifies the remote identifier range.	Type the range for the remote identifier.
Address Range		
Range Name	Specifies the name of the range.	Click **Add** . The Add Address Range pop-up window is displayed: • Type the range name in the **Range Name** box.
Address Range		
Address Range (Low)	Specifies the lowest address in the IP address pool range.	Type an IP address that is part of the subnet specified in DHCP Subnet
Address Range (High)	Specifies the highest address in the IP address pool range.	Type an IP address that is part of the subnet specified in DHCP Subnet. This address must be greater than the address specified in Address Range (Low).
Static Bindings		
Host Name	Specifies the name of the client used in DHCP messages exchanged between the server and the client. The name must be unique to the client within the subnet on which the client resides.	Type a client hostname.
MAC Address	Specifies the MAC address of the client to be permanently assigned a static IP address.	Type the hexadecimal MAC address of the client.
Fixed IP Address	Specifies the IP address of the client.	Type the IP address.
Global Settings		
General		
Duplicate clients on interface	Specifies the DHCP local server to include the client subinterface when distinguishing between duplicate DHCP clients (clients with the same MAC address or client ID) in the same subnet.	To enable this option, select the check box.
Pool Match Order	Specifies the order in which the DHCP local server uses information in the DHCP client PDU to determine how to obtain an address for the client.	Select the pool match order.
Authentication		

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Table 6: DHCP Service Configuration Pages Summary for EX4300 Switches *(continued)*

Field	Function	Your Action
Password	Specifies the password that is sent to the external AAA authentication server for subscriber authentication.	Type the password.
Username-include		
Circuit Type	Specifies the circuit type that is linked with the username.	To enable this option, select the check box.
Interface Name	Name of the interface.	To enable this option, select the check box.
Mac Address	Specifies the MAC address of the client PDU that is linked with the username during the subscriber authentication process.	To enable this option, select the check box.
Logical System Name	Specifies that the logical system name that is linked with the username during the subscriber authentication process.	To enable this option, select the check box.
Option-60	Specifies the payload of Option 60 (Vendor Class Identifier) from the client PDU be linked with the username during the subscriber authentication process.	To enable this option, select the check box.
Routing Instance Name	Specifies the routing instance name that is linked with the username during the subscriber authentication process.	To enable this option, select the check box.
Option-82		
Circuit Identifier	Specifies the name of the client used by the DHCP server to index its database of address bindings. The name must be unique to the client within the subnet on which the client resides.	To enable this option, select the check box.
Remote Identifier	Specifies the remote ID option in the client.	To enable this option, select the check box.
Domain Name	Specifies the domain name that clients must use to resolve hostnames.	Type the domain name.
User Prefix	Specifies the prefix to the username as defined by the user.	Type the prefix.
Delimiter	Specifies a character that separates components that make up the username.	Type the delimiter.

Related Documentation

- Understanding DHCP Services for Switches on page 7
- Monitoring DHCP Services on page 203

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Configuring a DHCP SIP Server (CLI Procedure)

You can use the **sip-server** statement on the EX Series switch to configure option 120 on a DHCP server. The DHCP server sends configured option values—Session Initiation Protocol (SIP) server addresses or names—to DHCP clients when they request them. Previously, you were only allowed to specify a SIP server by address using **[edit system services dhcp option 120]**. You specify either an IPv4 address or a fully qualified domain name to be used by SIP clients to locate a SIP server. You cannot specify both an address and name in the same statement.

To configure a SIP server using the ***address*** option:

```
[edit system services dhcp]
user@switch# set sip-server address
```

For example, to configure one address:

```
[edit system services dhcp]
user@switch set sip-server 172.168.0.11
```

To configure a SIP server using the ***name*** option:

```
[edit system services dhcp]
user@switch# set sip-server name
```

For example, to configure a name:

```
[edit system services dhcp]
user@switch set sip-server abc.example.com
```

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 31
- Understanding DHCP Services for Switches on page 7

Configuring a DHCP Client (CLI Procedure)

A Dynamic Host Configuration Protocol (DHCP) server can provide many valuable TCP/IP network services. DHCP can dynamically allocate IP parameters, such as an IP address, to clients, and it can also deliver software upgrades to clients.

DHCP configuration consists of two components, configuration of DHCP clients and configuration of a DHCP server. Client configuration determines how clients send a message requesting an IP address, whereas a DHCP server configuration enables the server to send an IP address configuration back to the client. This topic describes configuring a DHCP client. For directions for configuring a DHCP server, see "Configuring a DHCP Server on Switches (CLI Procedure)" on page 32 or *Configuring a DHCP Server on Switches (CLI Procedure)*.

You can change DHCP client configurations from the switch, using client identifiers to indicate which clients you want to configure.

To configure a DHCP client, you configure an interface to belong to the DHCP family and specify additional attributes, as desired:

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```
[edit]
user@switch# set interfaces interface-name unit number family inet dhcp
configuration-statement
```

The options that you can configure are listed in Table 7 on page 32. Replace the variable *configuration-statement* with one or more of the statements listed in this table. If you do not explicitly configure these options, the switch uses default values for them.

Table 7: DHCP Client Settings

Configuration Statement	Description
client-identifier	Unique client ID—By default this consists of the hardware type (01 for Ethernet) and the MAC address (a.b.c.d). For this example, the value would be 01abcd.
lease-time	Time in seconds that a client holds the lease for an IP address assigned by a DHCP server. If a client does not request a specific lease time, then the server sends the default lease time. The default lease time on a Junos OS DHCP server is 1 day.
retransmission-attempt	Number of times the client attempts to retransmit a DHCP packet.
retransmission-interval	Time between transmission attempts.
server-address	IP address of the server that the client queries for an IP address.
update-server	TCP/IP settings learned from an external DHCP server to the DHCP server running on the switch are propagated.
vendor-option	Vendor class ID (CPU's manufacturer ID string) for the DHCP client.

Related Documentation

- Configuring a DHCP Server on Switches (CLI Procedure) on page 32
- Understanding DHCP Services for Switches on page 7

Configuring a DHCP Server on Switches (CLI Procedure)

NOTE: This task uses Junos OS for EX Series switches that does not support the Enhanced Layer 2 Software (ELS) configuration style. If your switch runs software that supports ELS, see *Configuring a DHCP Server on Switches (CLI Procedure)*. For ELS details, see *Getting Started with Enhanced Layer 2 Software*.

A Dynamic Host Configuration Protocol (DHCP) server can provide two valuable TCP/IP network services. DHCP can dynamically allocate IP parameters, such as an IP address, to clients and it can also deliver software upgrades to clients.

A DHCP configuration consists of two components—an optional reconfiguration of default settings on DHCP clients and the configuration of a DHCP server. This topic covers configuration of the DHCP server. For information about reconfiguring a DHCP client, see "Configuring a DHCP Client (CLI Procedure)" on page 31.

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You can configure either of two versions of a DHCP server on a switch— the extended server version or the legacy server version. We recommend that you configure the extended server unless you need to keep your DHCP server configuration backward-compatible with the legacy server version.

This topic includes the following tasks:

1. Configuring an Extended DHCP Server on a Switch on page 33
2. Configuring a Legacy DHCP Server on a Switch (CLI Procedure) on page 34

Configuring an Extended DHCP Server on a Switch

To configure an extended DHCP server, you must configure a DHCP pool, indicate IP addresses for the pool, and create a server group. Additional configurations are optional.

Do not assign addresses that are already in use in the network to address pools. The extended DHCP server does not check whether addresses are already in use before it assings them to clients.

1. Create an address pool for DHCP IP addresses:

   ```
   [edit]
   user@switch# set access address-pool address-pool
   ```

2. Configure an address-assignment pool that can be used by different client applications for DHCP dynamic assignment:

   ```
   [edit access address-assignment]
   user@switch# set pool address-pool-name
   ```

3. Create a server group on the switch, providing a group name and an interface name for DHCP:

   ```
   [edit system services dhcp-local-server]
   user@switch# set group group-name interface interface-name
   ```

4. (Optional) Process the information protocol data units (PDUs):

   ```
   [edit system services dhcp-local-server]
   user@switch# set overrides process-inform
   ```

5. (Optional) Redefine the order of attribute matching for pool selection:

   ```
   [edit system services dhcp-local-server]
   user@switch# set pool-match-order ip-address-first
   ```

6. (Optional) Enable dynamic reconfiguration triggered by the DHCP extended server for all DHCP clients or only for the DHCP clients serviced by the specified group of interfaces:

   ```
   [edit system services dhcp-local-server]
   user@switch# set reconfigure

   [edit system services dhcp-local-server group group-name]
   user@switch# set reconfigure
   ```

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Configuring a Legacy DHCP Server on a Switch (CLI Procedure)

To configure a legacy DHCP server, you must configure a pool of IP addresses for dynamic assignment. You only need to supply a series of network addresses. Additional configurations are optional.

1. Configure a pool of IP addresses for dynamic assignment:

   ```
   [edit system services dhcp]
   user@switch# set pool network-range
   ```

   

   NOTE: Step 2 through Step 15 are for assigning global values at the **[edit system services dhcp]** hierarchy level. You can also assign the same values to a specific pool by using those same commands at the **[edit system services dhcp pool *network-range*]** hierarchy level.

2. (Optional) Change the domain search list used to resolve hostnames:

   ```
   [edit system services dhcp]
   user@switch# set domain-search [ domain-list ]
   ```

3. (Optional) Change the domain name server (DNS) name that the DHCP server advertises to clients:

   ```
   [edit system services dhcp]
   user@switch# set name-server address
   ```

4. (Optional) Change the DHCP options:

   ```
   [edit system services dhcp]
   user@switch# set option id-number
   ```

5. (Optional) Change the devices advertised to clients:

   ```
   [edit system services dhcp]
   user@switch# set router  address
   ```

6. (Optional) Configure the name of the boot server advertised to DHCP clients. The client uses a boot file located on the boot server to complete the DHCP setup. This configuration step is equivalent to DHCP Option 66:

   ```
   [edit system services dhcp]
   user@switch# set boot-server (address | hostname)
   ```

7. (Optional) Set the boot file advertised to DHCP clients. After the client receives an IP address and the boot file location from the DHCP server, the client uses the boot image stored in the boot file to complete DHCP setup. This configuration step is equivalent to DHCP Option 67:

   ```
   [edit system services dhcp]
   user@switch# set boot-file filename
   ```

8. (Optional) Change the SIP server:

   ```
   [edit system services dhcp]
   user@switch# set sip-server addresses-or-names
   ```


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For more information, see "Configuring a DHCP SIP Server (CLI Procedure)" on page 31.

9. (Optional) Change the DHCP client's hardware address:

```
[edit system services dhcp]
user@switch# set static-binding mac-address
```

10. (Optional) Change the NetBIOS name server:

```
[edit system services dhcp]
user@switch# set wins-server address
```

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 31
- Configuring a DHCP SIP Server (CLI Procedure) on page 31
- Understanding DHCP Services for Switches on page 7

Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure)

You can configure an EX Series switch to act as an extended DHCP relay agent. This means that a locally attached host can issue a DHCP request as a broadcast message and the switch configured for DHCP relay relays the message to a specified DHCP server. Configure a switch to be a DHCP relay agent if you have locally attached hosts and a remote DHCP server.

Before you begin:

- Ensure that the switch can connect to the DHCP server.

To configure a switch to act as an extended DHCP relay agent server:

1. Create at least one DHCP server group, which is a group of 1 through 5 DHCP server IP addresses:

```
[edit forwarding-options dhcp-relay]
user@switch# set server-group server-group-name  ip-address
```

2. Set the global active DHCP server group. The DHCP relay server relays DHCP client requests to the DHCP servers defined in the active server group:

```
[edit forwarding-options dhcp-relay]
user@switch# set active-server-group  server-group-name
```

3. Create a DHCP relay group that includes at least one interface. DHCP relay runs on the interfaces defined in DHCP groups:

```
[edit forwarding-options dhcp-relay]
user@switch# set group group-name interface  interface-name
```

4. (Optional) Configure overrides of default DHCP relay behaviors, at the global level. See the override options in the overrides statement.

```
[edit forwarding-options dhcp-relay]
user@switch# set overrides
```

5. (Optional) Configure DHCP relay to use the DHCP vendor class identifier option (option 60) in DHCP client packets, at the global level:

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```
[edit forwarding-options dhcp-relay]
user@switch# set relay-option option-number 60
```

6. (Optional) Configure settings for a DHCP relay group that override the settings at the global level, using these statements:

```
[edit forwarding-options dhcp-relay group group-name]
user@switch# set active-server-group server-group-name
user@switch# set overrides
user@switch# set relay-option option-number 60
```

7. (Optional) Configure settings for a DHCP relay group interface that override the settings at the global and **group** levels, using these statements:

```
[edit forwarding-options dhcp-relay group group-name  interface interface-name]
user@switch# exclude
user@switch# set overrides
user@switch# set trace
user@switch# set upto upto-interface-name
```

Related Documentation

- Configuring a DHCP Server on Switches (CLI Procedure) on page 32
- Configuring a DHCP Client (CLI Procedure) on page 31
- Understanding the Extended DHCP Relay Agent for EX Series Switches on page 12

Enabling HTTPS and XNM-SSL Services on Switches Using Self-Signed Certificates (CLI Procedure)

You can use the system-generated self-signed certificate or a manually generated self-signed certificate to enable Web management HTTPS and XNM-SSL services.

- To enable HTTPS services using the automatically generated self-signed certificate:

```
[edit]
user@switch# set system services web-management https system-generated-certificate
```

- To enable HTTPS services using a manually generated self-signed certificate:

```
[edit]
user@switch# set system services web-management https pki-local-certificate
certificate-id-name
```

NOTE: The value of the *certificate-id-name* must match the name you specified when you generated the self-signed certificate manually.

- To enable XNM-SSL services using a manually generated self-signed certificate:

```
[edit]
user@switch# set system services xnm-ssl local-certificate certificate-id-name
```

NOTE: The value of the *certificate-id-name* must match the name you specified when you generated the self-signed certificate manually.

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Related Documentation

- Manually Generating Self-Signed Certificates on Switches (CLI Procedure) on page 37
- Understanding Self-Signed Certificates on EX Series Switches on page 17

Manually Generating Self-Signed Certificates on Switches (CLI Procedure)

EX Series switches allow you to generate custom self-signed certificates and store them in the file system. The certificate you generate manually can coexist with the automatically generated self-signed certificate on the switch. To enable secure access to the switch over SSL, you can use either the system-generated self-signed certificate or a certificate you have generated manually.

To generate self-signed certificates manually, you must complete the following tasks:

- Generating a Public-Private Key Pair on Switches on page 37
- Generating Self-Signed Certificates on Switches on page 37

Generating a Public-Private Key Pair on Switches

A digital certificate has an associated cryptographic key pair that is used to sign the certificate digitally. The cryptographic key pair comprises a public key and a private key. When you generate a self-signed certificate, you must provide a public-private key pair that can be used to sign the self-signed certificate. Therefore, you must generate a public-private key pair before you can generate a self-signed certificate.

To generate a public-private key pair:

```
user@switch> request security pki generate-key-pair certificate-id certificate-id-name
```

NOTE: Optionally, you can specify the encryption algorithm and the size of the encryption key. If you do not specify the encryption algorithm and encryption key size, default values are used. The default encryption algorithm is RSA, and the default encryption key size is 1024 bits.

After the public-private key pair is generated, the switch displays the following:

```
generated key pair certificate-id-name, key size 1024 bits
```

Generating Self-Signed Certificates on Switches

To generate the self-signed certificate manually, include the certificate ID name, the subject of the distinguished name (DN), the domain name, the IP address of the switch, and the e-mail address of the certificate holder:

```
user@switch> request security pki local-certificate generate-self-signed certificate-id
certificate-id-name domain-name domain-name email email-address ip-address switch-ip-address
subject subject-of-distinguished-name
```

The certificate you have generated is stored in the switch's file system. The certificate ID you have specified while generating the certificate is a unique identifier that you can use to enable the HTTPS or XNM-SSL services.

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To verify that the certificate was generated and loaded properly, enter the **show security pki local-certificate** operational command.

Related Documentation

- Enabling HTTPS and XNM-SSL Services on Switches Using Self-Signed Certificates (CLI Procedure) on page 36
- Understanding Self-Signed Certificates on EX Series Switches on page 17

Deleting Self-Signed Certificates (CLI Procedure)

You can delete a self-signed certificate that is automatically or manually generated from the EX Series switch. When you delete the automatically generated self-signed certificate, the switch generates a new self-signed certificate and stores it in the file system.

- To delete the automatically generated certificate and its associated key pair from the switch:

  ```
  user@switch> clear security pki local-certificate system-generated
  ```

- To delete a manually generated certificate and its associated key pair from the switch:

  ```
  user@switch> clear security pki local-certificate certificate-id certificate-id-name
  ```

- To delete all manually generated certificates and their associated key pairs from the switch:

  ```
  user@switch> clear security pki local-certificate all
  ```

Related Documentation

- Manually Generating Self-Signed Certificates on Switches (CLI Procedure) on page 37
- Understanding Self-Signed Certificates on EX Series Switches on page 17

Configuring Junos OS to Disable Sending Protocol Redirect Messages on EX Series Switches (CLI Procedure)

EX series switches support sending ICMP redirect messages for both IPv4 and IPv6 traffic. By default, the switch sends protocol redirect messages. For security reasons, you may want to disable the switch from sending protocol redirect messages.

To disable the sending of redirect messages by the switch:

- Disable sending protocol redirect messages for the entire switch:

  For IPv4 traffic:

  ```
  [edit system]
  user@switch# set no-redirects
  ```

  For IPv6 traffic:

  ```
  [edit system]
  user@switch# set no-redirects-ipv6
  ```

- Disable sending the protocol redirect messages on a specific interface:

  For IPv4 traffic:

  ```
  [edit interfaces interface-name unit logical-unit-number family family]
  ```


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```
user@switch# set no-redirects
```

For IPv6 traffic:

```
[edit interfaces interface-name unit logical-unit-number family family]
user@switch# set no-redirects-ipv6
```

To re-enable the sending of redirect messages on the switch, delete the **no-redirects** statement (for IPv4 traffic) or the **no-redirects-ipv6** statement (for IPv6 traffic) from the configuration.

Related Documentation

- Understanding the Protocol Redirect Mechanism on EX Series Switches on page 19
- *Junos OS Network Interfaces Library for Routing Devices*

Preventing DHCP from Installing Access, Access-Internal, and Destination Routes by Default

You can configure both DHCP local server and DHCP relay agent to override the default installation of access, access-internal, and destination routes. For DHCPv4 you can override the installation of destination routes only or access-internal routes (the access-internal option prevents installation of both destination and access-internal routes). For DHCPv6 you can specify access routes, access-internal routes, or both. You can configure the override globally or for named interface groups.

NOTE: You cannot suppress access-internal routes when the subscriber is configured with both IA_NA and IA_PD addresses over IP demux interfaces—the IA_PD route relies on the IA_NA route for next hop connectivity.

NOTE: The **no-arp** statement is deprecated and the function is replaced by the **route-suppression** statement.

To configure route suppression and prevent DHCP from installing specific types of routes:

- For DHCP local server route suppression (for example, a global configuration):

  ```
  [edit system services dhcp-local-server]
  user@host# set route-suppression (DHCP Local Server and Relay Agent) access-internal
  ```

- For DHCP relay (for example, a group-specific configuration):

  ```
  [edit forwarding-options dhcp-relay group southeast]
  user@host# set route-suppression (DHCP Local Server and Relay Agent) destination
  ```

- For DHCPv6 local server (for example, a group-specific configuration):

  ```
  [edit system services dhcp-local-server group southern3]
  user@host# set dhcpv6 route-suppression (DHCP Local Server and Relay Agent) access
    access-internal
  ```

- For DHCPv6 relay (for example, a global configuration):

  ```
  [edit forwarding-options dhcp-relay]
  ```

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user@host# set dhcpv6 route-suppression (DHCP Local Server and Relay Agent) access

Related Documentation

- Suppressing DHCP Access, Access-Internal, and Destination Routes on page 13
- *Extended DHCP Local Server Overview*
- *DHCPv6 Local Server Overview*
- *Extended DHCP Relay Agent Overview*
- *DHCPv6 Relay Agent Overview*

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CHAPTER 7

Configuration Statements

- [edit system] Configuration Statement Hierarchy on EX Series Switches on page 44
- active-server-group on page 58
- address-assignment (Address-Assignment Pools) on page 59
- address-pool on page 60
- aggregate-clients (DHCP Relay Agent) on page 61
- always-write-giaddr on page 62
- authentication (DHCP Local Server) on page 63
- authentication (DHCP Relay Agent) on page 64
- boot-file on page 65
- boot-server (DHCP) on page 66
- bootp on page 67
- ca-name on page 68
- cache-size on page 69
- cache-timeout-negative on page 70
- certificates on page 71
- certification-authority on page 72
- circuit-id (DHCP Relay Agent) on page 73
- client-identifier on page 75
- client-identifier (DHCP Client) on page 76
- connection-limit on page 77
- crl (Encryption Interface) on page 78
- default-lease-time on page 78
- default-local-server-group on page 79
- default-relay-server-group on page 79
- description (Forwarding Options) on page 80
- dhcp on page 81
- dhcp (DHCP Client) on page 82
- dhcp (DHCP Server) on page 83

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- dhcp-attributes (Address-Assignment Pools) on page 84
- dhcp-local-server on page 85
- dhcp-relay (EX Series Switches only) on page 90
- dhcpv6 (DHCP Local Server) on page 92
- dhcpv6 (DHCP Relay Agent) on page 95
- domain on page 98
- domain-name (DHCP) on page 99
- domain-search on page 99
- drop on page 100
- dynamic-profile (DHCP Relay Agent) on page 101
- encoding on page 102
- enrollment-retry on page 102
- enrollment-url on page 103
- family (for EX Series switches) on page 104
- file on page 107
- ftp on page 108
- group (DHCP Local Server) on page 109
- group (DHCP Relay Agent) on page 112
- helpers on page 115
- http on page 117
- https on page 118
- interface (BOOTP) on page 119
- interface (DHCP Relay Agent) on page 120
- interface (DNS and TFTP Packet Forwarding or Relay Agent) on page 122
- interface-client-limit (DHCP Extended Server) on page 122
- interface-client-limit (DHCP Relay Agent) on page 123
- interfaces (for EX Series switches) on page 125
- ip-address-first on page 132
- layer2-unicast-replies on page 133
- ldap-url on page 134
- lease-time on page 135
- load-key-file on page 136
- local on page 137
- local-certificate on page 138
- maximum-certificates on page 138
- maximum-hop-count on page 139
- maximum-lease-time (DHCP) on page 139

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- minimum-wait-time on page 140
- name-server on page 140
- no-listen on page 141
- no-redirects (IPv4 Traffic) on page 142
- no-redirects-ipv6 on page 143
- option-number (DHCP Relay Agent Option) on page 144
- outbound-ssh on page 145
- overrides (DHCP Local Server) on page 148
- overrides (DHCP Relay Agent) on page 150
- path-length on page 151
- pool (System) on page 152
- pool (Address-Assignment Pools) on page 153
- pool-match-order on page 154
- port (HTTP/HTTPS) on page 155
- port (SRC Server) on page 155
- prefix (Address-Assignment Pools) on page 156
- prefix (DHCP Relay Agent) on page 157
- process-inform on page 158
- protocol-version on page 159
- rate-limit on page 160
- reconfigure (DHCP Local Server) on page 161
- relay-agent-interface-id (DHCPv6 Relay Agent) on page 162
- relay-option (DHCP Relay Agent) on page 163
- relay-option-60 on page 164
- relay-option-82 on page 165
- retransmission-attempt on page 166
- retransmission-interval on page 167
- route-suppression (DHCP Local Server and Relay Agent) on page 168
- server (DHCP and BOOTP Relay Agent) on page 169
- server (DNS and TFTP Service) on page 170
- server-address on page 171
- server-group on page 172
- server-identifier on page 173
- servers on page 174
- service-deployment on page 174
- service-profile (DHCP Relay Agent) on page 175
- services (System Services) on page 176

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- session (Time-out) on page 178
- sip-server on page 179
- source-address (SRC Software) on page 179
- source-address-giaddr on page 180
- ssh on page 181
- static-binding on page 182
- system-generated-certificate on page 183
- telnet on page 183
- tftp on page 184
- trace (DHCP Relay Agent) on page 185
- traceoptions (DNS and TFTP Packet Forwarding) on page 186
- traceoptions on page 188
- traceoptions (DHCP Server) on page 190
- update-server on page 192
- use-interface-description on page 193
- use-primary (DHCP Relay Agent) on page 195
- vendor-id on page 196
- vendor-option on page 197
- web-management on page 198
- wins-server (System) on page 199

[edit system] Configuration Statement Hierarchy on EX Series Switches

This topic lists supported and unsupported configuration statements in the **[edit system]** hierarchy level on EX Series switches.

- *Supported* statements are those that you can use to configure some aspect of a software feature on the switch.
- *Unsupported* statements are those that appear in the command-line interface (CLI) on the switch, but that have no effect on switch operation if you configure them.
- Not all features are supported on all switch platforms. For detailed information about feature support on specific EX Series switch platforms, see *EX Series Switch Software Features Overview*.

This topic lists:

- Supported Statements in the [edit system] Hierarchy Level on page 44
- Unsupported Statements in the [edit system] Hierarchy Level on page 57

Supported Statements in the [edit system] Hierarchy Level

The following hierarchy shows the **[edit system]** configuration statements supported on EX Series switches.

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```
system {
  accounting {
    destination {
      radius {
        server {
          server-address {
            accounting-port port-number;
            port port-number;
            retry number;
            secret password;
            source-address address;
            timeout seconds;
          }
        }
      }
      tacplus {
        server {
          server-address {
            port port-number;
            secret password;
            single-connection;
            timeout seconds;
          }
        }
      }
    }
    events
    traceoptions {
      file;
      flag;
      no-remote-trace;
    }
  }
  allow-v4-mapped-packets;
  archival {
    configuration {
      archive-sites {
        ftp://<username>:<password>@<host>:<port>/<url-path>;
        scp://<username>:<password>@<host>:<port>/<url-path>;
      }
      transfer-interval interval;
      transfer-on-commit;
    }
  }
  arp {
    aging-timer minutes;
    gratuitous-arp-delay;
    gratuitous-arp-on-ifup;
    interfaces interface-name{
      aging-timer minutes;
    }
    passive-learning;
    purging;
  }
  authentication-order [ authentication-methods ];
  autoinstallation {
```

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```
    configuration-servers {
      server-url <password password>;
    }
    interfaces {
      interface-name {
        bootp;
        rarp;
      }
    }
}
backup-router address <destination [ destination-addresses ]>;
commit {
  synchronize (and-quit | force);
}
(compress-configuration-files | no-compress-configuration-files);
default-address-selection;
domain-name domain-name;
domain-search [ domain-list ];
extensions {
  providers {
    provider-id {
      license-type license deployment-scope [ deployments ];
    }
  }
  resource-limits {
    package package-name {
      resources {
        cpu {
          priority number;
          time seconds;
        }
        file {
          core-size bytes;
          open number;
          size bytes;
        }
        memory {
          data-size bytes;
          locked-in bytes;
          resident-set-size bytes;
          socket-buffers bytes;
          stack-size bytes;
        }
      }
    }
    process process-ui-name {
      resources {
        cpu {
          priority number;
          time seconds;
        }
        file {
          core-size bytes;
          open number;
          size bytes;
        }
```


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```
            memory {
              data-size bytes;
              locked-in bytes;
              resident-set-size bytes;
              socket-buffers bytes;
              stack-size bytes;
            }
          }
        }
      }
    }
    internet-options {
      (gre-path-mtu-discovery | no-gre-path-mtu-discovery);
      icmpv4-rate-limit bucket-size number packet-rate rate;
      icmpv6-rate-limit bucket-size number packet-rate rate;
      (ipip-path-mtu-discovery | no-ipip-path-mtu-discovery);
      ipv6-duplicate-addr-detection-transmits;
      (ipv6-path-mtu-discovery | noipv6-path-mtu-discovery);
      ipv6-path-mtu-discovery-timeout;
      ipv6-reject-zero-hop-limit | no-ipv6-reject-zero-hop-limit;
      no-tcp-reset;
      no-tcp-rfc1323-paws;
      no-tcp-rfc1323;
      (path-mtu-discovery | no-path-mtu-discovery);
      source-port upper-limit port-number;
      (source-quench | no-source-quench);
      tcp-drop-synfin-set;
    }
    kernel-replication;
    license {
      autoupdate {
        url url{
          password password;
        }
      }
      renew {
        before-expiration days;
        interva hoursl;
      }
      traceoptions {
        file <filename> <files number> <size maximum-file-size> <world-readable |
          no-world-readable>;
        flag flag;
        no-remote-trace;
      }
    }
    location {
      altitude feet;
      building name;
      country-code code;
      floor number;
      hcoord horizontal-coordinate;
      lata service-area;
      latitude degrees;
      longitude degrees;
      npa-nxx number;
```

```
    postal-code postal-code;
    rack number;
    vcoord vertical-coordinate;
  }
  login {
    announcement "text";
    class class-name {
      access-end "hh<:mm:<ss>>";
      access-start "hh<:mm:<ss>>";
      allow-commands "regular-expression";
      allow-configuration-regexps "regular-expression";
      allowed-days [ sunday monday tuesday wednesday thursday friday saturday ];
      deny-commands "regular-expression";
      deny-configuration-regexps "regular-expression";
      idle-timeout minutes;
      login-alarms;
      login-script script-name;
      login-tip;
      permissions [ permissions ];
      security-role [security-role ] ;
    }
    deny-sources {
      address;
    }
    message "text";
    password {
      change-type (character-sets | set-transitions);
      format (des | md5 | sha1);
      maximum-length number;
      minimum-changes number;
      minimum-length number;
    }
    retry-options {
      backoff-factor number;
      backoff-threshold number;
      lockout-period number;
      maximum-time number;
      minimum-time number;
      tries-before-disconnect number;
    }
    user username {
      authentication {
        (encrypted-password "password" | plain-text-password);
        load-key-file filename;
        ssh-dsa "public-key" <from hostname>;
        ssh-rsa "public-key" <from hostname>;
      }
      class class-name;
      full-name "complete-name";
      uid uid-value;
    }
  }
  max-configurations-on-flash number;
  name-server {
    address;
  }
```


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```
nd-maxmcast-solicit;
nd-retransmit-timer;
no-multicast-echo;
no-neighbor-learn;
no-ping-record-route;
no-ping-time-stamp;
}
ntp {
  authentication-key key-number type md5 value password;
  boot-server address;
  broadcast <address> <key key-number> <ttl value> <version value>;
  broadcast-client;
  multicast-client <address>;
  peer address <key key-number> <prefer> <version value>;
  server address <key key-number> <prefer> <version value>;
  source-address source-address;
  trusted-key [ key-numbers ];
}
ports {
  auxiliary {
    disable;
    insecure;
    port-type (mini-usb | rj45);
    type (ansi | small-xterm | vt100 | xterm);
  }
  console {
    disable;
    insecure;
    log-out-on-disconnect;
    type (ansi | small-xterm | vt100 | xterm);
  }
}
radius-options {
  attributes {
    nas-ip-address address;
  }
  password-protocol mschap-v2;
}
radius-server {
  server-address {
    accounting-port port-number;
    port port-number;
    retry number;
    secret password;
    source-address source-address;
    timeout seconds;
  }
}
root-authentication {
  (encrypted-password "password" | plain-text-password);
  load-key-file filename;
  ssh-dsa "public-key" <from hostname>;
  ssh-rsa "public-key" <from hostname>;
}
(saved-core-context | no-saved-core-context);
saved-core-files number;
```

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```
scripts {
  commit {
    allow-transients;
    direct-access;
    file filename.xsl {
      checksum (md5 | sha-256 | sha2) hash;
      optional;
      refresh;
      refresh-from url;
      source url;
    }
    refresh;
    refresh-from url;
    traceoptions {
      file <filename> <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag;
      no-remote-trace;
    }
  }
  load-scripts-from-flash;
  op {
    file filename.xsl {
      arguments {
        argument-name {
          description descriptive-text;
        }
      }
      checksum (md5 | sha-256 | sha2) hash;
      command filename-alias;
      description descriptive-text;
      refresh;
      refresh-from url;
      source url;
    }
    no-allow-url;
    refresh;
    refresh-from url;
    traceoptions {
      file <filename> <files number> <size maximum-file-size> <world-readable |
        no-world-readable>;
      flag flag;
      no-remote-trace;
    }
  }
}
services {
  database-replication {
    traceoptions {
      file <filename> <files number> <match regular-expression>
        <size maximum-file-size> <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
    }
  }
  dhcp {
```


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```
boot-file filename;
boot-server (address | hostname);
default-lease-time (seconds | infinite);
domain-name domain-name;
domain-search {
  domain-suffix;
}
maximum-lease-time (seconds | infinite);
name-server {
  address;
}
next-server address;
option option-index (array type-name [ type-values ] | byte 8-bit-value | flag (false |
  off | on | true) | integer signed-32-bit-value | ip-address address |
  short signed-16-bit-value | string text-string | unsigned-integer 32-bit-value |
  unsigned-short 16-bit-value);
pool ip-prefix/prefix-length {
  address-range low address high address;
  boot-file filename;
  boot-server (address | hostname);
  default-lease-time (seconds | infinite);
  domain-name domain-name;
  domain-search {
    domain-suffix;
  }
  exclude-address {
    ipv4-address;
  }
  maximum-lease-time (seconds | infinite);
  name-server {
    address;
  }
  next-server address;
  option option-index (array type-name  type-values ] | byte 8-bit-value | flag (false |
    off | on | true) | integer signed-32-bit-value | ip-address address |
    short signed-16-bit-value | string text-string | unsigned-integer 32-bit-value |
    unsigned-short 16-bit-value);
  propagate-settings interface-name;
  router {
    address;
  }
  server-identifier identifier;
  sip-server {
    address {
      address;
    }
    name {
      name;
    }
  }
  wins-server {
    address;
  }
}
router {
  address;
```

```
}
server-identifier identifier;
sip-server {
  address {
    address;
  }
  name {
    name;
  }
}
static-binding mac-address {
  boot-file filename;
  boot-server (address | hostname);
  client-identifier (ascii ascii-text | hexadecimal hexadecimal-value);
  domain-name domain-name;
  domain-search {
    domain-suffix;
  }
  fixed-address {
    ipv4-address;
  }
  host-name hostname;
  name-server {
    address;
  }
  next-server address;
  option option-index (array type-name  type-values ] | byte 8-bit-value | flag (false |
    off | on | true) | integer signed-32-bit-value | ip-address address |
    short signed-16-bit-value | string text-string | unsigned-integer 32-bit-value |
    unsigned-short 16-bit-value);
  router {
    address;
  }
  server-identifier identifier;
  sip-server {
    address {
      address;
    }
    name {
      name;
    }
  }
  wins-server {
    address;
  }
}
traceoptions {
  file <filename> <files number> <match regular-expression>
    <size maximum-file-size> <world-readable | no-world-readable>;
  flag flag;
  level severity;
  no-remote-trace;
}
wins-server {
  address;
}
```


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```
}
dhcp-local-server {
    group group-name {
        interface interface-name {
            exclude;
            overrides {
                client-discover-match <option60-and-option82>;
                interface-client-limit number;
                no-arp;
                process-inform {
                    pool pool-name;
                }
            }
            trace;
            upto upto-interface-name;
        }
        overrides {
            client-discover-match <option60-and-option82>;
            interface-client-limit number;
            OBSOLETE - no-arp;
            process-inform {
                pool pool-name;
            }
        }
        reconfigure {
            attempts attempt-count;
            clear-on-abort;
            timeout timeout-value;
            token token-value;
            trigger {
                radius-disconnect;
            }
        }
    }
    overrides {
        client-discover-match <option60-and-option82>;
        interface-client-limit number;
        OBSOLETE - no-arp;
        process-inform {
            pool pool-name;
        }
    }
    pool-match-order {
        external-authority;
        ip-address-first;
        option-82;
    }
    reconfigure {
        attempts attempt-count;
        clear-on-abort;
        timeout timeout-value;
        token token-value;
        trigger {
            radius-disconnect;
        }
    }
```

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```
}
finger {
  connection-limit limit;
  rate-limit limit;
}
ftp {
  connection-limit limit;
  rate-limit limit;
}
netconf {
  ssh {
    connection-limit limit;
    port number;
    rate-limit limit;
  }
}
outbound-ssh {
  client client-id {
    address {
      port port-number;
      retry number;
      timeout seconds;
    }
    device-id device-id;
    keep-alive {
      retry number;
      timeout seconds;
    }
    reconnect-strategy (in-order | sticky);
    secret secret;
    services netconf;
  }
  traceoptions {
    file <filename> <files number> <match regular-expression>
      <size maximum-file-size> <world-readable | no-world-readable>;
    flag flag;
    no-remote-trace;
  }
}
service-deployment {
  local-certificate certificate-name;
  servers {
    server-address {
      port port-number;
      security-options {
        (ssl3 | tls);
      }
      user username;
    }
  }
  source-address source-address;
  traceoptions {
    file <filename> <files number> <match regular-expression>
      <size maximum-file-size> <world-readable | no-world-readable>;
    flag flag;
    no-remote-trace;
```


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```
    }
  }
  ssh {
    ciphers;
    connection-limit limit;
    hostkey-algorithm {
      ssh-dss | no-ssh-dss;
      ssh-ecdsa | no-ssh-ecdsa;
      ssh-rsa | no-ssh-rsh;
    }
    key-exchange;
    macs;
    protocol-version [ v1 v2 ];
    rate-limit limit;
    root-login (allow | deny | deny-password);
  }
  subscriber-management{
    gres-route-flush-delay;
    maintain-subscriber {
      interface-delete;
    }
    traceoptions {
      file filename <files number> <match regular-expression > <size maximum-file-size>
        <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
    }
  }
  telnet {
    connection-limit limit;
    rate-limit limit;
  }
  web-management {
    control {
      max-threads number;
    }
    http {
      interface [ interface-names ];
      port port-number;
    }
    https {
      interface [ interface-names ];
      (local-certificate certificate-name | pki-local-certificate certificate-name |
        system-generated-certificate);
      port port-number;
    }
    management-url url;
    session {
      idle-timeout minutes;
      session-limit number;
    }
  }
  xnm-clear-text {
    connection-limit limit;
    rate-limit limit;
  }
```

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```
    xnm-ssl {
      connection-limit limit;
      local-certificate certificate-name;
      rate-limit limit;
    }
  }
  static-host-mapping {
    hostname {
      alias [ aliases ];
      inet [ addresses ];
      inet6 [ addresses ];
      sysid system-identifier;
    }
  }
  syslog {
    allow-duplicates;
    archive <files number> <size size> <world-readable | no-world-readable>;
    console {
      facility severity;
    }
    file filename {
      allow-duplicates;
      facility severity;
      archive <archive-sites {ftp-url <password password>}> <files number> <size size>
        <start-time "YYYY-MM-DD.hh:mm"> <transfer-interval minutes> <world-readable |
        no-world-readable>;
      explicit-priority;
      match "regular-expression";
      structured-data {
        brief;
      }
    }
    host (hostname | other-routing-engine) {
      facility severity;
      explicit-priority;
      facility-override facility;
      log-prefix string;
      match "regular-expression";
    }
    log-rotate-frequency;
    time-format (year | millisecond | year millisecond);
    user (username | *) {
      facility severity;
      explicit-priority;
      match "regular-expression";
    }
  }
  tacplus-options {
    (exclude-cmd-attribute | no-cmd-attribute-value);
    service-name service-name;
  }
  tacplus-server {
    server-address {
      port port-number;
      secret password;
      single-connection;
```


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```
        source-address source-address;
        timeout seconds;
      }
    }
    time-zone (GMT | GMT+hour-offset | GMT-hour-offset | zone-name);
    tracing destination-override syslog host address;
    use-imported-time-zones;
}
```

Unsupported Statements in the [edit system] Hierarchy Level

All statements in the **[edit system]** hierarchy level that are displayed in the command-line interface (CLI) on the switch are supported on the switch and operate as documented with the following exceptions:

Table 8: Unsupported [edit system] Configuration Statements on EX Series Switches

Statement	Hierarchy
NOTE: Variables, such as *interface-name*, are not shown in the statements or hierarchies.	
mirror-flash-on-disk	**[edit system]**
processes	**[edit system]**

Related Documentation

- *Configuration File Management on EX Series Switches*
- *EX Series Switches Hardware and CLI Terminology Mapping*

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active-server-group

Syntax active-server-group *server-group-name*;

Hierarchy Level
[edit forwarding-options dhcp-relay],
[edit forwarding-options dhcp-relay dhcpv6],
[edit forwarding-options dhcp-relay group *group-name*],
[edit forwarding-options dhcp-relay group *group-name* dhcpv6],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay dhcpv6],
[edit logical-systems *logical-system-name* forwarding-options group *group-name*],
[edit logical-systems *logical-system-name* forwarding-options group *group-name* dhcpv6],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* dhcpv6],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay]
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name*],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 group *group-name*]

Release Information Statement introduced in Junos OS Release 8.3.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description Apply a DHCP relay agent configuration to the named group of DHCP server addresses. Use the statement at the **[edit ... dhcpv6]** hierarchy levels to configure DHCPv6 support.

A group-specific configuration overrides a global option.

Options ***server-group-name***—Name of the group of DHCP or DHCPv6 server addresses to which the DHCP or DHCPv6 relay agent configuration applies.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Extended DHCP Relay Agent Overview*
- *Configuring Active Server Groups*
- *Configuring Group-Specific DHCP Relay Options*
- *dhcp-relay*

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address-assignment (Address-Assignment Pools)

Syntax

```
address-assignment {
  abated-utilization percentage;
  abated-utilization-v6 percentage;
  high-utilization percentage;
  high-utilization-v6 percentage;
  neighbor-discovery-router-advertisement ndra-pool-name;
  pool pool-name {
    family family {
      dhcp-attributes {
        protocol-specific attributes;
      }
      host hostname {
        hardware-address mac-address;
        ip-address ip-address;
      }
      network ip-prefix/<prefix-length>;
      prefix ipv6-prefix;
      range range-name {
        high upper-limit;
        low lower-limit;
        prefix-length prefix-length;
      }
    }
    link pool-name;
  }
}
```

Hierarchy Level [edit access]

Release Information Statement introduced in Junos OS Release 9.0.
Statement introduced in Junos OS Release 12.1 for EX Series switches.
Statement introduced in Junos OS Release 14.1X53-D30 for the QFX Series.

Description Configure address-assignment pools that can be used by different client applications.

NOTE: Support for subordinate statements is platform-specific. See individual statement topics for support information.

Options ***pool-name***—Name assigned to an address-assignment pool.

The remaining statements are explained separately.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- *Address-Assignment Pools Overview*
- *Configuring Address-Assignment Pools*

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- *Configuring an Address-Assignment Pool for L2TP LNS with Inline Services*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

address-pool

Syntax address-pool *address-pool-name*;

Hierarchy Level [edit access address-assignment]

Release Information Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description Allocate IP addresses for extended DHCP clients.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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aggregate-clients (DHCP Relay Agent)

Syntax aggregate-clients (merge | replace);

Hierarchy Level [edit forwarding-options dhcp-relay dhcpv6 dynamic-profile *profile-name*],
[edit forwarding-options dhcp-relay dynamic-profile *profile-name*],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name* dynamic-profile *profile-name*],
[edit forwarding-options dhcp-relay group *group-name* dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay dhcpv6 dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay dhcpv6 group *group-name* dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay group *group-name* dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 group *group-name* dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* dynamic-profile *profile-name*],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 dynamic-profile *profile-name*],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dynamic-profile *profile-name*],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 group *group-name* dynamic-profile *profile-name*],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* dynamic-profile *profile-name*]

Release Information Statement introduced in Junos OS Release 9.3.
Options **merge** and **replace** introduced in Junos OS Release 9.5.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description Specify that the router merge (chain) client attributes such as firewall filters and CoS attributes or replace them when multiple client sessions exist on the same underlying VLAN. Use the statement at the **[edit ... dhcpv6]** hierarchy levels to configure DHCPv6 support.

M120 and M320 routers do not support DHCPv6.

Not supported for IP demux subscriber interfaces.

Options **merge**—Aggregate multiple client attributes for the same subscriber (logical interface)

replace—Replace the entire logical interface whenever a new client logs in to the network using the same VLAN logical interface

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Required Privilege Level
system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- *dhcp-relay*
- *Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces*
- *Configuring Group-Specific DHCP Relay Options*

always-write-giaddr

Syntax
always-write-giaddr;

Hierarchy Level
[edit forwarding-options dhcp-relay overrides],
[edit forwarding-options dhcp-relay group *group-name* overrides],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay overrides],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay group *group-name* overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* overrides],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay overrides],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* overrides],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* interface *interface-name* overrides]

Release Information
Statement introduced in Junos OS Release 8.3.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description
Overwrite the gateway IP address (giaddr) of every DHCP packet with the giaddr of the DHCP relay agent before forwarding the packet to the DHCP server.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Extended DHCP Relay Agent Overview*
- *dhcp-relay*

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authentication (DHCP Local Server)

Syntax

```
authentication {
  password password-string;
  username-include {
    circuit-type;
    client-id;
    delimiter delimiter-character;
    domain-name domain-name-string;
    interface-name ;
    logical-system-name;
    mac-address;
    option-60;
    option-82 <circuit-id> <remote-id>;
    relay-agent-interface-id;
    relay-agent-remote-id;
    relay-agent-subscriber-id;
    routing-instance-name;
    user-prefix user-prefix-string;
  }
}
```

Hierarchy Level

[edit system services dhcp-local-server],
[edit system services dhcp-local-server dhcpv6],
[edit system services dhcp-local-server dhcpv6 group *group-name*],
[edit system services dhcp-local-server group *group-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server ...],
[edit logical-systems *logical-system-name* system services dhcp-local-server ...],
[edit routing-instances *routing-instance-name* system services dhcp-local-server ...]

Release Information

Statement introduced in Junos OS Release 9.1.
Statement introduced in Junos OS Release 12.3R2 for EX Series switches.

Description

Configure the parameters the router sends to the external AAA server. A group configuration takes precedence over a global DHCP relay or DHCP local server configuration.

The remaining statements are explained separately.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Using External AAA Authentication Services with DHCP*

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authentication (DHCP Relay Agent)

Syntax

```
authentication {
  password password-string;
  username-include {
    circuit-type;
    client-id;
    delimiter delimiter-character;
    domain-name domain-name-string;
    interface-name;
    logical-system-name;
    mac-address;
    option-60;
    option-82 <circuit-id> <remote-id>;
    relay-agent-interface-id;
    relay-agent-remote-id;
    relay-agent-subscriber-id;
    routing-instance-name;
    user-prefix user-prefix-string;
  }
}
```

Hierarchy Level

[edit forwarding-options dhcp-relay],
[edit forwarding-options dhcp-relay dhcpv6],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name*],
[edit forwarding-options dhcp-relay group *group-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay ...],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay ...],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay ...]

Release Information

Statement introduced in Junos OS Release 9.1.
Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.

Description

Configure the parameters the router sends to the external AAA server. A group configuration takes precedence over a global DHCP relay configuration. Use the statement at the **[edit...dhcpv6]** hierarchy levels to configure DHCPv6 support.

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *dhcp-relay*
- *Using External AAA Authentication Services with DHCP*

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boot-file

Syntax boot-file *filename*;

Hierarchy Level [edit system services dhcp],
[edit system services dhcp],
[edit system services dhcp pool],
[edit system services dhcp static-binding]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description For J Series Services Routers and EX Series switches only. Set the boot file advertised to DHCP clients. After the client receives an IP address and the boot file location from the DHCP server, the client uses the boot image stored in the boot file to complete DHCP setup.

Options ***filename***—The location of the boot file on the boot server. The filename can include a pathname.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*
- boot-server on page 66

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boot-server (DHCP)

Syntax boot-server (*address* | *hostname*);

Hierarchy Level [edit system services dhcp],
[edit system services dhcp pool],
[edit system services dhcp static-binding]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description For J Series Services Routers and EX Series switches only. Configure the name of the boot server advertised to DHCP clients. The client uses a boot file located on the boot server to complete DHCP setup.

Options
- ***address***—IP address of a DHCP boot server.
- ***hostname***—Hostname of a DHCP boot server.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*
- boot-file on page 65

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bootp

Syntax

```
bootp {
  client-response-ttl number;
  description text-description;
  apply-secondary-as-giaddr text-description; (QFX platforms only)
  interface (interface-name | interface-group) {
    client-response-ttl number;
    description text-description;
    maximum-hop-count number;
    minimum-wait-time seconds;
    no-listen;
    server address {
      logical-system logical-system-name <routing-instance [ <default>
        routing-instance-names ]>;
      routing-instance [ <default> routing-instance-names ];
    }
    apply-secondary-as-giaddr (QFX platforms only)
  }
  maximum-hop-count number;
  minimum-wait-time seconds;
  relay-agent-option;
  server address {
    <logical-system logical-system-name> <routing-instance
      [ routing-instance-names ]>;
  }
}
```

Hierarchy Level [edit forwarding-options helpers]

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 11.3 for QFX Series switches.

Description Configures a router, switch, or interface to act as a Dynamic Host Configuration Protocol (DHCP) or bootstrap protocol (BOOTP) relay agent. For MX Series (MX80, MX240, MX480 and MX960) routers connected via IRB, see *Configuring Routers, Switches, and Interfaces as DHCP and BOOTP Relay Agents* for information on how to prevent BOOTP reply packets from being dropped.

DHCP relaying is disabled.

Options The remaining statements are explained separately.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring Routers, Switches, and Interfaces as DHCP and BOOTP Relay Agents*

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ca-name

Syntax ca-name *ca-identity*;

Hierarchy Level [edit security certificates certification-authority]

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 the OCX Series

Description (Encryption interface on M Series and T Series routers and EX Series switches only) Specify the certificate authority (CA) identity to use in the certificate request.

Options ***ca-identity***—CA identity to use in the certificate request.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- *Configuring Digital Certificates for an ES PIC*

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cache-size

Syntax cache-size *bytes*;

Hierarchy Level [edit security certificates]

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 the OCX Series.

Description (Encryption interface on M Series and T Series routers and EX Series switches only) Configure the cache size for digital certificates.

Options ***bytes***—Cache size for digital certificates.

Range: 64 through 4,294,967,295

Default: 2 megabytes (MB)

NOTE: We recommend that you limit your cache size to 4 MB.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration

Related Documentation

- *Configuring Digital Certificates for an ES PIC*

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cache-timeout-negative

Syntax cache-timeout-negative *seconds*;

Hierarchy Level [edit security certificates]

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 the OCX Series.

Description (Encryption interface on M Series and T Series routers and EX Series switches only) Configure a negative cache for digital certificates.

Options ***seconds***—Negative time to cache digital certificates, in seconds.

Range: 10 through 4,294,967,295

Default: 20

CAUTION: **Configuring a large negative cache value can lead to a denial-of-service attack.**

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration

Related Documentation

- *Configuring Digital Certificates for an ES PIC*

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certificates

Syntax

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

Hierarchy Level [edit security]

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 the OCX Series.

Description

(Encryption interface on M Series and T Series routers and EX Series switches only) Configure the digital certificates for IPsec.

The remaining statements are explained separately.

Required Privilege Level

admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- *Configuring Digital Certificates for an ES PIC*

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certification-authority

Syntax

```
certification-authority ca-profile-name {
  ca-name ca-identity;
  crl file-name;
  encoding (binary | pem);
  enrollment-url url-name;
  file certificate-filename;
  ldap-url url-name;
}
```

Hierarchy Level [edit security certificates]

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 the OCX Series.

Description (Encryption interface on M Series and T Series routers and EX Series switches only) Configure a certificate authority profile name.

The remaining statements are explained separately.

Required Privilege Level

admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration

Related Documentation

- *Configuring Digital Certificates for an ES PIC*

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circuit-id (DHCP Relay Agent)

Syntax

```
circuit-id {
  include-irb-and-l2;
  no-vlan-interface-name;
  prefix prefix;
  use-interface-description (logical | device);
  use-vlan-id;
}
```

Hierarchy Level

[edit forwarding-options dhcp-relay relay-option-82],
[edit forwarding-options dhcp-relay group *group-name* relay-option-82],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay relay-option-82],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay group *group-name* relay-option-82],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay relay-option-82],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* relay-option-82],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay relay-option-82],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* relay-option-82]

Release Information

Statement introduced in Junos OS Release 8.3.
Statement introduced in Junos OS Release 12.3 for EX Series switches.
include-irb-and-l2 , **no-vlan-interface-name**, and **use-vlan-id** options added in Junos OS Release 14.1.

Description

Specify the Agent Circuit ID suboption (suboption 1) of the DHCP relay agent information option (option 82) to include in DHCP packets destined for a DHCP server. Optionally specify that the suboption includes a prefix, textual description, or VLAN tag.

NOTE: For Layer 3 interfaces, when you configure relay-option-82 only, the Agent Circuit ID is the default. If no VLAN tags are configured, then the default is the logical interface device (IFL) name. For integrated routing and bridging (IRB) interfaces, the default is the Layer 2 IFL name and bridge domain name.

The interface to bridge domain relationship may be implicit (the interface is mapped to the bridge domain by the system based on VLAN tag) or explicit (the interface is mapped to the bridge domain by configuring it in the bridge domain definition). For the explicit case, tagging might not be relevant for the mapping.

The format of the Agent Circuit ID information for Fast Ethernet or Gigabit Ethernet interfaces that do not use virtual LANs (VLANs), stacked VLANs (S-VLANs), or bridge domains is as follows:

(fe | ge)-*fpc/pic/port.subunit*

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NOTE: For remote systems, the *subunit* is required and is used to differentiate an interface for remote systems.

The format of the Agent Circuit ID information for Fast Ethernet or Gigabit Ethernet interfaces that use VLANs is as follows:

(fe | ge)-*fpc/pic/port*:*vlan-id*

The format of the Agent Circuit ID information for Fast Ethernet or Gigabit Ethernet interfaces that use S-VLANs is as follows:

(fe | ge)-*fpc/pic/port*:*svlan-id-vlan-id*

In the case of an IRB interface, the format displays the Layer 2 interface instead of the IRB interface along with the bridge domain name. For IRB interfaces (or other pseudo devices) the default format is as follows:

- IRB interfaces that use bridge domains but do not use VLANs or S-VLANs:

  (fe | ge)-*fpc/pic/port*.*subunit*:*bridge-domain-name*

- IRB interfaces that use VLANs:

  (fe | ge)-*fpc/pic/port*.*subunit*:*vlan-name*

To include the IRB interface name with the Layer 2 interface name, configure the **include-irb-and-l2** statement. The format is as follows:

- IRB interfaces that use bridge domains but do not use VLANs or S-VLANs:

  (fe | ge)-*fpc/pic/port*:*bridge-domain-name*+irb.*subunit*

- IRB interfaces that use VLANs:

  (fe | ge)-*fpc/pic/port*:*vlan-name*+irb.*subunit*

To include only the IRB interface name without the Layer 2 interface and bridge domain or VLAN, configure the **no-vlan-interface-name** statement. The format is as follows:

irb.*subunit*

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Using DHCP Relay Agent Option 82 Information*
- *Configuring Option 82 Information*

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client-identifier

Syntax client-identifier (ascii *client-id* | hexadecimal *client-id*);

Hierarchy Level [edit system services dhcp],
[edit system services dhcp]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description For J Series Services Routers and EX Series switches only. Configure the client's unique identifier. This identifier is used by the DHCP server to index its database of address bindings. Either a client identifier or the client's MAC address is required to uniquely identify the client on the network.

Options ***client-id***—A name or number that uniquely identifies the client on the network. The client identifier can be an ASCII string or hexadecimal digits.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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client-identifier (DHCP Client)

Syntax client-identifier (ascii *ascii* | hexadecimal *hexadecimal*);

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number* family inet dhcp]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify an ASCII or hexadecimal identifier for the Dynamic Host Configuration Protocol (DHCP) client. The DHCP server identifies a client by a client-identifier value, which must be unique for each client.

Default If you do not include client-identifier in the configuration, the DHCP server uses the client hardware type and MAC address to identify the client.

Options **ascii** ***ascii***—Identifier consisting of ASCII characters, such as a fully qualified domain name.

hexadecimal ***hexadecimal***—Identifier consisting of hexadecimal numbers (0-9, a-f, A-F). Do not use colons.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 31

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connection-limit

Syntax connection-limit *limit*;

Hierarchy Level [edit system services finger],
[edit system services ftp],
[edit system services netconf ssh],
[edit system services ssh],
[edit system services telnet],
[edit system services xnm-clear-text],
[edit system services xnm-ssl]

Release Information Statement introduced 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 the OCX Series.

Description Configure the maximum number of connections sessions for each type of system services (finger, ftp, ssh, telnet, xnm-clear-text, or xnm-ssl) per protocol (either IPv6 or IPv4).

Options ***limit***—(Optional) Maximum number of established connections per protocol (either IPv6 or IPv4).

Range: 1 through 250

Default: 75

NOTE: The actual number of maximum connections depends on the availability of system resources, and might be fewer than the configured **connection-limit** value if the system resources are limited.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring clear-text or SSL Service for Junos XML Protocol Client Applications*
- *Configuring DTCP-over-SSH Service for the Flow-Tap Application*
- *Configuring Finger Service for Remote Access to the Router*
- *Configuring FTP Service for Remote Access to the Router or Switch*
- *Configuring SSH Service for Remote Access to the Router or Switch*
- *Configuring Telnet Service for Remote Access to a Router or Switch*

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crl (Encryption Interface)

Syntax crl *file-name*;

Hierarchy Level [edit security certificates]

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 the OCX Series.

Description (Encryption interface on M Series and T Series routers and EX Series switches only) Configure the certificate revocation list (CRL). A CRL is a time-stamped list identifying revoked certificates, which is signed by a CA and made available to the participating IPsec peers on a regular periodic basis.

Options ***file-name***—Specify the file from which to read the CRL.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration

Related Documentation
- *Configuring Digital Certificates for an ES PIC*

default-lease-time

Syntax default-lease-time *seconds*;

Hierarchy Level [edit system services dhcp],
[edit system services dhcp pool],
[edit system services dhcp static-binding]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description For J Series Services Routers and EX Series switches only. Specify the length of time in seconds that a client holds the lease for an IP address assigned by a DHCP server. This setting is used if a lease time is not requested by the client.

Options ***seconds***—Number of seconds the lease can be held.

Default: 86400 (1day)

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*
- maximum-lease-time on page 139

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default-local-server-group

Syntax default-local-server-group *local-server-group-name*;

Hierarchy Level [edit forwarding-options dhcp-relay relay-option-60 vendor-option],
[edit forwarding-options dhcp-relay group *group-name* relay-option-60 vendor-option]

Release Information Statement introduced before Junos OS Release 12.1 for EX Series switches.

Description Forward DHCP client packets to a default group of extended DHCP local servers when you use the DHCP vendor class identifier option (option 60) in DHCP packets to forward client traffic to specific DHCP servers.

Options ***local-server-group-name***—Name of the default extended DHCP local server group.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35
- Understanding the Extended DHCP Relay Agent for EX Series Switches on page 12

default-relay-server-group

Syntax default-relay-server-group *server-group-name*;

Hierarchy Level [edit forwarding-options dhcp-relay relay-option-60 relay-option-60 vendor-option],
[edit forwarding-options dhcp-relay group *group-name* relay-option-60 vendor-option]

Description Relay DHCP client packets to a default group of extended DHCP relay servers when you use the DHCP vendor class identifier option (option 60) in DHCP packets to forward client traffic to specific DHCP servers.

If the option 60 string received in the DHCP client packet does not match the ASCII or hexadecimal match string and match criteria that you specify (exact match or partial match), the extended DHCP relay agent relays the client packets to the specified default group of servers configured with the server-group statement at the **[edit forwarding-options dhcp-relay]** hierarchy level.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35
- Understanding the Extended DHCP Relay Agent for EX Series Switches on page 12

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description (Forwarding Options)

Syntax description *text-description*;

Hierarchy Level
[edit forwarding-options helpers bootp],
[edit forwarding-options helpers bootp interface (*interface-name* | *interface-group*)],
[edit forwarding-options helpers domain],
[edit forwarding-options helpers domain interface *interface-name*],
[edit forwarding-options helpers tftp],
[edit forwarding-options helpers tftp interface *interface-name*]

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 11.3 for QFX Series switches.

Description Describe a BOOTP, DHCP, Domain Name System (DNS), or Trivial File Transfer Protocol (TFTP) service, or an interface that is configured for the service.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Configuring DNS and TFTP Packet Forwarding*
- *Configuring Routers, Switches, and Interfaces as DHCP and BOOTP Relay Agents*

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dhcp

Syntax

```
dhcp {
  boot-file filename;
  boot-server (address | hostname);
  default-lease-time seconds;
  domain-name domain-name;
  domain-search [domain-list];
  maximum-lease-time seconds;
  name-server {
    address;
  }
  next-servernext-server
  option option-identifier-code ;
  pool address/prefix-length {
    address-range {
      low address;
      high address;
    }
    exclude-address {
      address;
    }
  }
  router {
    address;
  }
  static-binding mac-address {
    fixed-address {
      address;
    }
    host-name hostname;
    client-identifier (ascii client-id | hexadecimal client-id);
  }
  wins-server {
    address;
  }
}
```

Hierarchy Level [edit system services]

Release Information Statement introduced before Junos OS Release 7.4.

Description For J Series Services Routers only. Configure a router, switch, or interface as a DHCP server. A DHCP server can allocate network addresses and deliver configuration information to client hosts on a TCP/IP network.

The remaining statements are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*
- *System Management Configuration Statements*

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dhcp (DHCP Client)

Syntax

```
dhcp {
  client-identifier (ascii ascii | hexadecimal hexadecimal);
  lease-time (seconds | infinte);
  retransmission-attempt number;
  retransmission-interval seconds;
  server-address ip-address;
  update-server;
  vendor-id vendor-id;
}
```

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number* family inet]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure a DHCP client for an IPv4 interface.

The remaining statements are described separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 31

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dhcp (DHCP Server)

Syntax

```
dhcp {
  domain-search [domain-list];
  name-server {
    address;
  }
  option option-identifier-code ;
  pool subnet-address/prefix-length {
    address-range {
      low address;
      high address;
    }
    exclude-address {
      address;
    }
  }
  router {
    address;
  }
  sip-server [address | name]
  static-binding mac-address {
    fixed-address {
      address;
    }
    host-name hostname;
    client-identifier (ascii client-id | hexadecimal client-id);
  }
  wins-server {
    address;
  }
}
```

Hierarchy Level [edit system services]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure a switch to use the legacy version of DHCP. A DHCP server allocates network addresses and delivers configuration information to client hosts on a TCP/IP network.

The remaining statements are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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dhcp-attributes (Address-Assignment Pools)

Syntax

```
dhcp-attributes {
  boot-file filename;
  boot-server (address | hostname);
  dns-server [ ipv6-address ];
  domain-name domain-name;
  grace-period seconds;
  maximum-lease-time seconds;
  name-server [ server-list ];
  netbios-node-type node-type;
  option {
    [ (id-number option-type option-value)
    (id-number array option-type option-value) ];
  }
  option-match {
    option-82 {
      circuit-id value range named-range;
      remote-id value range named-range;
    }
  }
  preferred-lifetime seconds;
  router [ router-address ];
  server-identifier ip4-address;
  sip-server-address [ ipv6-address ];
  sip-server-domain-name domain-name;
  t1-percentage percentage;
  t2-percentage percentage;
  tftp-server address;
  valid-lifetime seconds;
  wins-server [ servers ];
}
```

Hierarchy Level [edit access address-assignment pool *pool-name* family *family*]

Release Information Statement introduced in Junos OS Release 9.0.
Statement introduced in Junos OS Release 12.3 for EX Series switches.

Description Configure address pools that can be used by different client applications.

The remaining statements are explained separately.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- *Address-Assignment Pools Overview*
- *DHCP Attributes for Address-Assignment Pools*
- *Configuring Address-Assignment Pools*
- *Configuring DHCP Client-Specific Attributes Applied When Clients Obtain an Address*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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dhcp-local-server

Syntax

```
dhcp-local-server {
  authentication {
    password password-string;
    username-include {
      circuit-type;
      delimiter delimiter-character;
      domain-name domain-name-string;
      interface-name ;
      logical-system-name;
      mac-address;
      option-60;
      option-82 <circuit-id> <remote-id>;
      routing-instance-name;
      user-prefix user-prefix-string;
    }
  }
  dhcpv6 {
    authentication {
      ...
    }
    group group-name {
      authentication {
        ...
      }
      interface interface-name {
        exclude;
        liveness-detection {
          failure-action (clear-binding | clear-binding-if-interface-up | log-only);
          method {
            bfd {
              version (0 | 1 | automatic);
              minimum-interval milliseconds;
              minimum-receive-interval milliseconds;
              multiplier number;
              no-adaptation;
              transmit-interval {
                minimum-interval milliseconds;
                threshold milliseconds;
              }
              detection-time {
                threshold milliseconds;
              }
              session-mode(automatic | multihop | singlehop);
              holddown-interval milliseconds;
            }
          }
        }
        overrides {
          interface-client-limit number;
          multi-address-embedded-option-response;
          process-inform {
            pool pool-name;
```

```
            }
            rapid-commit;
        }
        service-profile dynamic-profile-name;
        trace;
        upto upto-interface-name;
    }
    overrides {
        delegated-pool;
        interface-client-limit number;
        multi-address-embedded-option-response;
        process-inform {
            pool pool-name;
        }
        rapid-commit;
    }
    route-suppression;
    service-profile dynamic-profile-name;
}
liveness-detection {
    failure-action (clear-binding | clear-binding-if-interface-up | log-only);
    method {
        bfd {
            version (0 | 1 | automatic);
            minimum-interval milliseconds;
            minimum-receive-interval milliseconds;
            multiplier number;
            no-adaptation;
            transmit-interval {
                minimum-interval milliseconds;
                threshold milliseconds;
            }
            detection-time {
                threshold milliseconds;
            }
            session-mode(automatic | multihop | singlehop);
            holddown-interval milliseconds;
        }
    }
}
overrides {
    delegated-pool;
    interface-client-limit number;
    multi-address-embedded-option-response;
    process-inform {
        pool pool-name;
    }
    rapid-commit;
}
reconfigure {
    attempts attempt-count;
    clear-on-abort;
    strict;
    timeout timeout-value;
    token token-value;
    trigger {
```


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```
        radius-disconnect;
      }
    }
    route-suppression;
    service-profile dynamic-profile-name;
}
duplicate-clients-in-subnet (incoming-interface | option-82);
dynamic-profile profile-name <aggregate-clients (merge | replace) | use-primary
  primary-profile-name>;
forward-snooped-clients (all-interfaces | configured-interfaces |
  non-configured-interfaces);
group group-name {
  authentication {
    ...
  }
  dynamic-profile profile-name <aggregate-clients (merge | replace) | use-primary
    primary-profile-name>;
  interface interface-name {
    exclude;
    liveness-detection {
      failure-action (clear-binding | clear-binding-if-interface-up | log-only);
      method {
        bfd {
          version (0 | 1 | automatic);
          minimum-interval milliseconds;
          minimum-receive-interval milliseconds;
          multiplier number;
          no-adaptation;
          transmit-interval {
            minimum-interval milliseconds;
            threshold milliseconds;
          }
          detection-time {
            threshold milliseconds;
          }
          session-mode (automatic | multihop | singlehop);
          holddown-interval milliseconds;
        }
      }
    }
    overrides {
      client-discover-match (option60-and-option82 | incoming-interface);
      include-option-82 {
        forcerenew;
        nak;
      }
      interface-client-limit number;
      process-inform {
        pool pool-name;
      }
    }
    service-profile dynamic-profile-name;
    trace;
    upto upto-interface-name;
  }
  overrides {
```

```
        client-discover-match (option60-and-option82 | incoming-interface);
        include-option-82 {
          forcerenew;
          nak;
        }
        interface-client-limit number;
        process-inform {
          pool pool-name;
        }
      }
      requested-ip-network-match subnet-mask
      route-suppression;
      service-profile dynamic-profile-name;
    }
    liveness-detection {
      failure-action (clear-binding | clear-binding-if-interface-up | log-only);
      method {
        bfd {
          version (0 | 1 | automatic);
          minimum-interval milliseconds;
          minimum-receive-interval milliseconds;
          multiplier number;
          no-adaptation;
          transmit-interval {
            minimum-interval milliseconds;
            threshold milliseconds;
          }
          detection-time {
            threshold milliseconds;
          }
          session-mode(automatic | multihop | singlehop);
          holddown-interval milliseconds;
        }
      }
    }
    overrides {
      client-discover-match (option60-and-option82 | incoming-interface);
      include-option-82 {
        forcerenew;
        nak;
      }
      interface-client-limit number;
      process-inform {
        pool pool-name;
      }
    }
    pool-match-order {
      external-authority;
      ip-address-first;
      option-82;
    }
    reconfigure {
      attempts attempt-count;
      clear-on-abort;
      strict;
      timeout timeout-value;
```


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```
    token token-value;
    trigger {
      radius-disconnect;
    }
  }
  requested-ip-network-match subnet-mask;
  route-suppression;
  service-profile dynamic-profile-name;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services],
[edit logical-systems *logical-system-name* system services],
[edit routing-instances *routing-instance-name* system services],
[edit system services]

Release Information

Statement introduced in Junos OS Release 9.0.
Statement introduced in Junos OS Release 12.1 for EX Series switches.
Statement introduced in Junos OS Release 13.2X51 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description

Configure Dynamic Host Configuration Protocol (DHCP) local server options on the router or switch and enable the router or switch to function as an extended DHCP local server. The DHCP local server receives DHCP request and reply packets from DHCP clients and then responds with an IP address and other optional configuration information to the client.

The DHCP local server and the DHCP/BOOTP relay server, which are configured under the **[edit forwarding-options helpers]** hierarchy level, cannot both be enabled on the router or switch at the same time. The extended DHCP local server is fully compatible with the extended DHCP relay feature.

The **dhcpv6** stanza configures the router or switch to support Dynamic Host Configuration Protocol for IPv6 (DHCPv6). The DHCPv6 local server is fully compatible with the extended DHCP local server and the extended DHCP relay feature.

NOTE: When you configure the dhcp-local-server statement at the routing instance hierarchy level, you must use a routing instance type of virtual-router.

The remaining statements are explained separately.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Extended DHCP Local Server Overview*
- *DHCPv6 Local Server Overview*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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dhcp-relay (EX Series Switches only)

Syntax

```
dhcp-relay {
  group group-name {
    interface interface-name {
      overrides {
        always-write-giaddr;
        always-write-option-82;
        client-discover-match <option60-and-option82>;
        interface-client-limit number;
        layer2-unicast-replies;
        no-arp;
        trust-option-82;
      }
      }
      exclude {
        overrides {
        ...
      }
      trace;
      upto upto-interface-name;
    }
    overrides {
      ...
    }
    relay-option {
      ...
    }
  }
relay-option-82 {
  circuit-id {
    prefix prefix;
    use-interface-description (logical | device);
  }
}
server-group {
  server-group-name {
    server-ip-address;
  }
}
```

Hierarchy Level

[edit forwarding-options],
[edit routing-instances *routing-instance-name* forwarding-options]

Release Information

Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description

Configure extended DHCP relay options on the switch and enable the switch to function as a DHCP relay agent. A DHCP relay agent forwards DHCP request and reply packets between a DHCP client and a DHCP server.

The extended DHCP relay agent options configured with the **dhcp-relay** statement are incompatible with the DHCP/BOOTP relay agent options configured with the **bootp** statement. As a result, the extended DHCP relay agent and the DHCP/BOOTP relay agent cannot both be enabled on the switch at the same time. See "DHCP/BOOTP Relay for

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Switches Overview" on page 11 for more information about the DHCP/BOOTP relay agent.

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35
- Understanding the Extended DHCP Relay Agent for EX Series Switches on page 12

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dhcpv6 (DHCP Local Server)

Syntax

```
dhcpv6 {
  authentication {
    password password-string;
    username-include {
      circuit-type;
      client-id;
      delimiter delimiter-character;
      domain-name domain-name-string;
      logical-system-name;
      relay-agent-interface-id;
      relay-agent-remote-id;
      relay-agent-subscriber-id;
      routing-instance-name;
      user-prefix user-prefix-string;
    }
  }
  group group-name {
    authentication {
    ...
    interface interface-name {
      exclude;
      liveness-detection {
        failure-action (clear-binding | clear-binding-if-interface-up | log-only);
        method {
          bfd {
            version (0 | 1 | automatic);
            minimum-interval milliseconds;
            minimum-receive-interval milliseconds;
            multiplier number;
            no-adaptation;
            transmit-interval {
              minimum-interval milliseconds;
              threshold milliseconds;
            }
            detection-time {
              threshold milliseconds;
            }
            session-mode(automatic | multihop | singlehop);
            holddown-interval milliseconds;
          }
        }
      }
      overrides {
        include-option-82;
        interface-client-limit number;
        multi-address-embedded-option-response;
        process-inform {
          pool pool-name;
        }
        rapid-commit;
      }
      service-profile dynamic-profile-name;
```


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```
        trace;
        upto upto-interface-name;
    }
    overrides {
        delegated-pool;
        include-option-82;
        interface-client-limit number;
        multi-address-embedded-option-response;
        process-inform {
            pool pool-name;
        }
        rapid-commit;
    }
    route-suppression;
    service-profile dynamic-profile-name;
}
liveness-detection {
    failure-action (clear-binding | clear-binding-if-interface-up | log-only);
    method {
        bfd {
            version (0 | 1 | automatic);
            minimum-interval milliseconds;
            minimum-receive-interval milliseconds;
            multiplier number;
            no-adaptation;
            transmit-interval {
                minimum-interval milliseconds;
                threshold milliseconds;
            }
            detection-time {
                threshold milliseconds;
            }
            session-mode(automatic | multihop | singlehop);
            holddown-interval milliseconds;
        }
    }
}
overrides {
    delegated-pool;
    include-option-82;
    interface-client-limit number;
    multi-address-embedded-option-response;
    process-inform {
        pool pool-name;
    }
    rapid-commit;
    reconfigure {
        attempts attempt-count;
        clear-on-abort;
        strict;
        timeout timeout-value;
        token token-value;
        trigger {
            radius-disconnect;
        }
    }
```

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```
    }
    reconfigure {
      attempts attempt-count;
      clear-on-abort;
      strict;
      timeout timeout-value;
      token token-value;
      trigger {
        radius-disconnect;
      }
    }
    requested-ip-network-match subnet-mask;
    route-suppression;
    service-profile dynamic-profile-name;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server],
[edit logical-systems *logical-system-name* system services dhcp-local-server],
[edit routing-instances *routing-instance-name* system services dhcp-local-server],
[edit system services dhcp-local-server]

Release Information

Statement introduced in Junos OS Release 9.6.
Statement introduced in Junos OS Release 12.3 for EX Series switches.

Description

Configure DHCPv6 local server options on the router or switch and enable the router or switch to function as a server for the DHCP protocol for IP version 6 (IPv6). The DHCPv6 local server sends and receives packets using the IPv6 protocol and informs IPv6 of the routing requirements of router clients. The local server works together with the AAA service framework to control subscriber access (or DHCP client access) and accounting.

The DHCPv6 local server is fully compatible with the extended DHCP local server and DHCP relay agent.

The remaining statements are explained separately.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *DHCPv6 Local Server Overview*

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dhcpv6 (DHCP Relay Agent)

Syntax

```
dhcpv6 {
    active-server-group server-group-name;
    authentication {
        password password-string;
        username-include {
            circuit-type;
            client-id;
            delimiter delimiter-character;
            domain-name domain-name-string;
            logical-system-name;
            relay-agent-interface-id;
            relay-agent-remote-id;
            relay-agent-subscriber-id;
            routing-instance-name;
            user-prefix user-prefix-string;
        }
    }
    dynamic-profile profile-name {
        aggregate-clients (merge | replace);
        use-primary primary-profile-name;
    }
    group group-name {
        active-server-group server-group-name;
        authentication {
            ...
        }
        dynamic-profile profile-name {
            ...
        }
        interface interface-name {
            exclude;
            liveness-detection {
                failure-action (clear-binding | clear-binding-if-interface-up | log-only);
                method {
                    bfd {
                        version (0 | 1 | automatic);
                        minimum-interval milliseconds;
                        minimum-receive-interval milliseconds;
                        multiplier number;
                        no-adaptation;
                        transmit-interval {
                            minimum-interval milliseconds;
                            threshold milliseconds;
                        }
                        detection-time {
                            threshold milliseconds;
                        }
                        session-mode(automatic | multihop | singlehop);
                        holddown-interval milliseconds;
                    }
                }
            }
```

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```
        overrides {
            ...
        }
        service-profile dynamic-profile-name;
        trace;
        upto upto-interface-name;
    }
    }
    overrides {
        ...
    }
    relay-agent-interface-id {
        ...
    }
    relay-agent-remote-id {
        ...
    }
    relay-option {
        ...
    }
    route-suppression;
    service-profile dynamic-profile-name;
}
liveness-detection {
    ...
}
overrides {
    allow-snooped-clients;
    delay-authentication;
    interface-client-limit number;
    no-allow-snooped-clients;
    no-bind-on-request;
    send-release-on-delete;
}
relay-agent-interface-id {
    prefix prefix;
    use-interface-description (logical | device);
    use-option-82;
}
relay-agent-remote-id {
    prefix prefix;
    use-interface-description (logical | device);
}
relay-option {
    option-number option-number;
    default-action {
        drop;
        forward-only;
        relay-server-group relay-server-group;
    }
    equals (ascii ascii-string | hexadecimal hexadecimal-string) {
        drop;
        forward-only;
        relay-server-group relay-server-group;
    }
    starts-with (ascii ascii-string | hexadecimal hexadecimal-string) {
```


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```
        drop;
        forward-only;
        relay-server-group relay-server-group;
      }
    }
    server-group {
      server-group-name {
        server-ip-address;
      }
    }
    route-suppression;
    server-response-time seconds;
    service-profile dynamic-profile-name;
}
```

Hierarchy Level

[edit forwarding-options dhcp-relay],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay]

Release Information

Statement introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.3 for EX Series switches.

Description

Configure DHCPv6 relay options on the router or switch and enable the router or switch to function as a DHCPv6 relay agent. A DHCPv6 relay agent forwards DHCPv6 request and reply packets between a DHCPv6 client and a DHCPv6 server.

The DHCPv6 relay agent server is fully compatible with the extended DHCP local server and DHCP relay agent. However, the options configured with the **dhcpv6** statement are incompatible with the DHCP/BOOTP relay agent options configured with the **bootp** statement. As a result, the DHCPv6 relay agent and the DHCP/BOOTP relay agent cannot be enabled on the router or switch at the same time.

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *dhcp-relay*
- *DHCPv6 Relay Agent Overview*
- *Using External AAA Authentication Services with DHCP*

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domain

Syntax

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

Hierarchy Level [edit forwarding-options helpers]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Enable DNS request packet forwarding.

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring DNS and TFTP Packet Forwarding*

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domain-name (DHCP)

Syntax domain-name *domain-name*;

Hierarchy Level
[edit system services dhcp
[edit system services dhcp],
[edit system services dhcp pool],
[edit system services dhcp static-binding]

Release Information
Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description For J Series Services Routers and EX Series switches only. Configure the name of the domain in which clients search for a DHCP server host. This is the default domain name that is appended to hostnames that are not fully qualified.

Options ***domain-name***—Name of the domain.

Required Privilege Level
system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

domain-search

Syntax domain-search [*domain-list*];

Hierarchy Level
[edit system],
[edit system services dhcp],
[edit system services dhcp],
[edit system services dhcp pool],
[edit system services dhcp static-binding]

Release Information
Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure a list of domains to be searched.

Options ***domain-list***—A list of domain names to search. The list can contain up to six domain names, with a total of up to 256 characters.

Required Privilege Level
system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- *Reaching a Domain Name System Server*
- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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drop

Syntax drop;

Hierarchy Level [edit forwarding-options dhcp-relay relay-option-60]

Release Information Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description Drop (discard) DHCP client packets when you use relay option 60 (relay-option-60 is enabled) in DHCP packets to forward client traffic to specific DHCP servers.

Default Relay Option 60 is disabled.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35
- Understanding the Extended DHCP Relay Agent for EX Series Switches on page 12

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dynamic-profile (DHCP Relay Agent)

Syntax

```
dynamic-profile profile-name {
  aggregate-clients (merge | replace);
  use-primary primary-profile-name;
}
```

Hierarchy Level

[edit forwarding-options dhcp-relay],
[edit forwarding-options dhcp-relay dhcpv6],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name*],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name* interface *interface-name*],
[edit forwarding-options dhcp-relay group *group-name*],
[edit forwarding-options dhcp-relay group *group-name* interface *interface-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay ...],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay ...],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay ...]

Release Information

Statement introduced in Junos OS Release 9.2.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description

Specify the dynamic profile that is attached to all interfaces, to a named group of interfaces, or to a specific interface.

M120 and M320 routers do not support DHCPv6.

Options

profile-name—Name of the dynamic profile.

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *dhcp-relay*
- *Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces*
- *Grouping Interfaces with Common DHCP Configurations*
- *Configuring a Default Subscriber Service*

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encoding

Syntax encoding (binary | pem);

Hierarchy Level [edit security ike policy *ike-peer-address*],
[edit security certificates certification-authority *ca-profile-name*]

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 the OCX Series.

Description (Encryption interface on M Series and T Series routers and EX Series switches only) Specify the file format used for the **local-certificate** and **local-key-pair** statements.

Options **binary**—Binary file format.

pem—Privacy-enhanced mail (PEM), an ASCII base 64 encoded format.

Default: binary

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation
- *Configuring Digital Certificates for an ES PIC*
- *Configuring an IKE Policy for Digital Certificates for an ES PIC*

enrollment-retry

Syntax enrollment-retry *attempts*;

Hierarchy Level [edit security certificates]

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 the OCX Series.

Description (Encryption interface on M Series and T Series routers and EX Series switches only) Specify how many times a router or switch can resend a digital certificate request.

Options ***attempts***—Number of enrollment retries.

Range: 0 through 100

Default: 0

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation
- *Configuring Digital Certificates for an ES PIC*

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enrollment-url

Syntax enrollment-url *url-name*;

Hierarchy Level [edit security certificates certification-authority *ca-profile-name*]

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 the OCX Series.

Description (Encryption interface on M Series and T Series routers and EX Series switches only) Specify where your router or switch sends Simple Certificate Enrollment Protocol-based (SCEP-based) certificate enrollment requests (certificate authority URL).

Options *url-name*—Certificate authority URL.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation
- *Configuring Digital Certificates for an ES PIC*

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family (for EX Series switches)

Syntax

family ccc on page 104
family ethernet-switching on page 104
family inet on page 104
family inet6 on page 105
family iso on page 105
family mpls on page 105

family ccc

```
family ccc;
```

family ethernet-switching

```
family ethernet-switching {
  filter [input | output] filter-name;
  native-vlan-id vlan-id;
  port-mode mode;
  vlan (802.1Q Tagging) {
    members [ (all | names | vlan-ids)];
  }
}
```

family inet

```
family inet {
  address address {
    arp ip-address (mac | multicast-mac) mac-address <publish>;
    broadcast;
    preferred;
    primary;
    vrrp-group group-id {
      advertise-interval milliseconds;
      preempt | no-preempt {
        hold-time seconds;
      }
      priority number;
      virtual-address [addresses];
      virtual-link-local-address ip-address;
    }
  }
  dhcp {
    client-identifier (ascii ascii | hexadecimal hexadecimal);
    lease-time (seconds | infinite);
    retransmission-attempt number;
    retransmission-interval seconds;
    server-address ip-address;
    update-server;
    vendor-id vendor-id;
  }
  filter {
    input filter-name;
    output filter-name;
    }
  mtu bytes;
  no-redirects;
  no-neighbor-learn;
  primary;
  rpf-check;
```


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```
    targeted-broadcast;
}
```

family inet6

```
family inet6 {
    address address {
        eui-64;
        nd6-stale-time seconds;
        ndp ip-address (mac | multicast-mac) mac-address <publish>;
        preferred;
        primary;
        vrrp-inet6-group group-id {
            inet6-advertise-interval milliseconds;
            preempt | preempt {
                hold-time seconds;
            }
            priority number;
            virtual-inet6-address [addresses];
            virtual-link-local-address ipv6–address;
        }
    }
    (dad-disable | no-dad-disable);
    filter {
        input filter-name;
        output filter-name;
    }
    mtu bytes;
    no-neighbor-learn
    rpf-check;
}
```

family iso

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

family mpls

```
family mpls {
    mtu bytes;
}
```

Hierarchy Level

[edit interfaces *interface-name* unit *logical-unit-number*],
[edit interfaces interface-range *name* unit *logical-unit-number*]

Release Information

Statement introduced in Junos OS Release 9.0 for EX Series switches, including options **ethernet-switching**, **inet**, and **iso**.
Option **inet6** introduced in Junos OS Release 9.3 for EX Series switches.
Options **ccc** and **mpls** introduced in Junos OS Release 9.5 for EX Series switches.

Description

Configure protocol family information for the logical interface on the switch.

You must configure a logical interface to be able to use the physical device.

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Default Interfaces on EX2200, EX3200, EX3300, EX4200, and EX4500 switches are set to **family ethernet-switching** by the default factory configuration. Before you can change the family setting for an interface to another family type, you must delete this default setting or any user-configured family setting. EX6200 and EX8200 switch interfaces do not have a default family setting.

Options See Table 9 on page 106 for protocol families available on the switch interfaces. Different protocol families support different subsets of the interface types on the switch. Interface types on the switch are:

- Aggregated Ethernet (**ae**)
- Gigabit Ethernet (**ge**)
- Interface-range configuration (**interface-range**)
- Loopback (**lo0**)
- Management Ethernet (**me0**)
- Routed VLAN interface (RVI) (**vlan**)
- Virtual management Ethernet (**vme**)
- 10-Gigabit Ethernet (**xe**)

If you are using an interface range, the supported protocol families are the ones supported by the interface types that compose the range.

Not all interface types support all **family** substatements. Check your switch CLI for supported substatements for a particular protocol family configuration.

Table 9: Protocol Families and Supported Interface Types

Family	Description	Supported Interface Types						
		ae	ge	lo0	me0	vlan	vme	xe
ccc	Circuit cross-connect protocol family	✓*	✓					✓
ethernet-switching	Ethernet switching protocol family	✓	✓		✓			✓
inet	IPv4 protocol family	✓	✓	✓	✓	✓	✓	✓
inet6	IPv6 protocol family	✓	✓	✓	✓	✓	✓	✓
iso	Junos OS protocol family for IS-IS traffic	✓	✓	✓	✓	✓	✓	✓
mpls	MPLS protocol family	✓	✓	✓	✓		✓	✓

*Supported on EX8200 switches only

The remaining statements are explained separately.

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Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32
- *Example: Configuring MPLS on EX8200 and EX4500 Switches*
- *Configuring Gigabit Ethernet Interfaces (CLI Procedure)*
- *Configuring Aggregated Ethernet Links (CLI Procedure)*
- *Configuring Routed VLAN Interfaces (CLI Procedure)*

file

Syntax
file *certificate-filename*;

Hierarchy Level
[edit security certificates certification-authority *ca-profile-name*]

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 the OCX Series.

Description
(Encryption interface on M Series and T Series routers and EX Series switches only)
Specify the file from which to read the digital certificate.

Options
certificate-filename—File from which to read the digital certificate.

Required Privilege Level
admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation
- *Configuring Digital Certificates for an ES PIC*

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ftp

Syntax

```
ftp {
  connection-limit limit;
  rate-limit limit;
}
```

Hierarchy Level [edit system services]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Allow FTP requests from remote systems to the local router or switch.

Options The remaining statements are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring FTP Service for Remote Access to the Router or Switch*

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group (DHCP Local Server)

Syntax

```
group group-name {
  authentication {
    password password-string;
    username-include {
      circuit-type;
      client-id;
      delimiter delimiter-character;
      domain-name domain-name-string;
      logical-system-name;
      mac-address;
      option-60;
      option-82 <circuit-id> <remote-id>;
      relay-agent-interface-id
      relay-agent-remote-id;
      relay-agent-subscriber-id;
      routing-instance-name;
      user-prefix user-prefix-string;
    }
  }
  dynamic-profile profile-name <aggregate-clients (merge | replace) | use-primary
    primary-profile-name>;
  interface interface-name {
    exclude;
    overrides {
      client-discover-match (option60-and-option82 | incoming-interface);
      interface-client-limit number;
      process-inform {
        pool pool-name;
      }
      rapid-commit;
    }
    service-profile dynamic-profile-name;
    trace;
    upto upto-interface-name;
  }
  liveness-detection {
    failure-action (clear-binding | clear-binding-if-interface-up | log-only);
    method {
      bfd {
        version (0 | 1 | automatic);
        minimum-interval milliseconds;
        minimum-receive-interval milliseconds;
        multiplier number;
        no-adaptation;
        transmit-interval {
          minimum-interval milliseconds;
          threshold milliseconds;
        }
        detection-time {
          threshold milliseconds;
        }
        session-mode(automatic | multihop | singlehop);
```

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```
            holddown-interval milliseconds;
          }
        }
      }
      overrides {
        client-discover-match (option60-and-option82 | incoming-interface);
        delegated-pool;
        interface-client-limit number;
        process-inform {
          pool pool-name;
        }
        rapid-commit;
      }
      reconfigure {
        attempts attempt-count;
        clear-on-abort;
        strict;
        timeout timeout-value;
        token token-value;
        trigger {
          radius-disconnect;
        }
      }
      route-suppression;
      service-profile dynamic-profile-name;
    }
```

Hierarchy Level

[edit system services dhcp-local-server],
[edit system services dhcp-local-server dhcpv6],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server ...],
[edit logical-systems *logical-system-name* system services dhcp-local-server ...],
[edit routing-instances *routing-instance-name* system services dhcp-local-server ...]

Release Information

Statement introduced in Junos OS Release 9.0.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description

Configure a group of interfaces that have a common configuration, such as authentication parameters. A group must contain at least one interface.

Options

group-name—Name of the group.

The remaining statements are explained separately.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

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Related Documentation

- *Extended DHCP Local Server Overview*
- *Grouping Interfaces with Common DHCP Configurations*
- *Using External AAA Authentication Services with DHCP*
- *Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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group (DHCP Relay Agent)

Syntax

```
group group-name {
  active-server-group server-group-name;
  authentication {
    password password-string;
    username-include {
      circuit-type;
      client-id;
      delimiter delimiter-character;
      domain-name domain-name-string;
      logical-system-name;
      mac-address;
      option-60;
      option-82 [circuit-id] [remote-id];
      relay-agent-interface-id;
      relay-agent-remote-id;
      relay-agent-subscriber-id;
      routing-instance-name;
      user-prefix user-prefix-string;
    }
  }
  dynamic-profile profile-name {
    aggregate-clients (merge | replace);
    use-primary primary-profile-name;
  }
  interface interface-name {
    exclude;
    liveness-detection {
      failure-action (clear-binding | clear-binding-if-interface-up | log-only);
      method {
        bfd {
          version (0 | 1 | automatic);
          minimum-interval milliseconds;
          minimum-receive-interval milliseconds;
          multiplier number;
          no-adaptation;
          transmit-interval {
            minimum-interval milliseconds;
            threshold milliseconds;
          }
          detection-time {
            threshold milliseconds;
          }
          session-mode(automatic | multihop | singlehop);
          holddown-interval milliseconds;
        }
      }
    }
    overrides {
      ...
    }
    service-profile dynamic-profile-name;
    trace;
```


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```
    upto upto-interface-name;
}
overrides {
    allow-snooped-clients;
    always-write-giaddr;
    always-write-option-82;
    client-discover-match (option60-and-option82 | incoming-interface);
    disable-relay;
    interface-client-limit number;
    layer2-unicast-replies;
    no-allow-snooped-clients;
    no-bind-on-request;
    proxy-mode;
    replace-ip-source-with;
    send-release-on-delete;
    trust-option-82;
}
relay-agent-interface-id {
    prefix prefix;
    use-interface-description (logical | device);
    use-option-82;
}
relay-agent-remote-id {
    prefix prefix;
    use-interface-description (logical | device);
}
relay-option {
    option-number option-number;
    default-action {
        drop;
        forward-only;
        local-server-group local-server-group;
        relay-server-group relay-server-group;
    }
    equals (ascii ascii-string | hexadecimal hexadecimal-string) {
        drop;
        forward-only;
        local-server-group local-server-group;
        relay-server-group relay-server-group;
    }
    starts-with (ascii ascii-string | hexadecimal hexadecimal-string) {
        drop;
        forward-only;
        local-server-group local-server-group;
        relay-server-group relay-server-group;
    }
}
relay-option-82 {
    circuit-id {
        prefix prefix;
        use-interface-description (logical | device);
        use-option-82;
    }
    remote-id {
        prefix prefix;
        use-interface-description (logical | device);
```

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```
    }
  }
  route-suppression;
  service-profile dynamic-profile-name;
}
```

Hierarchy Level

[edit forwarding-options dhcp-relay],
[edit forwarding-options dhcp-relay dhcpv6],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay ...],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay ...],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay ...]

Release Information

Statement introduced in Junos OS Release 8.3.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description

Specify the name of a group of interfaces that have a common DHCP or DHCPv6 relay agent configuration. A group must contain at least one interface. Use the statement at the **[edit ... dhcpv6]** hierarchy levels to configure DHCPv6 support.

Options

group-name—Name of a group of interfaces that have a common DHCP or DHCPv6 relay agent configuration.

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *dhcp-relay*
- *Extended DHCP Relay Agent Overview*
- *Configuring Group-Specific DHCP Relay Options*
- *Grouping Interfaces with Common DHCP Configurations*
- *Using External AAA Authentication Services with DHCP*
- *Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces*

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helpers

Syntax

```
helpers {
  bootp {
    client-response-ttl number;
    description text-description;
    interface interface-group {
      client-response-ttl number;
      description text-description;
      maximum-hop-count number;
      minimum-wait-time seconds;
      no-listen;
      server address {
        logical-system logical-system-name <routing-instance [ <default>
          routing-instance-names ]>;
        routing-instance [ <default> routing-instance-names ];
      }
    }
    maximum-hop-count number;
    minimum-wait-time seconds;
    relay-agent-option;
    server address {
      logical-system logical-system-name <routing-instance [ <default>
        routing-instance-names ]>;
      routing-instance [ <default> routing-instance-names ];
    }
  }
  domain {
    description text-description;
    interface interface-name {
      broadcast;
      description text-description;
      no-listen;
      server address <logical-system logical-system-name> <routing-instance
        routing-instance-name>;
    }
    server address <logical-system logical-system-name> <routing-instance
      routing-instance-name>;
  }
  port (Packet Forwarding) port-number {
    description text-description;
    interface interface-name {
      broadcast;
      description text-description;
      no-listen;
      server address <logical-system logical-system-name> <routing-instance
        routing-instance-name>;
    }
    server address <logical-system logical-system-name> <routing-instance
      routing-instance-name>;
  }
  tftp {
    description text-description;
    interface interface-name {
```

```
        broadcast;
        description text-description;
        no-listen;
        server address <logical-system logical-system-name> <routing-instance
          routing-instance-name>;
      }
      server address <logical-system logical-system-name> <routing-instance
        routing-instance-name>;
    }
    traceoptions {
      file filename <files number> <match regular-expression> <size bytes> <world-readable |
        no-world-readable>;
      flag flag;
      level level;
      no-remote-trace level;
    }
}
```

Hierarchy Level [edit forwarding-options]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Enable TFTP or DNS request packet forwarding, or configure the router, switch, or interface to act as a DHCP/BOOTP relay agent. Use only one server address per interface or global configuration.

In addition to TFTP and DNS, you can use the helpers statement to enable LAN-Broadcast forwarding. To do this, you must manually define which UDP port is forwarded, as shown here:

```
user@ host# show forwarding-options
helpers {
  port 3000 {
    interface {
      fe-0/0/1.0 {
        server 111.0.0.2;
      }
    }
  }
  port 3001 {
    interface {
      fe-0/0/0.0 {
        server 100.0.0.2;
      }
    }
  }
}
```

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

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Related Documentation

- *Configuring DNS and TFTP Packet Forwarding*
- *Configuring Routers, Switches, and Interfaces as DHCP and BOOTP Relay Agents*

http

Syntax

```
http {
  interfaces [ interface-names ];
  port port;
}
```

Hierarchy Level [edit system services web-management]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure the port and interfaces for HTTP service, which is unencrypted.

Options

interfaces [*interface-names*]—Name of one or more interfaces on which to allow the HTTP service. By default, HTTP access is allowed through built-in Fast Ethernet or Gigabit Ethernet interfaces only.

The remaining statement is explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring Management Access for the EX Series Switch (J-Web Procedure)*
- *J-Web Interface User Guide*
- https on page 118
- port on page 155
- web-management on page 198

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https

Syntax

```
https {
  interfaces [ interface-names ];
  local-certificate name;
  port port;
}
```

Hierarchy Level [edit system services web-management]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure the secure version of HTTP (HTTPS) service, which is encrypted.

Options

interfaces [*interface-names*]—Name of one or more interfaces on which to allow the HTTPS service. By default, HTTPS access is allowed through any ingress interface, but HTTP access is allowed through built-in Fast Ethernet or Gigabit Ethernet interfaces only.

local-certificate *name*—Name of the X.509 certificate for a Secure Sockets Layer (SSL) connection. An SSL connection is configured at the **[edit security certificates local]** hierarchy.

The remaining statements are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring Management Access for the EX Series Switch (J-Web Procedure)*
- *J-Web Interface User Guide*
- http on page 117
- port on page 155
- web-management on page 198

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interface (BOOTP)

Syntax

```
interface (interface-name | interface-group) {
  broadcast;
  client-response-ttl number;
  description text-description;
  maximum-hop-count number;
  minimum-wait-time seconds;
  no-listen;
  server address {
    logical-system logical-system-name <routing-instance [ <default>
      routing-instance-names ]>;
    routing-instance [ <default> routing-instance-names ];
  }
  apply-secondary-as-giaddr (QFX platforms only)
}
```

Hierarchy Level [edit forwarding-options helpers bootp]

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 11.3 for QFX Series switches.

Description Specify the interface for a DHCP and BOOTP relay agent.

Options

interface-group—Sets a logical interface or group of logical interfaces with a specific DHCP relay configuration.

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring Routers, Switches, and Interfaces as DHCP and BOOTP Relay Agents*
- *Setting Up DHCP Option 82 with the Switch as a Relay Agent Between Clients and DHCP Server (CLI Procedure)*

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interface (DHCP Relay Agent)

Syntax

```
interface interface-name {
  exclude;
  overrides {
    allow-snooped-clients;
    always-write-giaddr;
    always-write-option-82;
    client-discover-match (option60-and-option82 | incoming-interface);
    disable-relay;
    interface-client-limit number;
    layer2-unicast-replies;
    no-allow-snooped-clients;
    proxy-mode;
    replace-ip-source-with;
    send-release-on-delete;
    trust-option-82;
  }
  service-profile dynamic-profile-name;
  trace;
  upto upto-interface-name;
}
```

Hierarchy Level

[edit forwarding-options dhcp-relay dhcpv6 group *group-name*],
[edit forwarding-options dhcp-relay group *group-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay ...],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay ...],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay ...]

Release Information

Statement introduced in Junos OS Release 8.3.
Options **upto** and **exclude** introduced in Junos OS Release 9.1.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description

Specify one or more interfaces, or a range of interfaces, that are within a specified group on which the DHCP or DHCPv6 relay agent is enabled. You can repeat the **interface *interface-name*** statement to specify multiple interfaces within a group, but you cannot specify the same interface in more than one group. Also, you cannot use an interface that is being used by the DHCP local server. Use the statement at the **[edit ... dhcpv6]** hierarchy levels to configure DHCPv6 support.

EX Series switches do not support DHCPv6.

NOTE: DHCP values are supported in Integrated Routing and Bridging (IRB) configurations. When you configure an IRB interface in a network that is using DHCP, the DHCP information (for example, authentication, address assignment, and so on) is propagated in the associated bridge domain. This enables the DHCP server to configure client IP addresses residing within the bridge domain. IRB currently only supports static DHCP configurations. For

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additional information about how to configure IRB, see *Configuring Integrated Routing and Bridging for Bridge Domains*.

Options

exclude—Exclude an interface or a range of interfaces from the group. This option and the **overrides** option are mutually exclusive.

interface-name—Name of the interface. You can repeat this option multiple times.

overrides—Override the specified default configuration settings for the interface. The overrides statement is described separately.

upto-interface-name—Upper end of the range of interfaces; the lower end of the range is the interface-name entry. The interface device name of the ***upto-interface-name*** must be the same as the device name of the ***interface-name***.

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Extended DHCP Relay Agent Overview*
- *dhcp-relay*
- **dhcp-relay (EX Series Switches only) on page 90**
- Understanding the Extended DHCP Relay Agent for EX Series Switches on page 12
- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35
- *Grouping Interfaces with Common DHCP Configurations*
- *Using External AAA Authentication Services with DHCP*

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interface (DNS and TFTP Packet Forwarding or Relay Agent)

Syntax

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

Hierarchy Level [edit forwarding-options helpers domain],
[edit forwarding-options helpers tftp]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Specify the interface for monitoring and forwarding DNS or TFTP requests.

Options *interface-name*—Name of the interface.

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Configuring DNS and TFTP Packet Forwarding*

interface-client-limit (DHCP Extended Server)

Syntax interface-client-limit *number*;

Hierarchy Level [edit system services dhcp-local-server overrides]

Release Information Statement introduced in Junos OS Release 12.1.

Description Set the maximum number of DHCP subscribers per interface allowed for a specific group or for all groups using the extended version of DHCP on switches. A group specification takes precedence over a global specification for the members of that group.

Default No limit.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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interface-client-limit (DHCP Relay Agent)

Syntax interface-client-limit *number*;

Hierarchy Level
[edit forwarding-options dhcp-relay dhcpv6 overrides],
[edit forwarding-options dhcp-relay overrides],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name* overrides],
[edit forwarding-options dhcp-relay group *group-name* overrides],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay dhcpv6 overrides],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay overrides],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay dhcpv6 group *group-name* overrides],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay group *group-name* overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 group *group-name* overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* overrides],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 overrides],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay overrides],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 group *group-name* overrides],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* overrides],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* interface *interface-name* overrides]

Release Information
Statement introduced in Junos OS Release 9.2.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description Set the maximum number of DHCP (or DHCPv6) subscribers or clients per interface allowed for a specific group or for all groups. A group specification takes precedence over a global specification for the members of that group. Use the statement at the **[edit ... dhcpv6]** hierarchy levels to configure DHCPv6 support.

M120 and M320 routers do not support DHCPv6.

Default No limit

Options *number*—Maximum number of clients allowed.
Range: 1 through 500,000

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

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Related Documentation

- *dhcp-relay*
- *Extended DHCP Relay Agent Overview*
- *Configuring Group-Specific DHCP Relay Options*
- *Overriding the Default DHCP Relay Configuration Settings*

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interfaces (for EX Series switches)

Syntax

interfaces ae on page 125
interfaces ge on page 125
interfaces interface-range on page 127
interfaces lo0 on page 127
interfaces me0 on page 128
interfaces traceoptions on page 128
interfaces vlan on page 128
interfaces vme on page 129
interfaces xe on page 130

interfaces ae

```
aex {
  accounting-profile name;
  aggregated-ether-options {
    (flow-control | no-flow-control);
    lacp {
      (active | passive);
      admin-key key;
      periodic interval;
      system-id mac-address;
    }
    (link-protection | no-link-protection);
    link-speed speed;
    (loopback | no-loopback);
    minimum-links number;
  }
  description text;
  disable;
  (gratuitous-arp-reply | no-gratuitous-arp-reply);
  mtu bytes;
  no-gratuitous-arp-request;
  traceoptions {
    flag flag;
  }
  (traps | no-traps);
  unit logical-unit-number {
    accounting-profile name;
    bandwidth rate;
    description text;
    disable;
    family family-name {...}
    proxy-arp (restricted | unrestricted);
    (traps | no-traps);
    vlan-id vlan-id-number;
  }
  vlan-tagging;
}
```

interfaces ge

```
ge-fpc/pic/port {
  accounting-profile name;
  description text;
  disable;
  ether-options {
    802.3ad {
```

```
        aex;
        (backup | primary);
        lacp {
          force-up;
        }
      }
      (auto-negotiation | no-auto-negotiation);
      (flow-control | no-flow-control);
      ieee-802-3az-eee;
      link-mode mode;
      (loopback | no-loopback);
      speed (auto-negotiation | speed);
    }
    (gratuitous-arp-reply | no-gratuitous-arp-reply);
    hold-time up milliseconds down milliseconds;
    media-type;
    mtu bytes;
    no-gratuitous-arp-request;
    traceoptions {
      flag flag;
    }
    (traps | no-traps);
    unit logical-unit-number {
      accounting-profile name;
      bandwidth rate;
      description text;
      disable;
      family family-name {...}
      proxy-arp (restricted | unrestricted);
      (traps | no-traps);
      vlan-id vlan-id-number;
    }
    vlan-tagging;
  }
```


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interfaces interface-range

```
interface-range name {
  accounting-profile name;
  description text;
  disable;
  ether-options {
    802.3ad {
      aex;
      (backup | primary);
      lacp {
        force-up;
      }
    }
    (auto-negotiation | no-auto-negotiation);
    (flow-control | no-flow-control);
    ieee-802-3az-eee;
    link-mode mode;
    (loopback | no-loopback);
    speed (auto-negotiation | speed);
  }
  (gratuitous-arp-reply | no-gratuitous-arp-reply);
  hold-time up milliseconds down milliseconds;
  member interface-name;
  member-range starting-interface name to ending-interface name;
  mtu bytes;
  unit logical-unit-number {
    accounting-profile name;
    bandwidth rate;
    description text;
    disable;
    family family-name {...}
    proxy-arp (restricted | unrestricted);
    (traps | no-traps);
    vlan-id vlan-id-number;
  }
  vlan-tagging;
}
```

interfaces lo0

```
lo0 {
  accounting-profile name;
  description text;
  disable;
  hold-time up milliseconds down milliseconds;
  traceoptions {
    flag flag;
  }
  (traps | no-traps);
  unit logical-unit-number {
    accounting-profile name;
    bandwidth rate;
    description text;
    disable;
    family family-name {...}
    (traps | no-traps);
  }
}
```

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interfaces me0

```
me0 {
  accounting-profile name;
  description text;
  disable;
  (gratuitous-arp-reply | no-gratuitous-arp-reply);
  hold-time up milliseconds down milliseconds;
  no-gratuitous-arp-request;
  traceoptions {
    flag flag;
  }
  (traps | no-traps);
  unit logical-unit-number {
    accounting-profile name;
    bandwidth rate;
    description text;
    disable;
    family family-name {...}
    (traps | no-traps);
    vlan-id vlan-id-number;
  }
  vlan-tagging;
}
```

interfaces traceoptions

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

interfaces vlan

```
vlan {
  accounting-profile name;
  description  text;
  disable;
  (gratuitous-arp-reply | no-gratuitous-arp-reply);
  hold-time up milliseconds down milliseconds;
  mtu bytes;
  no-gratuitous-arp-request;
  traceoptions {
    flag flag;
  }
  (traps | no-traps);
  unit logical-unit-number {
    accounting-profile name;
    bandwidth rate;
    description text;
    disable;
    family family-name {...}
    proxy-arp (restricted | unrestricted);
    (traps | no-traps);
  }
}
```


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interfaces vme

```
vme {
    accounting-profile name;
    description text;
    disable;
    (gratuitous-arp-reply | no-gratuitous-arp-reply);
    hold-time up milliseconds down milliseconds;
    mtu bytes;
    no-gratuitous-arp-request;
    traceoptions {
        flag flag;
    }
    (traps | no-traps);
    unit logical-unit-number {
        accounting-profile name;
        bandwidth rate;
        description text;
        disable;
        family family-name {...}
        (traps | no-traps);
        vlan-id vlan-id-number;
    }
    vlan-tagging;
}
```

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interfaces xe

```
xe-fpc/pic/port {
    accounting-profile name;
    description text;
    disable;
    ether-options {
        802.3ad {
            aex;
            (backup | primary);
            lacp {
                force-up;
            }
        }
        (flow-control | no-flow-control);
        link-mode mode;
        (loopback | no-loopback);
    }
    (gratuitous-arp-reply | no-gratuitous-arp-reply);
    hold-time up milliseconds down milliseconds;
    mtu bytes;
    no-gratuitous-arp-request;
    traceoptions {
        flag flag;
    }
    (traps | no-traps);
    unit logical-unit-number {
        accounting-profile name;
        bandwidth rate;
        description text;
        disable;
        family family-name {...}
        proxy-arp (restricted | unrestricted);
        (traps | no-traps);
        vlan-id vlan-id-number;
    }
    vlan-tagging;
}
```

Hierarchy Level [edit]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure interfaces on EX Series switches.

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Options See Table 10 on page 131 for the interface types and protocol-family options supported on the switch. Different protocol families support different subsets of the interface types on the switch. See the family statement for syntax of the protocol families supported for switch interfaces.

Not all interface types support all **family** substatements. Check your switch CLI for supported substatements for a particular protocol family configuration.

Table 10: Interface Types and Their Supported Protocol Families

Interface Type	Description	Supported Protocol Families					
		ccc	ethernet-switching	inet	inet6	iso	mpls
ae	Aggregated Ethernet interface (also referred to as a link aggregation group [LAG])	✓*	✓	✓	✓	✓	✓
ge	Gigabit Ethernet interface	✓	✓	✓	✓	✓	✓
interface-range	Interface-range configuration	Supported protocol families are the ones supported by the interface types that compose the range.					
lo0	Loopback interface			✓	✓	✓	✓
me0	Management Ethernet interface		✓	✓	✓	✓	✓
vlan	Routed VLAN interface (RVI)			✓	✓	✓	
vme	Virtual management Ethernet interface			✓	✓	✓	✓
xe	10-Gigabit Ethernet interface	✓	✓	✓	✓	✓	✓
		*Supported on EX8200 switches only					

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

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Related Documentation

- *Configuring Gigabit Ethernet Interfaces (CLI Procedure)*
- *Configuring Aggregated Ethernet Links (CLI Procedure)*
- *Configuring a Layer 3 Subinterface (CLI Procedure)*
- *Configuring Routed VLAN Interfaces (CLI Procedure)*
- *Configuring the Virtual Management Ethernet Interface for Global Management of an EX Series Virtual Chassis (CLI Procedure)*
- *EX Series Switches Interfaces Overview*
- *Junos OS Interfaces Fundamentals Configuration Guide*
- *Junos OS Ethernet Interfaces Configuration Guide*

ip-address-first

Syntax ip-address-first;

Hierarchy Level [edit logical-systems *logical-system-name* system services dhcp-local-server pool-match-order],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server pool-match-order],
[edit routing-instances *routing-instance-name* system services dhcp-local-server pool-match-order],
[edit system services dhcp-local-server pool-match-order]

Release Information Statement introduced in Junos OS Release 9.0.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description Configure the extended DHCP local server to use the IP address method to determine which address-assignment pool to use. The local server uses the IP address in the gateway IP address if one is present in the DHCP client PDU. If no gateway IP address is present, the local server uses the IP address of the receiving interface to find the address-assignment pool. The DHCP local server uses this method by default when no method is explicitly specified.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring How the Extended DHCP Local Server Determines Which Address-Assignment Pool to Use*
- *Extended DHCP Local Server Overview*
- *Address-Assignment Pools Overview*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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layer2-unicast-replies

Syntax layer2-unicast-replies;

Hierarchy Level [edit forwarding-options dhcp-relay overrides],
[edit forwarding-options dhcp-relay group *group-name* overrides],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay overrides],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay group *group-name* overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* overrides],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay overrides],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* overrides],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* interface *interface-name* overrides]

Release Information Statement introduced in Junos OS Release 8.3.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description Override the setting of the broadcast bit in DHCP request packets and instead use the Layer 2 unicast transmission method to transmit DHCP Offer reply packets and DHCP ACK reply packets from the DHCP server to DHCP clients during the discovery process.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Extended DHCP Relay Agent Overview*
- *dhcp-relay*

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ldap-url

Syntax <ldap-url *url-name*>;

Hierarchy Level [edit security certificates certification-authority *ca-profile-name*]

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 the OCX Series,

Description (Encryption interface on M Series and T Series routers and EX Series switches only) (Optional) Specify the Lightweight Directory Access Protocol (LDAP) URL for digital certificates.

Options ***url-name***—Name of the LDAP URL.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- *Configuring Digital Certificates for an ES PIC*

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lease-time

Syntax lease-time (*seconds* | infinte);

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number* family inet dhcp]

Release Information Statement introduced in Junos OS Release 8.5 for J Series devices.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 9.2 for SRX Series devices.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Request a specific lease time for the IP address. The lease time is the length of time in seconds that a client holds the lease for an IP address assigned by a DHCP server.

Default If no lease time is requested by client, then the server sends the lease time. The default lease time on a JUNOS OS DHCP server is one day.

Options ***seconds*** —Request a lease time of a specific duration.
Range: 60 through 2147483647 seconds

infinite—Request that the lease never expire.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 31
- *Example: Configuring the Device as a DHCP Client*
- interfaces on page 125
- *unit*
- family on page 104

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load-key-file

Syntax load-key-file *URL filename*;

Hierarchy Level [edit system root-authentication],
[edit system login user *username* authentication]

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 the OCX Series.

Description

NOTE: ECDSA is not supported on the QFabric system.

Load RSA (SSH version 1 and SSH version 2) and DSA or ECDSA (SSH version 2) public keys from a previously-generated named file at a specified URL location or local path. The file contains one or more SSH keys that are copied into the configuration when the command is issued.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Root Password*
- *Configuring the Root Password*
- *Configuring Junos OS User Accounts*
- *Configuring Junos OS User Accounts*

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local

Syntax

```
local certificate-name {
    certificate-key-string;
    load-key-file URL filename;
}
```

Hierarchy Level [edit security certificates]

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 the OCX Series.

Description Import a paired X.509 private key and authentication certificate, to enable Junos XML protocol client applications to establish Secure Sockets Layer (SSL) connections to the router or switch.

NOTE: For FIPS mode, the digital security certificates must be compliant with the National Institute of Standards and Technology (NIST) SP 800-131A standard.

Options

certificate-namecertificate-key-string—String of alphanumeric characters that constitute the private key and certificate.

certificate-name—Name that uniquely identifies the certificate.

load-key-file *URL filename*—File that contains the private key and certificate. It can be one of two types of values:

- Pathname of a file on the local disk (assuming you have already used another method to copy the certificate file to the router's or switch's local disk)
- URL to the certificate file location (for instance, on the computer where the Junos XML protocol client application runs)

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Importing SSL Certificates for Junos XML Protocol Support*

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local-certificate

Syntax local-certificate;

Hierarchy Level [edit system services service-deployment],
[edit system services web-management https],
[edit system services xnm-ssl]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Import or reference an SSL certificate.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- *Configuring clear-text or SSL Service for Junos XML Protocol Client Applications*
- *Generating SSL Certificates to Be Used for Secure Web Access*
- *Importing SSL Certificates for Junos XML Protocol Support*

maximum-certificates

Syntax maximum-certificates *number*;

Hierarchy Level [edit security certificates]

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 the OCX Series.

Description (Encryption interface on M Series and T Series routers and EX Series switches only) Configure the maximum number of peer digital certificates to be cached.

Options ***number***—Maximum number of peer digital certificates to be cached.

Range: 64 through 4,294,967,295 peer certificates

Default: 1024 peer certificates

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring Digital Certificates for an ES PIC*

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maximum-hop-count

Syntax maximum-hop-count *number*;

Hierarchy Level [edit forwarding-options helpers bootp],
[edit forwarding-options helpers bootpinterface (*interface-name* | *interface-group*)]

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 11.3 for QFX Series switches.

Description Specify the maximum number of hops allowed.

Options ***number***—Maximum number of hops.
Default: 4 hops

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Configuring Routers, Switches, and Interfaces as DHCP and BOOTP Relay Agents*

maximum-lease-time (DHCP)

Syntax maximum-lease-time *seconds*;

Hierarchy Level [edit system services dhcp],

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description For J Series Services Routers and EX Series switches only. Specify the maximum length of time in seconds for which a client can request and hold a lease on a DHCP server.

An exception is that the dynamic BOOTP lease length can exceed the maximum lease length specified.

Options ***seconds***—The maximum number of seconds the lease can be held.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration

Related Documentation
- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*
- default-lease-time on page 78

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minimum-wait-time

Syntax minimum-wait-time *seconds*;

Hierarchy Level [edit forwarding-options helpers bootp],
[edit forwarding-options helpers bootp interface (*interface-name* | *interface-group*)]

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 11.3 for QFX Series switches.

Description When the router is configured to act as a BOOTP server, the value set here defines how long the router should wait before forwarding requests.

Options **Range:** 0 to 30,000 seconds.
Default: 0 seconds

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Configuring Routers, Switches, and Interfaces as DHCP and BOOTP Relay Agents*

name-server

Syntax
```
name-server {
  address;
}
```

Hierarchy Level [edit system],
[edit system services dhcp],
[edit system services dhcp],
[edit system services dhcp pool],
[edit system services dhcp static-binding]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure one or more Domain Name System (DNS) name servers.

Options ***address***—Address of the name server. To configure multiple name servers, include a maximum of three ***address*** options.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- *Reaching a Domain Name System Server*
- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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no-listen

Syntax no-listen;

Hierarchy Level [edit forwarding-options helpers bootp interface (*interface-name* | *interface-group*)],
[edit forwarding-options helpers domain interface *interface-name*],
[edit forwarding-options helpers tftp interface *interface-name*]

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 11.3 for QFX Series switches.

Description Disable recognition of DNS requests or stop packets from being forwarded on a logical interface, a group of logical interfaces, a router, or a switch.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring DNS and TFTP Packet Forwarding*
- *Configuring Routers, Switches, and Interfaces as DHCP and BOOTP Relay Agents*

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no-redirects (IPv4 Traffic)

Syntax no-redirects;

Hierarchy Level [edit system],
[edit interfaces *interface-name* unit *logical-unit-number* family *family*]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 12.3 for EX Series switches.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Stop protocol redirect messages for IPv4 traffic from being sent on the entire switch or on an interface on the router or switch.

To disable the sending of protocol redirect messages for the entire router or switch, include the **no-redirects** statement at the **[edit system]** hierarchy level.

To disable the sending of protocol redirect messages on a specific interface, include the **no-redirects** statement at the **[edit interfaces *interface-name* unit *logical-unit-number* family *family*]** hierarchy level.

Default The router or switch sends redirect messages.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring Junos OS to Disable Protocol Redirect Messages on the Router or Switch*
- Understanding the Protocol Redirect Mechanism on EX Series Switches on page 19
- Configuring Junos OS to Disable Sending Protocol Redirect Messages on EX Series Switches (CLI Procedure) on page 38
- *Junos OS Network Interfaces Library for Routing Devices*

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no-redirects-ipv6

Syntax no-redirects-ipv6;

Hierarchy Level [edit system],
[edit interfaces *interface-name* unit *logical-unit-number* family *family*]

Release Information Statement introduced in Junos OS Release 12.3 for EX Series switches.

Description Stop protocol redirect messages for IPv6 traffic from being sent on the entire switch or on an interface on the switch.

To disable the sending of protocol redirect messages for the entire switch, include the **no-redirects-ipv6** statement at the **[edit system]** hierarchy level.

To disable the sending of protocol redirect messages on a specific interface, include the **no-redirects-ipv6** statement at the **[edit interfaces *interface-name* unit *logical-unit-number* family *family*]** hierarchy level.

Default The switch sends redirect messages.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Understanding the Protocol Redirect Mechanism on EX Series Switches on page 19
- Configuring Junos OS to Disable Sending Protocol Redirect Messages on EX Series Switches (CLI Procedure) on page 38

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option-number (DHCP Relay Agent Option)

Syntax option-number *option-number*;

Hierarchy Level
[edit forwarding-options dhcp-relay relay-option],
[edit forwarding-options dhcp-relay dhcpv6 relay-option],
[edit forwarding-options dhcp-relay group *group-name* relay-option],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name* relay-option],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay ...],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay ...],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay ...]

Release Information Statement introduced in Junos OS Release 12.3.
Statement introduced in Junos OS Release 12.3 for EX Series switches.

Description Specify the DHCP option DHCP relay agent uses for selective processing of client traffic. You can configure support globally or for a named group of interfaces. You can also configure support for the extended DHCP relay agent on a per logical system and per routing instance basis.

Use the **[edit forwarding-options dhcp-relay dhcpv6]** hierarchy level to configure the DHCPv6 relay agent support.

Options ***option-number***—The DHCP or DHCPv6 option in the incoming traffic.

NOTE: **EX Series switches do not support the User Class Options.**

- 15 (DHCPv6 only)—Use DHCPv6 option 15 (User Class Option) in packets
- 16 (DHCPv6 only)—(MX Series routers and EX Series switches only) Use DHCPv6 option 16 (Vendor Class Option) in packets
- 60 (DHCPv4 only)—(MX Series routers and EX Series switches only) Use DHCP option 60 (Vendor Class Identifier) in DHCP packets
- 77 (DHCPv4 only)—Use DHCP option 77 (User Class Identifier) in packets

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Using DHCP Option Information to Selectively Process DHCP Client Traffic*
- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35

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outbound-ssh

Syntax

```
[edit system services]
outbound-ssh {
  client client-id {
    address {
      port port-number;
      retry number;
      timeout seconds;
    }
    device-id device-id;
    keep-alive {
      retry number;
      timeout seconds;
    }
    reconnect-strategy (in-order | sticky);
    secret password;
    services netconf;
  }
  traceoptions {
    file filename <files number> <match regex> <size size> <world-readable |
      no-world-readable>;
    flag flag;
    no-remote-trace;
  }
}
```

Hierarchy Level [edit system services]

Release Information Statement introduced in Junos OS Release 8.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure a router or switch running the Junos OS behind a firewall to communicate with client management applications on the other side of the firewall.

Default To configure transmission of the router's or switch's device ID to the application, include the **device-id** statement at the **[edit system services]** hierarchy level.

Options

client-id—Identifies the **outbound-ssh** configuration stanza on the router or switch. Each **outbound-ssh** stanza represents a single outbound SSH connection. This attribute is not sent to the client.

device-id—Identifies the router or switch to the client during the initiation sequence.

keep-alive—(Optional) When configured, specifies that the router or switch send keepalive messages to the management server. To configure the keepalive message, you must set both the **timeout** and **retry** attributes.

reconnect-strategy—(Optional) Specify the method the router or switch uses to reestablish a disconnected outbound SSH connection. Two methods are available:

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- **in-order**—Specify that the router or switch first attempt to establish an outbound SSH session based on the management server address list. The router or switch attempts to establish a session with the first server on the list. If this connection is not available, the router or switch attempts to establish a session with the next server, and so on down the list until a connection is established.
- **sticky**—Specify that the router or switch first attempt to reconnect to the management server that it was last connected to. If the connection is unavailable, it attempts to establish a connection with the next client on the list and so forth until a connection is made.

retry—Number of keepalive messages the router or switch sends without receiving a response from the client before the current SSH connection is disconnected. The default is three messages.

secret—(Optional) Router's or switch's public SSH host key. If added to the **outbound-ssh** statement, during the initialization of the outbound SSH service, the router or switch passes its public key to the management server. This is the recommended method of maintaining a current copy of the router's or switch's public key.

timeout—Length of time that the Junos server waits for data before sending a keep alive signal. The default is 15 seconds.

When reconnecting to a client, the router or switch attempts to reconnect to the client based on the **retry** and **timeout** values for each client listed.

address—Hostname or the IPv4 address of the NSM application server. You can list multiple clients by adding each client's IP address or hostname along with the following connection parameters:

- **port**—Outbound SSH port for the client. The default is port 22.
- **retry**—Number of times the router or switch attempts to establish an outbound SSH connection before giving up. The default is three tries.
- **timeout**—Length of time that the router or switch attempts to establish an outbound SSH connection before giving up. The default is fifteen seconds.

filename—(Optional) By default, the filename of the log file used to record the trace options is the name of the traced process (for example, **mib2d** or **snmpd**). Use this option to override the default value.

files—(Optional) Maximum number of trace files generated. By default, the maximum number of trace files is 10. Use this option to override the default value.

When a trace file reaches its maximum size, the system archives the file and starts a new file. The system archives trace files by appending a number to the filename in sequential order from 1 to the maximum value (specified by the default value or the options value set here). Once the maximum value is reached, the numbering sequence is restarted at 1, overwriting the older file.

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size—(Optional) Maximum size of the trace file in kilobytes (KB). Once the maximum file size is reached, the system archives the file. The default value is 1000 KB. Use this option to override the default value.

match—(Optional) When used, the system only adds lines to the trace file that match the regular expression specified. For example, if the match value is set to **=error**, the system only records lines to the trace file that include the string **error**.

services—Services available for the session. Currently, NETCONF is the only service available.

world-readable | no-world-readable—(Optional) Whether the files are accessible by the originator of the trace operation only or by any user. By default, log files are only accessible by the user that started the trace operation (**no-world-readable**).

all | configuration | connectivity—(Optional) Type of tracing operation to perform.

all—Log all events.

configuration—Log all events pertaining to the configuration of the router or switch.

connectivity—Log all events pertaining to the establishment of a connection between the client server and the router or switch.

no-remote-trace—(Optional) Disable remote tracing.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring Outbound SSH Service*
- *System Management Configuration Statements*

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overrides (DHCP Local Server)

Syntax

```
overrides {
    allow-no-end-option;
    client-discover-match (option60-and-option82 | incoming-interface);
    delegated-pool;
    interface-client-limit number;
    multi-address-embedded-option-response;
    process-inform {
        pool pool-name;
    }
    rapid-commit;
}
```

Hierarchy Level

[edit system services dhcp-local-server],
[edit system services dhcp-local-server dhcpv6],
[edit system services dhcp-local-server dhcpv6 group *group-name*],
[edit system services dhcp-local-server dhcpv6 group *group-name* interface *interface-name*],
[edit system services dhcp-local-server group *group-name*],
[edit system services dhcp-local-server group *group-name* interface *interface-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server ...],
[edit logical-systems *logical-system-name* system services dhcp-local-server ...],
[edit routing-instances *routing-instance-name* system services dhcp-local-server ...]

Release Information

Statement introduced in Junos OS Release 9.2.
Statement introduced in Junos OS Release 12.1 for EX Series switches.
Support for the **allow-no-end-option** option introduced in Junos OS Release 14.1X53-D15 for EX Series switches.

Description

Override the default configuration settings for the extended DHCP local server. Specifying the **overrides** statement with no subordinate statements removes all DHCP local server overrides at that hierarchy level.

- To override global DHCP local server configuration options, include the **overrides** statement and its subordinate statements at the **[edit system services dhcp-local-server]** hierarchy level.
- To override configuration options for a named group of interfaces, include the statements at the **[edit system services dhcp-local-server group *group-name*]** hierarchy level.
- To override configuration options for a specific interface within a named group of interfaces, include the statements at the **[edit system services dhcp-local-server group *group-name* interface *interface-name*]** hierarchy level.
- Use the **[edit system services dhcp-local-server dhcpv6]** hierarchy level to override DHCPv6 configuration options.

The remaining statements are explained separately.

The **interface-client-limit** statement is not supported in the **[edit system services dhcp-local-server dhcpv6]** hierarchy level.

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The **delegated-pool**, **multi-address-embedded-option-response**, and the **rapid-commit** statements are supported in the **[edit system services dhcp-local-server dhcpv6 ...]** hierarchy level only.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Extended DHCP Local Server Overview*
- *Overriding Default DHCP Local Server Configuration Settings*
- *Deleting DHCP Local Server and DHCP Relay Override Settings*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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overrides (DHCP Relay Agent)

Syntax

```
overrides {
  allow-snooped-clients;
  allow-no-end-options;
  always-write-giaddr;
  always-write-option-82;
  client-discover-match (option60-and-option82 | incoming-interface);
  delay-authentication;
  delete-binding-on-renegotiation;
  disable-relay;
  interface-client-limit number;
  layer2-unicast-replies;
  no-allow-snooped-clients;
  no-bind-on-request;
  proxy-mode;
  replace-ip-source-with;
  send-release-on-delete;
  trust-option-82;
}
```

Hierarchy Level

[edit forwarding-options dhcp-relay],
[edit forwarding-options dhcp-relay dhcpv6],
[edit forwarding-options dhcp-relay group *group-name*],
[edit forwarding-options dhcp-relay group *group-name* interface *interface-name*],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name*],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name* interface *interface-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay ...],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay ...],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay ...]

Release Information

Statement introduced in Junos OS Release 8.3.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1 for EX Series switches.
Support for the **delete-binding-on-renegotiation** statement introduced in Junos OS Release 13.2 for EX Series switches.
Support for the **allow-no-end-options** statement introduced in Junos OS Release 14.1X53 for EX Series switches.

Description

Override the default configuration settings for the extended DHCP relay agent. Specifying the **overrides** statement with no subordinate statements removes all DHCP relay agent overrides at that hierarchy level. Use the statement at the **[edit ... dhcpv6]** hierarchy levels to configure DHCPv6 support.

M120 and M320 routers do not support DHCPv6.

The following statements are supported at both the **[edit ... dhcp-relay]** and **[edit ... dhcpv6]** hierarchy levels. All other statements are supported at the **dhcp-relay** hierarchy levels only.

- **allow-snooped-clients**

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- **interface-client-limit**
- **no-allow-snooped-clients**
- **no-bind-on-request**
- **send-release-on-delete**

The remaining statements are explained separately.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Extended DHCP Relay Agent Overview*
- *Overriding the Default DHCP Relay Configuration Settings*
- *Deleting DHCP Local Server and DHCP Relay Override Settings*
- *dhcp-relay*

path-length

Syntax
path-length *certificate-path-length*;

Hierarchy Level
[edit security certificates]

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 the OCX Series.

Description
(Encryption interface on M Series and T Series routers and EX Series switches only) Configure the digital certificate path length.

Options
certificate-path-length—Digital certificate path length.
Range: 2 through 15 certificates
Default: 15 certificates

Required Privilege Level
admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation
- *Configuring Digital Certificates for an ES PIC*

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pool (System)

Syntax

```
pool address/prefix-length {
  address-range {
    low address;
    high address;
  }
  exclude-address {
    address;
  }
}
```

Hierarchy Level [edit system services dhcp],

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description For J Series Services Routers and EX Series switches only. Configure a pool of IP addresses for DHCP clients on a subnet. When a client joins the network, the DHCP server dynamically allocates an IP address from this pool.

Options

address-range—Lowest and highest IP addresses in the pool that are available for dynamic address assignment. If no range is specified, the pool will use all available addresses within the subnet specified. (Broadcast addresses, interface addresses, and excluded addresses are not available.)

exclude-address—Addresses within the range that are not used for dynamic address assignment. You can exclude one or more addresses within the range.

The remaining statements are explained separately.

Required Privilege Level
system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*

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pool (Address-Assignment Pools)

Syntax

```
pool pool-name {
  family family {
    dhcp-attributes {
      [ protocol-specific attributes ]
    }
    host hostname {
      hardware-address mac-address;
      ip-address ip-address;
    }
    network ip-prefix/<prefix-length>;
    prefix ipv6-prefix;
    range range-name {
      high upper-limit;
      low lower-limit;
      prefix-length prefix-length;
    }
  }
  link pool-name;
}
```

Hierarchy Level [edit access address-assignment]

Release Information Statement introduced in Junos OS Release 9.0.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description Configure the name of an address-assignment pool.

NOTE: Subordinate statement support depends on the platform. See individual statement topics for more detailed support information.

Options ***pool-name***—Name assigned to the address-assignment pool.

The remaining statements are explained separately.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- *Address-Assignment Pools Overview*
- *Configuring Address-Assignment Pools*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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pool-match-order

Syntax

```
pool-match-order {
    external-authority;
    ip-address-first;
    option-82;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server],
[edit logical-systems *logical-system-name* system services dhcp-local-server],
[edit routing-instances *routing-instance-name* system services dhcp-local-server],
[edit system services dhcp-local-server]

Release Information

Statement introduced in Junos OS Release 9.0.
Statement introduced in Junos OS Release 12.1.

Description

Configure the order in which the DHCP local server uses information in the DHCP client PDU to determine how to obtain an address for the client.

The remaining statements are explained separately.

Default

DHCP local server uses the **ip-address-first** method to determine which address pool to use.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring How the Extended DHCP Local Server Determines Which Address-Assignment Pool to Use*
- *Extended DHCP Local Server Overview*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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port (HTTP/HTTPS)

Syntax port *port-number*;

Hierarchy Level [edit system services web-management]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure the port on which the HTTP or HTTPS service is connected.

Options ***port-number***—The TCP port number on which the specified service listens.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring Management Access for the EX Series Switch (J-Web Procedure)*
- *J-Web Interface User Guide*
- http on page 117
- https on page 118
- web-management on page 198

port (SRC Server)

Syntax port *port-number*;

Hierarchy Level [edit system services service-deployment servers *server-address*]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure the port number on which to contact the SRC server.

Options ***port-number***—(Optional) The TCP port number for the SRC server.
Default: 3333

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Junos OS to Work with SRC Software*

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prefix (Address-Assignment Pools)

Syntax prefix *ipv6-prefix*;

Hierarchy Level [edit access address-assignment pool *pool-name* family inet6]

Release Information Statement introduced in Junos OS Release 10.0.
Statement introduced in Junos OS Release 12.3 for EX Series switches.

Description Specify the IPv6 prefix for the IPv6 address-assignment pool. This statement is mandatory for IPv6 address-assignment pools.

Options ***ipv6-prefix***—The IPv6 prefix.

Required Privilege Level admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- *Address-Assignment Pools Overview*
- *Configuring Address-Assignment Pools*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32
- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35

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prefix (DHCP Relay Agent)

Syntax

prefix *prefix*;

Hierarchy Level

[edit forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id | relay-agent-remote-id)],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name* (relay-agent-interface-id | relay-agent-remote-id)],
[edit forwarding-options dhcp-relay relay-option-82 (circuit-id | remote-id)],
[edit forwarding-options dhcp-relay group *group-name* relay-option-82 (circuit-id | remote-id)],
[edit logical-systems *logical-system-name* ... forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id | relay-agent-remote-id)],
[edit logical-systems *logical-system-name* ... forwarding-options dhcp-relay ... relay-option-82 (circuit-id | remote-id)],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id | relay-agent-remote-id)],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay ... relay-option-82 (circuit-id | remote-id)]

Release Information

Statement introduced in Junos OS Release 8.3.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.3 for EX Series switches.
Support at the **[edit ... relay-agent-remote-id]** and **[edit ... remote-id]** hierarchy levels introduced in Junos OS Release 14.1.

Description

Add a prefix to the DHCP base option 82 Agent Circuit ID (suboption 1) or Agent Remote ID (suboption 2) information, or to the DHCPv6 option 18 (Relay Agent Interface-ID) or option 37 (Relay Agent Remote-ID) information in DHCP packets that DHCP relay agent sends to a DHCP server. The prefix can consist of any combination of the hostname, logical system name, and routing instance name.

Options

prefix—Any of the following:

- **host-name**—Prepend the hostname of the router configured with the **host-name** statement at the **[edit system]** hierarchy level to the DHCP option information.
- **logical-system-name**—Prepend the name of the logical system to the option information.
- **routing-instance-name**—Prepend the name of the routing instance to the option information.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Including a Prefix in DHCP Options*
- *Using DHCP Relay Agent Option 82 Information*
- *Configuring DHCPv6 Relay Agent Options*

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process-inform

Syntax

```
process-inform {
    pool pool-name;
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 group *group-name* overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 group *group-name* interface *interface-name* overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server group *group-name* overrides],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server group *group-name* interface *interface-name* overrides],
[edit logical-systems *logical-system-name* system services dhcp-local-server overrides],
[edit logical-systems *logical-system-name* system services dhcp-local-server dhcpv6 overrides],
[edit logical-systems *logical-system-name* system services dhcp-local-server dhcpv6 group *group-name* overrides],
[edit logical-systems *logical-system-name* system services dhcp-local-server dhcpv6 group *group-name* interface *interface-name* overrides],
[edit logical-systems *logical-system-name* system services dhcp-local-server group *group-name* overrides],
[edit logical-systems *logical-system-name* system services dhcp-local-server group *group-name* interface *interface-name* overrides],
[edit routing-instances *routing-instance-name* system services dhcp-local-server overrides],
[edit routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 overrides],
[edit routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 group *group-name* overrides],
[edit routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 group *group-name* interface *interface-name* overrides],
[edit routing-instances *routing-instance-name* system services dhcp-local-server group *group-name* overrides],
[edit routing-instances *routing-instance-name* system services dhcp-local-server group *group-name* interface *interface-name* overrides],
[edit system services dhcp-local-server overrides],
[edit system services dhcp-local-server dhcpv6 overrides],
[edit system services dhcp-local-server dhcpv6 group *group-name* overrides],
[edit system services dhcp-local-server dhcpv6 group *group-name* interface *interface-name* overrides],
[edit system services dhcp-local-server group *group-name* overrides],
[edit system services dhcp-local-server group *group-name* interface *interface-name* overrides]

Release Information

Statement introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description

Enable the processing of DHCP information request messages (DHCPINFORM for DHCPv4 and INFORMATION-REQUEST for DHCPv6) sent from the client to request DHCP options. For DHCP local servers, the messages are also passed to the configured server list.

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The remaining statement is explained separately.

Default Information request messages are not processed.

Required Privilege Level
system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- *Enabling Processing of Client Information Requests*
- *Overriding Default DHCP Local Server Configuration Settings*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

protocol-version

Syntax protocol-version *version*;

Hierarchy Level [edit system services ssh]

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 the OCX Series.

Description Specify the secure shell (SSH) protocol version.

Default **v2**—SSH protocol version 2 is the default, introduced in Junos OS Release 11.4.

Options ***version***—SSH protocol version: **v1**, **v2**, or both.

Required Privilege Level
admin—To view this statement in the configuration.
admin-control—To add this statement to the configuration.

Related Documentation
- *Configuring SSH Service for Remote Access to the Router or Switch*

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rate-limit

Syntax rate-limit *limit*;

Hierarchy Level [edit system services finger],
[edit system services ftp],
[edit system services netconf ssh],
[edit system services ssh],
[edit system services telnet],
[edit system services xnm-clear-text],
[edit system services xnm-ssl]

Release Information Statement introduced 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 the OCX Series.

Description Configure the maximum number of connections attempts per protocol (either IPv6 or IPv4) on an access service.

Default 150 connections

Options **rate-limit *limit***—(Optional) Maximum number of connection attempts allowed per minute, per IP protocol (either IPv4 or IPv6).

Range: 1 through 250

Default: 150

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring clear-text or SSL Service for Junos XML Protocol Client Applications*

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reconfigure (DHCP Local Server)

Syntax

```
reconfigure {
    attempts attempt-count;
    clear-on-abort;
    strict;
    timeout timeout-value;
    token token-value;
    trigger {
        radius-disconnect;
    }
}
```

Hierarchy Level

[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server group *group-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 group *group-name*],
[edit logical-systems *logical-system-name* system services dhcp-local-server],
[edit logical-systems *logical-system-name* system services dhcp-local-server dhcpv6],
[edit logical-systems *logical-system-name* system services dhcp-local-server group *group-name*],
[edit logical-systems *logical-system-name* system services dhcp-local-server dhcpv6 group *group-name*],
[edit routing-instances *routing-instance-name* system services dhcp-local-server],
[edit routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6],
[edit routing-instances *routing-instance-name* system services dhcp-local-server group *group-name*],
[edit routing-instances *routing-instance-name* system services dhcp-local-server dhcpv6 group *group-name*],
[edit system services dhcp-local-server],
[edit system services dhcp-local-server dhcpv6],
[edit system services dhcp-local-server group *group-name*],
[edit system services dhcp-local-server dhcpv6 group *group-name*]

Release Information

Statement introduced in Junos OS Release 10.0.
Support at the **[edit ... dhcpv6 ...]** hierarchy levels introduced in Junos OS Release 10.4.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description

Enable dynamic reconfiguration triggered by the DHCP local server of all DHCP clients or only the DHCP clients serviced by the specified group of interfaces. A group configuration takes precedence over a DHCP local server configuration. The **strict** statement is available only for DHCPv6.

The remaining statements are explained separately.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

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Related Documentation

- *Configuring Dynamic Client Reconfiguration of Extended Local Server Clients*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

relay-agent-interface-id (DHCPv6 Relay Agent)

Syntax

```
relay-agent-interface-id {
  prefix prefix;
  use-interface-description (logical | device);
  use-option-82;
}
```

Hierarchy Level

[edit forwarding-options dhcp-relay dhcpv6],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay dhcpv6 ...],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 ...],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 ...]

Release Information

Statement introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.3 for EX Series switches.

Description

Insert the DHCPv6 Relay Agent Interface-ID option (option 18) in DHCPv6 packets destined for the DHCPv6 server.

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *dhcp-relay*
- *Extended DHCP Relay Agent Overview*
- *DHCPv6 Relay Agent Overview*
- *Inserting DHCPv6 Interface-ID Option (Option 18) In DHCPv6 Packets*

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relay-option (DHCP Relay Agent)

Syntax

```
relay-option {
  option-number option-number;
  default-action {
    drop;
    forward-only;
    local-server-group local-server-group;
    relay-server-group relay-server-group;
  }
  equals (ascii ascii-string | hexadecimal hexadecimal-string) {
    drop;
    forward-only;
    local-server-group local-server-group;
    relay-server-group relay-server-group;
  }
  starts-with (ascii ascii-string | hexadecimal hexadecimal-string) {
    drop;
    forward-only;
    local-server-group local-server-group;
    relay-server-group relay-server-group;
  }
}
```

Hierarchy Level

[edit forwarding-options dhcp-relay],
[edit forwarding-options dhcp-relay dhcpv6],
[edit forwarding-options dhcp-relay group *group-name*],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay ...],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay ...],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay ...]

Release Information

Statement introduced in Junos OS Release 12.3.
Statement introduced in Junos OS Release 12.3 for EX Series switches.

Description

Configure the extended DHCP relay agent selective processing that is based on DHCP options in DHCP client packets and specify the action to perform on client traffic. You can configure support globally or for a named group of interfaces, and for either DHCP or DHCPv6 relay agent.

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Using DHCP Option Information to Selectively Process DHCP Client Traffic*

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relay-option-60

Syntax

```
relay-option-60 {
  vendor-option {
    default-local-server-group local-server-group-name |
    default-relay-server-group server-group-name
    drop;
    equals
    starts-with
  }
}
```

Hierarchy Level [edit forwarding-options]

Release Information Statement introduced before Junos OS Release 12.1 for EX Series switches.
Statement deprecated in Junos OS Release 12.3 for EX Series switches.

Description Configure the extended DHCP relay agent to use the DHCP vendor class identifier option (option 60) in DHCP client packets to forward client traffic to specific DHCP servers, or to drop selected DHCP client packets. This feature is useful in network environments where DHCP clients access services provided by multiple vendors and DHCP servers.

NOTE: The relay-option-60 statement has been deprecated and might be removed from future product releases. We recommend that you phase out its use. See option-number.

Default Disabled. There is no default vendor.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35
- Understanding the Extended DHCP Relay Agent for EX Series Switches on page 12

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relay-option-82

Syntax

```
relay-option-82 {
  circuit-id {
    include-irb-and-l2;
    no-vlan-interface-name;
    prefix prefix;
    use-interface-description (logical | device);
    use-vlan-id;
  }
  remote-id {
    include-irb-and-l2;
    no-vlan-interface-name;
    prefix prefix;
    use-interface-description (logical | device);
    use-vlan-id;
  }
}
```

Hierarchy Level

[edit forwarding-options dhcp-relay],
[edit forwarding-options dhcp-relay group *group-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay group *group-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name*],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name*]

Release Information

Statement introduced in Junos OS Release 8.3.
Statement introduced in Junos OS Release 12.3 for EX Series switches.

Description

Enable or disable the insertion of the DHCP relay agent information option (option 82) in DHCP packets destined for a DHCP server.

When you configure **relay-option-82** without configuring the **circuit-id** or **remote-id** option, the Agent Circuit ID is added by default.

You can use the **relay-option-82** statement and its subordinate statements at the **[edit forwarding-options dhcp-relay]** hierarchy level to control insertion of option 82 information globally, or at the **[edit forwarding-options dhcp-relay** group ***group-name*****]** hierarchy level to control insertion of option 82 information for a named group of interfaces.

To restore the default behavior (option 82 information is not inserted into DHCP packets), use the **delete relay-option-82** statement.

The remaining statements are explained separately.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

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Related Documentation

- *Using DHCP Relay Agent Option 82 Information*
- *dhcp-relay*

retransmission-attempt

Syntax retransmission-attempt *number*;

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number* family inet dhcp]

Release Information Statement introduced in Junos OS Release 8.5 for J Series devices.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 9.2 for SRX Series devices.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the number of times the device retransmits a Dynamic Host Control Protocol (DHCP) packet if a DHCP server fails to respond. After the specified number of attempts, no further attempts at reaching a server are made.

Options ***number***—Number of retransmit attempts..

Range: 0 through 6

Default: 4

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 31
- *Example: Configuring the Device as a DHCP Client*
- interfaces on page 125
- *unit*
- family on page 104

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retransmission-interval

Syntax retransmission-interval *seconds*;

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number* family inet dhcp]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the time between successive retransmissions of the client DHCP request if a DHCP server fails to respond.

Options ***seconds***—Number of seconds between successive retransmissions.

Range: 4 through 64 seconds

Default: 4 seconds

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 31

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route-suppression (DHCP Local Server and Relay Agent)

Syntax route-suppression (access | access-internal | destination);

Hierarchy Level [edit forwarding-options dhcp-relay],
[edit forwarding-options dhcp-relay dhcpv6],
[edit forwarding-options dhcp-relay group *group-name*],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name*],
[edit logical-systems *logical-system-name* ...],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name*...],
[edit routing-instances *routing-instance-name* ...],
[edit system services dhcp-local-server],
[edit system services dhcp-local-server dhcpv6],
[edit system services dhcp-local-server group *group-name*],
[edit system services dhcp-local-server dhcpv6 group *group-name*]

Release Information Statement introduced in Junos OS Release 13.2.

Description Configure the jdhcpd process to suppress the installation of access, access-internal, or destination routes during client binding.

NOTE: You cannot suppress access-internal routes when the subscriber is configured with both IA_NA and IA_PD addresses over IP demux interfaces—the IA_PD route relies on the IA_NA route for next hop connectivity.

Options

access—(DHCPv6 only) Suppress installation of access routes. You can use the **access** and **access-internal** options in the same statement for DHCPv6.

access-internal—In a DHCPv4 hierarchy, suppress installation of both access-internal and destination routes. In a DHCPv6 hierarchy, suppress access-internal routes only. Can be configured in the same statement with the **access** option.

destination—(DHCPv4 only) Suppress installation of destination routes. This option and the **access-internal** option are mutually exclusive; however, the **access-internal** option also suppresses destination routes.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Preventing DHCP from Installing Access, Access-Internal, and Destination Routes by Default on page 39

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server (DHCP and BOOTP Relay Agent)

Syntax

```
server address {
  logical-system logical-system-name <routing-instance [ <default>
    routing-instance-names ]>;
  routing-instance [ <default> routing-instance-names ];
}
```

Hierarchy Level

[edit forwarding-options helpers bootp],
[edit forwarding-options helpers bootp interface (*interface-name* | *interface-group*)]

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 11.3 for QFX Series switches.

Description

Configure the router or switch to act as a DHCP and BOOTP relay agent.

Options

- ***address***—One or more addresses of the server.
- **logical-system *logical-system-name***—(Optional) Logical system of the server.
- **routing-instance *routing-instance-names***—(Optional) Routing instance name that belong to the DHCP or BOOTP relay agent.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring Routers, Switches, and Interfaces as DHCP and BOOTP Relay Agents*

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server (DNS and TFTP Service)

Syntax server *address* <logical-system *logical-system-name*> <routing-instance *routing-instance-name*>;

Hierarchy Level [edit forwarding-options helpers domain],
[edit forwarding-options helpers domain interface *interface-name*],
[edit forwarding-options helpers tftp],
[edit forwarding-options helpers tftp interface *interface-name*]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Specify the DNS or TFTP server for forwarding DNS or TFTP requests. Only one server can be specified for each interface.

Options ***address***—Address of the server.

logical-system *logical-system-name*—(Optional) Logical system of the server.

routing-instance [*routing-instance-names*]—(Optional) Set the routing instance name or names that belong to the DNS server or TFTP server.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring DNS and TFTP Packet Forwarding*

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server-address

Syntax server-address *ip-address*;

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number* family inet dhcp]

Release Information Statement introduced in Junos OS Release 8.5 for J Series devices.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 9.2 for SRX Series devices.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Specify the address of the DHCP server that the client should accept DHCP offers from. If this option is included in the DHCP configuration, the client accepts offers only from this server and ignores all other offers.

Default The client accepts the first offer it receives from any DHCP server.

Options ***ip-address***—DHCP server address.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Configuring a DHCP Client (CLI Procedure) on page 31
- *Example: Configuring the Device as a DHCP Client*
- interfaces on page 125
- *unit*
- family on page 104

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server-group

Syntax

```
server-group {
    server-group-name {
        server-ip-address;
    }
}
```

Hierarchy Level

[edit forwarding-options dhcp-relay],
[edit forwarding-options dhcp-relay dhcpv6],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay dhcpv6],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6]

Release Information

Statement introduced in Junos OS Release 8.3.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description

Specify the name of a group of DHCP server addresses for use by the extended DHCP relay agent. Use the statement at the **[edit ... dhcpv6]** hierarchy levels to configure DHCPv6 support.

Options

server-group-name—Name of the group of DHCP or DHCPv6 server addresses.

server-ip-address—IP address of the DHCP server belonging to this named server group. Use IPv6 addresses when configuring DHCPv6 support. You can configure a maximum of five IP addresses in each named server group.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *dhcp-relay*
- *Extended DHCP Relay Agent Overview*
- *Configuring Server Groups*

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server-identifier

Syntax server-identifier *address*;

Hierarchy Level [edit system services dhcp],
[edit system services dhcp pool],
[edit system services dhcp static-binding]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description For J Series Services Routers and EX Series switches only. Configure a server identifier. The identifier can be used to identify a DHCP server in a DHCP message. It can also be used as a destination address from clients to servers (for example, when the boot file is set, but not the boot server).

Servers include the server identifier in **DHCPOFFER** messages so that clients can distinguish between multiple lease offers. Clients include the server identifier in **DHCPREQUEST** messages to select a lease and indicate which offer is accepted from multiple lease offers. Also, clients can use the server identifier to send unicast request messages to specific DHCP servers to renew a current lease.

This address must be a manually assigned, static IP address. The server cannot send a request and receive an IP address from itself or another DHCP server.

Default If no server identifier is set, the DHCP server sets the server identifier based on the primary interface address used by the server to receive a client request. For example, if the client sends a DHCP request and the server receives it on **fe-0/0/0** and the primary interface address is **1.1.1.1**, then the server identifier is set to **1.1.1.1**.

Options ***address***—IPv4 address of the server. This address must be accessible by all clients served within a specified range of addresses (based on an address pool or static binding).

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*

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servers

Syntax

```
servers server-address {
  port port-number;
}
```

Hierarchy Level [edit system services service-deployment]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure an IPv4 address for the Session and Resource Control (SRC) server.

Options *server-address*—The TCP port number.

Default: 3333

The remaining statements are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Junos OS to Work with SRC Software*

service-deployment

Syntax

```
service-deployment {
  servers server-address {
    port port-number;
  }
  source-address source-address;
}
```

Hierarchy Level [edit system services]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Enable Junos OS to work with the Session and Resource Control (SRC) software.

The remaining statements are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Junos OS to Work with SRC Software*

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service-profile (DHCP Relay Agent)

Syntax service-profile *dynamic-profile-name*;

Hierarchy Level
[edit forwarding-options dhcp-relay],
[edit forwarding-options dhcp-relay dhcpv6],
[edit forwarding-options dhcp-relay group *group-name*],
[edit forwarding-options dhcp-relay group *group-name* interface *interface-name*],
[edit forwarding-options dhcp-relay dhcpv6 group*group-name*],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name* interface *interface-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay ...],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay ...],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay ...]

Release Information
Statement introduced in Junos OS Release 11.2.
Statement introduced in Junos OS Release 12.3R2 for EX Series switches.
Support at the **[edit ... dhcpv6 ...]** hierarchy levels introduced in Junos OS Release 11.4.

Description Specify the default subscriber service (or the default DHCP client management service), which is activated when the subscriber (or client) logs in and no other service is activated by a RADIUS server or a provisioning server.

- To specify the default service for all DHCP relay agent clients, include the **service-profile** statement at the **[edit forwarding-options dhcp relay]** hierarchy level.
- To specify the default service for a named group of interfaces, include the **service-profile** statement at the **[edit forwarding-options dhcp relay group *group-name*]** hierarchy level.
- To specify the default service for a particular interface within a named group of interfaces, include the **service-profile** statement at the **[edit forwarding-options dhcp relay group *group-name* interface *interface-name*]** hierarchy level.

Options ***dynamic-profile-name***—Name of the dynamic profile.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *dhcp-relay*
- *Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces*
- *Grouping Interfaces with Common DHCP Configurations*
- *Default Subscriber Service Overview*
- *Configuring a Default Subscriber Service*

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services (System Services)

Syntax

```
services {
    dhcp { \* DHCP not supported on a DCF
        dhcp_services;
    }
    finger {
        connection-limit limit;
        rate-limit limit;
    }
    ftp {
        connection-limit limit;
        rate-limit limit;
    }
    service-deployment {
        servers address {
            port-number port-number;
        }
        source-address address;
    }
    ssh {
        connection-limit limit;
        protocol-version [v1 v2];
        rate-limit limit;
        root-login (allow | deny | deny-password);
    }
    telnet {
        connection-limit limit;
        rate-limit limit;
    }
    web-management {
        http {
            interfaces [ names ];
            port port;
        }
        https {
            interfaces [ names ];
            local-certificate name;
            port port;
        }
        session {
            idle-timeout [ minutes ];
            session-limit [ limit ];
        }
    }
    xnm-clear-text {
        connection-limit limit;
        rate-limit limit;
    }
    xnm-ssl {
        connection-limit limit;
        local-certificate name;
        rate-limit limit;
        ssl-renegotiation;
```


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```
  }
}
```

Hierarchy Level [edit system]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure the router or switch so that users on remote systems can access the local router or switch through the DHCP server, finger, rlogin, SSH, telnet, Web management, Junos XML protocol clear-text, Junos XML protocol SSL, and network utilities or enable Junos OS to work with the Session and Resource Control (SRC) software.

The remaining statements are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring clear-text or SSL Service for Junos XML Protocol Client Applications*
- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*
- *Configuring the Junos OS to Work with SRC Software*

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session (Time-out)

Syntax

```
session {
  idle-timeout minutes;
  session-limit session-limit;
}
```

Hierarchy Level [edit system services web-management]

Release Information Statement introduced in Junos OS Release 8.3.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure limits for the number of minutes a session can be idle before it times out, and configure the number of simultaneous J-Web user login sessions.

Options

idle-timeout *minutes*—Configure the number of minutes a session can be idle before it times out.

Range: 1 through 1440

Default: 1440

session-limit *session-limit*—Configure the maximum number of simultaneous J-Web user login sessions.

Range: 1 through 1024

Default: Unlimited

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *J-Web Interface User Guide*

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sip-server

Syntax sip-server [*address* | *name*];

Hierarchy Level [edit system services dhcp],
[edit system services dhcp],
[edit system services dhcp pool],
[edit system services dhcp static-binding]

Release Information Statement introduced in Junos OS Release 10.1 for EX Series switches.

Description Configure Session Initiation Protocol (SIP) server addresses or names for DHCP servers.

Options ***address***—IPv4 address of the SIP server. To configure multiple SIP servers, include multiple ***address*** options. This address must be accessible by all clients served within a specified range of addresses (based on an address pool or static binding).

name—Fully qualified domain name of the SIP server. To configure multiple SIP servers, include multiple ***name*** options. This domain name must be accessible by all clients served within a specified range of addresses (based on an address pool or static binding).

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- Configuring a DHCP SIP Server (CLI Procedure) on page 31
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

source-address (SRC Software)

Syntax source-address *source-address*;

Hierarchy Level [edit system services service-deployment]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Enable Junos OS to work with the Session and Resource Control (SRC) software.

Options ***source-address***— Local IPv4 address to be used as source address for traffic to the SRC server. The source address restricts traffic within the out-of-band network.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- *Configuring the Junos OS to Work with SRC Software*

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source-address-giaddr

Syntax source-address-giaddr;

Hierarchy Level [edit forwarding-options helpers bootp],
[edit forwarding-options helpers bootp interface *interface-name*]

Release Information Statement introduced in Junos OS Release 10.1 for EX Series switches.

Description Configure the gateway IP address (giaddr) as the source IP address of the switch for relayed DHCP packets when the switch is used as the DHCP relay agent.

When this statement is entered in the [**edit forwarding-options helpers bootp**] hierarchy, the gateway IP address is configured as the source IP address of the switch for relayed DHCP packets exiting all interfaces on the switch.

When this statement is entered in the [**edit forwarding-options helpers bootp interface *interface-name***] hierarchy, the gateway IP address is configured as the source IP address of the switch for relayed DHCP packets exiting the specified interface of the switch.

In Junos OS Release 10.1 for EX Series switches and later releases, the IP address of the interface that the DHCP packet exits on the switch acting as a DHCP relay agent is used as the source IP address for relayed DHCP packets by default.

In Junos OS Releases 9.6 and 10.0 for EX Series switches, the gateway IP address of the switch is always used as the source IP address for relayed DHCP packets when the switch is used as the DHCP relay agent.

In Junos OS Releases 9.3 through 9.5 for EX Series switches, the IP address of the interface that the DHCP packet exits on the switch acting as a DHCP relay agent is always used as the source IP address for relayed DHCP packets.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- DHCP/BOOTP Relay for Switches Overview on page 11

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ssh

Syntax

```
ssh {
  ciphers [ cipher-1 cipher-2 cipher-3 ...];
  client-alive-count-max seconds;
  client-alive-interval seconds;
  connection-limit limit;
  hostkey-algorithm <algorithm|no-algorithm>;
  key-exchange <algorithm>;
  macs <algorithm>;
  max-sessions-per-connection <number>;
  no-passwords;
  no-tcp-forwarding;
  protocol-version [v1 v2];
  rate-limit limit;
  root-login (allow | deny | deny-password);
}
```

Hierarchy Level [edit system services]

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.
client-alive-interval and **client-alive-max-count** statements introduced in Junos OS Release 12.2.
no-passwords statement introduced in Junos OS Release 13.3.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Allow SSH requests from remote systems to the local router or switch.

The remaining statements are explained separately.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring SSH Service for Remote Access to the Router or Switch*

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static-binding

Syntax

```
static-binding mac-address {
  client-identifier (ascii client-id | hexadecimal client-id);
  fixed-address {
    address;
  }
  host-name client-hostname;
}
```

Hierarchy Level

[edit system services dhcp],
[edit system services dhcp]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description

For J Series Services routers and EX Series switches only. Set static bindings for DHCP clients. A static binding is a mapping between a fixed IP address and the client's MAC address or client identifier.

Options

mac-address—The MAC address of the client. This is a hardware address that uniquely identifies a client on the network.

fixed-address *address*—Fixed IP address assigned to the client. Typically a client has one address assigned, but you can assign more.

host-name *client-hostname*—Hostname of the client requesting the DHCP server. The name can include the local domain name. Otherwise, the name is resolved based on the **domain-name** statement.

client-identifier (ascii *client-id* | hexadecimal *client-id*)—Used by the DHCP server to index the database of address bindings. The client identifier is an ASCII string or hexadecimal number and can include a type-value pair as specified in RFC 1700, *Assigned Numbers*. Either a client identifier or the client's MAC address must be configured to uniquely identify the client on the network.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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system-generated-certificate

Syntax system-generated-certificate;

Hierarchy Level [edit system services web-management https]

Release Information Command introduced in Junos OS Release 11.1 for EX Series switches.

Description Configure the automatically generated self-signed certificate for enabling HTTPS services..

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- Enabling HTTPS and XNM-SSL Services on Switches Using Self-Signed Certificates (CLI Procedure) on page 36

telnet

Syntax
```
telnet {
  connection-limit limit;
  rate-limit limit;
}
```

Hierarchy Level [edit system services]

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 the OCX Series.

Description Provide Telnet connections from remote systems to the local router or switch.

The remaining statements are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- *Configuring Telnet Service for Remote Access to a Router or Switch*

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tftp

Syntax

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

Hierarchy Level [edit forwarding-options helpers]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Enable TFTP request packet forwarding.

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring DNS and TFTP Packet Forwarding*

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trace (DHCP Relay Agent)

Syntax trace;

Hierarchy Level
[edit forwarding-options dhcp-relay dhcpv6 group *group-name* interface *interface-name*],
[edit forwarding-options dhcp-relay group *group-name* interface *interface-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay dhcpv6 group *group-name* interface *interface-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay group *group-name* interface *interface-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 group *group-name* interface *interface-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* interface *interface-name*],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 group *group-name* interface *interface-name*],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* interface *interface-name*]

Release Information
Statement introduced in Junos OS Release 10.4.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description Enable trace operations for a group of interfaces or for a specific interface within a group. Use the statement at the **[edit ... dhcpv6]** hierarchy levels to configure DHCPv6 support.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Tracing Extended DHCP Operations*
- *Tracing Extended DHCP Operations for Specific Interfaces*

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traceoptions (DNS and TFTP Packet Forwarding)

Syntax

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

Hierarchy Level [edit forwarding-options helpers]

Release Information Statement introduced before Junos OS Release 7.4.
Statement standardized and **match** option introduced in Junos OS Release 8.0.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure tracing operations for BOOTP, DNS and TFTP packet forwarding.

Default If you do not include this statement, no tracing operations are performed.

Options

file *filename*—Name of the file to receive the output of the tracing operation. Enclose the name in quotation marks (" "). All files are placed in a file named **fud** in the directory **/var/log**. If you include the **file** statement, you must specify a filename.

files *number*—(Optional) Maximum number of trace files. When a trace file named **trace-file** reaches its maximum size, it is renamed **trace-file.0**, then **trace-file.1**, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

If you specify a maximum number of files, you also must specify a maximum file size with the **size** option and a filename.

Range: 2 through 1000

Default: 3 files

flag *flag*—Tracing operation to perform. To specify more than one tracing operation, include multiple **flag** statements. You can include the following flags:

- **address**—Trace address management events
- **all**—Trace all events
- **bootp**—Trace BOOTP or DHCP services events
- **config**—Trace configuration events
- **domain**—Trace DNS service events
- **ifdb**—Trace interface database operations
- **io**—Trace I/O operations
- **main**—Trace main loop events
- **port**—Trace arbitrary protocol events

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- **rtsock**—Trace routing socket operations
- **tftp**—Trace TFTP service events
- **trace**—Trace tracing operations
- **ui**—Trace user interface operations
- **util**—Trace miscellaneous utility operations

match *regular-expression*—(Optional) Refine the output to include lines that contain the regular expression.

no-remote-trace—(Optional) Disable remote tracing globally or for a specific tracing operation.

no-world-readable—(Optional) Restrict file access to the owner.

size *size*—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named **trace-file** reaches this size, it is renamed **trace-file.0**. When the **trace-file** file again reaches its maximum size, **trace-file.0** is renamed **trace-file.1** and **trace-file** is renamed **trace-file.0**. This renaming scheme continues until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option and filename.

Syntax: ***x*k** to specify KB, ***x*m** to specify MB, or ***x*g** to specify GB

Range: 0 bytes through 4,294,967,295 KB

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Tracing BOOTP, DNS, and TFTP Forwarding Operations*

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traceoptions

Syntax

```
traceoptions {
  file filename <files number> <size size>;
  flag all;
  flag certificates;
  flag database;
  flag general;
  flag ike;
  flag parse;
  flag policy-manager;
  flag routing-socket;
  flag timer;
  level
  no-remote-trace
}
```

Hierarchy Level

[edit security],
[edit services ipsec-vpn]

Trace options can be configured at either the **[edit security]** or the **[edit services ipsec-vpn]** hierarchy level, but not at both levels.

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 the OCX Series.

Description

Configure security trace options.

To specify more than one trace option, include multiple **flag** statements. Trace option output is recorded in the **/var/log/kmd** file.

NOTE: The **traceoptions**statement is not supported on QFabric systems.

Options

files ***number***—(Optional) Maximum number of trace files. When a trace file (for example, **kmd**) reaches its maximum size, it is renamed **kmd.0**, then **kmd.1**, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

If you specify a maximum number of files, you must also specify a maximum file size with the **size** option.

Range: 2 through 1000 files

Default: 0 files

size ***size***—(Optional) Maximum size of each trace file, in kilobytes (KB). When a trace file (for example, **kmd**) reaches this size, it is renamed, **kmd.0**, then **kmd.1** and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

Default: 1024 KB

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flag *flag*—Trace operation to perform. To specify more than one trace operation, include multiple **flag** statements.

- **all**—Trace all security events.
- **certificates**—Trace certificate events.
- **database**—Trace database events.
- **general**—Trace general events.
- **ike**—Trace IKE module processing.
- **parse**—Trace configuration processing.
- **policy-manager**—Trace policy manager processing.
- **routing-socket**—Trace routing socket messages.
- **timer**—Trace internal timer events.

level *level*—(Optional) Set traceoptions level.

- **all**—match all levels.
- **error**—Match error conditions.
- **info**—Match informational messages.
- **notice**—Match conditions that should be handled specially.
- **verbose**—Match verbose messages.
- **warning**—Match warning messages.

no-remote-trace—(Optional) Disable remote tracing

Required Privilege Level

admin—To view the configuration.
admin-control—To add this statement to the configuration.

Related Documentation

- *Configuring Tracing Operations for Security Services*

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traceoptions (DHCP Server)

Syntax

```
traceoptions {
  file filename <files number> <match regex> <size size> <world-readable |
    no-world-readable>;
  flag flag;
}
```

Hierarchy Level [edit system services dhcp]

Release Information Statement for tracing J Series Services Router DHCP processes introduced in Junos OS Release 8.0.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Define tracing operations for DHCP processes for J Series Services Routers and EX Series switches.

Options

file *filename*—Name of the file that receives the output of the tracing operation. Enclose the name in quotation marks. All files are placed in the directory **/var/log**.

files *number*—(Optional) Maximum number of trace files. When a trace file named ***trace-file*** reaches its maximum size, it is renamed ***trace-file*.0**, then ***trace-file*.1**, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

If you specify a maximum number of files, you also must specify a maximum file size with the **size** option and a filename.

Range: 2 through 1000

Default: 3 files

flag *flag*—Tracing operation to perform. To specify more than one tracing operation, include multiple **flag** statements. You can include the following flags:

- **all**—All tracing operations
- **binding**—Trace binding operations
- **config**—Log reading of configuration
- **conflict**—Trace user-detected conflicts for IP addresses
- **event**—Trace important events
- **ifdb**—Trace interface database operations
- **io**— Trace I/O operations
- **lease**—Trace lease operations
- **main**—Trace main loop operations
- **misc**— Trace miscellaneous operations
- **packet**—Trace DHCP packets

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- **options**—Trace DHCP options
- **pool**—Trace address pool operations
- **protocol**—Trace protocol operations
- **rtsock**—Trace routing socket operations
- **scope**—Trace scope operations
- **signal**—Trace DHCP signal operations
- **trace**—All tracing operations
- **ui**—Trace user interface operations

match *regex*—(Optional) Refine the output to include lines that contain the regular expression.

- **all**—All tracing operations
- **binding**—Trace binding operations
- **config**— Log reading of configuration
- **conflict**—Trace user-detected conflicts for IP addresses
- **event**—Trace important events
- **ifdb**— Trace interface database operations
- **io**—Trace I/O operations
- **lease**—Trace lease operations
- **main**—Trace main loop operations
- **match *regex***— Refine the output to include lines that contain the regular expression.
- **misc**—Trace miscellaneous operations
- **packet**—Trace DHCP packets
- **options**—Trace DHCP options
- **pool**—Trace address pool operations
- **protocol**—Trace protocol operations
- **rtsock**—Trace routing socket operations
- **scope**—Trace scope operations
- **signal**—Trace DHCP signal operations
- **trace**—All tracing operations
- **ui**—Trace user interface operations

no-world-readable—(Optional) Disable unrestricted file access.

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size *size*—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named ***trace-file*** reaches this size, it is renamed ***trace-file*.0**. When the ***trace-file*** again reaches its maximum size, ***trace-file*.0** is renamed ***trace-file*.1** and ***trace-file*** is renamed ***trace-file*.0**. This renaming scheme continues until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option and filename.

Syntax: ***x*k** to specify KB, ***x*m** to specify MB, or ***x*g** to specify GB

Range: 10 KB through 1 GB

Default: 128 KB

world-readable—(Optional) Enable unrestricted file access.

Required Privilege Level
system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation
- *Configuring Tracing Operations for DHCP Processes*
- *System Management Configuration Statements*

update-server

Syntax
update-server;

Hierarchy Level
[edit Interfaces *interface-name* unit *logical-unit-number* inet dhcp]

Release Information
Statement introduced in Junos OS Release 8.5 for J Series devices.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 9.2 for SRX Series devices.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description
Propagate TCP/IP settings learned from an external DHCP server to the DHCP server running on the switch, router, or device.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- Configuring a DHCP Client (CLI Procedure) on page 31
- *Example: Configuring the Device as a DHCP Client*
- interfaces on page 125
- *unit*
- family on page 104

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use-interface-description

Syntax use-interface-description (logical | device);

Hierarchy Level
[edit forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id | relay-agent-remote-id)],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name* (relay-agent-interface-id | relay-agent-remote-id)],
[edit forwarding-options dhcp-relay relay-option-82 (circuit-id | remote-id)],
[edit forwarding-options dhcp-relay group *group-name* relay-option-82 (circuit-id | remote-id)],
[edit logical-systems *logical-system-name* ... forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id | relay-agent-remote-id)],
[edit logical-systems *logical-system-name* ... forwarding-options dhcp-relay ... relay-option-82 (circuit-id | remote-id)],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 (relay-agent-interface-id | relay-agent-remote-id)],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay ... relay-option-82 (circuit-id | remote-id)],
[edit vlans *vlan-name* forwarding-options dhcp-security dhcpv6-options option-18],
[edit vlans *vlan-name* forwarding-options dhcp-security dhcpv6-options option-37]

Release Information
Statement introduced in Junos OS Release 9.6.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.3 for EX Series switches.
Support at the **[edit ... relay-agent-remote-id]** and **[edit ... remote-id]** hierarchy levels introduced in Junos OS Release 14.1.
Support at the **[edit vlans *vlan-name* dhcp-security dhcpv6-options option-18]** and **[edit vlans *vlan-name* dhcp-security dhcpv6-options option-37]** hierarchy levels introduced in Junos OS Release 14.1X53-D10 for EX Series switches.

Description Use the textual interface description instead of the interface identifier in the DHCP base option 82 Agent Circuit ID (suboption 1) or Agent Remote ID (suboption 2) information, or in the DHCPv6 option 18 (Relay Agent Interface ID) or option 37 (Relay Agent Remote ID) information in DHCP packets that the DHCP relay agent sends to a DHCP server.

NOTE: For integrated routing and bridging (IRB) interfaces, the option 82 field must be able to uniquely identify the incoming interface based on either the Agent Circuit ID or Agent Remote ID. You can modify the information in the textual interface description to match the raw IFD (physical interface without a subunit) name and configure the option 82 field to use the interface description.

The textual description is configured using the **description** statement at the **[edit interfaces *interface-name*]** hierarchy level. If you specify that the textual description be used and no description is configured for the interface, DHCP relay defaults to using the Layer 2 interface name. When you use the interface description rather than the interface name,

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the interface description has to be specified under interface unit ("set interfaces ge-0/0/0 unit 0 description "client"). If you do not do this, then the interface name is used.

In the case of integrated routing and bridging (IRB) interfaces, the textual description of the Layer 2 interface is used instead of the IRB interface. If there is no description configured, the Layer 2 logical interface name is used. To include the IRB interface description instead of the Layer 2 interface description, configure the **use-interface-description** and the **no-vlan-interface-name** statements. If no description is configured for the IRB interface, DHCP relay defaults to using the IRB interface name.

NOTE: The **use-interface-description** statement is mutually exclusive with the **use-vlan-id** statement.

If you specify the textual interface description, rather than accepting the default syntax, the identification is for packets returned from the server, and only for instances where that identification would be required by the DHCP relay, such as a stateless pass-through.

NOTE: By default, DHCP relay accepts a maximum of 253 ASCII characters. If the textual interface description exceeds 253 characters, DHCP relay drops the packet, which results in the DHCP client failing to bind.

Options

logical—Use the textual description that is configured for the logical interface.

device—Use the textual description that is configured for the device interface.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Including a Textual Description in DHCP Options*
- *Using DHCP Relay Agent Option 82 Information*
- *Configuring DHCPv6 Relay Agent Options*

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use-primary (DHCP Relay Agent)

Syntax use-primary *primary-profile-name*;

Hierarchy Level
[edit forwarding-options dhcp-relay dhcpv6 dynamic-profile *profile-name*],
[edit forwarding-options dhcp-relay dynamic-profile *profile-name*],
[edit forwarding-options dhcp-relay dhcpv6 group *group-name* dynamic-profile *profile-name*],
[edit forwarding-options dhcp-relay group *group-name* dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay dhcpv6 dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay dhcpv6 group *group-name* dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay group *group-name* dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 group *group-name* dynamic-profile *profile-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* dynamic-profile *profile-name*],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 dynamic-profile *profile-name*],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dynamic-profile *profile-name*],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay dhcpv6 group *group-name* dynamic-profile *profile-name*],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* dynamic-profile *profile-name*]

Release Information Statement introduced in Junos OS Release 9.3.
Support at the **[edit ... dhcpv6]** hierarchy levels introduced in Junos OS Release 11.4.
Statement introduced in Junos OS Release 12.1 for EX Series switches.

Description Specify the dynamic profile to configure as the primary dynamic profile. The primary dynamic profile is instantiated when the first subscriber logs in. Subsequent subscribers are not assigned the primary dynamic profile; instead, they are assigned the dynamic profile specified for the interface. When the first subscriber logs out, the next subscriber that logs in is assigned the primary dynamic profile.

Use the statement at the **[edit ... dhcpv6]** hierarchy levels to configure DHCPv6 support.

EX Series switches do not support DHCPv6.

Options *primary-profile-name*—Name of the dynamic profile to configure as the primary dynamic profile

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
- *Attaching Dynamic Profiles to DHCP Subscriber Interfaces or DHCP Client Interfaces*

vendor-id

Syntax vendor-id *vendor-id*;

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number* family inet dhcp]

Release Information Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure a vendor class ID for the Dynamic Host Configuration Protocol (DHCP) client.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- Configuring a DHCP Client (CLI Procedure) on page 31

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vendor-option

Syntax

```
vendor-option {
  default-local-server-group local-server-group-name |
  default-relay-server-group server-group-name
  drop;
  equals
  starts-with
}
```

Hierarchy Level [edit forwarding-options dhcp-relay relay-option-60]

Release Information Statement introduced before Junos OS Release 12.1 for EX Series switches.
Statement deprecated in Junos OS Release 12.3 for EX Series switches.

Description Configure the match criteria when you use the DHCP vendor class identifier option (option 60) in DHCP client packets to forward client traffic to specific DHCP servers. The extended DHCP relay agent compares the option 60 vendor-specific strings received in DHCP client packets against the match criteria that you specify. If there is a match, you can define certain actions for the associated DHCP client packets.

NOTE: The vendor-option statement has been deprecated and might be removed from future product releases. We recommend that you phase out its use. See option-number.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35
- Understanding the Extended DHCP Relay Agent for EX Series Switches on page 12

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web-management

Syntax

```
web-management {
  http {
    interfaces [ interface-names ];
    port port;
  }
  https {
    interfaces [ interface-names ];
    local-certificate name;
    port port;
  }
}
```

Hierarchy Level [edit system services]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description Configure settings for HTTP or HTTPS access. HTTP access allows management of the router or switch using the browser-based J-Web graphical user interface. HTTPS access allows secure management of the router or switch using the J-Web interface. With HTTPS access, communication between the router or switch Web server and your browser is encrypted.

The remaining statements are explained separately.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring Management Access for the EX Series Switch (J-Web Procedure)*
- *J-Web Interface User Guide*
- http on page 117
- https on page 118
- port on page 155

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wins-server (System)

Syntax

```
wins-server {
  address;
}
```

Hierarchy Level

[edit system services dhcp],
[edit system services dhcp],
[edit system services dhcp pool],
[edit system services dhcp static-binding]

Release Information

Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.

Description

For J Series Services Routers and EX Series switches only. Specify one or more NetBIOS Name Servers. When a DHCP client is added to the network and assigned an IP address, the NetBIOS Name Server manages the Windows Internet Name Service (WINS) database that matches IP addresses (such as **192.168.1.3**) to Windows NetBIOS names (such as **\\Marketing**). List servers in order of preference.

Options

address—IPv4 address of the NetBIOS Name Server running WINS. To configure multiple servers, include multiple ***address*** options.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring the Router or Interface to Act as a DHCP Server on J Series Services Routers*
- Configuring a DHCP Server on Switches (CLI Procedure) on page 32

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PART 3

Administration

- Routine Monitoring on page 203
- Operational Commands on page 209

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CHAPTER 8

Routine Monitoring

- Monitoring DHCP Services on page 203
- Verifying and Managing DHCP Relay Configuration for EX Series Switches on page 207

Monitoring DHCP Services

Purpose

NOTE: This topic applies only to the J-Web Application package.

A switch or router can operate as a DHCP server. Use the monitoring functionality to view information about dynamic and static DHCP leases, conflicts, pools, and statistics.

Action

To monitor the DHCP server in the J-Web interface, select **Monitor** > **Services** > **DHCP**.

To monitor the DHCP server in the CLI, enter the following CLI commands:

- **show system services dhcp binding**
- **show system services dhcp conflict**
- **show system services dhcp pool**
- **show system services dhcp statistics**
- **show system services dhcp relay-statistics**
- **show system services dhcp global**
- **show system services dhcp client**
- **clear system services dhcp binding**
- **clear system services dhcp conflict**
- **clear system services dhcp statistics**
- **clear dhcp relay-statistics**

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On EX4300 switches, to monitor the DHCP server in the CLI, enter the following CLI commands:

- **show dhcp server binding**
- **show dhcp server statistics**
- **show dhcp relay binding**
- **show dhcp relay statistics**
- **clear dhcp server binding**
- **clear dhcp server statistics**
- **clear dhcp relay binding**
- **clear dhcp relay statistics**

Meaning Table 11 on page 204 summarizes the output fields in DHCP displays in the J-Web interface.

Table 11: Summary of DHCP Output Fields

Field	Values	Additional Information
Global tab		
Name	This column displays the following information: • Boot lease length • Domain Name • Name servers • Server identifier • Domain search • Gateway routers • WINS server • Boot file • Boot server • Default lease time • Minimum lease time • Maximum lease time	
Value	Displays the value for each of the parameters in the Name column.	
Bindings tab		
Allocated Address	List of IP addresses the DHCP server has assigned to clients.	
MAC Address	Corresponding media access control (MAC) address of the client.	
Binding Type	Type of binding assigned to the client: **dynamic** or **static**.	DHCP servers can assign a dynamic binding from a pool of IP addresses or a static binding to one or more specific IP addresses.

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Table 11: Summary of DHCP Output Fields *(continued)*

Field	Values	Additional Information
Lease Expires	Date and time the lease expires, or **never** for leases that do not expire.	
Pools tab		
Pool Name	Subnet on which the IP address pool is defined.	
Low Address	Lowest address in the IP address pool.	
High Address	Highest address in the IP address pool.	
Excluded Addresses	Addresses excluded from the address pool.	
Clients tab		
Interface Name	Name of the logical interface.	
Hardware Address	Vendor identification.	
Status	State of the client binding.	
Address Obtained	IP address obtained from the DHCP server.	
Update Server	Indicates whether server update is enabled.	
Lease Obtained	Date and time the lease was obtained.	
Lease Expires	Date and time the lease expires.	
Renew	Reacquires an IP address from the server for the interface. When you click this option, the command sends a discover message if the client state is INIT and a renew request message if the client state is BOUND. For all other states it performs no action.	
Release	Clears other resources received earlier from the server, and reinitializes the client state to INIT for the particular interface.	
Conflicts tab		
Detection Time	Date and time the client detected the conflict.	

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Table 11: Summary of DHCP Output Fields *(continued)*

Field	Values	Additional Information
Detection Method	How the conflict was detected.	Only client-detected conflicts are displayed.
Address	IP address where the conflict occurs.	The addresses in the conflicts list remain excluded until you use the **clear system services dhcp conflict** command to manually clear the list.
DHCP Statistics		
Relay Statistics tab		
Packet Counters	Displays the number of packet counters.	
Dropped Packet Counters	Graphically displays the number of dropped packet counters.	
Statistics tab		
Packets dropped	Total number of packets dropped and the number of packets dropped due to a particular condition.	
Messages received	Number of BOOTREQUEST, DHCPDECLINE, DHCPDISCOVER, DHCPINFORM, DHCPRELEASE, and DHCPREQUEST messages sent from DHCP clients and received by the DHCP server.	
Messages sent	Number of BOOTREPLY, DHCPACK, DHCPOFFER, DHCPNAK, and DHCPFORCERENEW messages sent from the DHCP server to DHCP clients.	

Table 12 on page 206 summarizes the output fields in DHCP displays in EX4300 switches in the J-Web interface.

Table 12: Summary of DHCP Output Fields for EX4300 Switches

Field	Values	Additional Information
Binding Information tab		
IP Address	IP address of the DHCP client..	
Session ID	Session ID of the subscriber session.	
Hardware Address	Hardware address of the DHCP client.	
Expires	Number of seconds in which the lease expires.	

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Table 12: Summary of DHCP Output Fields for EX4300 Switches *(continued)*

Field	Values	Additional Information
State	State of the address binding table on the extended DHCP local server: • **BOUND**—Client has an active IP address lease. • **FORCERENEW**—Client has received the **FORCERENEW** message from the server. • **INIT**—Initial state. • **RELEASE**—Client is releasing the IP address lease. • **RENEWING**—Client is sending a request to renew the IP address lease. • **REQUESTING**—Client is requesting a DHCP server. • **SELECTING**—Client is receiving offers from DHCP servers.	
Interface	Interface on which the request was received.	

Table 13 on page 207 summarizes the output fields in DHCP Statistics Information for EX4300 switches in the J-Web interface.

Table 13: Summary of the DHCP Statistics Information Output for EX4300 switches

Field	Values	Additional Information
Message Counters		
Message Counters	Graphically displays the number of messages sent and received.	
Dropped packet Counters		
MAC Limit	Graphically displays the number of dropped packet counters.	

Related Documentation

- Configuring DHCP Services (J-Web Procedure) on page 23
- Understanding DHCP Services for Switches on page 7

Verifying and Managing DHCP Relay Configuration for EX Series Switches

Purpose View or clear statistics for extended DHCP relay agent:

Action

- To display extended DHCP relay agent statistics:

  user@switcht> show dhcp relay statistics

- To clear all extended DHCP relay agent statistics:

  user@switcht> clear dhcp relay statistics

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Related Documentation

- Configuring an Extended DHCP Relay Server on EX Series Switches (CLI Procedure) on page 35
- Understanding the Extended DHCP Relay Agent for EX Series Switches on page 12

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CHAPTER 9

Operational Commands

- clear dhcp relay statistics
- clear security pki local-certificate
- clear system services dhcp binding
- clear system services dhcp conflict
- clear system services dhcp statistics
- request ipsec switch
- request security certificate (signed)
- request security certificate (unsigned)
- request security key-pair
- request security pki generate-key-pair
- request security pki local-certificate generate-self-signed
- show dhcp relay statistics
- show security pki local-certificate
- show system services dhcp binding
- show system services dhcp conflict
- show system services dhcp global
- show system services dhcp pool
- show system services dhcp statistics
- show system services service-deployment
- ssh
- telnet

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clear dhcp relay statistics

Syntax

clear dhcp relay statistics
<logical-system ***logical-system-name*****>**
<routing-instance ***routing-instance-name*****>**

Syntax

Syntax for EX Series switches:

show dhcp relay statistics
<routing-instance ***routing-instance-name*****>**

Release Information

Command introduced in Junos OS Release 8.3.
Statement introduced in Junos OS Release 12.1 for EX Series switches.
Command introduced in Junos OS Release 12.1X48R3 for PTX Series Packet Transport Routers.

Description

Clear all Dynamic Host Configuration Protocol (DHCP) relay statistics.

Options

logical-system ***logical-system-name***—(On routers only) (Optional) Perform this operation on the specified logical system. If you do not specify a logical system name, statistics are cleared for the default logical system.

routing-instance ***routing-instance-name***—(Optional) Perform this operation on the specified routing instance. If you do not specify a routing instance name, statistics are cleared for the default routing instance.

Required Privilege Level

view

Related Documentation

- show dhcp relay statistics on page 224

List of Sample Output

clear dhcp relay statistics on page 211

Output Fields

Table 14 on page 211 lists the output fields for the **clear dhcp relay statistics** command.

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Table 14: clear dhcp relay statistics Output Fields

Field Name	Field Description
Packets dropped	Number of packets discarded by the extended DHCP relay agent application due to errors. Only nonzero statistics appear in the **Packets dropped** output. When all of the Packets dropped statistics are 0 (zero), only the **Total** field appears. • **Total**—Total number of packets discarded by the extended DHCP relay agent application. • **Bad hardware address**—Number of packets discarded because an invalid hardware address was specified. • **Bad opcode**—Number of packets discarded because an invalid operation code was specified. • **Bad options**—Number of packets discarded because invalid options were specified. • **Invalid server address**—Number of packets discarded because an invalid server address was specified. • **Lease Time Violation**—Number of packets discarded because of a lease time violation • **No available addresses**—Number of packets discarded because there were no addresses available for assignment. • **No interface match**—Number of packets discarded because they did not belong to a configured interface. • **No routing instance match**—Number of packets discarded because they did not belong to a configured routing instance. • **No valid local address**—Number of packets discarded because there was no valid local address. • **Packet too short**—Number of packets discarded because they were too short. • **Read error**—Number of packets discarded because of a system read error. • **Send error**—Number of packets that the extended DHCP relay application could not send. • **Option 60**—Number of packets discarded containing DHCP option 60 vendor-specific information. • **Option 82**—Number of packets discarded because DHCP option 82 information could not be added.
Messages received	Number of DHCP messages received. • **BOOTREQUEST**—Number of BOOTP protocol data units (PDUs) received • **DHCPDECLINE**—Number of DHCP PDUs of type DECLINE received • **DHCPDISCOVER**—Number of DHCP PDUs of type DISCOVER received • **DHCPINFORM**—Number of DHCP PDUs of type INFORM received • **DHCPRELEASE**—Number of DHCP PDUs of type RELEASE received • **DHCPREQUEST**—Number of DHCP PDUs of type REQUEST received
Messages sent	Number of DHCP messages sent. • **BOOTREPLY**—Number of BOOTP PDUs transmitted • **DHCPOFFER**—Number of DHCP OFFER PDUs transmitted • **DHCPACK**—Number of DHCP ACK PDUs transmitted • **DHCPNACK**—Number of DHCP NACK PDUs transmitted

Sample Output

clear dhcp relay statistics

The following sample output displays the DHCP relay statistics before and after the **clear dhcp relay statistics** command is issued.

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

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```
Packets dropped:
    Total                     1
    Lease Time Violated       1

Messages received:
    BOOTREQUEST               116
    DHCPDECLINE               0
    DHCPDISCOVER              11
    DHCPINFORM                0
    DHCPRELEASE               0
    DHCPREQUEST               105

Messages sent:
    BOOTREPLY                 44
    DHCPOFFER                 11
    DHCPACK                   11
    DHCPNAK                   11


user@host> clear dhcp relay statistics


user@host> show dhcp relay statistics
Packets dropped:
    Total                     0

Messages received:
    BOOTREQUEST               0
    DHCPDECLINE               0
    DHCPDISCOVER              0
    DHCPINFORM                0
    DHCPRELEASE               0
    DHCPREQUEST               0

Messages sent:
    BOOTREPLY                 0
    DHCPOFFER                 0
    DHCPACK                   0
    DHCPNAK                   0
```


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clear security pki local-certificate

Syntax clear security pki local-certificate
<all | certificate-id *certificate-id-name* | system-generated>

Release Information Command introduced in Junos OS Release 11.1 for EX Series switches.

Description Delete local digital certificates, certificate requests, and the corresponding public/private key pairs from the switch.

Options **all**—(Optional) Delete all local digital certificates, certificate requests, and the corresponding public and private key pairs from the router.

NOTE: This option does not delete the automatically generated self-signed certificate or its public/private key pair.

certificate-id *certificate-id-name*—(Optional) Delete the specified local digital certificate and corresponding public and private key pair.

system-generated—(Optional) Delete the automatically generated self-signed certificate.

Required Privilege Level clear

Related Documentation
- Deleting Self-Signed Certificates (CLI Procedure) on page 38

List of Sample Output clear security pki local-certificate all on page 213

Output Fields This command produces no output.

Sample Output

clear security pki local-certificate all

```
user@switch> clear security pki local-certificate all
```

clear system services dhcp binding

Syntax clear system services dhcp binding
<*address*>

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description (J Series routers and EX Series switches only) Remove obsolete IP address bindings on a Dynamic Host Configuration Protocol (DHCP) server and return them to the IP address pool.

Options ***address***—(Optional) Remove a specific IP address binding and return it to the address pool.

Required Privilege Level view and system

Related Documentation
- show system services dhcp binding on page 230

List of Sample Output clear system services dhcp binding on page 214

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear system services dhcp binding

```
user@host> clear system services dhcp binding
```


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clear system services dhcp conflict

Syntax clear system services dhcp conflict
<address>

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description (J Series routers and EX Series switches only) Remove IP addresses from the Dynamic Host Configuration Protocol (DHCP) server conflict list and return them to the IP address pool.

Options ***address***—(Optional) Remove a specific IP address from the conflict list and return it to the address pool.

Required Privilege Level view and system

Related Documentation
- show system services dhcp conflict on page 233

List of Sample Output clear system services dhcp conflict on page 215

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear system services dhcp conflict

```
user@host> clear system services dhcp conflict
```

clear system services dhcp statistics

Syntax clear system services dhcp statistics

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description (J Series routers and EX Series switches only) Clear Dynamic Host Configuration Protocol (DHCP) server statistics.

Options This command has no options.

Required Privilege Level view and system

Related Documentation
- show system services dhcp statistics on page 238

List of Sample Output clear system services dhcp statistics on page 216

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear system services dhcp statistics

```
user@host> clear system services dhcp statistics
```


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request ipsec switch

Syntax request ipsec switch (interface <es-*fpc/pic/port*> | security-associations <*sa-name*>)

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description (Encryption interface on M Series, PTX Series, and T Series routers and EX Series switches only) Manually switch from the primary to the backup encryption services interface, or switch from the primary to the backup IP Security (IPsec) tunnel.

Options **interface <es-*fpc/pic/port*>**—Switch to the backup encryption interface.

security-associations <*sa-name*>—Switch to the backup tunnel.

Required Privilege Level view

Related Documentation
- *show ipsec redundancy*

List of Sample Output request ipsec switch on page 217

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request ipsec switch

```
user@host> request ipsec switch security-associations sa-private
```

request security certificate (signed)

Syntax request security certificate enroll filename *filename* subject *subject* alternative-subject *alternative-subject* certification-authority *certification-authority* encoding (binary | pem) key-file *key-file* domain-name *domain-name*

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description (Encryption interface on M Series and T Series routers and EX Series switches only) Obtain a signed certificate from a certificate authority (CA). The signed certificate validates the CA and the owner of the certificate. The results are saved in a specified file to the **/var/etc/ikecert** directory.

Options

filename *filename*—File that stores the certificate.

subject *subject*—Distinguished name (**dn**), which consists of a set of components—for example, an organization (**o**), an organization unit (**ou**), a country (**c**), and a locality (**l**).

alternative-subject *alternative-subject*—Tunnel source address.

certification-authority *certification-authority*—Name of the certificate authority profile in the configuration.

encoding (binary | pem)—File format used for the certificate. The format can be a binary file or privacy-enhanced mail (PEM), an ASCII base64-encoded format. The default format is binary.

key-file *key-file*—File containing a local private key.

domain-name *domain-name*—Fully qualified domain name.

Required Privilege Level maintenance

List of Sample Output request security certificate (signed) on page 218

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request security certificate (signed)

```
user@host> request security certificate enroll filename host.crt subject c=uk,o=london
alternative-subject 10.50.1.4 certification-authority verisign   key-file host-1.prv domain-name
host.juniper.net
CA name: juniper.net CA file: ca_verisign
local pub/private key pair: host.prv
subject: c=uk,o=london domain name: host.juniper.net
alternative subject: 10.50.1.4
Encoding: binary
Certificate enrollment has started. To view the status of your enrollment, check
 the key management process (kmd) log file at /var/log/kmd. <--------------
```

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request security certificate (unsigned)

Syntax request security certificate enroll filename *filename* ca-file *ca-file* ca-name *ca-name* encoding (binary | perm) url *url*

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description (Encryption interface on M Series and T Series routers and EX Series switches only) Obtain a certificate from a certificate authority (CA). The results are saved in a specified file to the **/var/etc/ikecert** directory.

Options

filename *filename*—File that stores the public key certificate.

ca-file *ca-file*—Name of the certificate authority profile in the configuration.

ca-name *ca-name*—Name of the certificate authority.

encoding (binary | pem)—File format used for the certificate. The format can be a binary file or privacy-enhanced mail (PEM), an ASCII base64-encoded format. The default value is **binary**.

url *url*—Certificate authority URL.

Required Privilege Level maintenance

List of Sample Output request security certificate (unsigned) on page 220

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request security certificate (unsigned)

```
user@host> request security certificate enroll filename ca_verisign ca-file verisign ca-name
juniper.net urlxyzcompany URL
http://<verisign ca-name xyzcompany url>/cgi-bin/pkiclient.exe CA name: juniper.net
 CA file: verisign Encoding: binary
Certificate enrollment has started. To view the status of your enrollment, check
 the key management process (kmd) log file at /var/log/kmd. <--------------
```


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request security key-pair

Syntax request security key-pair *filename*
<size *key-size*>
<type (rsa | dsa)>

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description (Encryption interface on M Series and T Series routers and EX Series switches only) Generate a public and private key pair for a digital certificate.

Options ***filename***—Name of a file in which to store the key pair.

size *key-size*—(Optional) Key size, in bits. The key size can be **512**, **1024**, or **2048**. The default value is **1024**.

type—(Optional) Algorithm used to encrypt the key:

- **rsa**—RSA algorithm. This is the default.
- **dsa**—Digital signature algorithm with Secure Hash Algorithm (SHA).

Required Privilege Level maintenance

List of Sample Output request security key-pair on page 221

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request security key-pair

```
user@host> request security key-pair security-key-file
```

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request security pki generate-key-pair

Syntax request security pki generate-key-pair certificate-id *certificate-id-name*
<size (512 | 1024 | 2048)>
<type (dsa | rsa)>

Release Information Command introduced in Junos OS Release 11.1 for EX Series switches.

Description Generate a public key infrastructure (PKI) public/private key pair for a local digital certificate.

Options

certificate-id *certificate-id-name*—Name of the local digital certificate and the public/private key pair.

size—(Optional) Key pair size. The key pair size can be **512**, **1024**, or **2048** bits. If a key pair size is not specified, the default value, **1024** bits, is applied.

type—(Optional) The algorithm to be used for encrypting the public/private key pair. The encryption algorithm can be **dsa** or **rsa** . If an encryption algorithm is not specified, the default value, **rsa**, is applied.

Required Privilege Level maintenance

Related Documentation

- Manually Generating Self-Signed Certificates on Switches (CLI Procedure) on page 37

List of Sample Output request security pki generate-key-pair on page 222

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request security pki generate-key-pair

```
user@switch> request security pki generate-key-pair certificate-id billy size 2048
Generated key pair billy, key size 2048 bits
```


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request security pki local-certificate generate-self-signed

Syntax request security pki local-certificate generate-self-signed certificate-id *certificate-id-name* domain-name *domain-name* ip-address *ip-address* email *email-address* subject *subject-distinguished-name*

Release Information Command introduced in Junos OS Release 11.1 for EX Series switches.

Description Manually generate a self-signed certificate for the given distinguished name.

Options

certificate-id *certificate-id-name*—Name of the local digital certificate and the public/private key pair.

domain-name *domain-name*—Fully qualified domain name (FQDN). The FQDN provides the identity of the certificate owner for Internet Key Exchange (IKE) negotiations and provides an alternative to the subject name.

email *email-address*—E-mail address of the certificate holder.

ip-address *ip-address*—IP address of the switch.

subject *subject-distinguished-name*—Distinguished name format that contains the common name, department, company name, state, and country:

- **CN**—Common name
- **OU**—Organizational unit name
- **O**—Organization name
- **ST**—State
- **C**—Country

Required Privilege Level maintenance
security

Related Documentation
- Manually Generating Self-Signed Certificates on Switches (CLI Procedure) on page 37

List of Sample Output request security pki local-certificate generate-self-signed on page 223

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

request security pki local-certificate generate-self-signed

```
user@switch> request security pki local-certificate generate-self-signed certificate-id self-cert
subject cn=abc domain-name abc.net email jdoe@abc.net
Self-signed certificate generated and loaded successfully
```

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show dhcp relay statistics

Syntax

show dhcp relay statistics
<**logical-system** *logical-system-name*>
<**routing-instance** *routing-instance-name*>

Syntax

Syntax for EX Series switches:

show dhcp relay statistics
<**routing-instance** *routing-instance-name*>

Release Information

Command introduced in Junos OS Release 8.3.
Command introduced in Junos OS Release 12.1 for EX Series switches.
Command introduced in Junos OS Release 12.1X48R3 for PTX Series Packet Transport Routers.

Description

Display Dynamic Host Configuration Protocol (DHCP) relay statistics.

Options

logical-system *logical-system-name*—(On routers only) (Optional) Perform this operation on the specified logical system. If you do not specify a logical system name, statistics are displayed for the default logical system.

routing-instance *routing-instance-name*—(Optional) Perform this operation on the specified routing instance. If you do not specify a routing instance name, statistics are displayed for the default routing instance.

Required Privilege Level

view

Related Documentation

- clear dhcp relay statistics on page 210

List of Sample Output

show dhcp relay statistics on page 226

Output Fields

Table 15 on page 225 lists the output fields for the **show dhcp relay statistics** command. Output fields are listed in the approximate order in which they appear.

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Table 15: show dhcp relay statistics Output Fields

Field Name	Field Description
Packets dropped	Number of packets discarded by the extended DHCP relay agent application due to errors. Only nonzero statistics appear in the **Packets dropped** output. When all of the Packets dropped statistics are 0 (zero), only the **Total** field appears. • **Total**—Total number of packets discarded by the extended DHCP relay agent application. • **Bad hardware address**—Number of packets discarded because an invalid hardware address was specified. • **Bad opcode**—Number of packets discarded because an invalid operation code was specified. • **Bad options**—Number of packets discarded because invalid options were specified. • **Invalid server address**—Number of packets discarded because an invalid server address was specified. • **Lease Time Violation**—Number of packets discarded because of a lease time violation • **No available addresses**—Number of packets discarded because there were no addresses available for assignment. • **No interface match**—Number of packets discarded because they did not belong to a configured interface. • **No routing instance match**—Number of packets discarded because they did not belong to a configured routing instance. • **No valid local address**—Number of packets discarded because there was no valid local address. • **Packet too short**—Number of packets discarded because they were too short. • **Read error**—Number of packets discarded because of a system read error. • **Send error**—Number of packets that the extended DHCP relay application could not send. • **Option 60**—Number of packets discarded containing DHCP option 60 vendor-specific information. • **Option 82**—Number of packets discarded because DHCP option 82 information could not be added.
Messages received	Number of DHCP messages received. • **BOOTREQUEST**—Number of BOOTP protocol data units (PDUs) received • **DHCPDECLINE**—Number of DHCP PDUs of type DECLINE received • **DHCPDISCOVER**—Number of DHCP PDUs of type DISCOVER received • **DHCPINFORM**—Number of DHCP PDUs of type INFORM received • **DHCPRELEASE**—Number of DHCP PDUs of type RELEASE received • **DHCPREQUEST**—Number of DHCP PDUs of type REQUEST received
Messages sent	Number of DHCP messages sent. • **BOOTREPLY**—Number of BOOTP PDUs transmitted • **DHCPOFFER**—Number of DHCP OFFER PDUs transmitted • **DHCPACK**—Number of DHCP ACK PDUs transmitted • **DHCPNACK**—Number of DHCP NACK PDUs transmitted • **DHCPFORCERENEW**—Number of DHCP FORCERENEW PDUs transmitted
External Server Response	State of the external DHCP server responsiveness.
Packets forwarded	Number of packets forwarded. • **BOOTREQUEST**—Number of BOOTREQUEST protocol data units (PDUs) forwarded • **BOOTREPLY**—Number of BOOTREPLY protocol data units (PDUs) forwarded

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Table 15: show dhcp relay statistics Output Fields *(continued)*

Field Name	Field Description
External Server Response	State of the external DHCP server responsiveness.

Sample Output

show dhcp relay statistics

```
user@host> show dhcp relay statistics
Packets dropped:
    Total                       34
    Bad hardware address        1
    Bad opcode                  1
    Bad options                 3
    Invalid server address      5
    Lease Time Violation        1
    No available addresses      1
    No interface match          2
    No routing instance match   9
    No valid local address      4
    Packet too short            2
    Read error                  1
    Send error                  1
    Option 60                   1
    Option 82                   2

Messages received:
    BOOTREQUEST                 116
    DHCPDECLINE                 0
    DHCPDISCOVER                11
    DHCPINFORM                  0
    DHCPRELEASE                 0
    DHCPREQUEST                 105

Messages sent:
    BOOTREPLY                   0
    DHCPOFFER                   2
    DHCPACK                     1
    DHCPNAK                     0
    DHCPFORCERENEW              0

Packets forwarded:
    Total                       4
    BOOTREQUEST                 2
    BOOTREPLY                   2

External Server Response:
    State                       Responding
```


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show security pki local-certificate

Syntax
show security pki local-certificate
<brief | detail>
<certificate-id *certificate-id-name*>
<system-generated>

Release Information
Command introduced in Junos OS Release 11.1 for EX Series switches.

Description
Display information about the local digital certificates and the corresponding public keys installed in the switch.

Options
none—(Same as brief) Display information about all local digital certificates and corresponding public keys.

brief | detail—(Optional) Display information about local digital certificates and corresponding public keys for the specified level of output.

certificate-id *certificate-id-name*—(Optional) Display information about only the specified the local digital certificate and corresponding public keys.

system-generated—(Optional) Display information about the automatically generated self-signed certificate.

Required Privilege Level
view

Related Documentation
- Manually Generating Self-Signed Certificates on Switches (CLI Procedure) on page 37

List of Sample Output
show security pki local-certificate on page 228
show security pki local-certificate detail on page 229

Output Fields
Table 16 on page 227 lists the output fields for the **show security pki local-certificate** command. Output fields are listed in the approximate order in which they appear.

Table 16: show security pki local-certificate Output Fields

Field Name	Field Description	Level of Output
Certificate identifier	Name of the digital certificate.	All levels
Certificate version	Revision number of the digital certificate.	**detail**
Serial number	Unique serial number of the digital certificate.	**detail**
Issued by	Authority that issued the digital certificate.	none **brief**
Issued to	Device that was issued the digital certificate.	none **brief**

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Table 16: show security pki local-certificate Output Fields *(continued)*

Field Name	Field Description	Level of Output
Issuer	Authority that issued the digital certificate, including details of the authority organized using the distinguished name format. Possible subfields are: • **Common name**—Name of the authority. • **Organization**—Organization of origin. • **Organizational unit**—Department within an organization. • **State**—State of origin. • **Country**—Country of origin.	**detail**
Subject	Details of the digital certificate holder organized using the distinguished name format. Possible subfields are: • **Common name**—Name of the authority. • **Organization**—Organization of origin. • **Organizational unit**—Department within an organization. • **State**—State of origin. • **Country**—Country of origin.	**detail**
Alternate subject	Domain name or IP address of the device related to the digital certificate.	**detail**
Validity	Time period when the digital certificate is valid. Values are: • **Not before**—Start time when the digital certificate becomes valid. • **Not after**—End time when the digital certificate becomes invalid.	All levels
Public key algorithm	Encryption algorithm used with the private key, such as **rsaEncryption (1024 bits)**.	All levels
Public key verification status	Public key verification status: **Failed** or **Passed**. The **detail** output also provides the verification hash.	All levels
Signature algorithm	Encryption algorithm that the CA used to sign the digital certificate, such as **sha1WithRSAEncryption**.	**detail**
Fingerprint	Secure Hash Algorithm (SHA1) and Message Digest 5 (MD5) hashes used to identify the digital certificate.	**detail**
Distribution CRL	Distinguished name information and URL for the certificate revocation list (CRL) server.	**detail**
Use for key	Use of the public key, such as **Certificate signing**, **CRL signing**, **Digital signature**, or **Key encipherment**.	**detail**

Sample Output

show security pki local-certificate

```
user@switch> show security pki local-certificate
Certificate identifier: local-entrust2
  Issued to: router2.juniper.net, Issued by: juniper
```


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```
  Validity:
    Not before: 2005 Nov 21st, 23:28:22 GMT
    Not after: 2008 Nov 21st, 23:58:22 GMT
  Public key algorithm: rsaEncryption(1024 bits)
  Public key verification status: Passed
```

show security pki local-certificate detail

```
user@switch> show security pki local-certificate detail
Certificate identifier: local-entrust3
  Certificate version: 3
  Serial number: 4355 94f9
  Issuer:
    Organization: juniper, Country: us
  Subject:
    Organization: juniper, Country: us, Common name: switch1.juniper.net
  Alternate subject: switch1.juniper.net
  Validity:
    Not before: 2005 Nov 21st, 23:33:58 GMT
    Not after: 2008 Nov 22nd, 00:03:58 GMT
  Public key algorithm: rsaEncryption(1024 bits)
  Public key verification status: Passed
    fb:79:df:d4:a9:03:0f:d3:69:7e:c1:e4:27:35:9c:d9:b1:a2:47:78
    d2:6d:f3:e5:f4:68:4f:b3:04:45:88:57:99:82:39:a6:51:9e:5f:42
    23:3f:d7:6e:3d:a5:54:a9:b1:2d:6e:90:dd:12:8a:bf:ef:2b:20:50
    ba:f0:da:d9:0c:ad:5e:d6:c6:98:3a:ae:3f:90:dd:94:78:c1:ea:2e
    7c:f0:2d:d4:79:d4:cd:f0:52:df:5e:72:f2:e7:ae:66:f7:61:f4:bc
    72:57:3e:6c:6d:d3:24:58:8b:f4:ef:da:2a:6a:fa:eb:98:f8:34:84
    79:54:da:4f:d3:6f:52:1f
  Signature algorithm: sha1WithRSAEncryption
  Fingerprint:
    61:3a:d0:b4:7a:16:9b:39:ba:81:3f:9d:ab:34:e5:c8:be:3b:a1:6d (sha1)
    60:a0:ff:58:05:4a:65:73:9d:74:3a:e1:83:6f:1b:c8 (md5)
  Distribution CRL:
    C=us, O=juniper, CN=CRL1
    http://CA-1/CRL/juniper_us_crlfile.crl
  Use for key: Digital signature
```

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show system services dhcp binding

Syntax
show system services dhcp binding
<detail>
<*address*>

Release Information
Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description
(J Series routers only) Display Dynamic Host Configuration Protocol (DHCP) server client binding information.

Options
none—Display brief information about all active client bindings.

detail—(Optional) Display detailed information about all active client bindings.

address—(Optional) Display detailed client binding information for the specified IP address only.

Required Privilege Level
view and system

Related Documentation
- clear system services dhcp binding on page 214

List of Sample Output
show system services dhcp binding on page 231
show system services dhcp binding address on page 231
show system services dhcp binding address detail on page 231

Output Fields
Table 17 on page 230 describes the output fields for the **show system services dhcp binding** command. Output fields are listed in the approximate order in which they appear.

Table 17: show system services dhcp binding Output Fields

Field Name	Field Description	Level of Output
Allocated address	List of IP addresses the DHCP server has assigned to clients.	All levels
MAC address	Corresponding media access control (MAC) hardware address of the client.	All levels
Client identifier	(***address*** option only) Client's unique identifier (represented by an ASCII string or hexadecimal digits). This identifier is used by the DHCP server to index its database of address bindings.	All levels
Binding Type	Type of binding assigned to the client. DHCP servers can assign a dynamic binding from a pool of IP addresses or a static binding to one or more specific IP addresses.	All levels
Lease Expires at	Time the lease expires or **never** for leases that do not expire.	All levels
Lease Obtained at	(***address*** option only) Time the client obtained the lease from the DHCP server.	**detail**

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Table 17: show system services dhcp binding Output Fields *(continued)*

Field Name	Field Description	Level of Output
State	Status of the binding. Bindings can be active or expired.	**detail**
Pool	Address pool that contains the IP address assigned to the client.	**detail**
Request received on	Interface on which the DHCP message exchange occurs. The IP address pool is configured based on the interface's IP address. If a relay agent is used, its IP address is also displayed.	**detail**
DHCP options	User-defined options created for the DHCP server. If no options have been defined, this field is blank.	**detail**

Sample Output

show system services dhcp binding

```
user@host> show system services dhcp binding

Allocated address   MAC address        Binding Type   Lease expires at
192.168.1.2         00:a0:12:00:12:ab  static         never
192.168.1.3         00:a0:12:00:13:02  dynamic        2004-05-03 13:01:42 PDT
```

show system services dhcp binding address

```
user@host> show system services dhcp binding 192.168.1.3

DHCP binding information:
Allocated address: 192.168.1.3
Mac address: 00:a0:12:00:12:ab
Client identifier
61 63 65 64 2d 30 30 3a 61 30 3a 31 32 3a 30 30aced-00:a0:12:00
3a 31 33 3a 30 32:13:02

Lease information:
    Binding Type dynamic
    Obtained at 2004-05-02 13:01:42 PDT
    Expires at 2004-05-03 13:01:42 PDT
```

show system services dhcp binding address detail

```
user@host> show system services dhcp binding 192.168.1.3 detail
DHCP binding information:
Allocated address        192.168.1.3
MAC address  00:a0:12:00:12:ab
    Pool             192.168.1.0/24
Request received on fe-0/0/0, relayed by 192.168.4.254

Lease information:
    Type             DHCP
    Obtained at      2004-05-02 13:01:42 PDT
    Expires at       2004-05-03 13:01:42 PDT
State active

DHCP options:
    Name: name-server, Value: { 6.6.6.6, 6.6.6.7 }
```

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```
Name: domain-name, Value: mydomain.tld
Code: 19, Type: flag, Value: off
Code: 40, Type: string, Value: domain.tld
Code: 32, Type: ip-address, Value: 3.3.3.33
```


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show system services dhcp conflict

Syntax show system services dhcp conflict

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description (J Series routers only and EX Series switches) Display Dynamic Host Configuration Protocol (DHCP) client-detected conflicts for IP addresses. When a conflict is detected, the DHCP server removes the address from the address pool.

Options This command has no options.

Required Privilege Level view and system

Related Documentation
- clear system services dhcp conflict on page 215

List of Sample Output show system services dhcp conflict on page 233

Output Fields Table 18 on page 233 describes the output fields for the **show system services dhcp conflict** command. Output fields are listed in the approximate order in which they appear.

Table 18: show system services dhcp conflict Output Fields

Field Name	Field Description
Detection time	Date and time the client detected the conflict.
Detection method	How the conflict was detected.
Address	IP address where the conflict occurs. The addresses in the conflicts list remain excluded from the pool until you use a **clear system services dhcp conflict** command to manually clear the list.

Sample Output

show system services dhcp conflict

```
user@host> show system services dhcp conflict

Detection time           Detection method  Address
2004-08-03 19:04:00 PDT  ARP               3.3.3.5
2004-08-04 04:23:12 PDT  Ping              4.4.4.8
2004-08-05 21:06:44 PDT  Client            3.3.3.10
```

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show system services dhcp global

Syntax show system services dhcp global

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description (J Series routers and EX Series switches only) Display Dynamic Host Configuration Protocol (DHCP) global configuration options. Global options apply to all scopes and clients served by the DHCP server. Global options are overridden if specified otherwise in scope or client options. Scope options apply to specific subnets or ranges of addresses. Client options apply to specific clients.

Options This command has no options.

Required Privilege Level view and system

List of Sample Output show system services dhcp global on page 235

Output Fields Table 19 on page 234 describes the output fields for the **show system services dhcp global** command. Output fields are listed in the approximate order in which they appear.

Table 19: show system services dhcp global Output Fields

Field Name	Field Description
BOOTP lease length	Length of lease time assigned to BOOTP clients.
Default lease time	Lease time assigned to clients that do not request a specific lease time.
Minimum lease time	Minimum time a client retains an IP address lease on the server.
Maximum lease time	Maximum time a client can retain an IP address lease on the server.
DHCP options	User-defined options created for the DHCP server. If no options have been defined, this field is blank.

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Sample Output

show system services dhcp global

```
user@host> show system services dhcp global

Global settings:
    BOOTP lease length         infinite

DHCP lease times:
    Default lease time         1 hour
    Minimum lease time         2 hours
    Maximum lease time         infinite

DHCP options:
    Name: name-server, Value: { 6.6.6.6, 6.6.6.7 }
    Name: domain-name, Value: mydomain.tld
    Code: 19, Type: flag, Value: off
    Code: 40, Type: string, Value: domain.tld
    Code: 32, Type: ip-address, Value: 3.3.3.33
```

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show system services dhcp pool

Syntax show system services dhcp pool
<detail>
<*subnet-address*>

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description (J Series routers and EX Series switches only) Display Dynamic Host Configuration Protocol (DHCP) server IP address pools.

Options **none**—Display brief information about all IP address pools.

detail—(Optional) Display detailed information.

subnet-address—(Optional) Display information for the specified subnet address.

Required Privilege Level view and system

List of Sample Output
show system services dhcp pool on page 237
show system services dhcp pool subnet-address on page 237
show system services dhcp pool subnet-address detail on page 237

Output Fields Table 20 on page 236 describes the output fields for the **show system services dhcp pool** command. Output fields are listed in the approximate order in which they appear.

Table 20: show system services dhcp pool Output Fields

Field Name	Field Description	Level of Output
Pool name	Subnet on which the IP address pool is defined.	None specified
Low address	Lowest address in the IP address pool.	None specified
High address	Highest address in the IP address pool.	None specified
Excluded addresses	Addresses excluded from the address pool.	None specified
Subnet	(***subnet-address*** option only) Subnet to which the specified address pool belongs.	None specified
Address range	(***subnet-address*** option only) Range of IP addresses in the address pool.	None specified
Addresses assigned	Number of IP addresses in the pool that are assigned to DHCP clients and the total number of IP addresses in the pool.	**detail**
Active	Number of assigned IP addresses in the pool that are active.	**detail**
Excluded	Number of assigned IP addresses in the pool that are excluded.	**detail**
Default lease time	Lease time assigned to clients that do not request a specific lease time.	**detail**

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Table 20: show system services dhcp pool Output Fields *(continued)*

Field Name	Field Description	Level of Output
Minimum lease time	Minimum time a client can retain an IP address lease on the server.	**detail**
Maximum lease time	Maximum time a client can retain an IP address lease on the server.	**detail**
DHCP options	User-defined options created for the DHCP server. If no options have been defined, this field is blank.	**detail**

Sample Output

show system services dhcp pool

```
user@host> show system services dhcp pool

Pool name    Low address   High address   Excluded addresses
3.3.3.0/24   3.3.3.2       3.3.3.254      3.3.3.1
```

show system services dhcp pool subnet-address

```
user@host> show system services dhcp pool 3.3.3.0/24

Pool information:
    Subnet                    3.3.3.0/24
    Address range             3.3.3.2 - 3.3.3.254
    Addresses assigned        2/253
```

show system services dhcp pool subnet-address detail

```
user@host> show system services dhcp pool 3.3.3.0/24 detail

Pool information:
    Subnet                    3.3.3.0/24
    Address range             3.3.3.2 - 3.3.3.254
    Addresses assigned        2/253
      Active: 1, Excluded: 1

DHCP lease times:
    Default lease time        1 hour
    Minimum lease time        2 hours
    Maximum lease time        infinite

DHCP options:
    Name: name-server, Value: { 6.6.6.6, 6.6.6.7 }
    Name: domain-name, Value: mydomain.tld
    Name: router, Value: { 3.3.3.1 }
    Name: server-identifier, Value: 3.3.3.1
    Code: 19, Type: flag, Value: off
    Code: 40, Type: string, Value: domain.tld
    Code: 32, Type: ip-address, Value: 3.3.3.333.3.3.254 3.3.3.1
```

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show system services dhcp statistics

Syntax show system services dhcp statistics

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description (J Series routers and EX Series switches only) Display Dynamic Host Configuration Protocol (DHCP) server statistics.

Options This command has no options.

Required Privilege Level view and system

Related Documentation
- clear system services dhcp statistics on page 216

List of Sample Output show system services dhcp statistics on page 239

Output Fields Table 21 on page 238 describes the output fields for the **show system services dhcp statistics** command. Output fields are listed in the approximate order in which they appear.

Table 21: show system services dhcp statistics Output Fields

Field Name	Field Description
Default lease time	Lease time assigned to clients that do not request a specific lease time.
Minimum lease time	Minimum time a client can retain an IP address lease on the server.
Maximum lease time	Maximum time a client can retain an IP address lease on the server.
Packets dropped	Total number of packets dropped and number of packets dropped because of: • Invalid hardware address • Invalid opcode • Invalid server address • No available address • No interface match • No routing instance match • No valid local addresses • Packet too short • Read error • Send error

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Table 21: show system services dhcp statistics Output Fields *(continued)*

Field Name	Field Description
Messages received	Number of the following message types sent from DHCP clients and received by the DHCP server: • BOOTREQUEST • DHCPDECLINE • DHCPDISCOVER • DHCPINFORM • DHCPRELEASE • DHCPREQUEST
Messages sent	Number of the following message types sent from the DHCP server to DHCP clients: • BOOTREPLY • DHCPACK • DHCPOFFER • DHCPNAK

Sample Output

show system services dhcp statistics

```
user@host> show system services dhcp statistics

DHCP lease times:
    Default lease time         1 hour
    Minimum lease time         2 hours
    Maximum lease time         infinite

Packets dropped:
    Total                      0
    Bad hardware address       0
    Bad opcode                 0
    Invalid server address     0
    No available addresses     0
    No interface match         0
    No routing instance match  0
    No valid local address     0
    Packet too short           0
    Read error                 0
    Send error                 0

Messages received:
    BOOTREQUEST                0
    DHCPDECLINE                0
    DHCPDISCOVER               0
    DHCPINFORM                 0
    DHCPRELEASE                0
    DHCPREQUEST                0

Messages sent:
    BOOTREPLY                  0
    DHCPACK                    0
    DHCPOFFER                  0
    DHCPNAK                    0
```

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show system services service-deployment

Syntax show system services service-deployment

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 information about a Session and Resource Control (SRC) client.

Options This command has no options.

Required Privilege Level system
view

List of Sample Output show system services service-deployment on page 241

Output Fields Table 22 on page 241 lists the output fields for the **show system services service-deployment** command. Output fields are listed in the approximate order in which they appear.

Table 22: show system services service-deployment Output Fields

Field Name	Field Description
PDT Keepalive settings	Configured PDT keepalive interval, in seconds.
Keepalives sent	Number of keepalives sent.
Notifications sent	Number of notifications sent.
Last update from peer	Time at which the last update from a peer was received.

Sample Output

show system services service-deployment

```
user@host> show system services service-deployment
Connected to 192.4.4.4 port 10288 since 2004-05-03 11:04:34 PDT Keepalive settings:
 Interval 15 seconds Keepalives sent: 750 Notifications sent: 0 Last update from
 peer: 00:00:06 ago
```

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ssh

List of Syntax

Syntax on page 242
Syntax (EX Series Switch and the QFX Series) on page 242

Syntax

ssh *host*
<bypass-routing>
<inet | inet6>
<interface *interface-name*>
<logical-system *logical-system-name*>
<routing-instance *routing-instance-name*>
<source *address*>
<v1 | v2>

Syntax (EX Series Switch and the QFX Series)

ssh *host*
<bypass-routing>
<inet | inet6>
<interface *interface-name*>
<routing-instance *routing-instance-name*>
<source *address*>
<v1 | v2>

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

Use the SSH program to open a connection between a local router or switch and a remote system and execute commands on the remote system. You can issue the **ssh** command from the Junos OS CLI to log in to a remote system or from a remote system to log in to the local router or switch. When executing this command, you include one or more CLI commands by enclosing them in quotation marks and separating the commands with semicolons:

ssh *address* '*cli-command1* ; *cli-command2* '

Options

host—Name or address of the remote system.

bypass-routing—(Optional) Bypass the normal routing tables and send ping requests directly to a system on an attached network. If the system is not on a directly attached network, an error is returned. Use this option to ping a local system through an interface that has no route through it.

inet | inet6—(Optional) Create an IPv4 or IPv6 connection, respectively.

interface *interface-name*—(Optional) Interface name for the SSH session. (This option does not work when **default-address-selection** is configured at the **[edit system]** hierarchy level, because this configuration uses the loopback interface as the source address for all locally generated IP packets.)

logical-system *logical-system-name*—(Optional) Name of a particular logical system for the SSH attempt.

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routing-instance ***routing-instance-name***—(Optional) Name of the routing instance for the SSH attempt.

source ***address***—(Optional) Source address of the SSH connection.

v1 | v2—(Optional) Use SSH version 1 or 2, respectively, when connecting to a remote host.

Additional Information

To configure an SSH (version 1) key for your user account, include the **authentication ssh-rsa** statement at the **[edit system login user** ***user-name*****]** hierarchy level. To configure an SSH (version 2) key for your user account, include the **authentication dsa-rsa** statement at the **[edit system login user** ***user-name*****]** hierarchy level.

You can limit the number of times a user can attempt to enter a password while logging in through SSH. To specify the number of times a user can attempt to enter a password to log in through SSH, include the **retry-options** statement at the **[edit system login]** hierarchy level. For details, see the .

Required Privilege Level

network

Related Documentation

- *Configuring SSH Host Keys for Secure Copying of Data*

List of Sample Output

ssh on page 243

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

ssh

```
user@switch> ssh cree
Host key not found from the list of known hosts.
Are you sure you want to continue connecting (yes/no)? yes

Host ?cree' added to the list of known hosts.
boojun@cree's password:
Last login: Sun Jun 21 10:43:42 1998 from junos-router
% ...
```

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telnet

List of Syntax
Syntax on page 244
Syntax (EX Series Switches) on page 244

Syntax

telnet *host*
<8bit>
<bypass-routing>
<inet | inet6>
<interface *interface-name*>
<logical-system *logical-system-name*>
<no-resolve>
<port *port-number*>
<routing-instance *routing-instance-name*>
<source *source-address*>

Syntax (EX Series Switches)

telnet *host*
<8bit>
<bypass-routing>
<inet | inet6>
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<source *source-address*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.

Description

Open a telnet session to a remote system. Type Ctrl+] to escape from the telnet session to the telnet command level, and then type **quit** to exit from telnet.

Options

host—Name or address of the remote system.

8bit—(Optional) Use an 8-bit data path.

bypass-routing—(Optional) Bypass the normal routing tables and send ping requests directly to a system on an attached network. If the system is not on a directly attached network, an error is returned. Use this option to ping a local system through an interface that has no route through it.

inet | inet6—(Optional) Open an IPv4 or IPv6 session, respectively.

interface *interface-name*—(Optional) Interface name for the telnet session. (This option does not work when **default-address-selection** is configured at the **[edit system]** hierarchy level, because this configuration uses the loopback interface as the source address for all locally generated IP packets.)

logical-system *logical-system-name*—(Optional) Name of a particular logical system for the telnet attempt.

no-resolve—(Optional) Do not attempt to determine the hostname that corresponds to the IP address.

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port ***port-number***—(Optional) Port number or service name on the remote system.

routing-instance ***routing-instance-name***—(Optional) Name of the routing instance for the telnet attempt.

source ***source-address***—(Optional) Source address of the telnet connection.

Additional Information You can limit the number of times a user can attempt to enter a password while logging in through telnet. To specify the number of times a user can attempt to enter a password to log in through telnet, include the **retry-options** statement at the [**edit system login**] hierarchy level. For details, see the *Junos OS Administration Library for Routing Devices*.

Required Privilege Level network

List of Sample Output telnet on page 245

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

telnet

```
user@host> telnet 192.154.1.254
Trying 192.154.169.254...
Connected to level5.company.net.
Escape character is '^]'.
ttypa
login:
```

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